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TMI-25-002
April 24, 2025

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

Three Mile Island Nuclear Station, Unit 1
Renewed Facility License No. DPR-50
NRC Docket Nos. 50-289 & 72-077

Three Mile Island Nuclear Station, Unit 2
Possession Only License No. DPR-73
NRC Docket No. 50-320

Subject: Annual Radiological Environmental Operating Report
January 1, 2024 through December 31, 2024

In accordance with Three Mile Island Unit 1 (TMI-1) Technical Specification (TS) 6.1.1 and TMI Unit 2 (TMI-2) TS 6.8.1.2, as well as Section E.7.2 of the Constellation Decommissioning Quality Assurance Program, enclosed is the Annual Radiological Environmental Operating Report (AREOR) covering the time period for January 1 through December 31, 2024, for the Three Mile Island Nuclear Station.

There are no new or revised regulatory commitments contained in this letter.

For questions regarding this submittal, please contact Dani Brookhart, Offsite Dose Calculation Manual (ODCM) Chemist, at Dani.Brookhart@constellation.com.

Respectfully,

Trevor L. Orth
Plant Manager
Crane Clean Energy Center

Attachment: Three Mile Island 2024 Annual Radiological Environmental Operating Report

cc: w/Attachment
NRC Regional Administrator – Region I
NRC Project Manager, NRR-DORL – TMI-1
NRC Project Manager, NMSS – TMI-1 and TMI-2
Licensing Manager, TMI-2 Solutions, LLC
Director, Bureau of Radiation Protection – PA Dept of Environmental Protection
Chairman, Board of County Commissioners of Dauphin County
Chairman, Board of Supervisors of Londonderry Township

THREE MILE ISLAND NUCLEAR STATION UNITS 1 AND 2

2024

Annual Radiological Environmental Operating Report

Document Number: 50-289, 50-320

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1.0 LIST OF ACRONYMS AND DEFINITIONS

1. Airborne Activity Sampling: Continuous sampling of air through the collection of particulates and radionuclides on filter media.
2. ARERR: Annual Radioactive Effluent Release Report
3. AREOR: Annual Radiological Environmental Operating Report
4. BWR: Boiling Water Reactor
5. Composite Sample: A series of single collected portions (aliquots) analyzed as one sample. The aliquots making up the sample are collected at time intervals that are very short compared to the composite period.
6. Control: A sampling station in a location not likely to be affected by plant effluents due to its distance and/or direction from the station.
7. Curie (Ci): A measure of radioactivity; equal to 3.7×10^{10} disintegrations per second, or 2.22×10^{12} disintegrations per minute.
8. Direct Radiation Monitoring: The measurement of radiation dose at various distances from the plant is assessed using Thermoluminescent Dosimeters (TLD), Optically Stimulated Luminescence Dosimeters (OSLD) and pressurized ionization chambers.
9. EPA: Environmental Protection Agency
10. GPI: Groundwater Protection Initiative
11. Grab Sample: A single discrete sample drawn at one point in time.
12. Indicator: A sampling location that is likely to be affected by plant effluents due to its proximity and/or direction from the plant.
13. Ingestion Pathway: The ingestion pathway includes milk, fish, drinking water and garden produce. Also sampled (under special circumstances) are other media such as vegetation or animal products when additional information about particular radionuclides is needed.
14. ISFSI: Independent Spent Fuel Storage Installation
15. Lower Limit of Detection (LLD): An *a priori* measure of the detection capability of a radiochemistry measurement based on instrument setup, calibration, background, decay time, and sample volume. An LLD is expressed as an activity concentration. The MDA is used for reporting results. LLD are specified by a regulator, such as the NRC and are typically listed in the ODCM.

16. MDA: Minimum Detectable Activity. For radiochemistry instruments, the MDA is the *a posteriori* minimum concentration that a counting system detects. The smallest concentration or activity of radioactive material in a sample that will yield a net count above instrument background and that is detected with 95% probability, with only five % probability of falsely concluding that a blank observation represents a true signal.

17. MDC: Minimum Detectable Concentration. Essentially synonymous with MDA for the purposes of radiological monitoring.

18. Mean: The sum of all of the values in a distribution divided by the number of values in the distribution, synonymous with average.

19. Microcurie: 3.7×10^4 disintegrations per second, or 2.22×10^6 disintegrations per minute.

20. N/A: Not Applicable

21. NEI: Nuclear Energy Institute

22. NIST: National Institute of Standards and Technology.

23. NRC: Nuclear Regulatory Commission

24. ODCM: Offsite Dose Calculation Manual

25. OSLD: Optically Stimulated Luminescence Dosimeter

26. pCi/L: picocuries / Liter

27. PWR: Pressurized Water Reactor

28. REMP: Radiological Environmental Monitoring Program

29. TLD: Thermoluminescent Dosimeter

2.0 EXECUTIVE SUMMARY

THREE MILE ISLAND NUCLEAR STATION UNITS 1 AND 2 Radiological Environmental Monitoring Program (REMP) was established prior to the station becoming operational to provide information on background radiation present in the area. The goal of TMI REMP is to evaluate the impact of the station on the environment. Environmental samples from different media are monitored as part of the program in accordance with specifications detailed in the Offsite Dose Calculation Manual (ODCM) and TMI Technical Specifications. The program compares data from Indicator locations near the plant, to Control locations farther away from the site to assess operation impacts.

The Annual Radiological Environmental Operating Report (AREOR) provides data obtained through analyses of environmental samples collected at TMI for the reporting period of January 1st through December 31st, 2024. During that time period 2342 analyses were performed on 1769 samples. In assessing all the data gathered for this report and comparing these results with preoperation it was concluded that the operation of TMI, 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 2024 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 2024 did not have any adverse effects on the health of the public or on the environment.

2.1 Summary of Conclusions:

No measurable activities above background levels were detected. All values were consistent with historical results which indicate no adverse radiological environmental impacts associated with the operation of TMI. Naturally occurring radionuclides are present in the Earth's crust and atmosphere and exists in detectable quantities throughout the world. It is common to detect naturally occurring radionuclides in many of the samples collected for REMP. Some examples of naturally occurring radionuclides that are frequently seen in samples are Potassium-40, Beryllium-7, Actinium-228 (present as a decay product of Radium-228), and Radium-226. Additionally, some relatively long-lived anthropogenic radioisotopes, such as Strontium-90 (SR-90) and Cesium-137 (Cs-137), are also seen in some REMP samples; these radionuclides exist in measurable quantities throughout the world as a result of fallout from historic atmospheric nuclear weapons testing.

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 Beryllium-7 (Be-7) was detected at levels consistent with those detected in previous years. No other activation products 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 or in sediment samples.

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

Food Product samples were analyzed for concentrations of gamma-emitting nuclides including I-131 and Sr-90. Concentrations of naturally occurring Be-7 and K-40 were consistent with those detected in previous years. Low level Sr-90 was detected in Tomatoes collected 08/14/2024 at E1-2 East of site at Visitor's Center at 10.9 ± 3.03 pCi/kg wet. No other fission or activation products were detected. Detailed information on the exposure of the U.S. population to ionizing radiation can be found in NCRP Report No. 160 .

Calculated Maximum Hypothetical Doses to an Individual from 2024 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	Calculated Dose (mrem/yr) TMI-2
From Radionuclides in Liquid Releases	3 total body, or	1.37E-02	8.76E-04
	10 any organ	1.97E-02	1.39E-03
From Radionuclides in Airborne Releases (Noble Gases)	5 total body, or	0*	0*
	15 skin	0*	0*
From Radionuclides in Airborne Releases (Iodines, Tritium and Particulates)	15 any organ	2.45E-04	8.10E-06

*No noble gases were released from TMI-1 and TMI-2.

	USEPA 40 CFR 190 Limits (mrem/yr)	Calculated Dose (mrem/yr) TMI-1 and TMI-2 Combined**
Total from Site	75 thyroid	0.298
	25 total body or other organs	0.332

**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 2024 TMINS operations was 0.296 mrem/yr based on calculations from ANSI/HI Standard N13.37.

Calculated Whole Body Doses to the Maximum Individual from 2024 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	1.37E-02	8.76E-04
From Radionuclides in Airborne Releases (Noble Gases)	0*	0*
From Radionuclides in Airborne Releases (Iodines, Tritium and Particulates)	2.45E-04	3.10E-06

*No noble gases were released from TMI-1 or TMI-2.

Individual Whole Body Dose Due to TMI-1 and TMI-2 Operations: 0.015 mrem/yr

Individual Whole Body Dose Due to Natural Background Radiation (1) 311 mrem/yr

(1) NCRP 160 – (2009)

3.0 INTRODUCTION

The Radiological Environmental Monitoring Program (REMP) provides data on measurable levels of radiation and radioactive materials in the environment. This program also evaluates the relationship between quantities of radioactive materials released from the plant and resultant doses to individuals from principal pathways of exposure. In this capacity, REMP provides a check on the effluent release program and dispersion modeling to ensure that concentrations in the environment due to radioactive effluents conform to the "As Low as Is Reasonably Achievable" (ALARA) design objectives of 10 CFR 50, Appendix I , and implements the requirements of Section IV.B.2 and IV.B.3 of Appendix I. REMP is designed to conform to the Nuclear Regulatory Commission (NRC) Regulatory Guide 4.1, NUREG 1301/1302 , and the 1979 NRC Branch Technical Position .

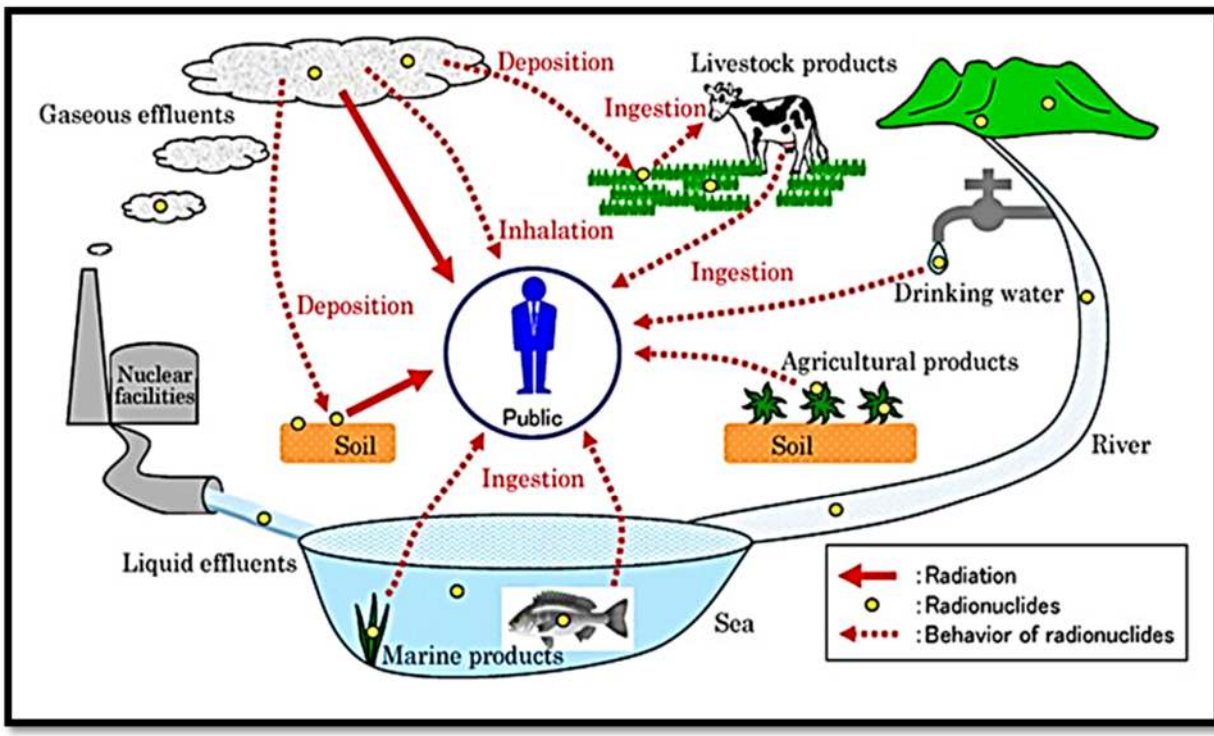

Figure 1, Potential exposure pathways to Members of the Public due to Plant Operations

Quality assurance aspects of the sampling program and TLD/OSLD data collection are conducted in accordance with Regulatory Guides 4.15 and 4.13 . REMP also adheres to the requirements of Pennsylvania, TMI Technical Specifications, and Offsite Dose Calculation Manual (ODCM). These governing documents dictate the environmental sampling, sample analysis protocols, data reporting and quality assurance requirements for the environmental monitoring program.

The Annual Radiological Environmental Operating Report (AREOR) provides summaries of the environmental data from exposure pathways, interpretations of the data, and analyses of trends of the results. Routinely monitored pathways include ingestion, inhalation, and direct radiation. Routes of exposure are based on site specific information such as meteorology, receptor locations, and water usage around the plant.

4.0 SITE DESCRIPTION AND SAMPLE LOCATIONS

THREE MILE ISLAND NUCLEAR STATION UNITS 1 AND 2 is a commercial nuclear power plant that achieved initial criticality in 1974 and 1978 Respectively. 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 Constellation Energy Company (formerly Exelon). TMI-2 is operated and owned by TMI-2 Solutions, LLC. The Three Mile Island Unit 2 (TMI-2) operating license was issued on February 8, 1978, and commercial operation was declared on December 30, 1978. On March 28, 1979, the unit experienced an accident that resulted in severe damage to the reactor core. TMI-2 has been in a non-operating status since that time. GPU Nuclear (GPUN) conducted a substantial program to defuel the Reactor Vessel (RV) and decontaminate the facility. As a result, TMI-2 was defueled and decontaminated to the extent that the plant was placed in a safe, inherently stable condition suitable for long-term management, and any threat to public health and safety had been minimized. This long-term management condition, termed Post-Defueling Monitored Storage (PDMS), was entered in December 1993.

In December 2020, the Nuclear Regulatory Commission (NRC) approved the transfer of GPUN Possession Only License No. DPR-73 for Three Mile Island Nuclear Station (TMINS) Unit 2 to TMI-2 Solutions. In February 2021, TMI-2 Solutions submitted a License Amendment Request (LAR) to the NRC to modify the TMI-2 Technical Specifications to permit the completion of the decommissioning of TMI-2. Following NRC approval and issuance of associated changes to the Possession Only License, TMI-2 exited PDMS and entered Decommissioning on March 31, 2023.

See the Land Use Census in Section 9 for population around the area, nearest privately-owned land, etc.

TMI sampling media are selected based on site specific information such as meteorology, receptor locations, and water usage around the plant. Sampling and analysis frequencies are documented in the Offsite Dose Calculation Manual and site procedures. Required sampling, analysis frequencies and location of sample collected are captured in the following tables and figures:

- Table 1, Radiological Environmental Monitoring Program – Direct Radiation
- Table 2, Radiological Environmental Monitoring Program – Airborne
- Table 3, Radiological Environmental Monitoring Program – Waterborne

- Table 4, Radiological Environmental Monitoring Program – Ingestion
- Table 5, REMP Sampling Locations – Direct Radiation
- Figure 2, REMP Sample Locations (Near Field/Site Boundary)
- Figure 3, REMP Sample Locations (Far Field)
- Figure 4, REMP Sample Locations (Onsite)

5.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM REQUIREMENTS

Table 1, Radiological Environmental Monitoring Program – Direct Radiation

Requirement	Sample Location Description, Distance, and Direction	Sampling Collection/ Frequency	Type and Frequency of Analyses
Direct Radiation 40 Routine monitoring stations with two or more dosimeters placed as follows: An inner ring of stations, one in each compass sector in the general area of the site boundary. An outer ring of stations, one in each compass sector at approximately 6-8 kilometers or 3.7-5 miles from the site; and Special interest areas, such as population centers, nearby recreation areas, and control stations	See Table 5	Quarterly	Analyze for gamma dose quarterly

Table 2, Radiological Environmental Monitoring Program – Airborne

Requirement	Sample Location Description, Distance, and Direction	Sampling Collection/ Frequency	Type and Frequency of Analyses
<u>Airborne Radioiodine and Particulates</u> Samples from 5 locations: Three locations close to the site boundary in different sectors of the highest calculated annual average ground level D/Q. One sample from the vicinity of a community having the highest calculated annual average ground level D/Q. One sample from a Control Location, approximately 15 to 30 kilometers or 9 to 19miles away in a less prevalent wind direction	E1-2: Visitor's Center 0.4 miles 97 degrees F1-3: 500kv Substation 0.6 miles 112 degrees G2-1: Farm on Becker Rd 1.4 miles 126 degrees M2-1: Goldsboro 1.3 miles 256 degrees A3-1: Mill St Substation 2.7 miles 357 degrees H3-1: Falmouth-Collins Substation 2.2 miles 160 degrees Q15-1: behind West Fairview Fire Dept. 13.4 miles 309 degrees	Continuous sampler operation with sample collection weekly	Particulate sampler: Analyze for gross beta radioactivity ≥ 24 hours following filter change / Weekly. Perform gamma isotopic analysis on each sample when gross beta activity is > 10 times the yearly mean of control samples. Perform gamma isotopic analysis on composite sample (by location)/Quarterly. Radioiodine canister: I-131 analysis/Weekly.

Table 3, Radiological Environmental Monitoring Program – Waterborne

Requirement	Sample Location Description, Distance, and Direction	Sampling Collection/ Frequency	Type and Frequency of Analyses
Surface Water 1 sample upstream (control) and 1 sample downstream (indicator)	A3-2: Swatara Creek, Middletown, 2.7 miles 356 degrees Q9-1: near intake Steelton Water Company, 8.5 miles 310 degrees J1-2: Downstream of TMINS liquid discharge, 0.5 miles 188 degrees	Composite sample over 1 monthly period	Gamma isotopic analysis monthly. Composite for tritium analysis quarterly.
Drinking Water 1 sample upstream (control) and 1 sample at nearest water supply that could be affected by the station discharge (indicator)	Q9-1: at Steelton Water Company, 8.5 miles 310 degrees G15-2: Wrightsville Water Treatment Plant, 13.3 miles 129 degrees G15-3: Lancaster Water Treatment Plant, 15.7 miles 124 degrees	Composite sample over 1 monthly period	Perform gross beta and gamma isotopic analysis monthly. Perform Sr-90 analysis if gross beta of monthly composite >10 times control. Composite for tritium analysis quarterly.
Sediment from Shoreline 1 sample upstream (control) 1 sample downstream (indicator)	A1-3: near north tip of TMI in Susquehanna River, 0.6 miles 359 degrees K1-3: downstream of TMINS liquid discharge in Susquehanna River, 0.2 miles 213 degrees J2-1: South of TMINS upstream of York Haven Dam, in Susquehanna River, 1.4 miles 179 degrees	Semiannual (Spring and Fall)	Gamma isotopic analysis on each sample.

Table 4, Radiological Environmental Monitoring Program – Ingestion

Requirement	Sample Location Description, Distance, and Direction	Sampling Collection/ Frequency	Type and Frequency of Analyses
Milk: Four samples from milking animals in three locations within 5 km distance having the highest dose potential. If there are none, then one sample from milking animals in each of three areas between 5 to 8 km distant where doses are calculated to be greater than 1 mrem per yr. One sample from milking animals at a control location 15 to 30 km distant and in the least prevalent wind direction.	Farm F4-1: ESE Turnpike Rd. 3.2 miles 104 degrees Farm G2-1: Becker Farm 1.4 miles 126 degrees P4-1: Fisher Farm 3.6 miles 295 degrees Farm J18-1: York, 17.6 miles 188 degrees	Semimonthly when animals are on pasture, monthly at other times.	Gamma isotopic analysis and I-131 analysis on each sample. Composite for Sr-90 analysis quarterly.
Fish and Invertebrates: Four samples from 2 locations: • One sample of recreationally important bottom feeders and 1 sample of recreationally important predators in the vicinity of the station discharge. One sample of recreationally important bottom feeders and 1 sample of recreationally important predators from an area not [1]influenced by the station discharge.	IND: Downstream of Station Discharge BKG: Upstream of Station Discharge	Sample twice per year (Spring and Fall).	Perform gamma isotopic and Sr-90 analysis on edible portions.

[1] P4-1 Farmer indicated milk to be produced again in the future.

Food Products: *Samples from 2 locations (when available)* • *1 sample of each principal class of food products at a location in the immediate vicinity of the station. (indicator)* • *1 sample of same species or group from a location not influenced by the station discharge.(Control)*	**Station E1-2:** East of site at Visitors Center 0.4 miles 97 degrees **Station B10-2:** Milton Hershey School 10.0 miles 31 degrees	Sample at time of harvest.	Perform gamma isotopic, and I-131, analysis on edible portions. Sr-90 analysis on green leafy vegetables or vegetation only.
Three different kinds of broad leaf vegetation grown nearest each of two different offsite locations of highest predicted annual average ground level D/Q if milk sampling is not performed and one sample collected from the control location. *One sample of each of the similar broad leaf vegetation grown 15 to 30 km distant in a less prevalent wind direction if milk sampling is not performed.*	**Station E1-2:** East of site at Visitors Center 0.4 miles 97 degrees **Station H1-2**: Red Hill Market 1.0 mile 151 degrees **Station B10-2:** Milton Hershey School 10.0 miles 31 degrees	Monthly during growing season	Perform gamma isotopic I-131 analysis.

