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PEACH BOTTOM ATOMIC POWER STATION
UNITS 2 and 3

Annual Radiological
Groundwater Protection Program Report

1 January 2015 Through 31 December 2015

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I. Summary and Conclusions

This report on the Radiological Groundwater Protection Program (RGPP) conducted for the Peach Bottom Atomic Power Station (PBAPS) by Exelon Nuclear covers the period 01 January 2015 through 31 December 2015. This evaluation involved numerous station personnel and contractor support personnel. At PBAPS, there are 31 permanent groundwater monitoring wells. Installation of the wells began in 2006. Of these monitoring locations, none were assigned to the station's Radiological Environmental Monitoring Program (REMP). This is the ninth in a series of annual reports on the status of the RGPP conducted at PBAPS. This report covers groundwater, surface water, seep water and precipitation water samples collected from the environment on station property in 2015. During that time period, 686 analyses were performed on more than 218 samples from 41 locations. These 41 locations include 27 groundwater monitoring wells, 3 surface water sample points, 3 groundwater seeps and 2 yard drain sumps (groundwater) and 6 precipitation water sampling points. Phase 1 of the monitoring was part of a comprehensive study initiated by Exelon to determine whether groundwater or surface water in the vicinity of PBAPS had been adversely impacted by any releases of radionuclides. Phase 1 was conducted by Conestoga Rovers and Associates (CRA) and the conclusions were made available to state and federal regulators as well as the public. Phase 2 of the RGPP was conducted by Exelon corporate and station personnel to initiate follow up of Phase 1 and begin long-term monitoring at groundwater and surface water locations selected during Phase 1. All analytical results from Phase 2 monitoring are reported herein.

Samples supporting the RGPP were analyzed for Tritium, Strontium-89 (Sr-89), Strontium-90 (Sr-90), gross alpha, gross beta, gamma-emitting radionuclides associated with licensed plant operations and isotopes known as 'hard to detects'.

In assessing all the data gathered for this report, it was concluded that the operation of PBAPS had no adverse radiological impact on the environment and there are currently no known active releases into the groundwater at PBAPS.

Tritium was detected in 3 samples at one location in concentrations greater than the United States Environmental Protection Agency (USEPA) drinking water standard (and the Nuclear Regulatory Commission [NRC] Reporting Limit) of 20,000 pCi/L. These samples ranged from 21,100 to 37,700 pCi/L.

Tritium was not detected at concentrations greater than the minimum detectable concentration (MDC) in any surface water, seep water or precipitation water sample locations. Based on the sample data tritium is not migrating off the station property at detectable concentrations.

II. Introduction

PBAPS is located along the Susquehanna River between Holtwood and Conowingo Dams in Peach Bottom Township, York County, Pennsylvania. The initial loading of fuel into Unit 1, a 40 MWe (net) high temperature gas-cooled reactor, began on 5 February 1966, and initial criticality was achieved on 3 March 1966. Shutdown of Peach Bottom Unit 1 for decommissioning was on 31 October 1974. For the purposes of the monitoring program, the beginning of the operational period for Unit 1 was considered to be 5 February 1966. A summary of the Unit 1 preoperational monitoring program was presented in a previous report [(1)]. PBAPS Units 2 and 3 are boiling water reactors, each with a power output of approximately 1366 MWe. The first fuel was loaded into Peach Bottom Unit 2 on 9 August 1973. Criticality was achieved on 16 September 1973 and full power was reached on 16 June 1974. The first fuel was loaded into Peach Bottom Unit 3 on 5 July 1974. Criticality was achieved on 7 August 1974 and full power was first reached on 21 December 1974. Preoperational summary reports [(2)(3)] for Units 2 and 3 have been previously issued and summarize the results of all analyses performed on samples collected from 5 February 1966 through 8 August 1973.

This report covers those analyses performed by Teledyne Brown Engineering (TBE) on samples collected in 2015.

A. Objective of the RGPP

The objectives of the RGPP are as follows:

1. Ensure that the site characterization of geology and hydrology provides an understanding of predominant groundwater gradients based upon current site conditions.

2. Identify site risk based on plant design and work practices.

3. Establish an on-site groundwater monitoring program to ensure timely detection of inadvertent radiological releases to ground water.

4. Establish a remediation protocol to prevent migration of licensed material off-site and to minimize decommissioning impacts.

5. Ensure that records of leaks, spills, remediation efforts are retained and retrievable to meet the requirements of 10 CFR 50.75(g).

6. Conduct initial and periodic briefings of their site specific Groundwater Protection Initiative (GPI) program with the designated State/Local officials.

7. Make informal communication as soon as practicable to appropriate State/Local officials, with follow-up notifications to the NRC, as appropriate, regarding significant on-site leaks/spills into groundwater and on-site or off-site water sample results exceeding the criteria in the REMP as described in the OCDM.

8. Submit a written 30-day report to the NRC for any water sample result for on-site groundwater that is or may be used as a source of drinking water that exceeds any of the criteria in the licensee's existing REMP/ODCM for 30-day reporting of off-site water sample results.

9. Document all on-site groundwater sample results and a description of any significant on-site leaks/spills into groundwater for each calendar year in the Annual Radiological Environmental Operating Report (AREOR) for REMP or the Annual Radioactive Effluent Release Report (ARERR).

10. Perform a self-assessment of the GPI program.

11. Conduct a review of the GPI program, including at a minimum the licensee's self assessments, under the auspices of the Nuclear Energy Institute (NEI).

B. Implementation of the Objectives

The objectives identified have been implemented at PBAPS via Corporate and Site specific procedures. These procedures include:

1. EN-AA-407, Response to Inadvertent Releases of Licensed Materials to Groundwater, Surface Water or Soil.

2. EN-AA-408, Radiological Groundwater Protection Program

3. EN-AA-408-4000, Radiological Groundwater Protection Program Implementation.

4. EN-PB-408-4160, Peach Bottom RGPP Reference Material

C. Program Description

1. Sample Collection

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

Groundwater, Surface Water and Precipitation Water

Samples of water are collected, managed, transported and analyzed in accordance with approved procedures. Groundwater, surface water, and precipitation water are collected. Sample locations, sample collection frequencies and analytical frequencies are controlled in accordance with approved station procedures. Contractor and/or station personnel are trained in the collection, preservation management and shipment of samples, as well as in documentation of sampling events. Analytical laboratories are subject to internal quality assurance programs, industry cross-check programs, as well as nuclear industry audits. Station personnel review and evaluate all analytical data deliverables as data are received.

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

D. Characteristics of Tritium (H-3)

Tritium (chemical symbol H-3) is a radioactive isotope of hydrogen. The most common form of tritium is tritium oxide, which is also called "tritiated water." The chemical properties of tritium are essentially those of ordinary hydrogen.

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

Tritium is produced naturally in the upper atmosphere when cosmic rays strike air molecules. Tritium is also produced during nuclear weapons explosions, as a by-product in reactors producing electricity and in special production reactors, where the isotopes lithium-7 (Li-7) and/or boron-10 (B-10) are activated to produce tritium. Like normal water, tritiated water is colorless and odorless. Tritiated water behaves chemically and physically like non-tritiated water in the subsurface and therefore tritiated water will travel at the same velocity as the average groundwater velocity.

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

III. Program Description

A. Sample Analysis

This section describes the general analytical methodologies used by TBE and Environmental Inc. Midwest Laboratories (EIML) to analyze the environmental samples for radioactivity for the PBAPS RGPP in 2015.

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

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

2. Concentrations of strontium in groundwater.

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

4. Concentrations of 'hard-to-detect' isotopes (Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240, U-233/234, U-235, U-238, Fe-55 and Ni-63) in groundwater. These analyses are required based on tritium results.