Table 5, REMP Sampling Locations – Direct Radiation

Site #	Location Type	Sector	Distance	Description
A1-4	Inner Ring	A	0.3	N of Reactor Building on W fence adjacent to North Weather Station, TMI
B1-1	Inner Ring	B	0.6	NNE of site on light pole in middle of North Bridge, TMI
B1-2	Inner Ring	B	0.4	NNE of Reactor Building on top of dike, TMI
C1-2	Inner Ring	C	0.3	NE of site along Route 441 N
D1-1	Inner Ring	D	0.2	ENE of Reactor Building on top of dike, TMI
E1-2	Inner Ring	E	0.4	E of site at TMI Visitor's Center
E1-4	Inner Ring	E	0.2	E of Reactor Building on top of dike, TMI
F1-2	Inner Ring	F	0.2	ESE of Reactor Building on top of dike midway within ISWSF, TMI
G1-3	Inner Ring	G	0.2	SE of Reactor Building on top of dike, TMI
H1-1	Inner Ring	H	0.5	SSE of site, TMI
H1-3*	Inner Ring	H	0.1	SSE of site, TMI
J1-1	Inner Ring	J	0.8	S of site, TMI
J1-3	Inner Ring	J	0.3	S of Reactor Building just S of SOB, TMI
J1-4*	Inner Ring	J	0.1	S of site, TMI
K1-4	Inner Ring	K	0.2	SSW of Reactor Building on top of dike behind Warehouse 2, TMI

Table 5, REMP Sampling Locations – Direct Radiation

Site #	Location Type	Sector	Distance	Description
K1-5*	Inner Ring	K	0.1	SSW of site, TNI
L1-1	Inner Ring	L	0.1	SW of site on top of dike W of Mech. Draft Cooling Tower, TMI
M1-1	Inner Ring	M	0.1	WSW of Reactor Building on SE corner of U-2 Screenhouse fence, TMI
N1-3	Inner Ring	N	0.1	W of Reactor Building on fence adjacent to Screenhouse entrance gate, TMI
P1-1	Inner Ring	P	0.4	WNW of site on Shelley Island
P1-2	Inner Ring	P	0.1	WNW of Reactor Building on fence N of Unit 1 Screenhouse, TMI
Q1-2	Inner Ring	Q	0.2	NW of Reactor Building on fence W of Warehouse 1, TMI
R1-1	Inner Ring	R	0.2	NNW of Reactor Building along W fence, TMI
C2-1	Inner Ring	C	1.5	NE of site at Middletown Junction
K2-1	Inner Ring	K	1.2	SSW of site on S. Shelley Island
M2-1	Inner Ring	M	1.3	WSW of site along Route 262 and adjacent to Fishing Creek, Goldsboro
A3-1	Inner Ring	A	2.7	N of site at Mill Street Substation
H3-1	Inner Ring	H	2.2	SSE of site, TMI
L1-2	Inner Ring	L	1	Beech Island, 2nd dock down from the northern tip on the western side of the island
R3-1	Inner Ring	R	2.6	NNW of site at Crawford Station, Middletown

Table 5, REMP Sampling Locations – Direct Radiation

Site #	Location Type	Sector	Distance	Description
F1-1	Inner Ring	F	1	500 KV Substation
G2-4	Inner Ring	G	2	East Falmouth
G1-2	Inner Ring	G	1	Red Hill
A5-1	Outer Ring	A	4.4	N of site on Vine Street Exit off Route 283
B5-1	Outer Ring	B	4.9	NNE of site at intersection of School House and Miller Roads
C5-1	Outer Ring	C	4.7	NE of site on Kennedy Lane
E5-1	Outer Ring	E	4.7	E of site at intersection of N. Market Street (Route 230) and Zeager Road
F5-1	Outer Ring	F	4.7	ESE of site along Amosite Road
G5-1	Outer Ring	G	4.8	SE of site at intersection of Bainbridge and Risser Roads
H5-1	Outer Ring	H	4.1	SSE of site by Guard Shack at Brunner Island Steam Electric Station
J5-1	Outer Ring	J	4.9	S of site along Canal Road, Conewago Heights
K5-1	Outer Ring	K	4.9	SSW of site along Conewago Creek Road, Strinestown
L5-1	Outer Ring	L	4.1	SW of site at intersection of Stevens and Wilson Roads
M5-1	Outer Ring	M	4.3	WSW of site at intersection of Lewisberry and Roxberry Roads, Newberrytown
N5-1	Outer Ring	N	4.9	W of site off of Old York Road along Robin Hood Drive

Table 5, REMP Sampling Locations – Direct Radiation

Site #	Location Type	Sector	Distance	Description
P5-1	Outer Ring	P	5.0	WNW of site at intersection of Valley Rd (Route 262) and Beinhower Rd
Q5-1	Outer Ring	Q	5.0	NW of site along Lumber Street, Highspire
R5-1	Outer Ring	R	4.9	NNW of site at intersection of Spring Garden Drive and Route 441
D6-1	Special Interest	D	5.2	ENE of site off Beagle Road
E7-1	Special Interest	E	6.7	E of site along Hummelstown Street, Elizabethtown
Q9-1	Special Interest	Q	8.5	NW of site at the Steelton Water Company
B10-1	Special Interest	B	9.2	NNE of site at intersection of West Areba Avenue and Mill Street, Hershey
G10-1	Special Interest	G	9.7	SE of site at farm along Engles Tollgate Road, Marietta
G15-1	Special Interest	G	14.4	SE of site at Columbia Water Treatment Plant
J15-1	Special Interest	J	12.6	S of site in Met-Ed York Load Dispatch Station
Q15-1	Special Interest	Q	13.4	NW of site behind West Fairview Fire Dept. Social Hall (abandoned)
R15-1	Special Interest	R	15	Colonial Park
A9-3	Special Interest	A	8	N of site at Duke Street Pumping Station, Hummelstown
B2-1	Inner Ring	B	1.9	NNE of site on Sunset Dr. (off Hillsdale Rd.)

Table 5, REMP Sampling Locations – Direct Radiation

Site #	Location Type	Sector	Distance	Description
C1-1	Inner Ring	C	0.7	NE of site along Route 441 N
C8-1	Special Interest	C	7.1	NE of site at Schenk's Church on School House Road
D1-2	Inner Ring	D	0.5	ENE of site off Route 441 along lane between garden center & residence
D2-2	Inner Ring	D	1.6	ENE of site along Hillsdale Rd. (S of Zion Rd.)
D15-1	Special Interest	D	10.8	ENE of site along Route 241, Lawn
E2-3	Inner Ring	E	2	E of site along Hillsdale Rd. (N of Creek Rd.)
F1-4	Inner Ring	F	0.2	ESE of Reactor Building on top of dike, TMI
F2-1	Inner Ring	F	1.3	ESE of site along Engle Road
F10-1	Special Interest	F	9.4	ESE of site along ESE of site along Donegal Springs
F25-1	Special Interest	F	22	ESE of site at intersection of Steel Way and Loop Roads, Lancaster
G1-5	Inner Ring	G	0.3	SE of Reactor Building on top of dike, TMI
G1-6	Inner Ring	G	0.3	SE of Reactor Building on top of dike, TMI
L15-1	Special Interest	L	11.8	SW of site on W side of Route 74, rear of church, Mt. Royal
M1-2	Inner Ring	M	0.4	WSW of site on E side of Shelley Island, Lot #157
M9-1	Special Interest	M	8.7	WSW of site along Alpine Road, Maytown

Table 5, REMP Sampling Locations – Direct Radiation

Site #	Location Type	Sector	Distance	Description
N1-1	Inner Ring	N	0.7	W of site on W side of Shelley Island, between lots #13 and #14
N2-1	Inner Ring	N	1.2	W of site at Goldsboro Marina
N8-1	Special Interest	N	7.7	W of site along Route 382, 1/2 mile north of Lewisberry
N15-2	Special Interest	N	10.4	W of site at intersection of Lisburn Road and Main Street, Lisburn
P2-1	Inner Ring	P	1.9	WNW of site along Route 262
P8-1	Special Interest	P	7.9	WNW of site along Evergreen Road, Reesers Summit
Q1-1	Inner Ring	Q	0.5	NW of site on E side of Shelley Island
Q2-1	Inner Ring	Q	1.9	NW of site along access road along river
R1-2	Inner Ring	R	1.7	NNW of site on central Henry Island
R9-1	Special Interest	R	8	NNW of site at intersection of Derry and 66th Streets, Rutherford Heights
L2-1	Inner Ring	L	2	River Road
K3-1	Inner Ring	K	3	On utility pole 0.4 miles past baseball field
J3-1	Inner Ring	J	3	On Utility pole directly under power lines
H3-1	Inner Ring	H	3	Falmouth
K8-1	Special Interest	K	8	Zion's View

Table 5, REMP Sampling Locations – Direct Radiation

Site #	Location Type	Sector	Distance	Description
J7-1	Special Interest	J	7	On utility pole past garage on right
H8-1	Special Interest	H	8	Starview
H15-1	Special Interest	H	15	Wilshire Hills
K15-1	Special Interest	K	15	Robin's Nest
L8-1	Special Interest	L	8	Andersontown
* Control Locations				

6.0 MAPS OF COLLECTION SITES

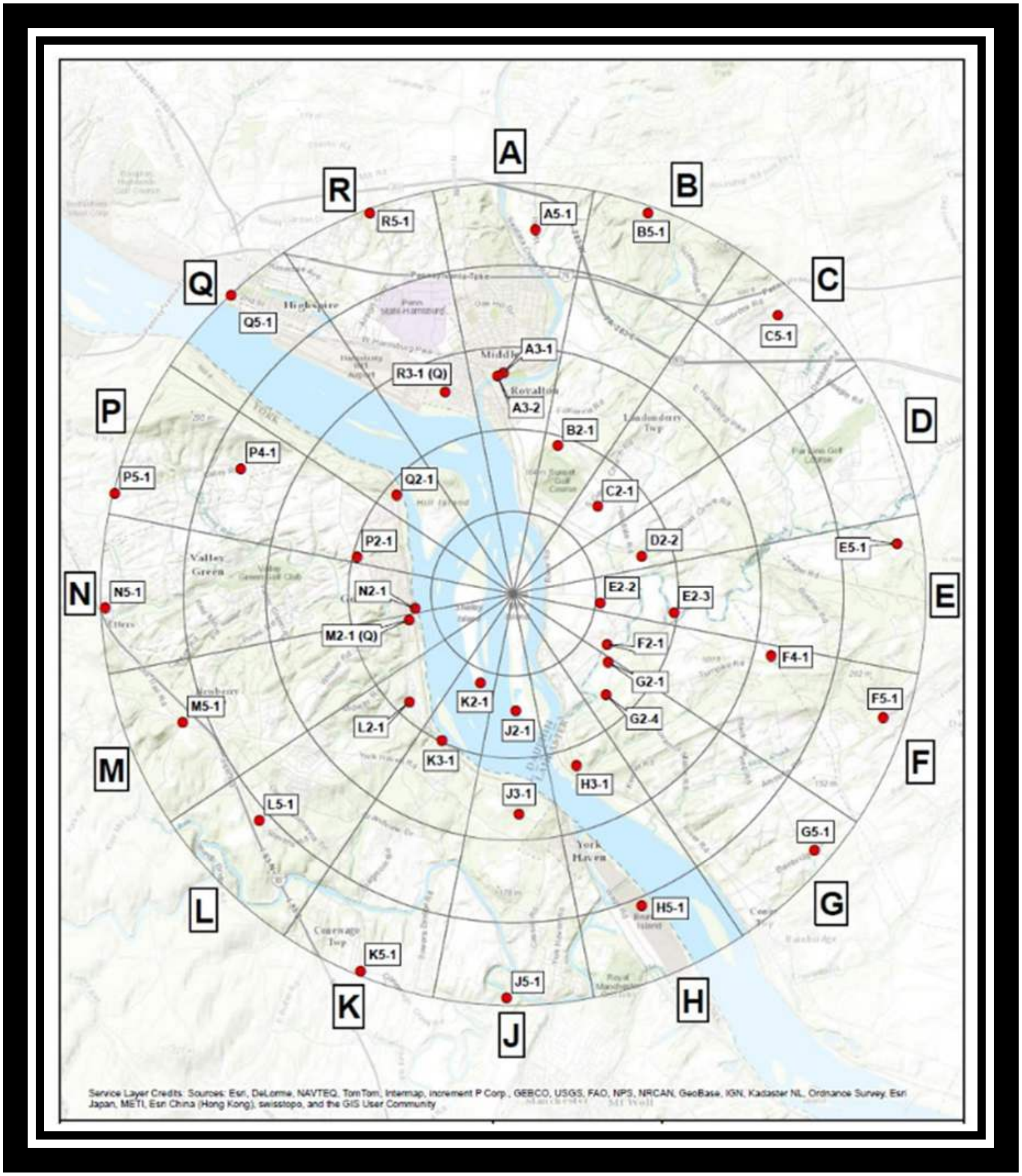

Figure 2, REMP Sample Locations (Near Field/Site Boundary)

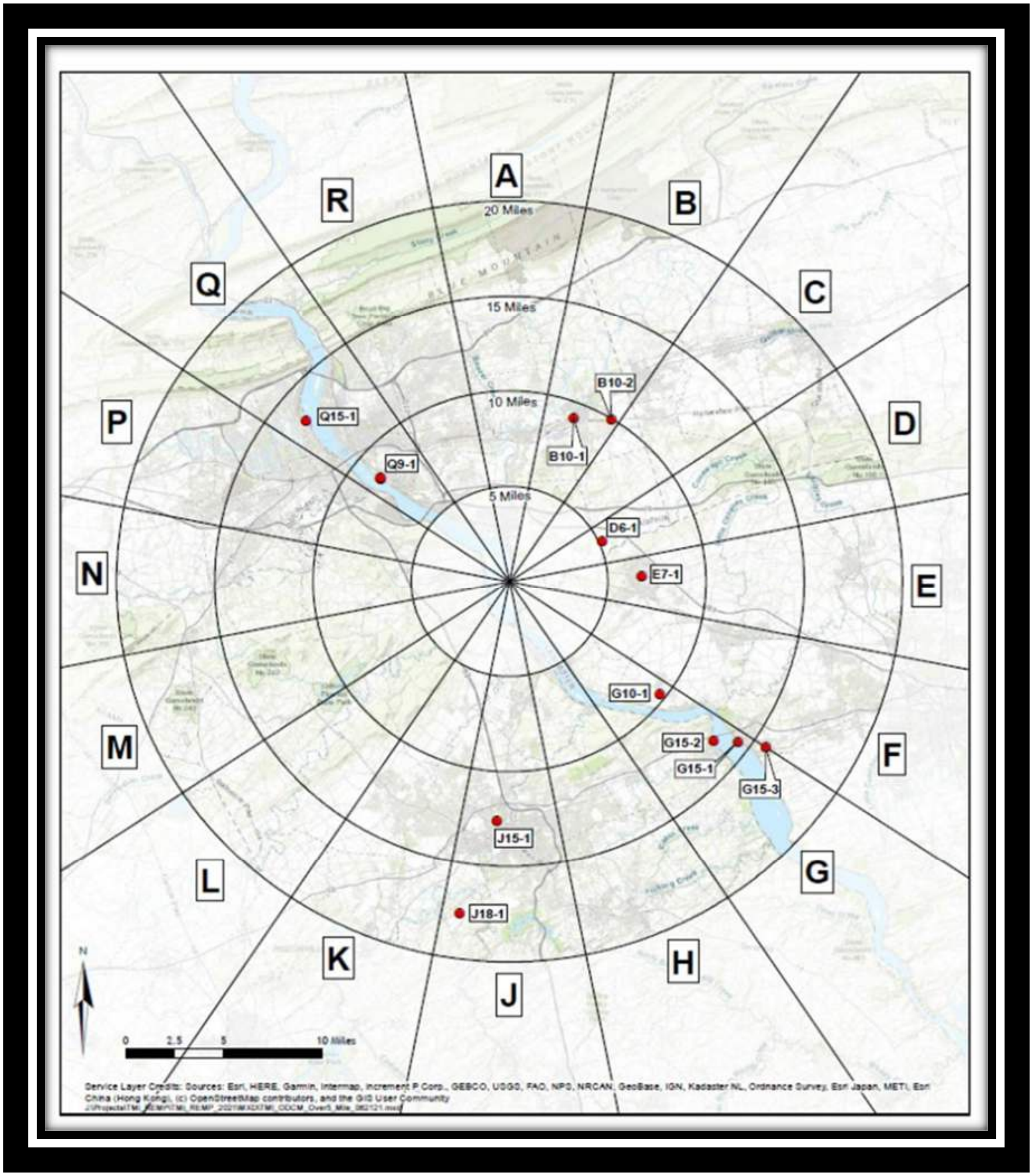

Figure 3, REMP Sample Locations (Far Field)

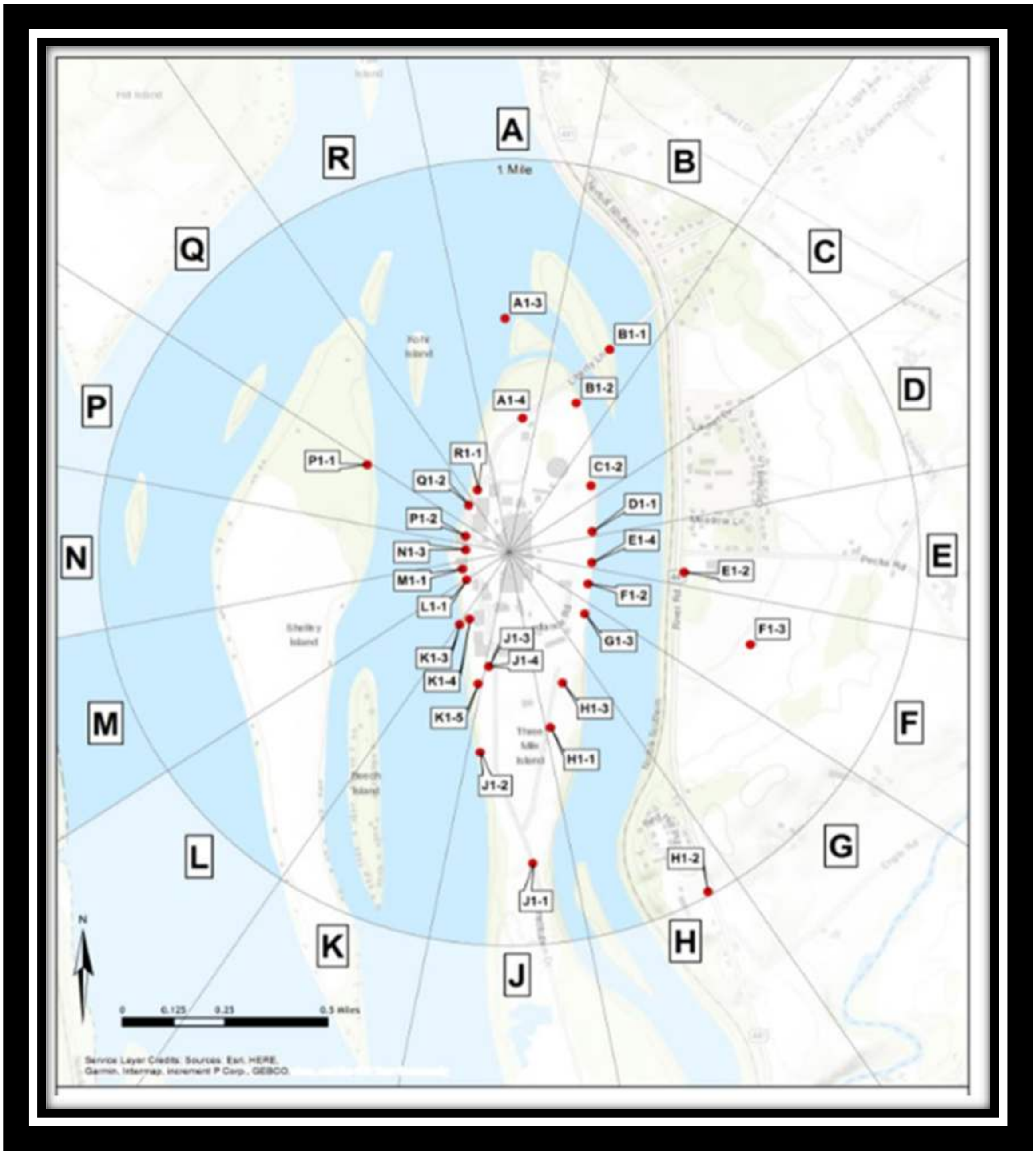

Figure 4, REMP Sample Locations (Onsite)

7.0 REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

Table 6, Reporting Levels for Radioactivity Concentrations in Environmental Samples

Radionuclide	Water (pCi/L)	Air Particulates or Gases (pCi/m^3)	Fish (pCi/Kg-wet)	Milk (pCi/L)	Food Products (pCi/Kg-wet)
H-3	20,000 [2]				
Mn-54	1,000		30,000		
Fe-59	400		10,000		
Co-58	1,000		30,000		
Co-60	300		10,000		
Zn-65	300		20,000		
Zr-Nb-95	400				
Sr-90	8	0.1	100	8	100
I-131	2 [3]	0.9		3	100
Cs-134	30	10	1,000	60	1,000
Cs-137	50	20	2,000	70	2,000
Ba-La-140	200			300	

Table 7, Lower Limits of Detection

Radionuclide	Water (pCi/L)	Air Particulates or Gases (pCi/m^3)	Fish (pCi/Kg-wet)	Milk (pCi/L)	Food Products (pCi/Kg-wet)	Sediment (pCi/Kg-dry)
Gross Beta	4.0	0.01				
H-3	2,000 [4]					
Mn-54	15		130			
Fe-59	30		260			
Co-58, Co-60	15		130			
Zn-65	30		260			
Zr-95	30					
Sr-90	2	0.01	10	2	10	
Nb-95	15					
I-131	1 [5]	0.07		1	60	
Cs-134	15	0.05	130	15	60	150
Cs-137	18	0.06	150	18	80	180
Ba-140	60			60		
La-140	15			15		

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[2] **For** drinking water samples: **If** no drinking water pathway exists, a value **of 30,000 pCi/L** may be used.
[3] **If** no drinking water pathway exists, a value of 20 pCi/l may be used
[4] **If** no drinking water pathway exists, a value **of 3,000 pCi/L** may be used. Some states may require a lower LLD for drinking water sources- per 40 CFR 141 Safe drinking water ACT.
[5] **If** no drinking water pathway exists, a value of 15 pCi/l may be used

8.0 SAMPLING PROGRAM, PROGRAM MODIFICATION AND INTEPRETATION OF RESULTS

At most nuclear stations, data was collected prior to plant operation to determine background radioactivity levels in the environment. Annual data is routinely compared to preoperational and/or 10-year average values to determine if changes in the environs are present. Strict comparison is difficult to make due to fallout from historical nuclear weapon testing. Cs-137 can be routinely found in environmental samples as a results of above ground nuclear weapons testing. It is important to note, levels of Cs-137 in environment are observed to fluctuate, for example as silt distributions shift due to natural erosion and transport processes, Cs-137 may or may not be observed in sediment samples. Results from samples collected and analyzed during the year, 2024, are described in this report.

In the following sections, results from direct radiation, air, water, and food products analyzed as part of REMP in 2024 are discussed. Sampling program descriptions and deviations are also discussed.

8.1 Environmental Direct Radiation Dosimetry Results

Dose is measured as net exposure (field reading less transit reading) normalized to 91-day quarters. Data is treated and analyzed consistent with ANSI/HPS N13.37-2014, which compares the measured dose for each location to the baseline background dose for that location. Environmental dose rates vary by location, depending on geological and land use considerations, and remain relatively constant for any given location (unless land use changes). Some facilities observe seasonal variation in environmental doses. Baseline Background Doses have been determined for both quarterly and annual measurements at each location using historical field measurements.

ANSI/HPS N13.37-2014 uses the concept of minimum differential dose (MDD), which is the minimum facility-related dose that can be detected above background. Due to natural background variations and measurement sensitivities and uncertainties, minimum differential dose is not zero. MDD is calculated based on statistical performance of the dosimetry system in the environment and is site specific.

Normalized doses that exceed the Minimum Differential Dose value above the Baseline Background Dose are considered to indicate Facility-Related Dose; a quality assurance review is performed to verify that any results indicating Facility-Related Dose are accurate.

During the calendar year 2024, a total of 90 locations were monitored and data analyzed in accordance with the requirements in Table 1, Radiological Environmental Monitoring Program – Direct Radiation. Attachment 4, Environmental Direct Radiation Dosimetry Results, provides the annual direct radiation dosimetry analysis.

All OSLD measurements were analyzed, and three of the OSLD analysis results indicated detectable radiation from the facility. The maximum estimated dose to the nearest member of the public was 0.296 mrem/yr total body based on occupancy and extrapolation methods. H1-3 Facility related dose was 38.8 mrem/yr, J1-4 Facility related dose was 35.1 mrem/yr, and J1-3 had facility related dose of 35.1 mrem/yr. All locations were evaluated further to determine the mean and range of OSLD measurements at indicator and control locations respectively. These locations are in near proximity to the ISFSI pad.

There were no unexpected results nor any program modifications in 2024.

In 2024 there were two instances of lost dosimeters resulting in a loss of data.

Dosimeters N1-1

Upon arrival on 12/18/2024 at the TMI N1-1 sample station for the dosimeter collection, field tech collected the Quarter 4 environmental dosimeters. The samples were then dropped during recovery. The dropped samples were unrecoverable. The missing dosimeter numbers are EX00061431L and EX00107546T.

Dosimeters H5-1

Upon arrival on 12/20/2024 at the TMI H5-1 sample station for the dosimeter collection, field tech found that the Quarter 4 environmental dosimeters and bracket were missing. The field tech did a complete sweep of the area and spoke to site operations, but nothing was found. The missing dosimeter numbers are EX000673830 and EX000818220.

8.2 Air Particulate and Radioiodine Sample Results

Air particulate filters and charcoal canisters were collected from locations specified in Table 2, Radiological Environmental Monitoring Program – Airborne. During the calendar year 2024, a total of 737 samples were collected and analyzed for gross beta, gamma emitters and iodine. 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. Particulate samplers are used to continuously collect airborne particulates on a filter. The samples are analyzed for gross beta activity following filter changeout which occurs weekly. Gamma isotopic analysis is also performed on the samples collected at each location and is analyzed quarterly. Radioiodine (I-131) analysis is performed weekly on radioiodine sample cartridges.

All radioiodine samples were below the detection limit.

All air particulate samples contained detectable amounts of beta emitters within trend as compared to the control location. Gross beta activity at indicator locations averaged $2.21E^{-2}$ pCi/m^3 and ranged from $7.49E^{-3}$ to $5.61E^{-2}$ pCi/m^3. This is comparable with the control location Q15-1 which averaged $2.23E^{-2}$ pCi/m^3 and ranged from $8.97E^{-3}$ to $4.62E^{-2}$ pCi/m^3.

Air particulate results from this monitoring period, 2024, were compared to 10-year average as shown in Figure 5. There was a noticeable change in the baseline trending gradually upward. Control and indicator locations are well in line with each other when reviewing the weekly data from both CGS and TBE laboratories. This upward trend is not attributed to the fuel cycle at TMI. Similar trending has been observed at other nuclear facilities across the region and may be attributed to ambient environmental shifts.

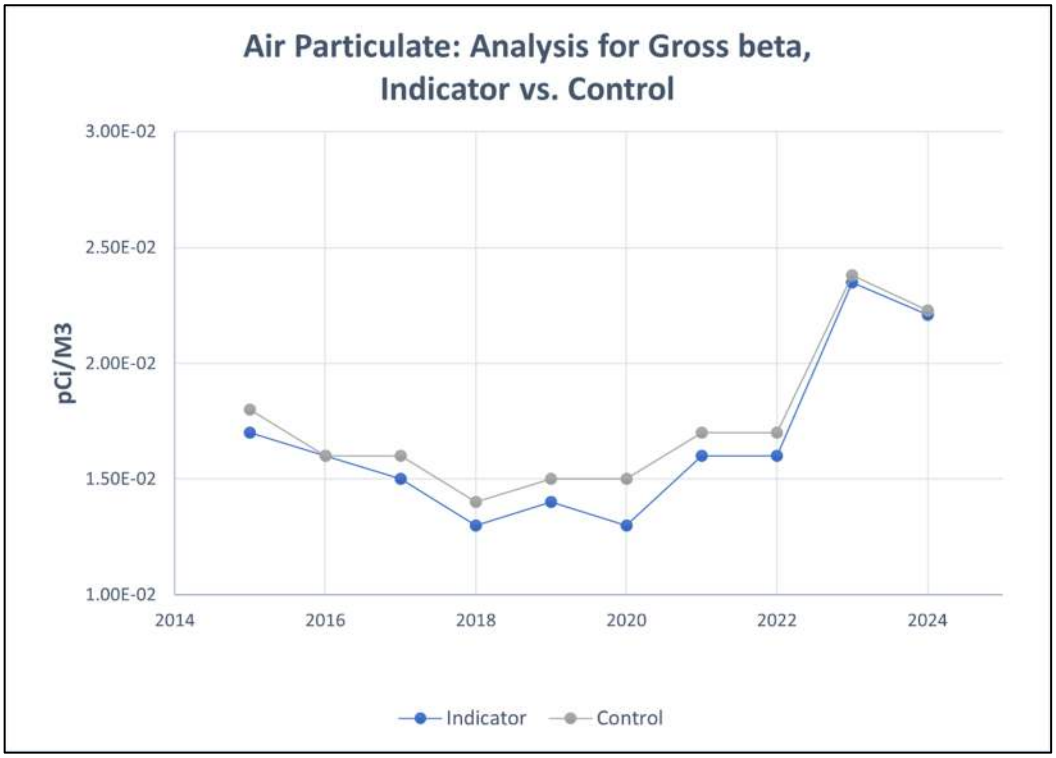

Figure 5, Air Particulate: Analysis for Gross Beta, Average for All Indicator vs. Control Location

8.3 Waterborne Sample Results

8.3.1 Surface Water (i.e., Bay, Lake etc.)

Composite water samples are collected monthly at the upstream control location and at the downstream indicator locations. Monthly composite samples are analyzed for gamma emitters and Tritium. Aliquots from the monthly composites are combined to form a quarterly composite which is then analyzed for tritium again. During the calendar year 2024, a total of 48 surface water samples were collected and analyzed in accordance with the requirements in the ODCM at J1-2, A3-2 and Q9-1 and shown in Table 3, Radiological Environmental Monitoring Program – Waterborne. Tritium was not detected in any samples in 2024. Tritium concentrations in surface water were below detectable levels of analysis as required in Table 7 Lower Limits of Detection, well in compliance with the EPA tritium drinking water limit of 20,000 pCi/L.

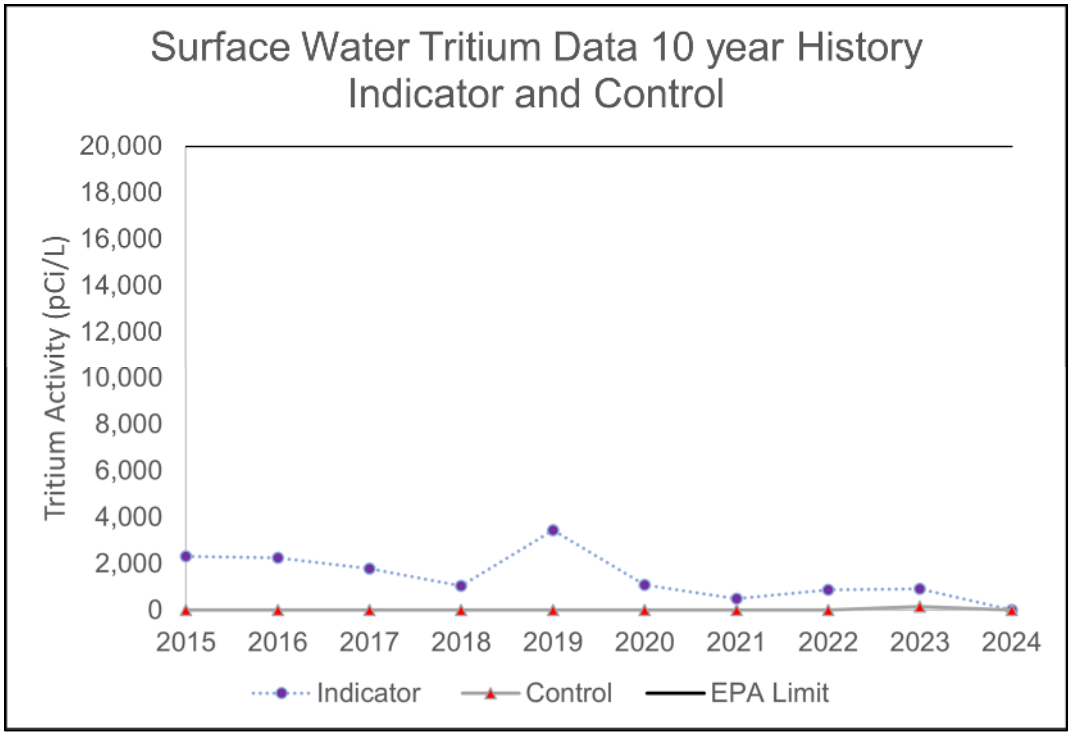

Figure 6: Surface Water Tritium Results

8.3.2 Effluent Surface Water

Monthly samples were collected from a continuous water sampler at one location (K1-1) and analyzed for Gamma emitters including Low level Iodine and Tritium monthly as well as quarterly. In addition, Sr-90 was analyzed on a semiannual composite of K1-1. There were no detectable amounts of non-natural radioactivity in K1-1 in 2024.

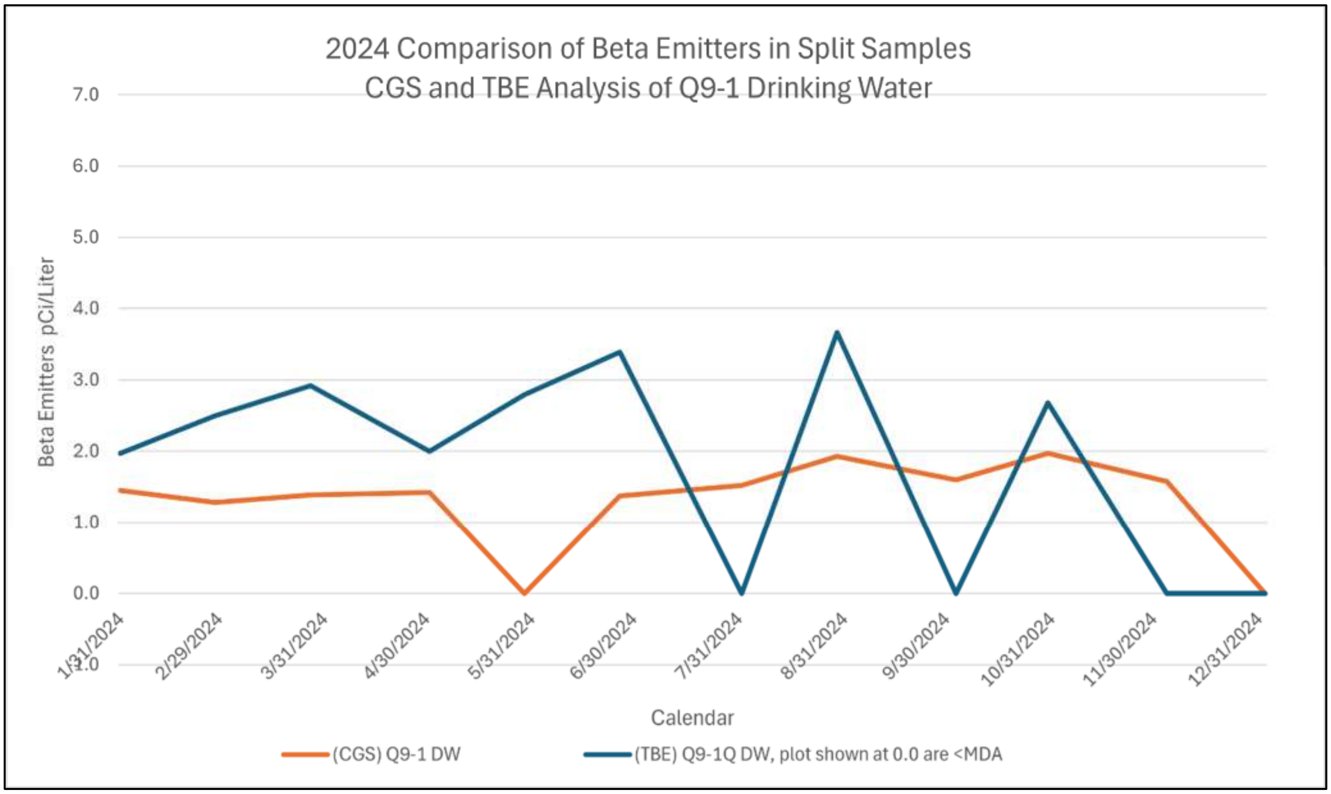

Figure 7: REMP Beta Emitters in Drinking Water Split Sample Comparison

8.3.3 <u>Drinking Water</u>

A total of 36 drinking water samples were obtained in 2024 at G15-2, G15-3 and Q9-1 (DW). These samples were analyzed for gross beta, tritium and gamma analysis monthly, tritium quarterly in accordance with requirements in the ODCM and shown in Table 3, Radiological Environmental Monitoring Program – Waterborne.

Beta emitters were observed in 34 of 36 samples and within historical trends. Beta emitters were detected in all 24 Indicator samples and averaged 2.04pCi/L and detectable results ranged from 0.724 to 3.71 pCi/L. Beta emitters were observed in 10 of 12 Control samples and averaged 1.46pCi/L and detectable results ranged from 0.976 to 1.97pCi/L. Split sample analysis for the control, Q9-1 DW, between the laboratories, CGS and TBE were in good agreement and in trend with each other as depicted in Figure 7: REMP Beta Emitters in Drinking Water Split Sample Comparison. There were no program modifications or changes in the environs 2024. There were no non-natural gamma emitters detected in any sample. Tritium concentrations in drinking water were undetectable and less than the required LLD of 200pCi/L, well below the EPA tritium drinking water limit of 20,000 pCi/L.

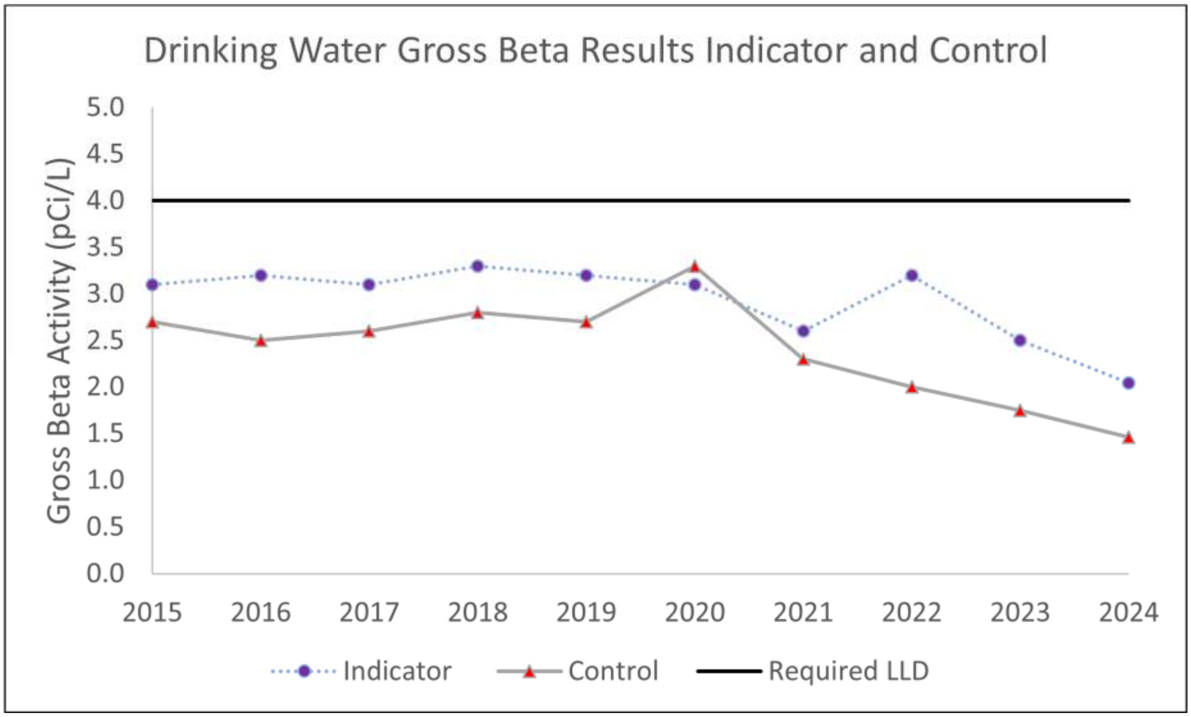

Figure 8: Drinking Water Gross Beta Samples Control vs. Indicator Comparison

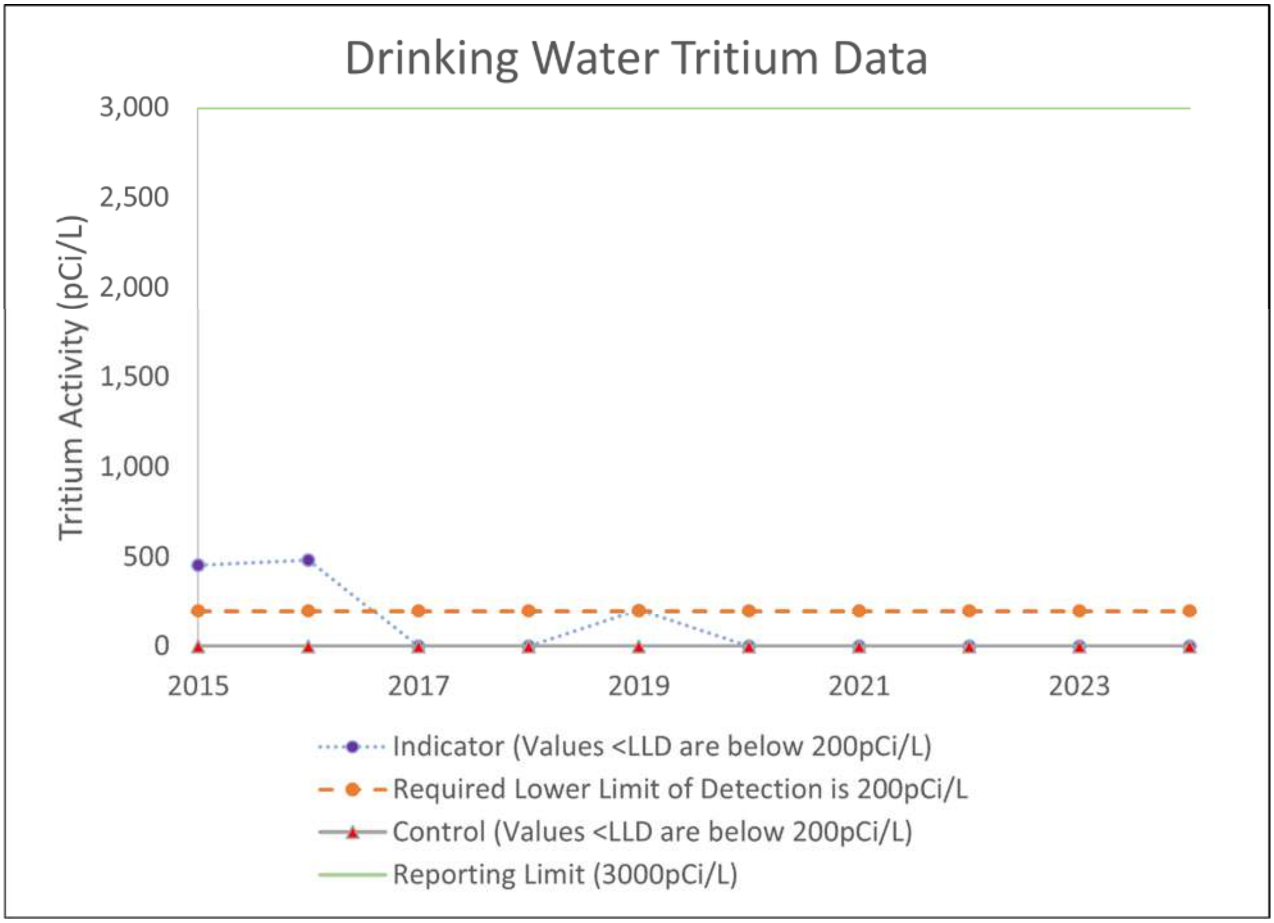

Figure 9: Drinking Water Tritium Sample Results

8.3.4 Sediment from Shoreline

Shoreline sediment collections were made in June and October, 2024 and analyzed for gamma-emitting isotopes. Samples are collected at both indicator and control locations. A total of 6 shoreline samples were analyzed in accordance with requirements in the ODCM and shown in Table 3, Radiological Environmental Monitoring Program – Waterborne.