B. Data Interpretation

The radiological data collected prior to PBAPS becoming operational were used as a baseline with which these operational data were compared. For the purpose of this report, PBAPS was considered operational at initial criticality. Several factors were important in the interpretation of the data:

1. <u>Lower Limit of Detection</u>

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

2. Laboratory Measurements Uncertainty

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

Statistically, the exact value of a measurement is expressed as a range with a stated level of confidence. The convention is to report results with a 95% level of confidence. The uncertainty comes from calibration standards, sample volume or weight measurements, sampling uncertainty and other factors. Exelon reports the uncertainty of a measurement created by statistical process (counting error) as well as all sources of error (Total Propagated Uncertainty or TPU). Each result has two values calculated. Exelon reports the TPU by following the result with plus or minus ± the estimated sample standard deviation as TPU that is obtained by propagating all sources of analytical uncertainty in measurements.

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

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

For groundwater and surface water 12 nuclides, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, I-131, Cs-134, Cs-137, Ba-140 and La-140 are measured.

C. Background Analysis

A pre-operational REMP was conducted to establish background radioactivity levels prior to operation of the Station. The environmental media sampled and analyzed during the pre-operational REMP were atmospheric radiation, fall-out, domestic water, surface water, marine life and foodstuffs. The results of the monitoring were detailed in the report entitled PBAPS, Environs Radiation Monitoring Program, Preoperational Summary Report Units 2 and 3, September 1970- August 1973, January 1974 and PBAPS, Environs Radiation Monitoring Program, Preoperational Summary Report Units 2 and 3, June 1977. The pre-operational REMP contained analytical results from samples collected from the surface water, discharge, well and rain water.

1. Background Concentrations of Tritium

The purpose of the following discussion is to summarize

background measurements of tritium in various media performed by others. Additional detail may be found by consulting references (CRA 2006)[1].

a. Tritium Production

Tritium is created in the environment from naturally occurring processes both cosmic and subterranean, as well as from anthropogenic (i.e., man-made) sources. In the upper atmosphere, "Cosmogenic" tritium is produced from the bombardment of stable nuclides and combines with oxygen to form tritiated water, which will then enter the hydrologic cycle. Below ground, "lithogenic" tritium is produced by the bombardment of natural lithium present in crystalline rocks by neutrons produced by the radioactive decay of naturally abundant uranium and thorium. Lithogenic production of tritium is usually negligible compared to other sources due to the limited abundance of lithium in rock. The lithogenic tritium is introduced directly to groundwater.

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

b. Precipitation Data

Precipitation samples are routinely collected at stations around the world for the analysis of tritium and other radionuclides. Two publicly available databases that provide tritium concentrations in precipitation are Global Network of Isotopes in Precipitation (GNIP) and USEPA's RadNet database. GNIP provides tritium precipitation concentration data for samples collected worldwide from 1960 to 2006. RadNet provides tritium precipitation concentration data for samples collected at stations throughout the U.S. from 1960 up to and including 2006. Based on GNIP data for sample stations located in the U.S. Midwest, tritium concentrations peaked around 1963. This peak, which approached 10,000 pCi/L for some stations, coincided with the atmospheric

testing of thermonuclear weapons. Tritium concentrations in surface water showed a sharp decline up until 1975 followed by a gradual decline since that time. Tritium concentrations have typically been below 100 pCi/L since around 1980. Tritium concentrations in wells may still be above the 200 pCi/L detection limit from the external causes described above. Water from previous years and decades is naturally captured in groundwater, so some well water sources today are affected by the surface water from the 1960s that was elevated in tritium.

c. Surface Water Data

Surface water level measurements were collected at the surface water monitoring locations during the groundwater level measurement event. The purpose of the surface water monitoring was to provide surface water elevation data to evaluate the groundwater/surface water interaction at the Station.

The USEPA RadNet surface water data typically has a reported 'Combined Standard Uncertainty' of 35 to 50 pCi/L. According to USEPA, this corresponds to a ± 70 to 100 pCi/L 95% confidence bound on each given measurement. Therefore, the typical background data provided may be subject to measurement uncertainty of approximately ± 70 to 100 pCi/L.

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

IV. Results and Discussion

A. Groundwater Results

Groundwater

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

Tritium

Samples from 41 locations were analyzed for tritium activity (Tables B-I.1, B-II.1 and B-III.1, Appendix B). Tritium values ranged from the detection limit to 37,700 pCi/L. Tritium was not detected in wells at or near the owner-controlled boundary. The location most representative of potential offsite user of drinking water is less than the MDC (Table B-I.1, Appendix B).

Low levels of tritium were detected at concentrations greater than the minimum detectable concentration (MDC) in 12 of 27 groundwater monitoring wells and 1 yard drain sump location. The tritium concentrations ranged from 174 pCi/L to 37,700 pCi/L (Table B–I.1, Appendix B).

No tritium was detected in any surface water samples (Table B–II.1, Appendix B). No tritium was detected in any precipitation water samples (Table B–III.1, Appendix B).

Strontium

Sr-89 and Sr-90 were not detected in any of the samples (Table B-I.1, Appendix B).

Gross Alpha and Gross Beta (dissolved and suspended)

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

Gross Alpha (dissolved) was detected in 5 of 25 groundwater locations analyzed. The concentrations ranged from 1.4 to 5.7 pCi/L.

Gross Alpha (suspended) was detected in 6 of 25 groundwater locations analyzed. The concentrations ranged from 1.1 to 12.1 pCi/L.

Gross Beta (dissolved) was detected in all 25 groundwater locations analyzed. The concentrations ranged from 1.2 to 30.3 pCi/L.

Gross Beta (suspended) was detected in 6 of 25 groundwater locations analyzed. The concentrations ranged from 2.4 to 10.4 pCi/L.

The activity detected is consistent with historical levels. The activity detected is naturally occurring and the levels are considered to be background (Table B-I.1, Appendix B).

Hard-To-Detect

Hard-To-Detect analyses were performed on a select group of groundwater and surface water locations to establish baseline levels. The analyses for groundwater included iron-55 (Fe-55), nickel-63 (Ni-63), americium-241 (Am-241), curium-242 (Cm-242), Cm-243/244, plutonium-238 (Pu-238), Pu-239/240, uranium-234 (U-234), U-235 and U-238.

U-234 was detected in 11 of 22 groundwater monitoring locations analyzed. The concentrations ranged from 0.15 to 10.1 pCi/L.

U-235 was detected in 2 of 22 groundwater monitoring locations analyzed. The concentrations ranged from 0.19 to 0.24 pCi/L.

U-238 was detected in 8 of 22 groundwater monitoring locations analyzed. The concentrations ranged from 0.20 to 8.85 pCi/L. No plant produced radionuclides were detected.

The activity detected is naturally occurring and the levels are considered to be background (Table B–I.3, Appendix B).

Gamma Emitters

No power-production gamma emitters were detected in any of the samples (Table B–I.2, Appendix B).

B. Surface Water Results

Surface Water

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

Tritium

Samples from three locations were analyzed for tritium activity. Tritium was not detected in any samples (Table B–II.1, Appendix B).

Gamma Emitters

No power-production gamma emitters were detected in any of the samples. No other gamma emitting nuclides were detected (Table B–II.2, Appendix B).

C. Precipitation Water Results

Precipitation Water

Samples were collected at six locations (1A, 1B, 1S, 1SSE, 1Z, and 4M). The following analysis was performed:

Tritium

Samples from six locations were analyzed for tritium activity. Tritium activity was not detected in any samples (Table B-III.1, Appendix B).

D. Drinking Water Well Survey

A drinking water well survey was conducted during the summer 2006 by CRA (CRA 2006)[1] around the PBAPS. The water well inventory was updated in 2012[4]. The updated water well database search indicated a new water well off Station property within a one mile radius of the Station. The well is described as a "test" well and its use is listed as "unused". In summary, there were no significant changes in off Station groundwater use from 2006-2012.

E. Summary of Results – Inter-Laboratory Comparison Program

Inter-Laboratory Comparison Program results for TBE and Environmental Inc. (Midwest Labs) are presented in the AREOR.

F. Leaks, Spills and Releases

An inadvertent release of licensed material occurred in April 2015, increasing tritium activity in groundwater monitoring wells located east of the Unit 3 Turbine Building.