Sediment samples from all locations were analyzed for gamma-emitting nuclides. All analyses met Minimum Detectable Activities. No fission or activation products were detected.

8.4 Ingestion Pathway Sample Results

8.4.1 Milk

Milk samples from milking animals were collected at 3 locations within 8 km having the highest dose potential, along with samples collected from control locations 15-30 km in the least prevalent wind direction, monthly from December through February and biweekly March through July. 69 samples were collected and analyzed for gamma emitters and a total of 12 quarterly composites of those samples were analyzed for Sr-90.

All Milk samples from all locations were analyzed as required by the ODCM for gamma-emitting nuclides and Sr-90. All analyses met Minimum Detectable Activities. No fission or activation products were detected.

8.4.2 Fish and Invertebrates

A total of 8 fish and invertebrate samples were collected in 2024. These samples were analyzed for Sr-90 and gamma emitting radionuclides in edible portions, in accordance with requirements of the ODCM and summarized in Table 4, Radiological Environmental Monitoring Program – Ingestion. These samples are collected from the indicator and control areas as required by the ODCM. Only the edible portions are analyzed excluding head, tail, bones, and shell fragments.

All Fish samples from all locations were analyzed as required by the ODCM for gamma-emitting nuclides and Sr-90. All analyses met Minimum Detectable Activities. No fission or activation products were detected.

8.4.3 Food Products

A total of 6 samples of non-leafy vegetation were analyzed in 2024, for gamma emitting radionuclides, and Sr-90 in accordance with requirements of the ODCM, as summarized in Table 4, Radiological Environmental Monitoring Program – Ingestion.

Sr-90 was detected in tomatoes collected 08/14/2024 at E1-2, East of Site at Visitors Center at 10.9 ± 3.03 pCi/kg wet. No other fission or activation products were detected in any other samples. This is below the investigation value of 50 pCi/kg for Sr-90 as listed in Attachment 1 of CY-AA-170-1000 Radiological Environmental Program and Meteorological Program Implementation.

8.4.4 Leafy Vegetation

In accordance with the ODCM and as described in Table 4, Radiological Environmental Monitoring Program – Ingestion, 36 broad leaf vegetation samples were collected from growing locations nearest site boundary in areas of highest predicted annual average ground level D/Q. Samples are collected and analyzed for gamma emitting radionuclides including I-131 from the indicator and control locations monthly during growing season, June through September. It is common to detect Cs-137 in broadleaf samples at both indicator and control locations. Cs-137 can be attributed to offsite sources such as weapons testing, Chernobyl, and Fukushima events. While Cs-137 is periodically found in vegetation samples, there was no Cs-137 detected in samples collected in 2024.

All analyses met Minimum Detectable Activities. No fission or activation products were detected.

9.0 LAND USE CENSUS

An annual land use census is required by the Offsite Dose Calculation Manual and is performed to ensure that changes in the use of areas at or beyond the site boundary are identified and modifications to REMP are made if required by changes in land use. The land use census satisfies the requirements of Section IV.B.3 of Appendix I to 10 CFR 50. NUREG-1301/1302 Control 3.12.2 specifies that "a Land Use Census shall be conducted and shall identify within a distance of 8 km (5 mi.) the location in each of the 16 meteorological sectors of the nearest milk animal, the nearest residence and the nearest garden of greater than 50 m^2 (500 ft^2) producing broad leaf vegetation. Note, per NUREG-1301/1302, Broad leaf vegetation sampling of at least three different kinds of vegetation may be performed at the SITE BOUNDARY in each of two different direction sectors with the highest predicted D/Qs in lieu of the garden census.

A Land Use Census was conducted during the calendar year, 2024, within the growing season to identify changes in land use, receptor locations, and new exposure pathways. The results for the 2024 Land Use Census are listed in Table 8: Land Use Census – Nearest Receptors within 5 miles. In summary, the highest D/Q locations for nearest garden, nearest residence and nearest milk animal did not change following the 2024 census. Milk sites were identified in Seven (7) of sixteen (16) meteorological sectors. Milk sites were identified in N, NE, ENE, E, ESE, SE and S sectors.

Table 8: Land Use Census – Nearest Receptors within 5 miles

Sector	Direction	Nearest Residence (Miles)	Nearest Milk Animal (Miles)	Nearest Garden (Miles)
A	N	1.0	2.1	1.9
B	NNE	0.76	Not Found in Sector	1.2
C	NE	0.53	4.2	1.1
D	ENE	0.46	4.5	0.5
E	E	0.06	1.1	0.5
F	ESE	1.10	3.2	0.5
G	SE	0.71	1.4	0.6
H	SSE	0.71	Not Found in Sector	0.8**
J	S	2.24	>5.0*	2.5
K	SSW	0.61	Not Found in Sector	1.6
L	SW	0.54	Not Found in Sector	1.7
M	WSW	1.20	Not Found in Sector	1.3
N	W	1.22	Not Found in Sector	1.3
P	WNW	1.11	Not Found in Sector	1.5
Q	NW	1.11	Not Found in Sector	1.2
R	NNW	1.14	Not Found in Sector	2.4

*Farm is outside the 5-mile radius but is included because it is a regularly sampled REMP milk farm

**A regularly sampled REMP farm

10.0 SAMPLE DEVIATIONS, ANOMALIES AND UNAVAILABILITY

Sampling and analysis are performed for media types addressed in the Offsite Dose Calculation Manual. Sampling and analysis challenges may be experienced due to a multitude of reasons including environmental factors, loss of TLDs/OSLDs, contamination of samples, etc. To aid classification of sampling and analysis challenges experienced in 2024, the following three terms are used to describe the issues: Sample Anomalies, Sample Deviation, and Unavailable Samples.

Media that experienced downtime (i.e., air samplers or water samplers) during a surveillance period are classified a “Sample Deviation”. “Sample Anomalies” are defined as errors that were introduced to a sample once it arrived in the laboratory, errors that prevent the sample from being analyzed as it normally would or may have altered the outcome of the analysis (i.e., cross contamination, human error).

“Sample Unavailability” is defined as sample collection with no available sample (i.e., food crop, TLD).

All required samples were collected and analyzed as scheduled except for the following:

Table 9: Sample Deviation Summary

Sample Type and Analysis	Location	Collection Date or Period	Reason for not conducting REMP sampling as required by ODCM	Plans for preventing reoccurrence
Air Filter-Beta analysis	M2-1	02/28/24	Moisture due to heavy weather caused a hole in the filter invalidating volume measurement	Entered into corrective action tracking to document occurrence
Air Filter -Beta Charcoal- I-131	G2-1	10/30/24	Blown GFCI caused insufficient volume collection	Entered into corrective action tracking to document occurrence
Air Filter -Beta Charcoal- I-131	G2-1	12/19/24	Blown GFCI caused insufficient volume collection	Entered into corrective action tracking to document occurrence
OSLD – ambient radiation	N1-1	12/18/24	Dosimeters were dropped during recovery and lost	Entered into corrective action tracking to document occurrence
OSLD – ambient radiation	H5-1	12/20/24	Missing Dosimeter and mounting bracket	Entered into corrective action tracking to document occurrence

11.0 OTHER SUPPLEMENTAL INFORMATION

11.1 NEI 07-07 Onsite Radiological Groundwater Monitoring Program

THREE MILE ISLAND NUCLEAR STATION UNITS 1 AND 2 has developed a Groundwater Protection Initiative (GPI) program in accordance with NEI 07-07, Industry Ground Water Protection Initiative – Final Guidance Document. The purpose of the GPI is to ensure timely detection and an effective response to situations involving inadvertent radiological releases to groundwater in order to prevent migration of licensed radioactive material off-site and to quantify impacts on decommissioning. It is important to note, samples and results taken in support of NEI 07-07 on-site groundwater monitoring program are separate from the Radiological Environmental Monitoring Program (REMP). Results of the NEI 07-07 Radiological Groundwater Monitoring Program for onsite groundwater wells are provided in this AREOR in Attachment 5, Table 15.

11.2 Independent Spent Fuel Storage Installation (ISFSI) Monitoring Program

ISFSI operations began in October 2021. Forty-seven casks were added to the Constellation TMI-1 ISFSI pad in 2022 utilizing the NAC MAGNASTOR® System. Site boundary Environmental OSLD's, which measure gamma radiation closest to ISFSI are C1-2, D1-1, E1-4, F1-2, G1-3, K1-3, K1-5, L1-1, M1-1 and N1-3. OSLD K1-5 was added at the site boundary and OSLD's H1-3 and J1-4 were added as closest to the ISFSI pad. There was radiation detected above background at H1-3 at 38.8 mrem/yr and J1-4- at 35.1mrem/yr. Therefore, there was Facility Related dose attributed to TMI from ISFSI operations at H1-3 and J1-4 and to any real individual who is located beyond the control area. True Ambient gamma radiation levels were measured utilizing Optically Stimulated Luminescence Dosimeters (OSLD). Ninety-three OSLD locations were established around the site and listed in Table 5. Results of OSLD measurements are given in Attachment 4.

11.3 Corrections to Previous Reports

1. In the 2023 AREOR, Table 3 Waterborne Locations contained a typo showing Q9-1 DW to be 88.5 miles distant when it is actually 8.5 miles distant to the site. This has been corrected in the 2024 Table 3 Waterborne Locations. The page of the 2023 AREOR containing this error can be found in Attachment 6 of this report.

2. The 2023 AREOR mistakenly stated in Table 11 that Sr-90 was detected in Cabbage at B10-2 collected on 8/16/23 and analyzed by GEL, a subcontractor to CGS. The results should have been reported in Table 12 Interlaboratory Split Samples as a QA and that Sr-90 was detected by TBE at 1.76E-2 +/- 2.9E-3 pCi/kg. The primary lab only analyzed this cabbage sample for gamma emitters. The only request for Sr-90 analysis was on the TBE sample which was reported under the project number L102024 for reference. The page of the 2023 AREOR containing this error can be found in Attachment 6 of this report.

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[42] Constellation. “Three Mile Island Nuclear Station Offsite Dose Calculation Manual (ODCM).

[43] National Council of Radiation Protection and Measurements Report No. 160. “Ionizing Radiation Exposure of the Population of the United States.” 2009.

[44] Teledyne Brown Engineering Environmental Services. "4th Quarter 2024 Quality Assurance Report", January - December 2024.

[45] GEL 2024 Annual Quality Assurance Report for the Radiological Environmental Monitoring Program (REMP) Rev.1.

[46] AMO Environmental Decisions, "2024 Annual RGPP Monitoring Report Summary of Results and Conclusions Three Mile Island Generating Station Middletown, Pennsylvania

Attachment 1, Data Table Summary

Medium or Pathway Sampled (Units)	Type, Total Number of Analyses performed (e.g., I-131, 400)	Lower Limit of Detection (LLD)	Indicator Mean[6]; (f[7]). Range[6]	Location with Highest Annual Mean: Name Distance and Direction	Location with Highest Annual Mean: Mean[6] (f[7]) Range[6]	Control Mean[6] (f[7]). Range[6]	Number of Nonroutine Reported Measurements
Air Particulates (pCi/m^3)	Beta, 368	(0.01)	2.21 E^{-2} (315/315) (7.49E^{-3} – 5.61E^{-2})	F1-3, 500kv Substation 0.6 miles, Sector F	2.30 E^{-2} (53/53) (1.02 E^{-2}-5.61E^{-2})	2.23 E^{-2} (53/53) (8.97 E^{-3}-4.62E^{-2})	0
Direct Radiation (mrem/qtr.)	Gamma Dose, 716	NA	8.75 (692/716) (8.0 – 10.3)	H1-3, 0.1 miles in Sector H	9.68 (8/8) (6.7 – 11.2)	9.70 (7/24) (6.7 – 11.2)	0
Vegetation (pCi/kg-wet)	Strontium-90, 6	(10)	10.9 (1/15) 10.9 ± 3.03	E1-2, East of site at Visitors Center 0.4 miles Sector F	10.9 (1/15) 10.9 ± 3.03	<LLD	0
Effluent Water (pCi/L)	Gross Beta, 12	(4)	1.83, (12/12) (1.06-2.83)	K1-1, 0.2miles, Sector K	1.83, (12/12) (1.06-2.83)	NA	0
Drinking Water (pCi/L)	Gross Beta, 36	(4)	2.04, (24/24) (0.724-3.71)	G15-2, 13.3 miles, Sector G	2.47, (12/12) (1.35-3.71)	1.46, (10/12) (0.976 – 1.97)	0

[6] Mean and range are based on detectable measurements only.
[7] Fraction of detectable measurements at specified locations is indicated in parentheses.

Attachment 2, Complete Data Table for All Analysis Results Obtained In 2024

The following data tables in this attachment are organized by frequency and media type of samples collected for the Radiological Environmental Monitoring Program reporting out the surveillance of the pathways of exposure to the environment for 2024. The goal of the continuous and periodic sampling of these media types provides thorough assessments that plant operations are within all regulatory limits ensuring the safety of the public.

Table 10: Monthly Waterborne Sample Results

Table 11 Weekly Airborne Sample Results

Table 12 Quarterly Isotopic Sample Results

Table 13 Semi-Annual Fish and Sediment Isotopic Sample Results

Table 10: Monthly Sample Results

Radionuclides in Surface Water (pCi/L)											
Date	A3-2 (Control)		Q9-1 (SW)		J1-2		K1-1				
	I-131	Tritium	Gamma Emitters	Tritium	Gamma Emitters	Tritium	Gamma Emitters	Gross Beta		Tritium	Sr89/90 (Semi-Annual Composite)
								Gross Beta Activity	Uncertainty (2-σ)		
1/31/2024	*	ND	*	*	*	*	*	1.86E+00	7.95E-01	*	
2/28/2024	*	ND	*	*	*	*	*	1.06 E+00	7.52E-01	*	
3/27/2024	*	ND	*	*	*	*	*	1.47 E+00	7.26E-01	*	
5/1/2024	*	ND	*	*	*	*	*	1.19 E+00	6.92E-01	*	
5/29/2024	*	ND	*	*	*	*	*	1.59E+00	7.76E-01	*	
6/26/2024	*	ND	*	*	*	*	*	2.17 E+00	8.15E-01	*	*
8/1/2024	*	ND	*	*	*	*	*	1.75 E+00	8.06E-01	*	
8/29/2024	*	ND	*	*	*	*	*	2.83 E+00	8.44E-01	*	
10/3/2024	*	ND	*	*	*	*	*	1.72 E+00	7.73E-01	*	
10/30/2024	*	ND	*	*	*	*	*	2.27 E+00	8.14E-01	*	
12/4/2024	*	ND	*	*	*	*	*	1.99 E+00	8.03E-01	*	
1/2/2025	*	ND	*	*	*	*	*	2.02 E+00	7.62E-01	*	*

* All Non-Natural Radionuclides <MDA

ND No Data, Samples not analyzed for this parameter

Table 10 Continued: Monthly Radionuclides in Drinking Water (pCi/L)

Location	G15-2				G15-3				Q9-1 (DW) (Control)			
Date	Gamma Emitters	Tritium	Gross Beta Activity	Uncertainty (2-σ)	Gamma Emitters	Tritium	Gross Beta Activity	Uncertainty (2-σ)	Gamma Emitters	Tritium	Gross Beta Activity	Uncertainty (2-σ)
1/31/2024	*	*	2.46E+00	8.42E-01	*	*	7.24E-01	7.14E-01	*	*	1.45E+00	7.69E-01
2/28/2024	*	*	1.99E+00	8.23E-01	*	*	1.46E+00	7.84E-01	*	*	1.28E+00	7.70E-01
3/27/2024	*	*	2.23E+00	7.92E-01	*	*	1.50E+00	7.29E-01	*	*	1.39E+00	7.22E-01
5/1/2024	*	*	1.35E+00	7.09E-01	*	*	1.26E+00	6.99E-01	*	*	1.42E+00	7.11E-01
5/29/2024	*	*	1.60E+00	7.80E-01	*	*	9.54E-01	7.31E-01	*	*	<MDA	
6/26/2024	*	*	2.39E+00	8.29E-01	*	*	1.41E+00	7.61E-01	*	*	1.37E+00	7.53E-01
8/1/2024	*	*	2.39E+00	8.49E-01	*	*	1.72E+00	8.05E-01	*	*	1.52E+00	7.89E-01
8/29/2024	*	*	3.08E+00	8.66E-01	*	*	1.65E+00	7.62E-01	*	*	1.93E+00	7.81E-01
10/3/2024	*	*	2.00E+00	7.94E-01	*	*	1.83E+00	7.84E-01	*	*	1.60E+00	7.62E-01
10/30/2024	*	*	3.14E+00	8.72E-01	*	*	2.22E+00	8.12E-01	*	*	1.97E+00	7.88E-01
12/4/2024	*	*	3.71E+00	9.15E-01	*	*	2.79E+00	8.60E-01	*	*	1.58E+00	7.68E-01
1/2/2025	*	*	3.32E+00	8.58E-01	*	*	1.68E+00	7.35E-01	*	*	<MDA	

* All Non-Natural Radionuclides <MDA

Table 10 Continued: Monthly and Biweekly Samples for Radionuclides in Milk (pCi/L)

Date	F4-1	G2-1	J18-1 (Control)
1/18/2024	*	*	*
2/14/2024	*	*	*
3/07/2024	*	*	*
3/20/2024	*	*	*
4/04/2024	*	*	*
4/18/2024	*	*	*
5/01/2024	*	*	*
5/15/2024	*	*	*
5/29/2024	*	*	*
6/13/2024	*	*	*
6/26/2024	*	*	*
7/10/2024	*	*	*
7/24/2024	*	*	*
8/08/2024	*	*	*
8/22/2024	*	*	*
9/05/2024	*	*	*
9/19/2024	*	*	*
10/03/2024	*	*	*
10/17/2024	*	*	*
10/30/2024	*	*	*
11/13/2024	*	*	*
11/26/2024	*	*	*
12/11/2024	*	*	*

* All Non-Natural Radionuclides <MDA

Table 10 Continued: Monthly Samples for Radionuclides in Vegetation (pCi/kg wet)

Sample Code	Sample Date	Sample Type	Sr-90	Gamma Emitters
E1-2	6/19/2024	Lettuce	ND	*
East of site at Visitors Center	6/19/2024	Collards	ND	*
	6/19/2024	Horseradish	ND	*
	7/17/2024	Cabbage	ND	*
	7/17/2024	Broccoli	ND	*
	7/17/2024	Collards	ND	*
	8/14/2024	Collards	ND	*
	8/14/2024	Horseradish	ND	*
	8/14/2024	Kale	ND	*
	8/14/2024	Potatoes	*	*
	8/14/2024	Tomatoes	10.9 ± 3.03	*
	9/11/2024	Corn	*	*
	9/11/2024	Collards	ND	*
	9/11/2024	Kale	ND	*
	9/11/2024	Horseradish	ND	*
H1-2	6/19/2024	Cucumber	ND	*
Red Hill Market	6/19/2024	Zucchini	ND	*
	6/19/2024	Rhubarb	ND	*
	7/17/2024	Squash	ND	*
	7/17/2024	Eggplant Leaves	ND	*
	7/17/2024	Cucumber	ND	*
	8/14/2024	Eggplant Leaves	ND	*
	8/14/2024	Cucumber	ND	*
	8/14/2024	Squash Leaves	ND	*
	9/11/2024	Cucumber	ND	*
	9/11/2024	Yellow Squash Leaves	ND	*
	9/11/2024	Squash Leaves	ND	*

Table 10 Continued: Monthly Samples for Radionuclides in Vegetation (pCi/kg wet)

Sample Code	Sample Date	Sample Type	Sr-90	Gamma Emitters
B10-2 (Control)	6/19/2024	Lettuce	ND	*
Milton Hershey School	6/19/2024	Kale	ND	*
	6/19/2024	Leafy Greens	ND	*
	7/17/2024	Squash	ND	*
	7/17/2024	Cucumber	ND	*
	7/17/2024	Pepper Leaves	ND	*
	8/14/2024	Pepper Leaves	ND	*
	8/14/2024	Squash Leaves	ND	*
	8/14/2024	Cucumber	ND	*
	8/14/2024	Tomatoes	*	*
	8/14/2024	Corn	*	*
	8/14/2024	Potatoes	*	*
	9/11/2024	Pumpkin Leaves	ND	*
	9/11/2024	Squash Leaves	ND	*
	9/11/2024	Zucchini Leaves	ND	*

* All Non-Natural Gamma Emitters <MDA
ND No Data, Analysis not required

Table 11: Weekly Air Monitoring Particulate and I-131 filters (pCi/m³)

Gross Beta activity in Air Particulates (pCi/m³)														
	E1-2		F1-3		G2-1		M2-1		A3-1		H3-1		Q15-1 (Control)	
Date	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)
1/04/2024	2.46E-02	2.37E-03	2.17E-02	2.25E-03	2.15E-02	2.23E-03	1.88E-02	2.02E-03	2.28E-02	2.29E-03	2.08E-02	2.19E-03	2.10E-02	2.23E-03
1/11/2024	1.73E-02	2.05E-03	1.53E-02	1.96E-03	1.42E-02	1.94E-03	1.40E-02	1.78E-03	1.35E-02	1.88E-03	1.52E-02	1.92E-03	1.66E-02	2.01E-03
1/18/2024	3.39E-02	2.68E-03	3.06E-02	2.56E-03	2.94E-02	2.50E-03	2.84E-02	2.35E-03	3.13E-02	2.57E-03	2.98E-02	2.49E-03	3.19E-02	2.60E-03
1/25/2024	2.64E-02	2.37E-03	2.75E-02	2.39E-03	2.45E-02	2.28E-03	2.55E-02	2.20E-03	2.63E-02	2.35E-03	2.43E-02	2.26E-03	2.66E-02	2.37E-03
1/31/2024	1.25E-02	2.06E-03	1.17E-02	2.00E-03	1.08E-02	1.95E-03	1.01E-02	1.80E-03	1.11E-02	1.98E-03	1.06E-02	1.92E-03	1.23E-02	2.04E-03
2/08/2024	1.83E-02	1.99E-03	1.74E-02	1.94E-03	1.59E-02	1.88E-03	1.77E-02	1.80E-03	1.74E-02	1.93E-03	1.73E-02	1.92E-03	1.80E-02	1.94E-03
2/14/2024	2.28E-02	2.63E-03	2.53E-02	2.69E-03	2.59E-02	2.68E-03	2.34E-02	2.47E-03	2.45E-02	2.65E-03	2.02E-02	2.45E-03	2.43E-02	2.66E-03
2/22/2024	2.14E-02	2.04E-03	2.23E-02	2.06E-03	2.26E-02	2.05E-03	2.22E-02	1.97E-03	2.30E-02	2.09E-03	2.23E-02	2.03E-03	2.19E-02	2.08E-03
2/28/2024	2.37E-02	2.56E-03	2.39E-02	2.55E-03	2.30E-02	2.50E-03	ND	ND	2.37E-02	2.53E-03	2.41E-02	2.53E-03	2.35E-02	2.51E-03
3/07/2024	1.32E-02	1.75E-03	1.31E-02	1.73E-03	1.37E-02	1.73E-03	1.09E-02	1.56E-03	1.29E-02	1.73E-03	1.16E-02	1.64E-03	1.16E-02	1.69E-03
3/14/2024	1.86E-02	2.21E-03	1.72E-02	2.14E-03	1.88E-02	2.19E-03	1.74E-02	2.01E-03	1.88E-02	2.21E-03	2.05E-02	2.23E-03	1.76E-02	2.16E-03
3/20/2024	2.06E-02	2.49E-03	1.87E-02	2.40E-03	1.73E-02	2.32E-03	1.89E-02	2.26E-03	1.95E-02	2.42E-03	1.92E-02	2.38E-03	1.77E-02	2.37E-03
3/27/2024	1.31E-02	1.99E-03	1.72E-02	2.13E-03	1.31E-02	1.96E-03	1.11E-02	1.76E-03	1.44E-02	2.02E-03	1.48E-02	2.01E-03	1.49E-02	2.04E-03
4/04/2024	1.63E-02	1.89E-03	1.40E-02	1.78E-03	1.34E-02	1.75E-03	1.42E-02	1.68E-03	1.47E-02	1.81E-03	1.47E-02	1.78E-03	1.56E-02	1.85E-03
4/11/2024	1.61E-02	2.01E-03	1.55E-02	1.97E-03	1.53E-02	1.95E-03	1.40E-02	1.79E-03	1.43E-02	1.93E-03	1.57E-02	1.95E-03	1.52E-02	1.97E-03
4/18/2024	1.99E-02	2.21E-03	2.10E-02	2.23E-03	1.76E-02	2.09E-03	1.77E-02	1.98E-03	1.79E-02	2.11E-03	1.76E-02	2.07E-03	1.92E-02	2.16E-03
4/25/2024	1.54E-02	2.04E-03	1.52E-02	2.01E-03	1.75E-02	2.09E-03	1.60E-02	1.91E-03	1.65E-02	2.06E-03	1.64E-02	2.03E-03	1.67E-02	2.07E-03
5/01/2024	2.45E-02	2.63E-03	2.34E-02	3.18E-03	2.26E-02	2.52E-03	2.26E-02	2.39E-03	2.18E-02	2.51E-03	2.22E-02	2.50E-03	2.18E-02	2.53E-03
5/09/2024	1.41E-02	1.70E-03	1.52E-02	1.76E-03	1.59E-02	2.75E-03	1.34E-02	1.69E-03	1.57E-02	1.78E-03	1.48E-02	1.77E-03	1.67E-02	1.82E-03
5/15/2024	8.08E-03	2.05E-03	1.02E-02	2.15E-03	8.85E-03	2.11E-03	8.94E-03	2.12E-03	8.78E-03	2.09E-03	7.49E-03	2.07E-03	8.97E-03	2.11E-03
5/23/2024	1.40E-02	1.84E-03	1.52E-02	1.89E-03	1.57E-02	1.92E-03	1.49E-02	1.90E-03	1.61E-02	1.93E-03	1.62E-02	1.96E-03	1.65E-02	1.95E-03
5/29/2024	1.94E-02	2.38E-03	2.14E-02	2.46E-03	2.10E-02	2.45E-03	2.10E-02	2.47E-03	2.05E-02	2.43E-03	2.20E-02	2.51E-03	2.26E-02	2.52E-03
6/06/2024	1.87E-02	1.98E-03	1.97E-02	2.02E-03	2.07E-02	2.07E-03	1.67E-02	1.93E-03	1.98E-02	2.03E-03	2.15E-02	2.12E-03	1.90E-02	2.01E-03

Table 11 Continued: Weekly Air Monitoring Particulate and I-131 filters (pCi/m^3)

Gross Beta activity in Air Particulates (pCi/m^3)														
	E1-2		F1-3		G2-1		M2-1		A3-1		H3-1		Q15-1 Control)	
Date	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)
6/13/2024	1.08E-02	1.82E-03	1.19E-02	1.88E-03	1.37E-02	1.96E-03	1.17E-02	1.89E-03	1.19E-02	1.88E-03	1.41E-02	1.99E-03	1.28E-02	1.92E-03
6/20/2024	2.35E-02	2.41E-03	2.35E-02	2.42E-03	2.50E-02	2.78E-03	2.06E-02	2.34E-03	2.42E-02	2.44E-03	2.22E-02	2.42E-03	2.55E-02	2.49E-03
6/26/2024	2.63E-02	2.67E-03	2.84E-02	2.75E-03	2.78E-02	2.74E-03	2.84E-02	2.77E-03	2.60E-02	2.67E-03	2.84E-02	2.78E-03	2.84E-02	2.76E-03
7/03/2024	1.48E-02	1.93E-03	1.50E-02	1.94E-03	1.68E-02	2.02E-03	1.42E-02	1.93E-03	1.60E-02	1.98E-03	1.42E-02	1.94E-03	1.50E-02	1.95E-03
7/10/2024	2.61E-02	2.43E-03	2.66E-02	2.45E-03	2.94E-02	2.55E-03	2.87E-02	2.53E-03	3.02E-02	2.57E-03	2.73E-02	2.51E-03	2.83E-02	2.51E-03
7/18/2024	2.29E-02	2.15E-03	2.42E-02	2.18E-03	2.54E-02	2.23E-03	2.13E-02	2.11E-03	2.56E-02	2.23E-03	2.56E-02	2.26E-03	2.57E-02	2.24E-03
7/24/2024	2.28E-02	2.55E-03	2.51E-02	2.64E-03	2.22E-02	2.97E-03	2.32E-02	2.60E-03	2.45E-02	2.62E-03	2.23E-02	2.57E-03	2.31E-02	2.58E-03
8/01/2024	2.36E-02	2.15E-03	2.69E-02	2.26E-03	2.59E-02	2.23E-03	2.42E-02	2.19E-03	2.60E-02	2.23E-03	2.78E-02	2.31E-03	2.75E-02	2.29E-03
8/08/2024	2.62E-02	2.44E-03	2.75E-02	2.49E-03	2.52E-02	2.44E-03	2.58E-02	2.46E-03	2.86E-02	2.52E-03	2.43E-02	2.43E-03	2.81E-02	2.52E-03
8/15/2024	1.77E-02	2.14E-03	1.88E-02	2.19E-03	1.89E-02	2.20E-03	1.66E-02	2.13E-03	1.94E-02	2.21E-03	1.77E-02	2.19E-03	1.76E-02	2.15E-03
8/22/2024	1.88E-02	2.21E-03	2.01E-02	2.26E-03	1.90E-02	2.23E-03	1.73E-02	2.18E-03	1.93E-02	2.23E-03	1.90E-02	2.25E-03	2.07E-02	2.29E-03
8/29/2024	4.12E-02	2.87E-03	5.61E-02	3.26E-03	5.26E-02	3.19E-03	4.35E-02	2.96E-03	3.98E-02	2.84E-03	4.00E-02	2.89E-03	3.90E-02	2.83E-03
9/05/2024	2.04E-02	2.30E-03	2.99E-02	2.61E-03	2.67E-02	2.52E-03	2.11E-02	2.35E-03	2.00E-02	2.30E-03	2.04E-02	2.34E-03	1.63E-02	2.17E-03
9/12/2024	2.38E-02	2.37E-03	2.74E-02	2.50E-03	2.40E-02	2.40E-03	2.33E-02	2.38E-03	2.63E-02	2.47E-03	2.35E-02	2.41E-03	2.30E-02	2.36E-03
9/19/2024	3.26E-02	2.63E-03	3.39E-02	2.68E-03	3.68E-02	2.77E-03	3.53E-02	2.74E-03	3.18E-02	2.62E-03	3.21E-02	2.65E-03	2.98E-02	2.57E-03
9/26/2024	2.24E-02	2.24E-03	2.34E-02	2.28E-03	2.45E-02	2.33E-03	2.46E-02	2.40E-03	2.59E-02	2.37E-03	2.33E-02	2.31E-03	2.47E-02	2.33E-03
10/03/2024	1.13E-02	1.89E-03	1.22E-02	1.93E-03	1.04E-02	1.87E-03	9.78E-03	1.85E-03	1.07E-02	1.88E-03	1.06E-02	1.89E-03	1.09E-02	1.89E-03
10/10/2024	2.69E-02	2.40E-03	2.83E-02	2.45E-03	2.95E-02	2.50E-03	2.80E-02	2.46E-03	2.98E-02	2.50E-03	2.97E-02	2.53E-03	2.97E-02	2.50E-03
10/17/2024	2.76E-02	2.41E-03	2.67E-02	2.39E-03	2.77E-02	2.43E-03	2.79E-02	2.45E-03	2.62E-02	2.38E-03	2.66E-02	2.41E-03	2.73E-02	2.42E-03
10/24/2024	3.73E-02	2.72E-03	4.26E-02	2.87E-03	4.14E-02	2.86E-03	3.89E-02	2.79E-03	4.35E-02	2.90E-03	4.11E-02	2.88E-03	4.62E-02	2.98E-03
10/30/2024	1.96E-02	2.45E-03	2.53E-02	2.66E-03	ND	ND	2.40E-02	2.64E-03	2.35E-02	2.60E-03	2.34E-02	2.63E-03	2.50E-02	2.66E-03
11/07/2024	2.42E-02	2.15E-03	2.75E-02	2.26E-03	2.75E-02	2.27E-03	2.64E-02	2.24E-03	2.87E-02	2.30E-03	2.38E-02	2.18E-03	2.84E-02	2.30E-03
11/13/2024	2.03E-02	2.46E-03	2.16E-02	2.52E-03	2.54E-02	2.66E-03	2.01E-02	2.50E-03	2.18E-02	2.53E-03	1.95E-02	2.48E-03	2.09E-02	2.51E-03
11/20/2024	2.63E-02	2.45E-03	3.31E-02	2.67E-03	3.16E-02	2.63E-03	3.08E-02	2.62E-03	3.39E-02	2.70E-03	3.22E-02	2.68E-03	3.21E-02	2.65E-03
11/26/2024	2.04E-02	2.36E-03	2.41E-02	2.51E-03	2.46E-02	2.54E-03	2.41E-02	2.53E-03	2.39E-02	2.50E-03	2.53E-02	2.58E-03	2.22E-02	2.45E-03

Table 11 Continued: Weekly Air Monitoring Particulate and I-131 filters (pCi/m^3)

Gross Beta activity in Air Particulates (pCi/m^3)														
	E1-2		F1-3		G2-1		M2-1		A3-1		H3-1		Q15-1 Control)	
Date	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)	Gross Beta Activity	Date	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)	Gross Beta Activity	(2-σ)
12/4/2024	2.38E-02	2.15E-03	2.94E-02	2.33E-03	3.05E-02	2.38E-03	2.75E-02	2.30E-03	2.94E-02	2.34E-03	3.11E-02	2.42E-03	2.94E-02	2.34E-03
12/11/2024	2.87E-02	2.53E-03	3.31E-02	2.67E-03	3.25E-02	2.67E-03	3.11E-02	2.63E-03	3.33E-02	2.68E-03	3.11E-02	2.64E-03	3.01E-02	2.59E-03
12/19/2024	1.89E-02	1.93E-03	2.09E-02	2.01E-03	ND	ND	1.70E-02	1.89E-03	2.25E-02	2.07E-03	2.03E-02	2.02E-03	1.88E-02	1.95E-03
12/26/2024	2.01E-02	2.20E-03	2.25E-02	2.29E-03	2.31E-02	2.32E-03	2.08E-02	2.25E-03	2.07E-02	2.23E-03	2.31E-02	2.35E-03	2.09E-02	2.24E-03
1/02/2025	1.69E-02	2.05E-03	1.97E-02	2.16E-03	2.16E-02	2.24E-03	1.83E-02	2.13E-03	2.08E-02	2.20E-03	1.92E-02	2.17E-03	2.19E-02	2.25E-03
[ND] Indicates No Data due to sampler malfunction resulting in insufficient volume collected.														

Table 11 Continued: Weekly Air Monitoring Particulate and I-131 filters (pCi/m^3)							
Airborne I-131 (pCi/m^3) Activity on Charcoal Cartridges							
Date	E1-2	F1-3	G2-1	M2-1	A3-1	H3-1	Q15-1
1/04/2024	*	*	*	*	*	*	*
1/11/2024	*	*	*	*	*	*	*
1/18/2024	*	*	*	*	*	*	*
1/25/2024	*	*	*	*	*	*	*
1/31/2024	*	*	*	*	*	*	*
2/08/2024	*	*	*	*	*	*	*
2/14/2024	*	*	*	*	*	*	*
2/22/2024	*	*	*	*	*	*	*
2/28/2024	*	*	*	*	*	*	*
3/07/2024	*	*	*	*	*	*	*
3/14/2024	*	*	*	*	*	*	*
3/20/2024	*	*	*	*	*	*	*
3/27/2024	*	*	*	*	*	*	*
4/04/2024	*	*	*	*	*	*	*
4/11/2024	*	*	*	*	*	*	*
4/18/2024	*	*	*	*	*	*	*
4/25/2024	*	*	*	*	*	*	*
5/01/2024	*	*	*	*	*	*	*
5/09/2024	*	*	*	*	*	*	*
5/15/2024	*	*	*	*	*	*	*
5/23/2024	*	*	*	*	*	*	*
5/29/2024	*	*	*	*	*	*	*
6/06/2024	*	*	*	*	*	*	*
6/13/2024	*	*	*	*	*	*	*
6/20/2024	*	*	*	*	*	*	*
6/26/2024	*	*	*	*	*	*	*
7/03/2024	*	*	*	*	*	*	*

Table 11 Continued: Weekly Air Monitoring Particulate and I-131 filters (pCi/m^3)

Airborne I-131 (pCi/m^3) Activity on Charcoal Cartridges

7/10/2024	*	*	*	*	*	*	*
7/18/2024	*	*	*	*	*	*	*
7/24/2024	*	*	*	*	*	*	*
8/01/2024	*	*	*	*	*	*	*
8/08/2024	*	*	*	*	*	*	*
8/15/2024	*	*	*	*	*	*	*
8/22/2024	*	*	*	*	*	*	*
8/29/2024	*	*	*	*	*	*	*
9/05/2024	*	*	*	*	*	*	*
9/12/2024	*	*	*	*	*	*	*
9/19/2024	*	*	*	*	*	*	*
9/26/2024	*	*	*	*	*	*	*
10/03/2024	*	*	*	*	*	*	*
10/10/2024	*	*	*	*	*	*	*
10/17/2024	*	*	*	*	*	*	*
10/24/2024	*	*	*	*	*	*	*
10/30/2024	*	*	ND	*	*	*	*
11/07/2024	*	*	*	*	*	*	*
11/13/2024	*	*	*	*	*	*	*
11/20/2024	*	*	*	*	*	*	*
11/26/2024	*	*	*	*	*	*	*
12/4/2024	*	*	*	*	*	*	*
12/11/2024	*	*	*	*	*	*	*
12/19/2024	*	*	ND	*	*	*	*
12/26/2024	*	*	*	*	*	*	*
1/02/2025	*	*	*	*	*	*	*

*<MDA, Minimum Detectable Activity

ND Indicates No Data due to sampler malfunction resulting in insufficient volume collected.

Table 12: Quarterly isotopic data –Air (pCi/m^3), Milk (pCi/L), Water (pCi/L)

Location	Nuclide	Q1	Q2	Q3	Q4
Quarterly Air Filter Composite for Gamma Emitters (pCi/m^3)					
E1-2	Cs134, Cs137	<MDAs	<MDAs	<MDAs	<MDAs
F1-3	Cs134, Cs137	<MDAs	<MDAs	<MDAs	<MDAs
G2-1	Cs134, Cs137	<MDAs	<MDAs	<MDAs	<MDAs
M2-1	Cs134, Cs137	<MDAs	<MDAs	<MDAs	<MDAs
A3-1	Cs134, Cs137	<MDAs	<MDAs	<MDAs	<MDAs
H3-1	Cs134, Cs137	<MDAs	<MDAs	<MDAs	<MDAs
Q15-1 (Control)	Cs134, Cs137	<MDAs	<MDAs	<MDAs	<MDAs
Quarterly Strontium-90 in Milk (pCi/L)					
F4-1	Sr-90	<MDA	<MDA	<MDA	<MDA
G2-1	Sr-90	<MDA	<MDA	<MDA	<MDA
J18-1 (Control)	Sr-90	<MDA	<MDA	<MDA	<MDA
Quarterly Tritium in Water (pCi/L)					
G15-2 (Control)	H-3	<MDA	<MDA	<MDA	<MDA
G15-3	H-3	<MDA	<MDA	<MDA	<MDA
Q9-1 (DW)	H-3	<MDA	<MDA	<MDA	<MDA
Q9-1 (SW)	H-3	<MDA	<MDA	<MDA	<MDA
J1-2	H-3	<MDA	<MDA	<MDA	<MDA
K1-1	H-3	<MDA	<MDA	<MDA	<MDA
NOTE: <MDA denotes laboratory analysis detected No non-natural radionuclides at or above the ODCM required Minimum Detectable Activity					

Table 13: Semi-Annual Fish and Sediment Isotopic Data

Radionuclides in Fish (pCi/kg wet)				
Sample Code	Sample Date	Sample Type	Gamma Emitters	Sr-90
BKG (Control)	6/13/2024	Bottom Feeder	*	*
Upstream of Station Discharge	6/13/2024	Predator Fish	*	*
	10/22/2024	Bottom Feeder	*	*
	10/22/2024	Predator Fish	*	*
IND	6/11/2024	Bottom Feeder	*	*
Downstream of Station Discharge	6/11/2024	Predator Fish	*	*
	10/16/2024	Bottom Feeder	*	*
	10/16/2024	Predator Fish	*	*

* All Non-Natural Gamma Emitters <MDA

Radionuclides in Sediment (pCi/kg dry)		
Sample Code	Sample Date	Gamma Emitters
A3-1 (Control)	6/19/2024	*
North Tip of TMI in Susquehanna River	10/29/2024	*
J2-1	6/19/2024	*
South of TMINS & upstream of York Haven Dam, in Susquehanna River	10/29/2024	*
K1-3	6/19/2024	*
downstream of TMINS liquid discharge in Susquehanna River	10/29/2024	*

* All Non-Natural Gamma Emitters <MDA

Attachment 3, Cross Check Intercomparison Program

Participation in cross check intercomparison studies is mandatory for laboratories performing analyses of REMP samples satisfying the requirements in the Offsite Site Dose Calculation Manual. Intercomparison studies provide a consistent and effective means to evaluate the accuracy and precision of analyses performed by a laboratory. Study results should fall within specified control limits and results that fall outside the control limits are investigated and corrected.

Constellation Generation Solutions Laboratory participated in the following proficiency testing studies provided by Environmental Resource Associates (ERA) and Eckert Ziegler Analytics (EZA) in 2024. The Laboratory's intercomparison program results for 2024 are summarized below.

Attachment 3 is a summary of Constellation Generation Solutions (CGS) laboratory's quality assurance program. It consists of Table 14 which is a compilation of the results of the CGS laboratory's participation in an interlaboratory comparison program with Environmental Resource Associates (ERA) located in Arvada, Colorado and Eckert and Ziegler Analytics, Inc. (EZA) located in Atlanta, Georgia.

It also includes a compilation of the results of the Constellation Generation Solutions (CGS) Laboratory's participation in a split sample program with Teledyne Brown Engineering located in Knoxville, Tennessee.

The CGS laboratory's intercomparison results, are in full agreement when they were evaluated using designated acceptance ranges and the Resolution Test Criteria in accordance with the Constellation Radiochemistry Quality Control procedure, except as noted in the Pass/Fail column and described below. The CGS laboratory's results are provided with their analytical uncertainties of 2 sigma. When evaluating with the Resolution Test a one sigma uncertainty is used to determine Pass or Fail and noted accordingly.

All results reported passed their respective acceptance ranges and Resolution Test Criteria with two exceptions described as follows:

> RAD-137 I-131 water study on 04/08/2024 on Detector 6 (D6) failed high at 29.7 pCi/L for a true value of 25.1 pCi/L with an acceptance range of 21.7 – 28.5 pCi/L. This was a new detector and the study had very low area counts. Of the three runs, the other two values would have passed. Results on all other detectors were successful. Further review of the data indicated all the Ba-133 results in the other RAD-137 water study were in acceptable range. In that study, Ba-133 is meant to approximate I-131 results as it has an energy very close to I-131 in the spectrum. The detector is new in the lab and there is an ongoing review of its performance to identify the optimal operating range and any inherent bias.

E14044 Filter study on 12/05/24 failed low for Cs-134 on D6 reporting 91.3 +/- 3.25 pCi for a true value of 116 pCi. This study also had unusually low area counts in this range of the spectrum. The result did pass the acceptance range of 81.2 – 150.8 pCi, however due to the extremely low activity level, count times were extended significantly to capture other isotopes with lower yields resulting in very low uncertainties for higher yield isotopes. In the case of Cs-134 the uncertainty was less than 5% and at the level of recovery observed, the result failed the resolution test. Routine analysis is normally performed to achieve 15% +/- 5 %. Review of all other studies performed on this detector showed successful performance for Cs-134 and all other isotopes. The evaluation of detector performance is ongoing to identify inherent bias or variability at low count rates as is observed in environmental samples.