Quarterly samples of groundwater monitoring wells were obtained the week of April 6, 2015 in accordance with the requirements of EN-AA-408-4000, Radiological Groundwater Protection Program (RGPP) Implementation. Results of the sampling were received on April 16, 2015. The results from groundwater monitoring well samples east of the Unit 3 Turbine Building revealed an increase in tritium activity. Monitoring well MW-PB-25 tritium activity was 37,700 pCi/L from a sample obtained on April 7, 2015. The previous tritium activity in a sample obtained from this well on January 5, 2015 was 8,890 pCi/L.

Increases in tritium activity in three additional wells located east of the Unit 3 Turbine Building were also identified from samples obtained on April 7, 2015. Tritium activity in these wells were as follows; MW-PB-24, 841 pCi/L; MW-PB-26, 1,740 pCi/L; MW-PB-27, 2,500 pCi/L. Tritium activity from these wells ranged from less than minimum detectable activity to 602 pCi/L during the January 2015 sampling.

On April 17, 2015, the elevated activity in MW-PB-25 was confirmed. Per LS-AA-1120, Reportable Event RAD 1.34, voluntary informal communication to designated State/Local officials shall be made before the end of the next business day. On April 20, 2015, voluntary informal communications were delivered to the Nuclear Regulatory Commission, Pennsylvania Bureau of Radiation Protection, American Nuclear Insurers and Nuclear Energy Institute due to the groundwater monitoring well tritium activity increase. The voluntary informal communications were completed within the time limit required by LS-AA-1120, Reportable Event RAD 1.34.

The investigation found that condensed steam pooled on the Unit 3 Turbine Building Moisture Separator Area floor due to a raised floor drain. This water leaked through a small opening nearby to the ground below, increasing tritium activity in the wells adjacent to the building.
The floor drain was modified to allow water to flow into the drain. Activity in the monitoring wells adjacent to the Unit 3 Turbine Building has been on a decreasing trend since the modification.

G. Trends

A tritium plume has been identified northeast of the Unit 3 Turbine Building. The plume extends eastward toward well MW-PB-4. The plume is bounded on the north by wells MW-PB-12 and MW-PB-22. The plume is bounded on the south by wells MW-PB-20 and MW-PB-21.

Wells MW-PB-24, 25, 26 and 27 were each sampled and analyzed 20 times during 2015. On all occasions, MW-PB-25 samples had the highest tritium activity.

After modifications to the floor drain as described above, the wells exhibited decreasing or steady trends for the remainder of 2015.

H. Investigations

MW-PB-4

In 2006, monitoring wells MW-PB-1 through MW-PB-14 were installed. Tritium activity was detected in MW-PB-4, located north of the Unit 3 Circulating Water Pump Structure and MW-PB-12, north of the Administration Building. Groundwater flow on site is from west to east. Monitoring wells were installed to the west, southwest and northwest of monitoring wells MW-PB-4 and MW-PB-12. The wells with the highest tritium activity are the wells installed directly east of and adjacent to the Unit 3 Turbine Building, wells MW-PB-24, 25, 26 and 27.

Investigation of potential sources identified that the likely source of groundwater contamination was due to degraded floor seams in the Unit 3 Turbine Building Moisture Separator area 116' elevation. Leaks internal to the building entered the groundwater through the degraded floor seams. The floor seams were repaired in August 2010. The floor in the Unit 3 Turbine Building Moisture Separator area 116' elevation was sealed and recoated in October 2011.

MW-PB-29, 30 and 31

An extent-of-condition inspection of the Unit 2 Turbine Building Moisture Separator area 116' elevation floor was performed in October 2010. Minor degradation of the floor seams was identified and repaired. In May 2011, monitoring wells MW-PB-29 and 30 were installed directly east of and adjacent to the Unit 2 Turbine Building; MW-PB-31 was installed southeast of and adjacent to the Unit 2 Turbine Building. These wells were installed to determine if a condition existed east of the Unit 2 Turbine Building that is similar to the condition east of the Unit 3 Turbine Building.

Wells MW-PB-29, 30 and 31 were sampled quarterly in 2015. Tritium activity in the wells ranged from less than the MDC to 841 pCi/L. Samples from these wells were also analyzed for gamma emitting isotopes and hard to detect radionuclides. All results were less than the MDC for each isotope.

The Unit 2 Turbine Building Moisture Separator area 116' elevation floor was sealed and recoated in October 2012. Groundwater intrusion into a ventilation pit on the east side of the area was identified. The groundwater was removed and degraded seams in the ventilation pit were successfully repaired.

MW-PB-24, 25, 26 and 27

Wells MW-PB-24, 25, 26 and 27 are considered the wells of primary interest. These wells were sampled on a frequency ranging from weekly to quarterly. Below are 3 tables. The first lists the highest tritium activity of the wells of primary interest and the date of the sampling. The second table lists the highest tritium activity of the wells during 2015. The third table lists the activity of the wells from the last sampling of 2015. The tritium activity is in pCi/L.

Well #	Tritium Activity	Date
MW-PB-24	33,500	3/15/2010
MW-PB-25	161,000	3/8/2010
MW-PB-26	196,000	3/8/2010
MW-PB-27	71,800	2/22/2010

Well #	Tritium Activity	Date
MW-PB-24	2,180	8/2/2015
MW-PB-25	37,700	4/8/2015
MW-PB-26	1,740	4/8/2015
MW-PB-27	2,500	4/8/2015

Well #	Tritium Activity	Date
MW-PB-24	619	12/15/2015
MW-PB-25	8,680	12/15/2015
MW-PB-26	324	12/15/2015
MW-PB-27	1,170	12/15/2015

Potential sources of tritium in the groundwater are investigated via procedural processes and documented in the corrective action program. The most likely pathway for tritium to enter the groundwater has been determined to be leaks internal to the Unit 3 Turbine Building Moisture Separator 116', migrating through degraded floor seams or other unidentified openings in the floor.

I. Actions Taken

1. As previously described, a floor drain in the Unit 3 Turbine Building M/S area was modified to allow water to flow into the drain. Activity in

the monitoring wells adjacent to the Unit 3 Turbine Building has been on a decreasing trend since the modification.

2. Installation of Monitoring Wells

   No groundwater monitoring wells were installed in 2015.

3. Actions to Recover/Reverse Plumes

   There were no actions to recover the plume.

J. Deviations

The data tables show that duplicate samples were obtained at several wells during 2015. These duplicate samples were obtained and analyzed for quality control purposes.

There are no additional deviations to report.

V. References

1. Conestoga Rovers and Associates, Fleetwide Assessment, Peach Bottom Atomic Power Station, Delta, PA, Fleetwide Assessment, Rev. 1, September 1, 2006.

2. Peach Bottom Atomic Power Station, Environs Radiation Monitoring Program, Preoperational Summary Report units 2 and 3, June 1977.

3. Peach Bottom Atomic Power Station, Environs Radiation Monitoring Program, Preoperational Summary Report units 2 and 3, September 1970-August 1973, January 1974.

4. Conestoga Rovers and Associates, Hydrogeologic Investigation Report, Peach Bottom Atomic Power Station, November 2012.