The vendor laboratories used by CGS for subcontracting and interlaboratory comparison samples, GEL Laboratories and Teledyne Brown Engineering (TBE), also participate in the ERA and EZA interlaboratory comparison program. A presentation of their full data report is provided in their Annual Environmental Quality Assurance Program Reports, (Ref 44,45). In summary Gel and TBE reported results met vendor and laboratory acceptance ranges with the following exceptions described here.

For TBE, the following three studies reported data that did not meet the specified acceptance criteria and were addressed through the TBE Corrective Action Program. Investigations of the failures are described as follows:

TBE Crosschecks failed high for MRAD-40 Gross Beta at 42.1 pCi/Filter. The true value was 22.2 and the acceptable range was 13.5-33.5 pCi/Filter. All QC associated with the original sample was acceptable and no anomalies were found. This sample was used as the WG duplicate with a result of 42.5 pCi. Both were counted on the same detector. Upon comparison to historical sample data, the alpha activity of this ERA submitted sample was the highest assigned result, and the beta activity was the lowest. Therefore, the alpha-to-beta crosstalk was more significant than normal, causing the beta activity to report falsely high data. The counting room laboratory staff will adjust the alpha-to-beta crosstalk via correction calculation measures when high alpha are observed. Subsequent study MRAD-41 for Gross Beta filter returned acceptable results.

RAD-137 Gross Alpha in water failed low at 35.2 pCi/L. The true value was 52.6 pCi/L and the acceptable range was 39.6 – 65.6 pCi/L. A QuiKResponse repeat study was analyzed and failed high at 40.3 pCi/L and the acceptable range was 21.5 – 38.5 pCi/L. Investigation showed higher than usual solids in the ERA study, out of the usual range of client samples received by the lab. Also, a different attenuation curve, Th-230, was used for the crosscheck than had been used historically. This curve was less representative of client samples. The lab review of data also showed that a replicate run of the sample would have passed but the lab chose the wrong replicate to report. The lab has gone to a lower volume of sample and resumed using the Am-241 attenuation curve which more closely mirrors client samples and subsequent crosschecks are reporting acceptable.

Quarter 1-2024 gamma results for Co-60 (air filter) and Ce-141 (soil) both failed high. The reported result for the filter Co-60 was 168+/- 12.7 and the known value was 126+/-2.1; the reported results for the soil Ce-141 was 0.106 and the known value was 0.0714+/-0.0013 pCi/g. The root cause investigation showed successful results for the filter on another detector. All QC associated with this sample was acceptable. The soil was recounted on another detector and Ce-141 result of 0.085 was acceptable and generally the same for other geometries. All QC associated with this sample was acceptable. No effective corrective action can be taken at this time. Historically, the Filter Co-60 and soil Ce-141 results have been well within TBE QC acceptance ranges. TBE has successfully passed cross-check results and it appears that these two results are anomalous. If there is a recurrence, a root cause investigation will be done promptly.

For the GEL Laboratory, the following six studies reported data that did not meet the specified acceptance criteria and were addressed through the GEL's internal nonconformance system. A summary is found below:

RAD-136 water Sr-90 failed high, while I-131 failed low.

Strontium-90: The Group Leader has reviewed the method to identify the bias. The method LCS trend was reviewed and no anomalies were identified. The calibration used for the analysis was compared to the new calibration performed recently and the original reported data was processed with both calibrations for comparison. Data still maintained a high bias but was within the limits of the study. A sample of known Strontium concentration was analyzed, and the results were processed using the new calibration. The result was within the mid-range of the acceptance limits. Instrument run logs were reviewed and there was no indication of possible bias from a previously counted sample.

Iodine-131: The laboratory has reviewed the data and found no errors. All batch QC samples, including a duplicate, met acceptance criteria. The carrier yields were found to be slightly higher than typically seen in this method, possibly contributing to the low bias in the result. The laboratory will continue to investigate all steps of the analytical process.

RAD-137 water Sr-90 and I-131 studies both failed low.

Strontium-90: The unacceptable result was analyzed by a modified method of 905.0 and recovered 83% of the known value which is acceptable for the laboratory's LCS. The PT sample was also analyzed by EPA DW method 905.0 and achieved an acceptable result recovering 94% of the assigned value. The RPD between the methods was 12%. The laboratory is evaluating calibration, yield determination, techniques, reagents, carriers, and each step of the process for areas of improvement.

Iodine-131: The laboratory has reviewed the data and no errors were noted. All batch QC samples, including an in-batch duplicate, met acceptance criteria. It was noted that the carrier yields were found to be slightly higher than are typically seen in this method including the reference sample used to calculate the LCS, potentially contributing to the low bias in the result.

RAD-138 Sr-90 and I-131 on water failed low.

Strontium-90: The laboratory conducted an in-depth review of all available data and did not identify any specific errors or anomalies that could explain the performance evaluation failure. The instrument calibrations were reviewed for possible significant areas of variance when compared to previous calibrations and none were noted. The quality department conducted direct observations of the analytical processes noting minor areas of improvement during precipitations and column separations. A definitive root cause was not isolated during the investigation.

Iodine-131: The laboratory has reviewed the data and found no errors. All batch QC samples, including an in-batch duplicate, met the acceptance criteria. As part of the investigation, the quality department observed the preparation process. During the review, it was identified that a reagent may have been improperly diluted, potentially contributing to the low bias observed in the results. This procedural discrepancy has been noted as a probable cause requiring corrective action.

The laboratory has since successfully completed a single-blind spiked sample, achieving results within the acceptance criteria for both Sr-90 and I-131.

Table 14: Cross Check Intercomparison Results

Study Date	Study ID	Units	Radionuclide	Reported Value	Assigned Value	Acceptance		Performance Evaluation
						Lower Limit	Upper Limit	
3/14/2024	E14036 Milk	pCi/L	I-131	96.7	90.8	63.6	118	Pass
		pCi/L	Cs-134	182	198	139	257	Pass
		pCi/L	Cs-137	181	171	120	222	Pass
		pCi/L	Ce-141	88.1	85	59.5	111	Pass
		pCi/L	Cr-51	281	230	161	299	Pass
		pCi/L	Mn-54	187	183	128	238	Pass
		pCi/L	Fe-59	93.6	86.5	60.6	112	Pass
		pCi/L	Co-60	152	158	111	205	Pass
		pCi/L	Zn-65	161	176	123	229	Pass
3/14/2024	E14037 Water	pCi/L	Beta Cs-137	238	231	162	300	Pass
3/14/2024	E14038 Charcoal	pCi	I-131	75.9	90.2	63.1	117	Pass
		pCi	I-131	79.0	90.2	63.1	117	Pass
		pCi	I-131	77.1	90.2	63.1	117	Pass
		pCi	I-131	77.3	90.2	63.1	117	Pass
4/8/2024	RAD-137 Water	pCi/L	I-131	27.1	25.1	21.7	28.5	Pass
		pCi/L	I-131	25.1	25.1	21.7	28.5	Pass
		pCi/L	I-131	27.5	25.1	21.7	28.5	Pass
4/8/2024	RAD-137 Water	pCi/L	I-131	29.7	25.1	21.7	28.5	Fail [1]

Table 14 Continued: Cross Check Intercomparison Results								
Study Date	Study ID	Units	Radionuclide	Reported Value	Assigned Value	Acceptance		Performance Evaluation
						Lower Limit	Upper Limit	
4/8/2024	RAD-137 Water	pCi/L	Beta Cs-137	36.6	46.5	33.9	59.1	Pass
4/8/2024	RAD-137 Water	pCi/L	Cs-134	55.9	57.8	42.8	72.8	Pass
		pCi/L	Cs-137	190	186	149	223	Pass
		pCi/L	Co-60	98.8	98.8	79.7	118	Pass
		pCi/L	Zn-65	228	240	188	292	Pass
4/8/2024	RAD-137 Water	pCi/L	Cs-134	60.7	57.8	42.8	72.8	Pass
		pCi/L	Cs-137	185	186	149	223	Pass
		pCi/L	Co-60	97.7	98.8	79.7	118	Pass
		pCi/L	Zn-65	233	240	188	292	Pass
4/8/2024	RAD-137 Water	pCi/L	Cs-134	59.8	57.8	42.8	72.8	Pass
		pCi/L	Cs-137	190	186	149	223	Pass
		pCi/L	Co-60	97.2	98.8	79.7	118	Pass
		pCi/L	Zn-65	240	240	188	292	Pass
4/8/2024	RAD-137 Water	pCi/L	Cs-134	58.6	57.8	42.8	72.8	Pass
		pCi/L	Cs-137	185	186	149	223	Pass
4/8/2024	RAD-137 Water	pCi/L	Co-60	102	98.8	79.7	118	Pass

Table 14 Continued: Cross Check Intercomparison Results

Study Date	Study ID	Units	Radionuclide	Reported Value	Assigned Value	Acceptance		Performance Evaluation
						Lower Limit	Upper Limit	
		pCi/L	Zn-65	227	240	188	292	Pass
6/13/2024	E14101 Soil	pCi/g	Cs-134	0.406	0.408	0.286	0.530	Pass
		pCi/g	Cs-137	0.402	0.451	0.316	0.586	Pass
6/13/2024	E14101 Soil	pCi/g	Cs-134	0.372	0.408	0.286	0.530	Pass
		pCi/g	Cs-137	0.365	0.451	0.316	0.586	Pass
6/13/2024	E14039 Water	pCi/L	Beta Cs-137	265	262	183	341	Pass
6/13/2024	E14040	pCi/L	Ce-141	45.4	37.5	26.3	48.8	Pass
		pCi/L	Co-60	402	391	274	508	Pass
		pCi/L	Cr-51	250	291	204	378	Pass
		pCi/L	Cs-134	237	242	169	315	Pass
		pCi/L	Cs-137	233	229	160	298	Pass
		pCi/L	Fe-59	183	174	122	226	Pass
		pCi/L	Mn-54	209	204	143	265	Pass
		pCi/L	Zn-65	89.6	99.1	69.4	129	Pass
6/13/2024	E14040	pCi/L	Ce-141	40	37.5	26.3	48.8	Pass
		pCi/L	Co-60	397	391	274	508	Pass
		pCi/L	Cr-51	286	291	204	378	Pass
		pCi/L	Cs-134	238	242	169	315	Pass
		pCi/L	Cs-137	237	229	160	298	Pass
		pCi/L	Fe-59	183	174	122	226	Pass

Table 14 Continued: Cross Check Intercomparison Results

Study Date	Study ID	Units	Radionuclide	Reported Value	Assigned Value	Acceptance		Performance Evaluation
						Lower Limit	Upper Limit	
		pCi/L	Mn-54	212	204	143	265	Pass
		pCi/L	Zn-65	95.4	99.1	69.4	129	Pass
6/13/2024	E14041 Filter	pCi	Ce-141	25.4	25.2	17.6	32.8	Pass
		pCi	Co-60	258	262	183	341	Pass
		pCi	Cr-51	211	195	137	254	Pass
6/13/2024	E14041 Filter	pCi	Cs-134	137	162	113	211	Pass
		pCi	Cs-137	159	153	107	199	Pass
		pCi	Fe-59	132	117	81.9	152	Pass
		pCi	Mn-54	143	137	95.9	178	Pass
		pCi	Zn-65	71.0	66.4	46.5	86.3	Pass
6/13/2024	E14042A Filter	pCi	Beta Cs-137	249	220	154	286	Pass
9/12/2024	E14043 Filter	pCi	Beta Cs-137	242	221	84.7	157	Pass
9/12/2024	E14102 Soil	pCi/g	Cs-134	0.318	0.336	0.235	0.437	Pass
		pCi/g	Cs-137	0.287	0.295	0.207	0.384	Pass
9/12/2024	E14102 Soil	pCi/g	Cs-134	0.299	0.336	0.235	0.437	Pass
		pCi/g	Cs-137	0.269	0.295	0.207	0.384	Pass
9/12/2024	E14043 Filter	pCi	Beta Cs-137	242	221	84.7	157	Pass
9/12/2024	E14102 Soil	pCi/g	Cs-134	0.318	0.336	0.235	0.437	Pass

Table 14 Continued: Cross Check Intercomparison Results

Study Date	Study ID	Units	Radionuclide	Reported Value	Assigned Value	Acceptance		Performance Evaluation
						Lower Limit	Upper Limit	
		pCi/g	Cs-137	0.287	0.295	0.207	0.384	Pass
9/12/2024	E14102 Soil	pCi/g	Cs-134	0.299	0.336	0.235	0.437	Pass
		pCi/g	Cs-137	0.269	0.295	0.207	0.384	Pass
9/16/2024	MRAD-41 Filter	pCi	Cs-134	499	581	377	712	Pass
		pCi	Cs-137	880	848	696	1110	Pass
		pCi	Co-60	865	839	713	1070	Pass
9/16/2024	MRAD-41 Filter	pCi	Zn-65	269	239	196	365	Pass
10/4/2024	RAD-139 Water	pCi/L	Cs-134	79.6	80.2	63.0	97.4	Pass
		pCi/L	Cs-137	49.7	46.3	23.3	69.3	Pass
		pCi/L	Co-60	47.9	45.3	31.6	59.0	Pass
		pCi/L	Zn-65	108	114	75.0	153	Pass
10/4/2024	RAD-139 Water	pCi/L	Cs-134	79.8	80.2	63.0	97.4	Pass
		pCi/L	Cs-137	46.0	46.3	23.3	69.3	Pass
		pCi/L	Co-60	49.4	45.3	31.6	59.0	Pass
10/4/2024	RAD-139 Water	pCi/L	Zn-65	106	114	75.0	153	Pass
10/4/2024	RAD-139 Water	pCi/L	Cs-134	79.4	80.2	63.0	97.4	Pass

Table 14 Continued: Cross Check Intercomparison Results

Study Date	Study ID	Units	Radionuclide	Reported Value	Assigned Value	Acceptance		Performance Evaluation
						Lower Limit	Upper Limit	
		pCi/L	Cs-137	46.3	46.3	23.3	69.3	Pass
		pCi/L	Co-60	47.5	45.3	31.6	59.0	Pass
		pCi/L	Zn-65	106	114	75.0	153	Pass
10/4/2024	RAD-139 Water	pCi/L	I-131	26.4	26.3	22.7	29.9	Pass
10/4/2024	RAD-139 Water	pCi/L	I-131	26.3	26.3	22.7	29.9	Pass
12/5/2024	E14044 Filter	pCi	Ce-141	75.7	74.8	52	97	Pass
		pCi	Co-58	105	97.9	69	127	Pass
		pCi	Cr-60	220	219	153	285	Pass
		pCi	Cr-51	182	185	130	241	Pass
		pCi	Cs-134	97.9	116	81	151	Pass
		pCi	Cs-137	144	144	101	187	Pass
		pCi	Fe-59	130	107	75	139	Pass
		pCi	Mn-54	113	104	73	135	Pass
		pCi	Zn-65	164	155	109	202	Pass
12/5/2024	E14044 Filter	pCi	Ce-141	69.3	74.8	52	97	Pass
		pCi	Co-58	93.7	97.9	69	127	Pass
		pCi	Cr-60	196	219	153	285	Pass
		pCi	Cr-51	166	185	130	241	Pass
		pCi	Cs-134	91.3	116	81	151	Fail [1]
		pCi	Cs-137	135	144	101	187	Pass

Table 14 Continued: Cross Check Intercomparison Results

Study Date	Study ID	Units	Radionuclide	Reported Value	Assigned Value	Acceptance		Performance Evaluation
						Lower Limit	Upper Limit	
		pCi	Fe-59	113	107	75	139	Pass
		pCi	Mn-54	106	104	73	135	Pass
		pCi	Zn-65	146	155	109	202	Pass
12/5/2024	E14044 Filter	pCi	Ce-141	66.6	74.8	52	97	Pass
		pCi	Co-58	92.4	97.9	69	127	Pass
		pCi	Cr-60	204	219	153	285	Pass
		pCi	Cr-51	175	185	130	241	Pass
		pCi	Cs-134	95.7	116	81	151	Pass
		pCi	Cs-137	139	144	101	187	Pass
12/5/2024	E14044 Filter	pCi	Fe-59	119	107	75	139	Pass
		pCi	Mn-54	102	104	73	135	Pass
		pCi	Zn-65	139	155	109	202	Pass
12/5/2024	E14045 Water	pCi/L	Beta Cs-137	257	240	168	312	Pass
12/5/2024	E14046 Charcoal	pCi	I-131	58.0	65.3	45.7	84.9	Pass
		pCi	I-131	59.3	65.3	45.7	84.9	Pass
		pCi	I-131	59.4	65.3	45.7	84.9	Pass
12/5/2024	E14047 Milk	pCi/L	Ce-141	74.7	71.6	50.1	93.1	Pass
		pCi/L	Co-58	95.2	93.7	65.6	122	Pass
		pCi/L	Co-60	211	210	147	273	Pass
		pCi/L	Cr-51	164	177	124	230	Pass

Table 14 Continued: Cross Check Intercomparison Results

Study Date	Study ID	Units	Radionuclide	Reported Value	Assigned Value	Acceptance		Performance Evaluation
						Lower Limit	Upper Limit	
		pCi/L	Cs-134	114	111	77.7	144	Pass
		pCi/L	Cs-137	150	138	96.6	179	Pass
		pCi/L	Fe-59	112	102	71.4	133	Pass
		pCi/L	I-131	50.1	51.0	35.7	66.3	Pass
		pCi/L	Mn-54	106	99.5	69.7	129	Pass
		pCi/L	Zn-65	141	149	104	194	Pass
12/5/2024	E14047 Milk	pCi/L	Ce-141	77.8	71.6	50.1	93.1	Pass
		pCi/L	Co-58	96.9	93.7	65.6	122	Pass
		pCi/L	Co-60	208	210	147	273	Pass
		pCi/L	Cr-51	205	177	124	230	Pass
12/5/2024	E14047 Milk	pCi/L	Cs-134	110	111	77.7	144	Pass
		pCi/L	Cs-137	140	138	96.6	179	Pass
		pCi/L	Fe-59	100	102	71.4	133	Pass
		pCi/L	I-131	45.5	51.0	35.7	66.3	Pass
		pCi/L	Mn-54	109	99.5	69.7	129	Pass
		pCi/L	Zn-65	136	149	104	194	Pass
12/5/2024	E14047 Milk	pCi/L	Ce-141	71.9	71.6	50.1	93.1	Pass
		pCi/L	Co-58	89.7	93.7	65.6	122	Pass
		pCi/L	Co-60	232	210	147	273	Pass
		pCi/L	Cr-51	180	177	124	230	Pass
		pCi/L	Cs-134	113	111	77.7	144	Pass
		pCi/L	Cs-137	149	138	96.6	179	Pass
		pCi/L	Fe-59	112	102	71.4	133	Pass

Table 14 Continued: Cross Check Intercomparison Results

Study Date	Study ID	Units	Radionuclide	Reported Value	Assigned Value	Acceptance		Performance Evaluation
						Lower Limit	Upper Limit	
		pCi/L	I-131	63.3	51.0	35.7	66.3	Pass
		pCi/L	Mn-54	105	99.5	69.7	129	Pass
		pCi/L	Zn-65	148	149	104	194	Pass

[1] See Discussion at the beginning of Attachment 3

Table 14 Continued: Split Sample Intercomparison Results

Sample Type	**Location**	**Sample Date**	**Analysis**	**Result Units**	**CGS Analysis w 2σ**		**Split Analysis w 2σ**	**Pass/Fail (Split)**
Water	Q9-1	1/31/2024	Gross Beta	pCi/L	1.45	0.769	1.97E ± 1.27	Pass
Water	Q9-1	1/31/2024	LLI	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	1/31/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	1/31/2024	Tritium	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	2/28/2024	Gross Beta	pCi/L	1.28	0.770	2.5 ± 1.25	Pass
Water	Q9-1	2/28/2024	LLI	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	2/28/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	2/28/2024	Tritium	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	3/27/2024	Gross Beta	pCi/L	1.39	0.722	2.92 ± 1.26	Pass
Water	Q9-1	3/27/2024	LLI	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	3/27/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	3/27/2024	Tritium	pCi/L	<MDA		<MDA	Pass

Table 14 Continued: Split Sample Intercomparison Results

Sample Type	Location	Sample Date	Analysis	Result Units	CGS Analysis w 2σ		Split Analysis w 2σ	Pass/Fail (Split)
Water	Q9-1	5/1/2024	Gross Beta	pCi/L	1.42	0.711	2.00 ± 1.3	Pass
Water	Q9-1	5/1/2024	LLI	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	5/1/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	5/1/2024	Tritium	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	5/29/2024	Gross Beta	pCi/L	<MDA		2.79 ± 1.4	Pass
Water	Q9-1	5/29/2024	LLI	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	5/29/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	5/29/2024	Tritium	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	6/26/2024	Gross Beta	pCi/L	1.37	0.753	3.39 ± 1.52	Pass
Water	Q9-1	6/26/2024	LLI	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	6/26/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	6/26/2024	Tritium	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	8/1/2024	Gross Beta	pCi/L	1.52	0.789	<MDA	Pass
Water	Q9-1	8/1/2024	LLI	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	8/1/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	8/1/2024	Tritium	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	8/29/2024	Gross Beta	pCi/L	1.93	0.781	3.66 ± 1.43	Pass
Water	Q9-1	8/29/2024	LLI	pCi/L	<MDA		<MDA	Pass