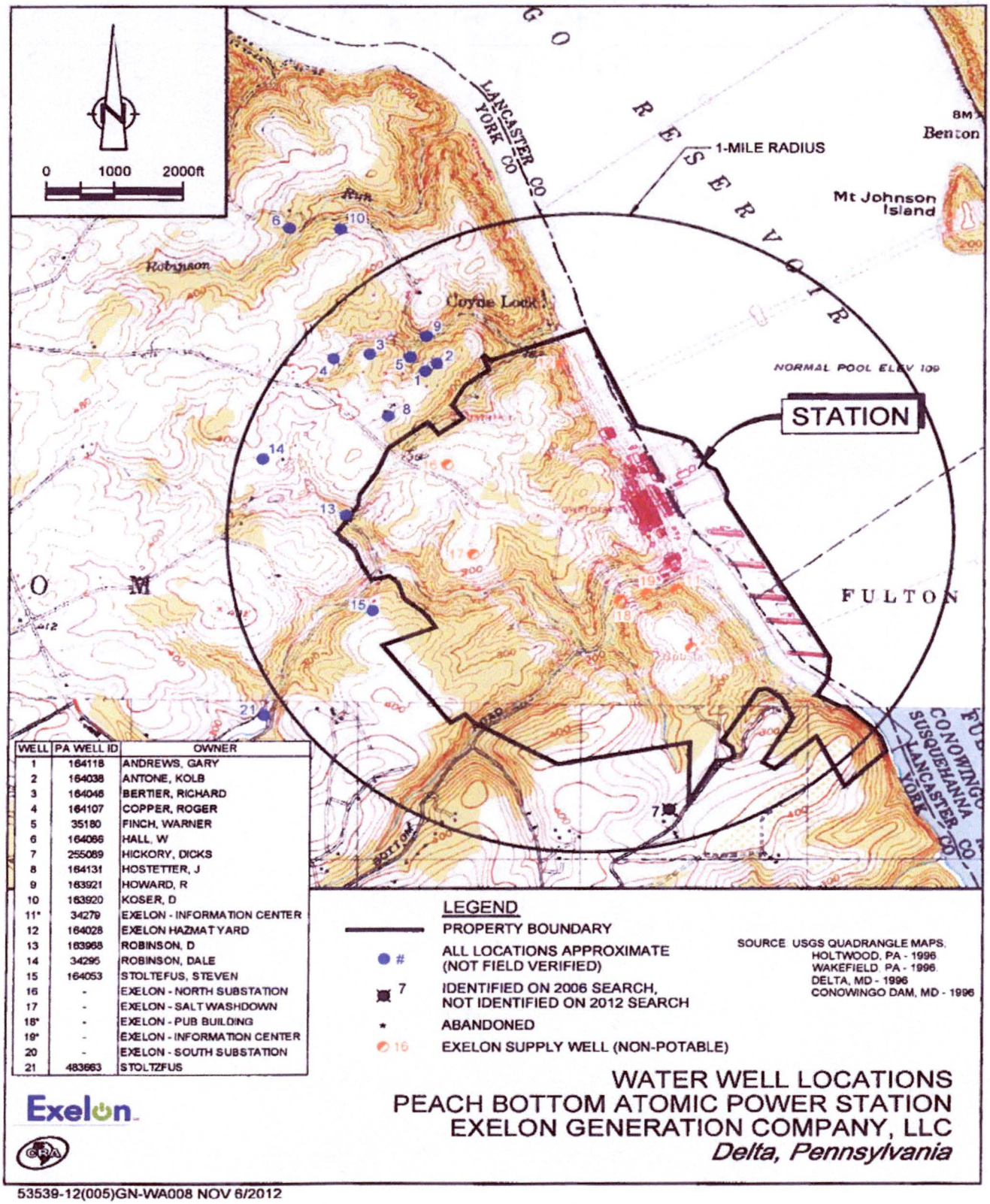
5. AMO Environmental Decisions, 2015 RGPP Summary Monitoring Report, May 2015, July 2015, October 2015 and February 2016.

APPENDIX A

SAMPLING LOCATIONS, DISTANCE AND DIRECTION

TABLE A-1: Radiological Groundwater Protection Program - Sampling Locations, Distance and Direction, Peach Bottom Atomic Power Station, 2015

Site	Site Type	Sector	Distance (ft.)
MW-PB-1	Groundwater Well	SW	1,166.6
MW-PB-2	Groundwater Well	WNW	309.0
MW-PB-3	Groundwater Well	SSE	709.7
MW-PB-4	Groundwater Well	ENE	350.2
MW-PB-5	Groundwater Well	NNW	1,146.1
MW-PB-6	Groundwater Well	NE	1,072.4
MW-PB-7	Groundwater Well	SE	813.9
MW-PB-8	Groundwater Well	SE	1,167.0
MW-PB-9	Groundwater Well	SE	2,816.9
MW-PB-10	Groundwater Well	SSE	1,125.1
MW-PB-11	Groundwater Well	SE	438.4
MW-PB-12	Groundwater Well	NNE	317.2
MW-PB-13	Groundwater Well	NW	329.4
MW-PB-14	Groundwater Well	S	1,231.2
MW-PB-15	Groundwater Well	SE	1,087.9
MW-PB-16	Groundwater Well	SE	1,101.6
MW-PB-17	Groundwater Well	SE	1,005.4
MW-PB-18	Groundwater Well	SE	1,010.0
MW-PB-19	Groundwater Well	NW	226.8
MW-PB-20	Groundwater Well	E	260.5
MW-PB-21	Groundwater Well	E	363.3
MW-PB-22	Groundwater Well	NE	315.4
MW-PB-24	Groundwater Well	N	185.9
MW-PB-25	Groundwater Well	N	159.7
MW-PB-26	Groundwater Well	NNE	121.1
MW-PB-27	Groundwater Well	NNE	139.1
MW-PB-28	Groundwater Well	NW	249.6
MW-PB-29	Groundwater Well	SE	325.0
MW-PB-30	Groundwater Well	SE	379.2
MW-PB-31	Groundwater Well	SE	450.1
SW-PB-1	Surface Water	NNW	2,850.5
SW-PB-5	Surface Water	SE	675.1
SW-PB-6	Surface Water	SE	1,305.9
SP-PB-1	Groundwater Seep	S	514.2
SP-PB-2	Groundwater Seep	WNW	311.6
SP-PB-3	Groundwater Seep	NNW	1,281.1
U/2 YARD DRAIN SUMP	Groundwater	SSE	498.7
U/3 YARD DRAIN SUMP	Groundwater	WSW	175.8
1A	Precipitation Water	ESE	1,271
1B	Precipitation Water	NW	2,587
1S	Precipitation Water	S	1,315
1SSE	Precipitation Water	SSE	1,312
1Z	Precipitation Water	SE	1,763
4M	Precipitation Water	SE	45,989



WELL	PA WELL ID	OWNER
1	164118	ANDREWS, GARY
2	164038	ANTONE, KOLB
3	164046	BERTIER, RICHARD
4	164107	COPPER, ROGER
5	35180	FINCH, WARNER
6	164066	HALL, W
7	255089	HICKORY, DICKS
8	164131	HOSTETTER, J
9	163921	HOWARD, R
10	163920	KOSER, D
11*	34279	EXELON - INFORMATION CENTER
12	164028	EXELON HAZMAT YARD
13	163968	ROBINSON, D
14	34295	ROBINSON, DALE
15	164053	STOLTEFUS, STEVEN
16	-	EXELON - NORTH SUBSTATION
17	-	EXELON - SALT WASHDOWN
18*	-	EXELON - PUB BUILDING
19*	-	EXELON - INFORMATION CENTER
20	-	EXELON - SOUTH SUBSTATION
21	483663	STOLTZFUS

Figure A-1
Well Water Locations, Peach Bottom Atomic Power Station, 2015

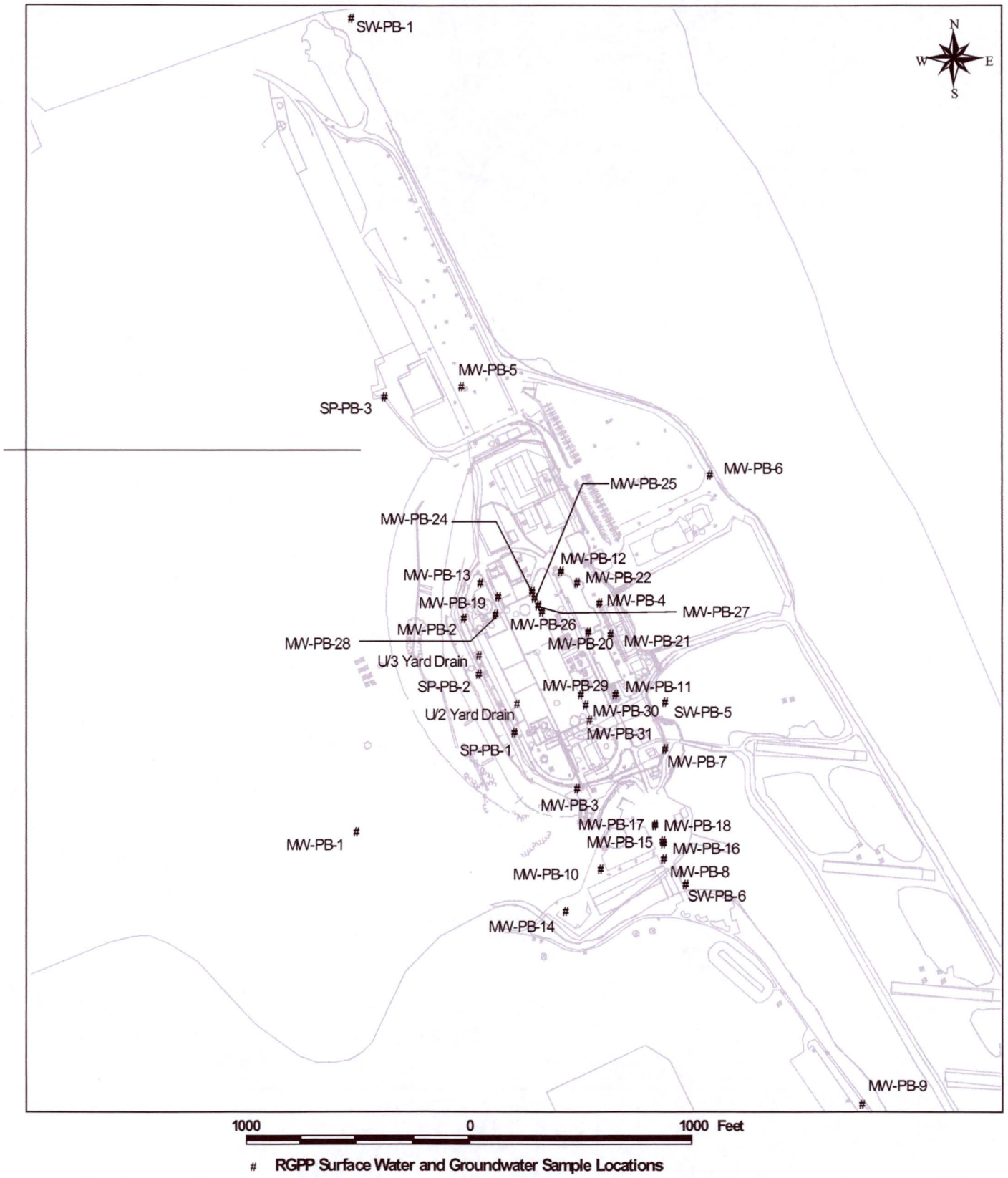


Figure A-2
RGPP Monitoring Locations, Peach Bottom Atomic Power Station, 2015

APPENDIX B

DATA TABLES

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER AND SEEP SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, PEACH BOTTOM ATOMIC POWER STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
MW-PB-1	04/10/15		< 190						
MW-PB-10	01/07/15		< 163						
MW-PB-10	04/06/15		< 193	< 2.9	< 0.9	< 8.7	< 5.5	9.7 ± 5.0	10.4 ± 2.8
MW-PB-10	07/08/15		< 193						
MW-PB-10	11/04/15		< 191						
MW-PB-11	01/06/15		< 162						
MW-PB-11	01/06/15		< 165						
MW-PB-11	04/08/15		< 194	< 4.4	< 0.7	< 1.5	1.7 ± 1.0	2.8 ± 0.9	< 1.7
MW-PB-11	07/07/15		< 191						
MW-PB-11	11/04/15		< 192						
MW-PB-12	01/06/15		< 164						
MW-PB-12	04/06/15		< 192	< 5.2	< 0.6	< 0.6	< 0.8	1.2 ± 0.6	< 1.6
MW-PB-12	07/07/15		< 192						
MW-PB-12	12/04/15	Original	191 ± 125						
MW-PB-12	12/04/15	Recount	219 ± 130						
MW-PB-12	12/04/15	Rerun	323 ± 135						
MW-PB-13	01/06/15		< 166						
MW-PB-13	04/07/15	Original	< 197	< 3.8	< 0.4	< 16.0	< 4.1	30.3 ± 8.0	< 3.5
MW-PB-13	04/23/15	Original	401 ± 138						
MW-PB-13	04/23/15	Rerun	443 ± 133						
MW-PB-13	05/11/15		206 ± 113						
MW-PB-13	07/07/15		240 ± 133						
MW-PB-13	08/03/15		337 ± 136						
MW-PB-13	11/04/15		252 ± 133						
MW-PB-14	04/06/15		< 188						
MW-PB-15	01/07/15		< 166						
MW-PB-15	04/06/15		< 192	< 4.1	< 0.5	< 1.2	< 0.8	12.2 ± 1.5	< 1.6
MW-PB-15	07/08/15		< 194						
MW-PB-15	11/05/15		< 189						
MW-PB-16	01/07/15		< 164						
MW-PB-16	04/06/15		< 189	< 5.0	< 0.6	5.7 ± 1.2	5.9 ± 1.5	9.4 ± 1.0	2.4 ± 1.2
MW-PB-16	07/08/15		< 192						
MW-PB-16	11/05/15		< 189						
MW-PB-19	01/06/15		< 165						
MW-PB-19	01/06/15		< 163						
MW-PB-19	04/07/15		< 187	< 5.4	< 0.8	< 0.6	< 1.1	2.1 ± 0.6	< 1.6
MW-PB-19	07/07/15		< 196						
MW-PB-19	07/07/15	TBE	< 195						
MW-PB-19	07/07/15	EIML	215 ± 86						
MW-PB-19	11/04/15	TBE	< 171						
MW-PB-19	11/04/15	TBE	< 193						
MW-PB-19	11/04/15	EIML	< 151						
MW-PB-2	01/06/15		< 168						
MW-PB-2	04/07/15		< 195	< 2.2	< 0.8	1.4 ± 0.9	< 1.1	7.8 ± 0.9	< 2.8
MW-PB-2	07/07/15		< 192						
MW-PB-2	11/04/15		< 193						
MW-PB-20	01/06/15		< 161						
MW-PB-20	04/08/15		< 192	< 4.1	< 0.5	< 4.8	< 4.1	7.6 ± 4.0	< 3.8
MW-PB-20	07/07/15		< 189						
MW-PB-20	11/05/15		< 193						
MW-PB-21	01/06/15		< 164						
MW-PB-21	04/08/15		< 190	< 5.8	< 0.7	< 2.2	< 0.5	17.1 ± 1.6	< 1.5
MW-PB-21	07/07/15		< 189						
MW-PB-21	11/05/15		< 192						
MW-PB-22	01/06/15		617 ± 136						
MW-PB-22	04/08/15		314 ± 136	< 4.0	< 0.5	< 1.3	< 0.6	1.7 ± 0.8	< 1.7
MW-PB-22	04/08/15		333 ± 129	< 5.2	< 0.5	< 0.8	< 0.6	2.8 ± 0.9	< 1.6
MW-PB-22	07/07/15		761 ± 154						