Table 14 Continued: Split Sample Intercomparison Results

Sample Type	Location	Sample Date	Analysis	Result Units	CGS Analysis w 2σ		Split Analysis w 2σ	Pass/Fail (Split)
Water	Q9-1	8/29/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	8/29/2024	Tritium	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	10/3/2024	Gross Beta	pCi/L	1.60	0.762	<MDA	Pass
Water	Q9-1	10/3/2024	LLI	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	10/3/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	10/3/2024	Tritium	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	10/30/2024	Gross Beta	pCi/L	1.97	0.788	2.68 ± 1.62	Pass
Water	Q9-1	10/30/2024	LLI	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	10/30/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	10/30/2024	Tritium	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	12/4/2024	Gross Beta	pCi/L	1.58	0.768	<MDA	Pass
Water	Q9-1	12/4/2024	LLI	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	12/4/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	12/4/2024	Tritium	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	1/2/2025	Gross Beta	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	1/2/2025	LLI	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	1/2/2025	Gamma	pCi/L	<MDA		<MDA	Pass
Water	Q9-1	1/2/2025	Tritium	pCi/L	<MDA		<MDA	Pass

Table 14 Continued: Split Sample Intercomparison Results

Sample Type	Location	Sample Date	Analysis	Result Units	CGS Analysis w 2σ		Split Analysis w 2σ	Pass/Fail (Split)
Milk	G2-1	1/18/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	1/18/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	2/14/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	2/14/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	3/7/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	3/7/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	3/20/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	3/20/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	4/4/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	4/4/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	4/18/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	4/18/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	5/1/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	5/1/2024	LLI	pCi/L	<MDA		<MDA	Pass

Table 14 Continued: Split Sample Intercomparison Results

Sample Type	Location	Sample Date	Analysis	Result Units	CGS Analysis w 2σ		Split Analysis w 2σ	Pass/Fail (Split)
Milk	G2-1	5/15/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	5/15/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	5/29/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	5/29/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	6/13/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	6/13/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	6/26/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	6/26/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	7/10/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	7/10/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	7/24/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	7/24/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	8/8/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	8/8/2024	LLI	pCi/L	<MDA		<MDA	Pass

Table 14 Continued: Split Sample Intercomparison Results

Sample Type	Location	Sample Date	Analysis	Result Units	CGS Analysis w 2σ		Split Analysis w 2σ	Pass/Fail (Split)
Milk	G2-1	8/22/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	8/22/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	9/5/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	9/5/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	9/19/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	9/19/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	10/3/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	10/3/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	10/17/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	10/17/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	10/30/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	10/30/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	11/13/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	11/13/2024	LLI	pCi/L	<MDA		<MDA	Pass

Table 14 Continued: Split Sample Intercomparison Results

Sample Type	Location	Sample Date	Analysis	Result Units	CGS Analysis w 2σ		Split Analysis w 2σ	Pass/Fail (Split)
Milk	G2-1	11/26/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	11/26/2024	LLI	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	12/11/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Milk	G2-1	12/11/2024	LLI	pCi/L	<MDA		<MDA	Pass
Filter Composite	E1-2	3/27/2024	Gamma	pCi/m3	<MDA		<MDA	Pass
Filter Composite	E1-2	6/26/2024	Gamma	pCi/m3	<MDA		<MDA	Pass
Filter Composite	E1-2	10/3/2024	Gamma	pCi/m3	<MDA		<MDA	Pass
Filter Composite	E1-2	1/2/2025	Gamma	pCi/m3	<MDA		<MDA	Pass
Vegetation	H1-2	6/19/2024	Gamma	pCi/Kg	<MDA		<MDA	Pass
Vegetation	H1-2	7/17/2024	Gamma	pCi/Kg	<MDA		<MDA	Pass
Vegetation	H1-2	8/14/2024	Gamma	pCi/Kg	<MDA		<MDA	Pass
Vegetation	H1-2	9/11/2024	Gamma	pCi/Kg	<MDA		<MDA	Pass
Vegetation	B10-2	8/14/2024	Gamma	pCi/Kg	<MDA		<MDA	Pass
Vegetation	B10-2	8/14/2024	Strontium-90	pCi/Kg	NA		<MDA	NA

Table 14 Continued: Split Sample Intercomparison Results

Sample Type	Location	Sample Date	Analysis	Result Units	CGS Analysis w 2σ		Split Analysis w 2σ	Pass/Fail (Split)
Fish	INDP	10/16/2024	Gamma	pCi/Kg	<MDA		<MDA	Pass
Fish	INDP	10/16/2024	Strontium-90	pCi/Kg	<MDA		<MDA	Pass
Sediment	J2-1	10/29/24	Gamma	pCi/Kg	<MDA		<MDA	Pass
Water	WA1	6/28/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Water	WA2	6/28/2024	Gamma	pCi/L	<MDA		<MDA	Pass
Oysters	IA3	6/19/2024	Gamma	pCi/Kg	<MDA		<MDA	Pass
Oysters	IA6	6/19/2024	Gamma	pCi/Kg	<MDA		<MDA	Pass
Bottom Sediment	WBS4	6/19/2024	Gamma	pCi/Kg	<MDA		<MDA	Pass
Bottom Sediment	WBS2	6/19/2024	Gamma	pCi/Kg	<MDA		<MDA	Pass
Vegetation	IB10	7/22/2024	Gamma	pCi/Kg	<MDA		<MDA	Pass
Vegetation	IB11	7/22/2024	Gamma	pCi/Kg	<MDA		<MDA	Pass
Vegetation	IB12	7/22/2024	Gamma	pCi/Kg	<MDA		<MDA	Pass
Vegetation	East	7/23/2024	Gamma	pCi/Kg	<MDA		<MDA	Pass
Milk	Farm A	09/03/2024	Gamma	Gamma	pCi/L		<MDA	Pass

Table 14 Continued: Split Sample Intercomparison Results

Sample Type	Location	Sample Date	Analysis	Result Units	CGS Analysis w 2σ		Split Analysis w 2σ	Pass/Fail (Split)
Milk	Farm A	09/03/2024	Gamma	LLI	pCi/L		<MDA	Pass
Milk	Farm B	09/03/2024	Gamma	Gamma	pCi/L		<MDA	Pass
Milk	Farm B	09/03/2024	Gamma	LLI	pCi/L		<MDA	Pass
Milk	#55	09/09/2024	Gamma	Gamma	pCi/L		<MDA	Pass
Milk	#55	09/09/2024	Gamma	LLI	pCi/L		<MDA	Pass
Fish (Spanish Mackerel)	IA1	8/14/2024	Gamma	pCi/kg	<MDA		<MDA	Pass
Filter Composite	CC-A1*	9/30/2024	Gamma	pCi/m3	<MDA		<MDA	Pass
Filter Composite	CC-A2*	9/30/2024	Gamma	pCi/m3	<MDA		<MDA	Pass
Filter Composite	CC-A3*	9/30/2024	Gamma	pCi/m3	<MDA		<MDA	Pass
Filter Composite	CC-A4*	9/30/2024	Gamma	pCi/m3	<MDA		<MDA	Pass
Filter Composite	CC-A5*	9/30/2024	Gamma	pCi/m3	<MDA		<MDA	Pass
Filter Composite	CC-SFA1*	9/30/2024	Gamma	pCi/m3	<MDA		<MDA	Pass
Filter Composite	CC-SFA2*	9/30/2024	Gamma	pCi/m3	<MDA		<MDA	Pass

Table 14 Continued: Split Sample Intercomparison Results

Sample Type	Location	Sample Date	Analysis	Result Units	CGS Analysis w 2σ		Split Analysis w 2σ	Pass/Fail (Split)
Filter Composite	CC-SFA3*	9/30/2024	Gamma	pCi/m3	<MDA		<MDA	Pass
Filter Composite	CC-SFA4*	9/30/2024	Gamma	pCi/m3	<MDA		<MDA	Pass

[<MDA] All non-natural gamma emitters below Minimum Detectable Activity.

[NA] Analysis not required.

* Samples cannot be split and are analyzed first by CGS and then by TBE for comparison.

Attachment 4, Environmental Direct Radiation Dosimetry Results

Monitoring Location	Quarterly Baseline, B_Q (mrem)	B_Q + MDD_Q (mrem)	Normalized Quarterly Monitoring Data, M_Q (mrem)				Quarterly Facility Dose, $F_Q=M_Q-B_Q$ (mrem, or "ND" if $F_Q \leq MDD_Q$)				Annual Baseline, B_A (mrem)	B_A + MDD_A (mrem)	Annual Monitoring Data, M_A (mrem)	Annual Facility Dose, $F_A=M_A-B_A$ (mrem, or "ND" if $F_A \leq MDD_A$)
			1	2	3	4	1	2	3	4				
TM-ID-K2-1	21.5	28.13	20.5	21.2	19.1	22.4	ND	ND	ND	ND	86.20	101.35	83.2	ND
TM-ID-L1-2	17.6	24.23	13.6	13	13.4	16.7	ND	ND	ND	ND	70.30	85.45	56.7	ND
TM-ID-M1-2	19	25.63	15.5	18.9	16.8	18.4	ND	ND	ND	ND	76.10	91.25	69.6	ND
TM-ID-N1-1	18.5	25.13	16.5	16.2	16.5	*	ND	ND	ND	ND	73.90	89.05	49.2	ND
TM-ID-P1-1	18.3	24.93	15.5	16.8	14.6	20	ND	ND	ND	ND	73.00	88.15	66.9	ND
TM-ID-Q1-1	18.7	25.33	16.5	18.8	16.7	16.6	ND	ND	ND	ND	74.70	89.85	68.6	ND
TM-ID-R1-2	16.9	23.53	14	14.3	14	15	ND	ND	ND	ND	67.80	82.95	57.3	ND
TM-ID-A1-4	16.8	23.43	14.9	15	13.2	16.2	ND	ND	ND	ND	67.10	82.25	59.3	ND
TM-ID-B1-1	17.7	24.33	15.8	14.2	12.8	16.1	ND	ND	ND	ND	70.80	85.95	58.9	ND
TM-ID-B1-2	17.2	23.83	15.3	17.3	12.6	15.4	ND	ND	ND	ND	68.70	83.85	60.6	ND
TM-ID-C1-2	17	23.63	13.3	15.5	13.3	16.1	ND	ND	ND	ND	67.90	83.05	58.2	ND
TM-ID-D1-1	17.9	24.53	15.3	15.1	13.5	16.3	ND	ND	ND	ND	71.40	86.55	60.2	ND
TM-ID-E1-4	18.1	24.73	16.1	18.1	12.7	19.1	ND	ND	ND	ND	72.30	87.45	66	ND
TM-ID-F1-2	20.4	27.03	17.2	17.8	14.3	16.4	ND	ND	ND	ND	81.50	96.65	65.7	ND
TM-ID-F1-4	19	25.63	15.1	17.7	13.1	16.8	ND	ND	ND	ND	75.80	90.95	62.7	ND
TM-ID-G1-3	18	24.63	15.8	16.8	13.3	15.6	ND	ND	ND	ND	71.90	87.05	61.5	ND
TM-ID-G1-5	17.7	24.33	16.6	18.9	15.1	17.9	ND	ND	ND	ND	70.60	85.75	68.5	ND

Monitoring Location	Quarterly Baseline, B_Q (mrem)	B_Q + MDD_Q (mrem)	Normalized Quarterly Monitoring Data, M_Q (mrem)				Quarterly Facility Dose, F_Q=M_Q-B_Q (mrem, or "ND" if $F_Q \leq MDD_Q$)				Annual Baseline, B_A (mrem)	B_A + MDD_A (mrem)	Annual Monitoring Data, M_A (mrem)	Annual Facility Dose, F_A=M_A-B_A (mrem, or "ND" if $F_A \leq MDD_A$)
			1	2	3	4	1	2	3	4				
TM-ID-G1-6	18.8	25.43	17.8	16.8	15	17.9	ND	ND	ND	ND	75.30	90.45	67.5	ND
TM-ID-H1-1	19.3	25.93	22	24.1	23	19.5	ND	ND	ND	ND	77.00	92.15	88.6	ND
TM-ID-J1-1	17.3	23.93	14.8	14.4	13.5	16.6	ND	ND	ND	ND	69.30	84.45	59.3	ND
TM-ID-J1-3	15.3	21.93	23.7	25.6	23.3	23.6	8.4	10.3	8	8.3	61.10	76.25	96.2	35.1
TM-ID-K1-4	17.4	24.03	16.6	18.3	14.6	15.3	ND	ND	ND	ND	69.60	84.75	64.8	ND
TM-ID-L1-1	18.7	25.33	18.6	17.1	14.7	18	ND	ND	ND	ND	74.70	89.85	68.4	ND
TM-ID-M1-1	17	23.63	15.7	13.7	13.6	16.7	ND	ND	ND	ND	67.90	83.05	59.7	ND
TM-ID-N1-3	18.8	25.43	18	17.3	15.3	18.8	ND	ND	ND	ND	75.20	90.35	69.4	ND
TM-ID-P1-2	18.4	25.03	19.3	21.7	18.2	19.2	ND	ND	ND	ND	73.70	88.85	78.4	ND
TM-ID-Q1-2	15.8	22.43	14.3	15.8	12.6	15.9	ND	ND	ND	ND	63.20	78.35	58.6	ND
TM-ID-R1-1	16.8	23.43	15.8	14.3	12.4	15	ND	ND	ND	ND	67.10	82.25	57.5	ND
TM-ID-A5-1	20.8	27.43	19.4	17.9	18.6	19.8	ND	ND	ND	ND	83.20	98.35	75.7	ND
TM-ID-B5-1	20	26.63	18.4	17.6	18.9	19.7	ND	ND	ND	ND	79.80	94.95	74.6	ND
TM-ID-H15-1	19.8	26.43	18.6	18	17	16.9	ND	ND	ND	ND	79.20	94.35	70.5	ND
TM-ID-H5-1	15.9	22.53	13.1	13.4	13.1	*	ND	ND	ND	ND	63.70	78.85	39.6	ND
TM-ID-H8-1	29.7	36.33	28.1	25.5	26.4	29.7	ND	ND	ND	ND	118.60	133.75	109.7	ND
TM-ID-J15-1	23.2	29.83	22.4	21	20	21.6	ND	ND	ND	ND	92.90	108.05	85	ND

Monitoring Location	Quarterly Baseline, B_Q (mrem)	B_Q + MDD_Q (mrem)	Normalized Quarterly Monitoring Data, M_Q (mrem)				Quarterly Facility Dose, F_Q=M_Q-B_Q (mrem, or "ND" if $F_Q \leq MDD_Q$)				Annual Baseline, B_A (mrem)	B_A + MDD_A (mrem)	Annual Monitoring Data, M_A (mrem)	Annual Facility Dose, F_A=M_A-B_A (mrem, or "ND" if $F_A \leq MDD_A$)
			1	2	3	4	1	2	3	4				
TM-ID-J3-1	19.5	26.13	18.3	17.6	17.3	18.8	ND	ND	ND	ND	77.90	93.05	72	ND
TM-ID-J5-1	21.4	28.03	20	20.1	20.4	19.7	ND	ND	ND	ND	85.70	100.85	80.2	ND
TM-ID-J7-1	22.8	29.43	22.1	21.8	20.3	21.3	ND	ND	ND	ND	91.10	106.25	85.5	ND
TM-ID-K15-1	19.1	25.73	17.2	15.9	16.5	17.4	ND	ND	ND	ND	76.50	91.65	67	ND
TM-ID-K3-1	17.4	24.03	15.7	14.9	14.5	14.6	ND	ND	ND	ND	69.70	84.85	59.7	ND
TM-ID-K5-1	21.2	27.83	21.6	19.9	20.2	20.6	ND	ND	ND	ND	84.60	99.75	82.3	ND
TM-ID-K8-1	20.5	27.13	18.8	16.1	16.2	19.1	ND	ND	ND	ND	81.80	96.95	70.2	ND
TM-ID-L15-1	19.6	26.23	17.5	18.1	17.9	18.3	ND	ND	ND	ND	78.50	93.65	71.8	ND
TM-ID-L2-1	19.4	26.03	17.1	16.7	17.6	17.9	ND	ND	ND	ND	77.40	92.55	69.3	ND
TM-ID-L5-1	17.6	24.23	16.6	13.7	16	17.4	ND	ND	ND	ND	70.50	85.65	63.7	ND
TM-ID-L8-1	19.6	26.23	17.1	17.5	15.8	18.1	ND	ND	ND	ND	78.40	93.55	68.5	ND
TM-ID-M2-1	17.4	24.03	16.6	16.6	15.9	15.9	ND	ND	ND	ND	69.60	84.75	65	ND
TM-ID-M5-1	19.2	25.83	18.2	17.7	19.1	19.7	ND	ND	ND	ND	76.90	92.05	74.7	ND
TM-ID-M9-1	23.5	30.13	21.3	20.4	21.6	20.9	ND	ND	ND	ND	93.80	108.95	84.2	ND
TM-ID-N15-2	21.6	28.23	19.6	20.4	20.5	18.1	ND	ND	ND	ND	86.40	101.55	78.6	ND
TM-ID-N2-1	20	26.63	19	19.2	16.9	19.3	ND	ND	ND	ND	80.10	95.25	74.4	ND
TM-ID-N5-1	16.9	23.53	15.2	13.9	14.7	13.9	ND	ND	ND	ND	67.70	82.85	57.7	ND

Monitoring Location	Quarterly Baseline, B_Q (mrem)	B_Q + MDD_Q (mrem)	Normalized Quarterly Monitoring Data, M_Q (mrem)				Quarterly Facility Dose, $F_Q=M_Q-B_Q$ (mrem, or "ND" if $F_Q \leq MDD_Q$)				Annual Baseline, B_A (mrem)	B_A + MDD_A (mrem)	Annual Monitoring Data, M_A (mrem)	Annual Facility Dose, $F_A=M_A-B_A$ (mrem, or "ND" if $F_A \leq MDD_A$)
			1	2	3	4	1	2	3	4				
TM-ID-N8-1	20.3	26.93	19.8	20.2	16.3	16	ND	ND	ND	ND	81.20	96.35	72.3	ND
TM-ID-P2-1	22.3	28.93	20.5	22.5	21.8	19.8	ND	ND	ND	ND	89.20	104.35	84.6	ND
TM-ID-P5-1	19.6	26.23	18.9	18	16.6	20	ND	ND	ND	ND	77.60	92.75	73.5	ND
TM-ID-P8-1	17.1	23.73	15.6	16.2	14.4	13.6	ND	ND	ND	ND	68.50	83.65	59.8	ND
TM-ID-Q15-1	21.5	28.13	21	20.1	18.7	19.7	ND	ND	ND	ND	86.20	101.35	79.5	ND
TM-ID-Q2-1	17.7	24.33	16.9	15.7	14	14.5	ND	ND	ND	ND	70.70	85.85	61.1	ND
TM-ID-Q5-1	18.1	24.73	18.8	14.7	14	17.3	ND	ND	ND	ND	72.60	87.75	64.8	ND
TM-ID-Q9-1	18.9	25.53	16.9	14.5	16.4	15.9	ND	ND	ND	ND	75.40	90.55	63.7	ND
TM-ID-R5-1	21.1	27.73	19.8	20.3	18.5	15.2	ND	ND	ND	ND	84.50	99.65	73.8	ND
TM-ID-A3-1	16.5	23.13	15	11	14.5	15.4	ND	ND	ND	ND	66.00	81.15	55.9	ND
TM-ID-A9-3	17.6	24.23	15.9	14.6	15.2	17.2	ND	ND	ND	ND	70.60	85.75	62.9	ND
TM-ID-B10-1	19.3	25.93	18.5	16.3	18.9	18.4	ND	ND	ND	ND	77.40	92.55	72.1	ND
TM-ID-B2-1	17.2	23.83	16.1	12.2	16.1	17.8	ND	ND	ND	ND	69.00	84.15	62.2	ND
TM-ID-C1-1	20.2	26.83	18.4	16	18.8	18.6	ND	ND	ND	ND	80.80	95.95	71.8	ND
TM-ID-C2-1	19.2	25.83	17.4	14.3	17.1	17.6	ND	ND	ND	ND	76.90	92.05	66.4	ND
TM-ID-C5-1	20.7	27.33	19.5	14	18.9	20	ND	ND	ND	ND	82.70	97.85	72.4	ND
TM-ID-C8-1	20.9	27.53	19.3	14.2	18.4	18.8	ND	ND	ND	ND	83.40	98.55	70.7	ND

Monitoring Location	Quarterly Baseline, B_Q (mrem)	B_Q + MDD_Q (mrem)	Normalized Quarterly Monitoring Data, M_Q (mrem)				Quarterly Facility Dose, $F_Q=M_Q-B_Q$ (mrem, or "ND" if $F_Q \le MDD_Q$)				Annual Baseline, B_A (mrem)	B_A + MDD_A (mrem)	Annual Monitoring Data, M_A (mrem)	Annual Facility Dose, $F_A=M_A-B_A$ (mrem, or "ND" if $F_A \le MDD_A$)
			1	2	3	4	1	2	3	4				
TM-ID-D1-2	18.8	25.43	17.6	15.9	17	19.1	ND	ND	ND	ND	75.20	90.35	69.6	ND
TM-ID-D15-1	19.8	26.43	19	13.7	19	19.8	ND	ND	ND	ND	79.10	94.25	71.5	ND
TM-ID-D2-2	23	29.63	21.3	18.3	20.7	21.9	ND	ND	ND	ND	91.80	106.95	82.2	ND
TM-ID-D6-1	22.3	28.93	20.8	18.5	20	19.9	ND	ND	ND	ND	89.40	104.55	79.2	ND
TM-ID-E1-2	17.8	24.43	15.9	14	15.7	15.3	ND	ND	ND	ND	71.30	86.45	60.9	ND
TM-ID-E2-3	21.5	28.13	20.1	17.3	19.6	21.1	ND	ND	ND	ND	86.00	101.15	78.1	ND
TM-ID-E5-1	21.9	28.53	20.5	14.9	20.1	23.5	ND	ND	ND	ND	87.70	102.85	79	ND
TM-ID-E7-1	20.3	26.93	20	15.5	17.7	18.1	ND	ND	ND	ND	81.20	96.35	71.3	ND
TM-ID-F1-1	19.4	26.03	18.6	15.2	17.7	17.4	ND	ND	ND	ND	77.50	92.65	68.9	ND
TM-ID-F10-1	23.7	30.33	22.9	19.5	23.2	22.2	ND	ND	ND	ND	94.60	109.75	87.8	ND
TM-ID-F2-1	21.9	28.53	21.1	16.3	20.7	20.4	ND	ND	ND	ND	87.60	102.75	78.5	ND
TM-ID-F25-1	20.9	27.53	19.9	16.8	19.3	18.5	ND	ND	ND	ND	83.60	98.75	74.5	ND
TM-ID-F5-1	22.9	29.53	20.9	17.7	21.3	23.2	ND	ND	ND	ND	91.50	106.65	83.1	ND
TM-ID-G1-2	20.1	26.73	19.4	16.9	19.5	19.1	ND	ND	ND	ND	80.40	95.55	74.9	ND
TM-ID-G10-1	27.8	34.43	26.4	25.3	28.6	26.2	ND	ND	ND	ND	111.30	126.45	106.5	ND
TM-ID-G15-1	24.1	30.73	19.9	18.2	20	20	ND	ND	ND	ND	96.30	111.45	78.1	ND
TM-ID-G2-4	23.9	30.53	21.9	16.5	20.1	22.9	ND	ND	ND	ND	95.60	110.75	81.4	ND