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER AND SEEP SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, PEACH BOTTOM ATOMIC POWER STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
MW-PB-22	11/05/15	Original	984 ± 169						
MW-PB-22	11/05/15	Rerun	803 ± 165						
MW-PB-24	01/06/15		< 180						
MW-PB-24	04/07/15	Original	841 ± 159	< 4.4	< 0.5	< 1.5	< 1.2	3.5 ± 1.1	< 2.9
MW-PB-24	04/07/15	Recount	842 ± 155						
MW-PB-24	04/07/15	Rerun	993 ± 165						
MW-PB-24	04/17/15		907 ± 165						
MW-PB-24	04/23/15	Original	1740 ± 220						
MW-PB-24	04/23/15	Rerun	1870 ± 234						
MW-PB-24	04/27/15		1390 ± 197						
MW-PB-24	05/04/15		892 ± 154						
MW-PB-24	05/11/15		701 ± 144						
MW-PB-24	05/18/15		200 ± 119						
MW-PB-24	05/26/15		< 183						
MW-PB-24	06/01/15		302 ± 131						
MW-PB-24	06/04/15		1050 ± 162						
MW-PB-24	06/08/15		1600 ± 222						
MW-PB-24	06/15/15		1420 ± 217						
MW-PB-24	06/22/15		772 ± 164						
MW-PB-24	06/29/15		333 ± 122						
MW-PB-24	07/06/15		1270 ± 182						
MW-PB-24	08/03/15	Original	2180 ± 276						
MW-PB-24	08/03/15	Recount	2090 ± 267						
MW-PB-24	09/03/15		1670 ± 229						
MW-PB-24	11/04/15		569 ± 147						
MW-PB-24	12/14/15		619 ± 147						
MW-PB-25	01/06/15		8890 ± 928						
MW-PB-25	04/07/15	Original	37700 ± 3800	< 3.5	< 0.4	< 1.2	< 0.5	11.9 ± 2.3	< 1.5
MW-PB-25	04/07/15	Recount	36000 ± 3630						
MW-PB-25	04/07/15	Rerun	38100 ± 3850						
MW-PB-25	04/17/15		21100 ± 2150						
MW-PB-25	04/23/15	Original	24200 ± 2450						
MW-PB-25	04/23/15	Rerun	26100 ± 2640						
MW-PB-25	04/27/15		11700 ± 1210						
MW-PB-25	05/04/15		9410 ± 973						
MW-PB-25	05/11/15		7570 ± 796						
MW-PB-25	05/18/15		7950 ± 833						
MW-PB-25	05/26/15		5960 ± 640						
MW-PB-25	06/01/15		14100 ± 1460						
MW-PB-25	06/04/15		7350 ± 777						
MW-PB-25	06/08/15		5520 ± 602						
MW-PB-25	06/15/15		5650 ± 620						
MW-PB-25	06/22/15		6540 ± 707						
MW-PB-25	06/29/15		6880 ± 735						
MW-PB-25	07/06/15		6480 ± 689						
MW-PB-25	08/03/15		6660 ± 716						
MW-PB-25	09/03/15	Original	9980 ± 1050						
MW-PB-25	09/03/15	Recount	8980 ± 954						
MW-PB-25	11/04/15		5600 ± 607						
MW-PB-25	12/14/15	Original	8680 ± 919						
MW-PB-25	12/14/15	Recount	7880 ± 840						
MW-PB-26	01/06/15		407 ± 137						
MW-PB-26	04/07/15	Original	1740 ± 226	< 3.2	< 0.5	2.2 ± 1.0	12.1 ± 2.0	5.2 ± 0.9	9.0 ± 1.6
MW-PB-26	04/07/15	Recount	1700 ± 225						
MW-PB-26	04/07/15	Rerun	1710 ± 221						
MW-PB-26	04/17/15		876 ± 164						
MW-PB-26	04/23/15		596 ± 138						
MW-PB-26	04/27/15		577 ± 151						

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER AND SEEP SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, PEACH BOTTOM ATOMIC POWER STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
MW-PB-26	05/04/15		741 ± 148						
MW-PB-26	05/11/15		536 ± 137						
MW-PB-26	05/18/15		559 ± 139						
MW-PB-26	05/26/15		295 ± 126						
MW-PB-26	06/01/15		362 ± 135						
MW-PB-26	06/04/15		551 ± 137						
MW-PB-26	06/08/15		449 ± 146						
MW-PB-26	06/15/15		488 ± 157						
MW-PB-26	06/22/15		448 ± 144						
MW-PB-26	06/29/15		498 ± 135						
MW-PB-26	07/06/15		793 ± 149						
MW-PB-26	08/03/15		323 ± 135						
MW-PB-26	09/03/15		383 ± 135						
MW-PB-26	11/04/15		425 ± 137						
MW-PB-26	12/14/15		324 ± 130						
MW-PB-27	01/06/15		555 ± 143						
MW-PB-27	01/06/15		602 ± 144						
MW-PB-27	04/07/15	Original	2120 ± 259	< 3.4	< 0.5	2.7 ± 1.0	< 0.5	5.0 ± 0.9	< 1.5
MW-PB-27	04/07/15	Recount	2210 ± 269						
MW-PB-27	04/07/15	Rerun	2180 ± 267						
MW-PB-27	04/07/15	Original	2500 ± 297	< 4.2	< 0.4	4.0 ± 1.0	1.1 ± 0.7	5.3 ± 1.0	< 1.5
MW-PB-27	04/07/15	Recount	2240 ± 273						
MW-PB-27	04/07/15	Rerun	2480 ± 294						
MW-PB-27	04/17/15		2330 ± 283						
MW-PB-27	04/23/15		1920 ± 238						
MW-PB-27	04/27/15		1850 ± 243						
MW-PB-27	05/04/15		2030 ± 244						
MW-PB-27	05/11/15		1850 ± 232						
MW-PB-27	05/18/15		2310 ± 276						
MW-PB-27	05/26/15		2030 ± 257						
MW-PB-27	06/01/15		1830 ± 241						
MW-PB-27	06/04/15		1500 ± 201						
MW-PB-27	06/08/15		1980 ± 256						
MW-PB-27	06/15/15		1110 ± 185						
MW-PB-27	06/22/15		1490 ± 214						
MW-PB-27	06/29/15		1600 ± 216						
MW-PB-27	07/06/15		1230 ± 177						
MW-PB-27	08/03/15		1560 ± 217						
MW-PB-27	09/03/15		1250 ± 190						
MW-PB-27	11/04/15		834 ± 159						
MW-PB-27	12/14/15	Original	1170 ± 183						
MW-PB-27	12/14/15	Recount	1020 ± 173						
MW-PB-28	01/06/15		< 162						
MW-PB-28	04/07/15		< 189	< 3.9	< 0.8	< 1.0	2.9 ± 1.1	1.9 ± 0.7	7.8 ± 1.6
MW-PB-28	07/07/15	Original	309 ± 137						
MW-PB-28	07/07/15	Recount	272 ± 136						
MW-PB-28	07/07/15	Rerun	422 ± 120						
MW-PB-28	08/03/15		< 194						
MW-PB-28	11/04/15		< 193						
MW-PB-29	01/06/15		439 ± 123						
MW-PB-29	04/08/15		290 ± 128	< 4.6	< 0.7	< 0.7	< 0.5	2.0 ± 0.7	< 1.5
MW-PB-29	07/07/15	TBE	292 ± 136						
MW-PB-29	07/07/15	TBE	223 ± 131						
MW-PB-29	07/07/15	EIML	169 ± 86						
MW-PB-29	11/04/15		241 ± 131						
MW-PB-3	01/06/15		< 167						
MW-PB-3	04/08/15		< 189	< 2.6	< 0.8	< 1.3	< 0.8	2.8 ± 0.8	< 1.6
MW-PB-3	07/07/15		< 191						