Monitoring Location	Quarterly Baseline, B_Q (mrem)	B_Q + MDD_Q (mrem)	Normalized Quarterly Monitoring Data, M_Q (mrem)				Quarterly Facility Dose, $F_Q=M_Q-B_Q$ (mrem, or "ND" if $F_Q \leq MDD_Q$)				Annual Baseline, B_A (mrem)	B_A + MDD_A (mrem)	Annual Monitoring Data, M_A (mrem)	Annual Facility Dose, $F_A=M_A-B_A$ (mrem, or "ND" if $F_A \leq MDD_A$)
			1	2	3	4	1	2	3	4				
TM-ID-G5-1	19.7	26.33	17.9	14.9	18.2	19.1	ND	ND	ND	ND	78.90	94.05	70.1	ND
TM-ID-H3-1	16.3	22.93	15.6	11.1	14.4	11.4	ND	ND	ND	ND	65.30	80.45	52.5	ND
TM-ID-R15-1	19	25.63	17	11.2	17	17.6	ND	ND	ND	ND	76.00	91.15	62.8	ND
TM-ID-R3-1	21.9	28.53	20.4	17.5	20.9	20.5	ND	ND	ND	ND	87.60	102.75	79.3	ND
TM-ID-R9-1	21.2	27.83	19	17	19.5	21.1	ND	ND	ND	ND	84.80	99.95	76.6	ND
TM-ID-J1-4	15.3	21.93	26.3	24.1	21.1	24.7	11	8.8	ND	9.4	61.1	76.25	96.2	35.1
TM-ID-K1-5	17.4	24.03	19.7	21.3	18.5	19.8	ND	ND	ND	ND	69.6	84.75	79.3	ND
TM-ID-H1-3	18	24.63	27.8	29	24.7	29.2	9.8	11	6.7	11.2	71.9	87.05	110.7	38.8

* Lost Sample, See Table 9 Exceptions

MDD_Q = Quarterly Minimum Differential Dose = 6.63 mrem
MDD_A = Annual Minimum Differential Dose = 15.15 mrem
ND = Not Detected, where $M_Q \leq (B_Q+MDD_Q)$ or $M_A \leq (B_A+MDD_A)$

1.0 Summary and Conclusions

The Station conformed with its RGPP in 2024 with respect to sampling protocol. Three Mile Island has 49 monitoring wells that are sampled for tritium. Samples collected from Source and Long-Term Shutdown designated wells are analyzed for tritium quarterly; samples collected from Mid-Field designated wells are analyzed for tritium semi-annually, and samples collected from Background and Perimeter designated wells are analyzed for tritium annually as part of the Station RGPP (EN-TM-408-4160). RGPP sampling at the Station is performed by Constellation Generation Service, under contract to Constellation. Laboratory testing is performed by Teledyne Brown Engineering. The laboratory data, field data, and depth to water readings are uploaded to the RACER website, which is a data repository for the RGPP sampling rounds.

Based on a review of the data collected during the 2024 RGPP sampling rounds 117 samples were collected from 49 wells. There were 16 positive results for Tritium as described below:

Of the 20 wells sampled in 1st Quarter 2024, there were 2 positive results above the 200pCi/L lower limit of detection for Tritium.

Location	Date	Tritium (pCi/L)
MW-TMI-6I	2/20/24	255
NW-B	2/20/24	202

Of the 49 well sampled in 2nd Quarter 2024, there were 9 positive results for above the 200pCi/L lower limit of detection for Tritium.

Location	Date	Tritium (pCi/L)
MW-TMI-22S	5/21/24	256
NW-C	6/27/24	267
MW-TMI-21D	5/21/2024	1190
MW-TMI-21I	5/21/2024	332
MW-TMI-22I	5/21/2024	489
MW-TMI-22D	5/21/2024	1280
MW-TMI-6I	5/22/2024	210
NW-A	6/27/2024	198
NW-C	6/27/2024	267

Of the 18 wells sampled in 3rd Quarter 2024, there were no positive results above the 200pCi/L lower limit of detection for Tritium.

Of the 30 wells sampled in 4th Quarter 2024, there were 5 positive results above the 200pCi/L lower limit of detection for Tritium.

Location	Date	Tritium (pCi/L)
MW-TMI-21D	11/19/2024	1180
MW-TMI-21I	11/19/2024	202
MW-TMI-22I	11/19/2024	230
MW-TMI-22D	11/19/2024	1290
NW-C	12/3/2024	431

Tritium was not detected in the overburden aquifer during the 1st, 3rd and 4th quarter 2024 RGPP sampling rounds. Tritium was only detected in the overburden aquifer sample collected from MW-TMI-22S at 256 pCi/L during the 2nd quarter 2024 RGPP sampling round.

The maximum tritium concentration in the upper bedrock aquifer at the end of 2024 was 1,290 pCi/L (MW-TMI-22D). The maximum tritium concentration in the lower bedrock aquifer at the end of 2024 was 431 pCi/L (NW-C).

Mid-Field designated RGPP wells MW-TMI-6I and MW-TMI-6D were abandoned prior to the 3rd quarter 2024 RGPP sampling round. These wells were abandoned prior to the 3rd quarter 2024 RGPP sampling round due to their location in relation to ongoing decommissioning activities. These are scheduled to be replaced in 2025.

Station-related gamma-radionuclides, Hard-to-detects (Fe-55 and Ni-63) and Sr-89 and Sr-90 were not detected at concentrations greater than their respective LLDs in any of the groundwater samples collected in 2024.

Gross-alpha (dissolved and suspended) was not detected at concentrations that exceeded the Alert Level in 2024.

Tritium present in precipitation recapture was not likely to affect groundwater quality in the area of the turbine and reactor buildings.

There does not appear to be an active source of tritium to groundwater.
The wells sampled effectively monitored groundwater conditions at the facility.

Maps of the sampling locations are located at the end of this attachment. Figure 1a shows surface water and overburden RGPP monitoring locations; Figure 1b shows upper bedrock aquifer RGPP monitoring locations; and Figure 1c shows lower bedrock aquifer RGPP monitoring.

Gross-Alpha Alert Level

At Three Mile Island Generating Station, samples from the thirteen Source designated sample points and seven Long-Term Shutdown designated wells are analyzed once every two years for gross alpha dissolved and suspended fractions. Based on historical data an Alert Level was established and will be able to account for fluctuations in naturally occurring alpha activity in the area of wells, while identifying a result that may be indicative of a potential release. 2024 sample results are provided for gross-alpha (dissolved and suspended) in Table 15: Groundwater Protection Initiative 2024 Results at the end of this attachment. Gross-alpha analysis was most recently performed on Source and Long-Term Shutdown designated wells, during the 2nd quarter 2024 RGPP sampling round. Gross-alpha (suspended) was detected in the sample collected from MW-TMI-6D at 1.8 pCi/L. However, the gross-alpha (suspended) concentration did not exceed the Alert Level for that well. Gross-alpha (dissolved) was not detected in the samples collected during the 2nd quarter 2024 RGPP sampling round.

2024 Gross Alpha Suspended and Dissolved				
Location	Date (Sample ID)	Gross Alpha Suspended	Gross Alpha Dissolved	Units
48S	May 2024	0.929	2.82	pCi/L
MS-2	May 2024	1.08	0.964	pCi/L
MS-20	May 2024	0.782	1.74	pCi/L
MS-21	May 2024	0.778	0.599	pCi/L
MS-22	May 2024	1.05	0.431	pCi/L
MS-3	May 2024	1.1	1.26	pCi/L
MS-5	May 2024	1.08	1.1	pCi/L
MS-7	May 2024	0.809	0.671	pCi/L
MS-8	May 2024	0.781	1.29	pCi/L
MW-TMI-12S	May 2024	1.08	1.35	pCi/L
MW-TMI-21S	May 2024	1.05	1.18	pCi/L
MW-TMI-22S	May 2024	1.05	1.52	pCi/L
MW-TMI-3I	May 2024	1.03	1.21	pCi/L
MW-TMI-6D	May 2024	1.8	1.51	pCi/L
MW-TMI-6I	May 2024	0.79	1.4	pCi/L
NW-B	May 2024	0.924	1.67	pCi/L
OS-14	May 2024	0.78	1.75	pCi/L
OS-16	May 2024	1.2	0.698	pCi/L
OSF	May 2024	0.926	2.18	pCi/L
RW 1	May 2024	0.78	1.74	pCi/L

All Long-Term Shutdown and Source designated wells will have gross-alpha analysis performed again in 2026 in accordance with the biennial sampling schedule.

Gamma-Radionuclides

Gamma-radionuclide analysis was most recently performed during the 2nd quarter 2024 RGPP sampling round. Station-related gamma radionuclides were not detected at concentrations exceeding their respective LLDs in 2024. All wells will be analyzed for gamma-radionuclides in 2026 in accordance with the biennial sampling schedule.

Hard-to-Detects (Fe-55 and Ni-63)

In 2024, samples collected from the Long-Term Shutdown designated wells were analyzed for hard-to-detects (Fe-55 and Ni-63). Hard to detects (Fe-55 and Ni-63) were not detected at concentrations greater than their respective LLDs in the samples collected in 2024. Long-Term Shutdown designated wells will be analyzed for hard to detects (Fe-55 and Ni-63) in 2025 and Source designated well samples will be analyzed for hard- to-detects (Fe-55 and Ni-63) again in 2026 in accordance with the biennial sampling schedule.

Sr-89 and Sr-90

In 2024, samples collected from the Long-Term Shutdown and Source designated sample locations were analyzed for Sr-89 and Sr-90. Sr-89 and Sr-90 were not detected in the samples collected in 2024.

Precipitation Recapture

The Station collected precipitation recapture samples quarterly in 2024. Tritium was only detected in the sample collected from TM-PR-MW-22S during the 2nd quarter precipitation sampling round in 2024 with a concentration of 389 pCi/L. A summary of 2024 precipitation recapture results is presented in the table below.

Table 15: Groundwater Protection Initiative 2024 Results

Sample ID	Date	Directional Sector	Tritium Result	Qual
TM-PR-EDCB	2/14/2024	SE	196	U
TM-PR-EDCB	6/26/2024	SE	190	U
TM-PR-EDCB	9/27/2024	SE	188	U
TM-PR-EDCB	12/4/2024	SE	189	U
TM-PR-ESE	2/14/2024	ESE	195	U
TM-PR-ESE	5/21/2024	ESE	190	U
TM-PR-ESE	8/27/2024	ESE	185	U
TM-PR-ESE	11/19/2024	ESE	183	U
TM-PR-MS-1	2/14/2024	NNE	197	U
TM-PR-MS-1	5/21/2024	NNE	184	U
TM-PR-MS-1	8/27/2024	NNE	189	U

TM-PR-MS-1	11/19/2024	NNE	185	U
TM-PR-MS-2	2/14/2024	SE	198	U
TM-PR-MS-2	5/21/2024	SE	192	U
TM-PR-MS-2	8/27/2024	SE	188	U
TM-PR-MS-2	11/19/2024	SE	186	U
TM-PR-MS-4	2/14/2024	SSE	197	U
TM-PR-MS-4	5/21/2024	SSE	188	U
TM-PR-MS-4	8/27/2024	SSE	183	U
TM-PR-MS-4	11/19/2024	SSE	191	U
TM-PR-MS-8	2/14/2024	SW	192	U
TM-PR-MS-8	5/21/2024	SW	192	U
TM-PR-MS-8	8/27/2024	SW	185	U
TM-PR-MS-8	11/19/2024	SW	190	U
TM-PR-MW-22S	2/14/2024	NNW	198	U
TM-PR-MW-22S	5/21/2024	NNW	389	+
TM-PR-MW-22S	8/27/2024	NNW	191	U
TM-PR-MW-22S	11/19/2024	NNW	185	U
TM-PR-RW-1	2/14/2024	NE	197	U
TM-PR-RW-1	5/21/2024	NE	187	U
TM-PR-RW-1	8/27/2024	NE	189	U
TM-PR-RW-1	11/19/2024	NE	191	U
+ - Result detected at a concentration greater than the laboratory detection limit.				
U - Result not detected at a concentration greater than the laboratory detection limit.				
- All results presented in pico-curies per liter (pCi/L)				

Table 15 Continued: Groundwater Protection Initiative 2024 Results

2024 Gross Alpha Suspended and Dissolved				
Location	Date (Sample ID)	Gross Alpha Suspended	Gross Alpha Dissolved	Units
48S	May 2024	0.929	2.82	pCi/L
MS-2	May 2024	1.08	0.964	pCi/L
MS-20	May 2024	0.782	1.74	pCi/L
MS-21	May 2024	0.778	0.599	pCi/L
MS-22	May 2024	1.05	0.431	pCi/L
MS-3	May 2024	1.1	1.26	pCi/L
MS-5	May 2024	1.08	1.1	pCi/L
MS-7	May 2024	0.809	0.671	pCi/L
MS-8	May 2024	0.781	1.29	pCi/L

MW-TMI-12S	May 2024	1.08	1.35	pCi/L
MW-TMI-21S	May 2024	1.05	1.18	pCi/L
MW-TMI-22S	May 2024	1.05	1.52	pCi/L
MW-TMI-3I	May 2024	1.03	1.21	pCi/L
MW-TMI-6D	May 2024	1.8	1.51	pCi/L
MW-TMI-6I	May 2024	0.79	1.4	pCi/L
NW-B	May 2024	0.924	1.67	pCi/L
OS-14	May 2024	0.78	1.75	pCi/L
OS-16	May 2024	1.2	0.698	pCi/L
OSF	May 2024	0.926	2.18	pCi/L
RW 1	May 2024	0.78	1.74	pCi/L

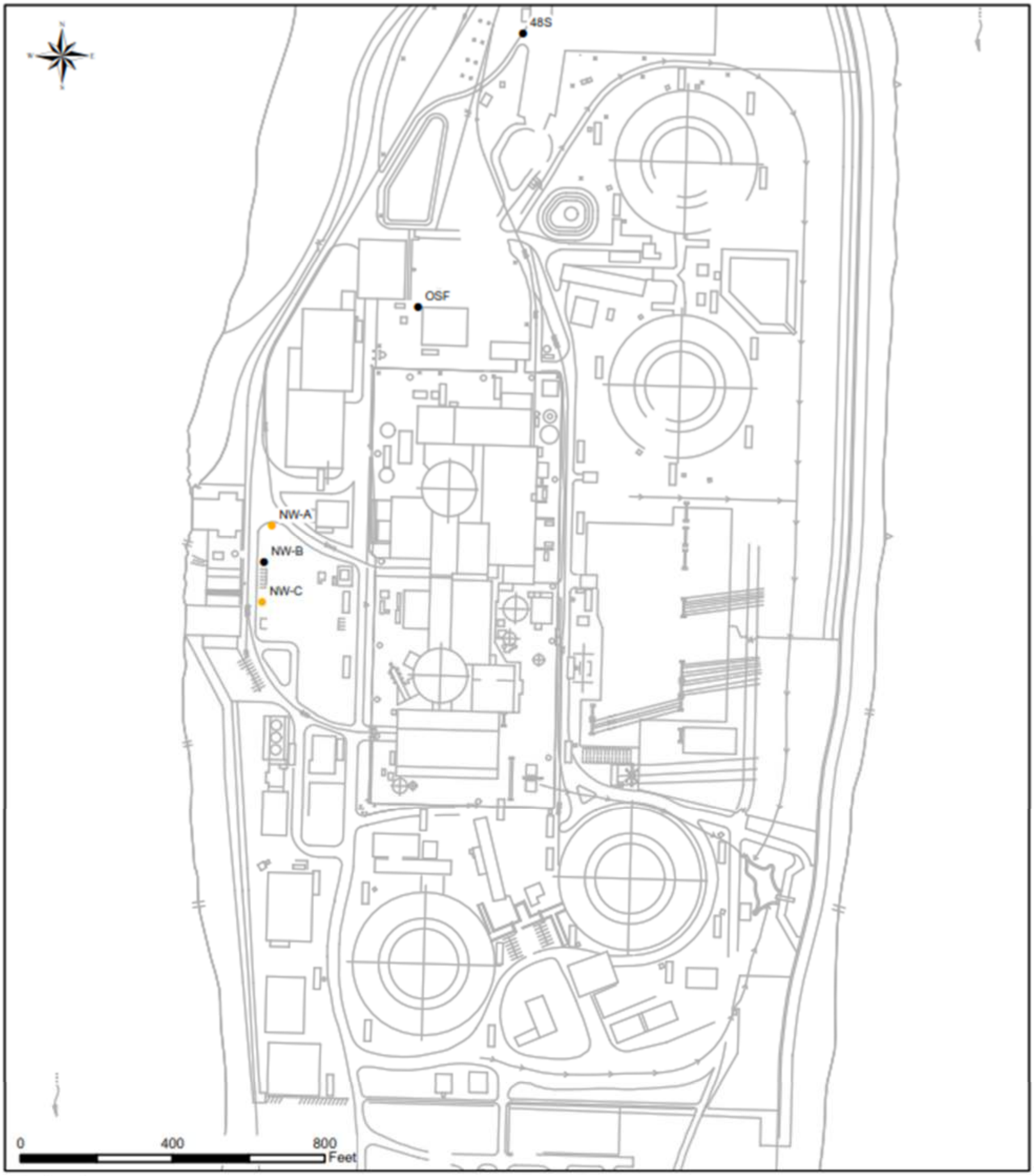
Explanation:
Overburden RGPP Monitoring Locations
- Long-Term Shutdown
- Mid-Field
- Perimeter
- Source

Figure 1a
RGPP Monitoring Locations
Overburden Aquifer
Constellation Energy Corporation
TMI Generating Station

Explanation:
Upper Bedrock RGPP Monitoring Location

- Background
- Long-Term Shutdown
- Mid-Field
- Perimeter
- Source

Figure 1b
RGPP Monitoring Locations Upper Bedrock Aquifer
Constellation Energy Corporation
TMI Generating Station



Explanation:
Lower Bedrock RGPP Monitoring Location
- Mid-Field
- Source

Figure 1c
RGPP Monitoring Locations Lower Bedrock Aquifer
Constellation Energy Corporation
TMI Generating Station

Attachment 6, Errata 2023 AREOR

1.0 Correction to the 2023 AREOR original document errors displayed below:

1. Refer to section 11.3.1 for Discussion, Table 3 Waterborne Locations contained a typo showing Q9-1 DW to be 88.5 miles distant correction is 8.5 miles.

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Table 3, Radiological Environmental Monitoring Program – Waterborne

Requirement	Sample Location Description, Distance, and Direction	Sampling Collection/ Frequency	Type and Frequency of Analyses
Surface Water 1 sample upstream (control) and 1 sample downstream (indicator)	A3-2: Swatara Creek, Middletown, 2.7 miles 356 degrees Q9-1: near intake Steelton Water Company, 8.5 miles 310 degrees J1-2: Downstream of TMINS liquid discharge, 0.5 miles 188 degrees	Composite sample over 1 monthly period	Gamma isotopic analysis monthly. Composite for tritium analysis quarterly.
Drinking Water 1 sample upstream (control) and 1 sample at nearest water supply that could be affected by the station discharge (indicator)	G15-2: Wrightsville Water Treatment Plant, 13.3 miles 129 degrees G15-3: Lancaster Water Treatment Plant, 15.7 miles 124 degrees Q9-1: at Steelton Water Company, 88.5 miles 310 degrees	Composite sample over 1 monthly period	Perform gross beta and gamma isotopic analysis monthly. Perform Sr-90 analysis if gross beta of monthly composite >10 times control. Composite for tritium analysis quarterly.
Sediment from Shoreline 1 sample upstream (control) 1 sample downstream (indicator)	A1-3: near north tip of TMI in Susquehanna River, 0.6 miles 359 degrees K1-3: downstream of TMINS liquid discharge in Susquehanna River, 0.2 miles 213 degrees J2-1: South of TMINS upstream of York Haven Dam, in Susquehanna River, 1.4 miles 179 degrees	Semiannual (Spring and Fall)	Gamma isotopic analysis on each sample.

2. Refer to section 11.3.2 for Discussion, Table 11 Sr-90 detected in Cabbage at B10-2 was actually a split sample that should have been reported in Table 12, Interlaboratory Split Samples.

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	8/16/2023	Melon Leaves	ND	*
	8/16/2023	Zucchini	ND	*
	9/20/2023	Cauliflower	ND	*
	9/20/2023	Broccoli	ND	*
	9/20/2023	Brussels Sprouts	ND	*
B10-2 (Control)	6/14/2023	Cabbage	ND	*
Milton Hershey School	6/14/2023	Broccoli	ND	*
	6/14/2023	Bok Choy Leaves	ND	*
	7/12/2023	Kale	ND	*
	7/12/2023	Collards	ND	*
	7/12/2023	Broccoli	ND	*
	8/16/2023	Kale	ND	*
	8/16/2023	Collards	ND	*
	8/16/2023	Cabbage	1.76E-2 ± 2.9E-3	*
	8/16/2023	Tomatoes	*	*
	8/16/2023	Potatoes	*	*
	8/16/2023	Corn	*	*
	9/20/2023	Eggplant Leaves	ND	*
	9/20/2023	Pepper Leaves	ND	*
	9/20/2023	Pumpkin Leaves	ND	*

* All Non-Natural Gamma Emitters <MDA

ND No Data, Analysis not required