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER AND SEEP SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, PEACH BOTTOM ATOMIC POWER STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
MW-PB-3	11/04/15	TBE	< 191						
MW-PB-3	11/04/15	TBE	< 189						
MW-PB-3	11/04/15	EIML	166 ± 83						
MW-PB-30	01/06/15		< 163						
MW-PB-30	04/08/15		< 184	< 5.3	< 0.6	< 0.5	2.0 ± 0.9	2.6 ± 0.7	2.9 ± 1.2
MW-PB-30	07/07/15	Original	826 ± 166						
MW-PB-30	07/07/15	Recount	790 ± 163						
MW-PB-30	07/07/15	Rerun	940 ± 147						
MW-PB-30	11/04/15	TBE Original	602 ± 148						
MW-PB-30	11/04/15	TBE Rerun	718 ± 161						
MW-PB-30	11/04/15	TBE Original	841 ± 158						
MW-PB-30	11/04/15	TBE Rerun	722 ± 160						
MW-PB-30	11/04/15	EIML	511 ± 99						
MW-PB-31	01/06/15		174 ± 108						
MW-PB-31	07/07/15		< 193						
MW-PB-31	12/04/15		< 190						
MW-PB-4	01/06/15		317 ± 132						
MW-PB-4	04/08/15		200 ± 124	< 3.0	< 0.8	< 5.4	< 1.1	11.0 ± 1.8	< 2.8
MW-PB-4	04/23/15		368 ± 135						
MW-PB-4	04/27/15		356 ± 136						
MW-PB-4	05/04/15		359 ± 125						
MW-PB-4	05/11/15		< 168						
MW-PB-4	05/18/15		183 ± 117						
MW-PB-4	05/26/15		< 175						
MW-PB-4	06/01/15		213 ± 128						
MW-PB-4	06/04/15		357 ± 128						
MW-PB-4	06/08/15		242 ± 132						
MW-PB-4	06/15/15		363 ± 125						
MW-PB-4	06/22/15		208 ± 134						
MW-PB-4	06/29/15	Recount 1	196 ± 117						
MW-PB-4	06/29/15	Recount 2	212 ± 128						
MW-PB-4	07/06/15		313 ± 123						
MW-PB-4	08/03/15		275 ± 133						
MW-PB-4	09/03/15		197 ± 126						
MW-PB-4	11/05/15		205 ± 125						
MW-PB-5	06/08/15		< 190						
MW-PB-6	04/10/15		< 191						
MW-PB-7	01/07/15		< 154						
MW-PB-7	04/10/15		< 186	< 2.8	< 0.7	< 3.5	< 0.8	8.3 ± 1.5	< 1.6
MW-PB-7	11/05/15		< 189						
MW-PB-8	01/07/15		< 165						
MW-PB-8	04/06/15		< 189	< 2.9	< 0.8	< 5.1	< 0.8	17.0 ± 3.3	2.5 ± 1.2
MW-PB-8	07/06/15		< 191						
MW-PB-8	11/05/15		< 188						
SP-PB-1	03/24/15		< 192						
SP-PB-1	06/10/15		< 200						
SP-PB-2	01/06/15		< 166						
U/2 YARD DRAIN	04/23/15		< 193	< 4.4	< 0.5	< 1.0	< 0.4	1.8 ± 0.9	< 1.5
U/2 YARD DRAIN	07/30/15	Original	206 ± 129						
U/2 YARD DRAIN	07/30/15	Recount	267 ± 133						
U/3 YARD DRAIN	03/13/15		< 188						
U/3 YARD DRAIN	06/10/15		< 183						
U/3 YARD DRAIN	07/30/15		< 194						
U-3 YARD DRAIN	11/04/15		< 184						

TABLE B-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER AND SEEP WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, PEACH BOTTOM ATOMIC POWER STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
MW-PB-1	04/10/15	< 6	< 6	< 13	< 7	< 12	< 8	< 11	< 10	< 6	< 7	< 24	< 11
MW-PB-10	04/06/15	< 3	< 4	< 7	< 3	< 8	< 4	< 6	< 8	< 4	< 4	< 22	< 6
MW-PB-10	11/04/15	< 7	< 7	< 13	< 6	< 16	< 7	< 11	< 14	< 5	< 6	< 35	< 5
MW-PB-11	04/08/15	< 4	< 4	< 7	< 3	< 7	< 5	< 7	< 8	< 4	< 5	< 20	< 7
MW-PB-12	04/06/15	< 6	< 6	< 15	< 6	< 14	< 8	< 10	< 13	< 6	< 8	< 32	< 10
MW-PB-13	04/07/15	< 7	< 6	< 13	< 7	< 13	< 8	< 12	< 12	< 7	< 6	< 30	< 12
MW-PB-14	04/06/15	< 6	< 6	< 11	< 5	< 12	< 7	< 8	< 12	< 5	< 6	< 33	< 9
MW-PB-15	01/07/15	< 8	< 8	< 15	< 8	< 14	< 10	< 13	< 13	< 8	< 9	< 36	< 11
MW-PB-15	04/06/15	< 5	< 5	< 10	< 4	< 10	< 6	< 9	< 10	< 5	< 5	< 26	< 7
MW-PB-15	07/08/15	< 5	< 6	< 10	< 5	< 8	< 5	< 9	< 11	< 5	< 5	< 28	< 10
MW-PB-15	11/05/15	< 5	< 5	< 10	< 4	< 12	< 6	< 9	< 11	< 6	< 5	< 26	< 9
MW-PB-16	01/07/15	< 3	< 3	< 5	< 3	< 7	< 4	< 6	< 5	< 3	< 3	< 16	< 4
MW-PB-16	04/06/15	< 7	< 7	< 13	< 8	< 14	< 9	< 12	< 15	< 8	< 7	< 37	< 11
MW-PB-16	07/08/15	< 7	< 7	< 17	< 7	< 16	< 8	< 13	< 15	< 8	< 8	< 38	< 13
MW-PB-16	11/05/15	< 6	< 6	< 12	< 6	< 12	< 8	< 10	< 13	< 6	< 6	< 33	< 10
MW-PB-19	04/07/15	< 5	< 5	< 13	< 5	< 12	< 7	< 9	< 11	< 6	< 6	< 30	< 6
MW-PB-2	04/07/15	< 5	< 4	< 7	< 5	< 7	< 5	< 7	< 9	< 4	< 5	< 23	< 7
MW-PB-20	04/08/15	< 5	< 5	< 12	< 5	< 9	< 6	< 8	< 8	< 5	< 6	< 24	< 10
MW-PB-21	04/08/15	< 5	< 4	< 8	< 4	< 7	< 4	< 8	< 7	< 4	< 5	< 18	< 5
MW-PB-22	04/08/15	< 5	< 5	< 12	< 5	< 11	< 5	< 8	< 8	< 5	< 5	< 23	< 9
MW-PB-22	04/08/15	< 7	< 9	< 16	< 9	< 16	< 7	< 12	< 13	< 8	< 6	< 37	< 12
MW-PB-24	04/07/15	< 5	< 4	< 10	< 5	< 11	< 6	< 9	< 9	< 5	< 5	< 25	< 9
MW-PB-24	11/04/15	< 5	< 5	< 11	< 5	< 11	< 7	< 8	< 11	< 5	< 5	< 28	< 10
MW-PB-25	04/07/15	< 4	< 4	< 7	< 4	< 8	< 5	< 9	< 9	< 4	< 5	< 24	< 7
MW-PB-25	11/04/15	< 5	< 4	< 10	< 5	< 11	< 6	< 10	< 14	< 5	< 5	< 26	< 9
MW-PB-26	04/07/15	< 5	< 7	< 13	< 6	< 14	< 7	< 9	< 11	< 5	< 6	< 29	< 10
MW-PB-26	11/04/15	< 6	< 6	< 17	< 6	< 12	< 6	< 11	< 13	< 6	< 6	< 35	< 10
MW-PB-27	04/07/15	< 6	< 6	< 12	< 6	< 12	< 7	< 11	< 14	< 6	< 5	< 35	< 13
MW-PB-27	04/07/15	< 6	< 6	< 13	< 5	< 10	< 7	< 11	< 12	< 5	< 6	< 30	< 9
MW-PB-27	11/04/15	< 5	< 5	< 10	< 5	< 9	< 6	< 11	< 15	< 6	< 7	< 34	< 10
MW-PB-28	04/07/15	< 6	< 6	< 12	< 6	< 11	< 8	< 10	< 12	< 5	< 6	< 30	< 11
MW-PB-29	04/08/15	< 6	< 5	< 12	< 7	< 8	< 6	< 9	< 9	< 6	< 5	< 25	< 8
MW-PB-3	04/08/15	< 4	< 4	< 9	< 5	< 9	< 5	< 8	< 9	< 4	< 4	< 24	< 7
MW-PB-30	04/08/15	< 6	< 6	< 10	< 6	< 10	< 6	< 8	< 11	< 5	< 6	< 25	< 9
MW-PB-4	04/08/15	< 4	< 4	< 10	< 4	< 7	< 5	< 8	< 8	< 4	< 4	< 21	< 5
MW-PB-5	06/08/15	< 10	< 8	< 15	< 7	< 15	< 10	< 15	< 12	< 8	< 8	< 36	< 12
MW-PB-6	04/10/15	< 6	< 5	< 11	< 5	< 12	< 5	< 10	< 8	< 5	< 6	< 24	< 6
MW-PB-7	04/10/15	< 4	< 4	< 8	< 4	< 9	< 4	< 7	< 7	< 4	< 5	< 20	< 5
MW-PB-8	01/07/15	< 7	< 5	< 14	< 8	< 11	< 8	< 12	< 12	< 7	< 9	< 28	< 11
MW-PB-8	04/06/15	< 4	< 4	< 9	< 4	< 10	< 5	< 7	< 9	< 4	< 4	< 25	< 7

TABLE B-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER AND SEEP WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, PEACH BOTTOM ATOMIC POWER STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
MW-PB-8	07/06/15	< 4	< 4	< 9	< 4	< 12	< 5	< 7	< 12	< 4	< 5	< 31	< 8
MW-PB-8	11/05/15	< 5	< 5	< 11	< 4	< 8	< 5	< 7	< 10	< 4	< 5	< 24	< 8
U2 YARD DRAIN	04/23/15	< 2	< 2	< 5	< 2	< 5	< 3	< 5	< 13	< 2	< 2	< 22	< 5
U3 YARD DRAIN	06/10/15	< 5	< 5	< 14	< 6	< 12	< 6	< 10	< 11	< 5	< 6	< 26	< 9

TABLE B-I.3 **CONCENTRATIONS OF HARD TO DETECTS IN GROUNDWATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, PEACH BOTTOM ATOMIC POWER STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Am-241	Cm-242	Cm-243/244	Pu-238	Pu-239/240	U-234	U-235	U-238	Fe-55	Ni-63
MW-PB-10	04/06/15	< 0.11	< 0.06	< 0.06	< 0.15	< 0.12	0.24 ± 0.12	< 0.06	< 0.03		
MW-PB-11	04/08/15	< 0.03	< 0.03	< 0.05	< 0.07	< 0.15	0.15 ± 0.10	< 0.06	< 0.11		
MW-PB-12	04/06/15	< 0.09	< 0.06	< 0.02	< 0.10	< 0.17	< 0.03	< 0.04	< 0.05		
MW-PB-13	04/07/15	< 0.07	< 0.02	< 0.08	< 0.05	< 0.14	10.1 ± 1.73	0.19 ± 0.11	8.85 ± 1.53		
MW-PB-15	04/06/15	< 0.07	< 0.04	< 0.14	< 0.07	< 0.09	< 0.10	< 0.06	< 0.07		
MW-PB-16	04/06/15	< 0.11	< 0.11	< 0.11	< 0.15	< 0.14	< 0.10	< 0.03	< 0.16		
MW-PB-19	04/07/15	< 0.06	< 0.02	< 0.02	< 0.16	< 0.05	0.31 ± 0.14	< 0.04	0.20 ± 0.12		
MW-PB-2	04/07/15	< 0.11	< 0.07	< 0.02	< 0.06	< 0.11	3.31 ± 0.45	< 0.06	2.10 ± 0.34		
MW-PB-20	04/08/15	< 0.11	< 0.07	< 0.02	< 0.16	< 0.10	< 0.12	< 0.20	< 0.19		
MW-PB-21	04/08/15	< 0.05	< 0.03	< 0.04	< 0.03	< 0.11	< 0.12	< 0.10	< 0.14		
MW-PB-22	04/08/15	< 0.15	< 0.07	< 0.08	< 0.12	< 0.11	< 0.11	< 0.08	< 0.09		
MW-PB-22	04/08/15	< 0.14	< 0.08	< 0.10	< 0.13	< 0.15	< 0.12	< 0.07	< 0.13		
MW-PB-24	04/07/15	< 0.10	< 0.05	< 0.07	< 0.15	< 0.06	< 0.07	< 0.04	< 0.07	< 182	< 3.2
MW-PB-25	04/07/15	< 0.08	< 0.03	< 0.16	< 0.17	< 0.13	1.17 ± 0.28	< 0.08	0.66 ± 0.20	< 124	< 3.3
MW-PB-26	04/07/15	< 0.08	< 0.08	< 0.08	< 0.10	< 0.08	5.05 ± 0.66	< 0.07	2.18 ± 0.40	< 193	< 3.1
MW-PB-27	04/07/15	< 0.14	< 0.04	< 0.07	< 0.17	< 0.15	5.20 ± 0.68	0.24 ± 0.13	2.04 ± 0.38	< 185	< 3.1
MW-PB-27	04/07/15	< 0.12	< 0.02	< 0.11	< 0.09	< 0.09	5.76 ± 0.71	< 0.07	2.16 ± 0.38	< 199	< 3
MW-PB-28	04/07/15	< 0.10	< 0.05	< 0.06	< 0.07	< 0.13	0.54 ± 0.20	< 0.09	0.45 ± 0.19		
MW-PB-29	04/08/15	< 0.02	< 0.13	< 0.08	< 0.11	< 0.16	< 0.10	< 0.09	< 0.12		
MW-PB-3	04/08/15	< 0.02	< 0.02	< 0.09	< 0.04	< 0.13	2.70 ± 0.41	< 0.04	1.57 ± 0.30		
MW-PB-30	04/08/15	< 0.09	< 0.18	< 0.03	< 0.11	< 0.12	< 0.09	< 0.10	< 0.11		
MW-PB-31	04/08/15	< 0.13	< 0.10	< 0.12	< 0.17	< 0.12	0.30 + 0.14	< 0.06	< 0.11		
MW-PB-4	04/08/15	< 0.05	< 0.02	< 0.07	< 0.17	< 0.08	< 0.06	< 0.09	< 0.11	< 185	< 3.3
MW-PB-7	04/10/15	< 0.12	< 0.15	< 0.06	< 0.20	< 0.17	< 0.08	< 0.07	< 0.09		
MW-PB-7	04/10/15	< 0.19	< 0.08	< 0.10	< 0.12	< 0.08	< 0.07	< 0.05	< 0.09		
MW-PB-8	04/06/15	< 0.19	< 0.02	< 0.10	< 0.04	< 0.04	< 0.13	< 0.03	< 0.13		

TABLE B-II.1 **CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, PEACH BOTTOM ATOMIC POWER STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3
SW-PB-1	01/05/15		< 157
SW-PB-1	04/08/15		< 182
SW-PB-1	04/08/15		< 185
SW-PB-1	07/06/15		< 187
SW-PB-1	07/06/15	TBE	< 189
SW-PB-1	07/06/15	EIML	< 155
SW-PB-1	11/03/15		< 190
SW-PB-5	01/05/15		< 162
SW-PB-5	04/08/15		< 182
SW-PB-5	07/06/15		< 191
SW-PB-5	11/03/15		< 189
SW-PB-5	11/03/15		< 190
SW-PB-5	11/03/15		< 151
SW-PB-6	01/05/15		< 165
SW-PB-6	01/05/15		< 167
SW-PB-6	04/08/15		< 185
SW-PB-6	07/06/15		< 185
SW-PB-6	11/03/15		< 194

TABLE B-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, PEACH BOTTOM ATOMIC POWER STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
SW-PB-1	04/08/15	< 6	< 6	< 13	< 6	< 12	< 7	< 11	< 9	< 6	< 6	< 28	< 7
SW-PB-1	04/08/15	< 6	< 7	< 11	< 7	< 12	< 6	< 7	< 13	< 6	< 5	< 28	< 9
SW-PB-5	04/08/15	< 6	< 7	< 12	< 5	< 12	< 7	< 13	< 13	< 6	< 7	< 36	< 10
SW-PB-6	04/08/15	< 5	< 7	< 12	< 6	< 12	< 6	< 10	< 12	< 6	< 7	< 28	< 8

TABLE B-III.1 CONCENTRATIONS OF TRITIUM IN PRECIPITATION WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, PEACH BOTTOM ATOMIC POWER STATION, 2015

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3
1A	12/31/14	< 172
1A	01/28/15	< 184
1A	02/25/15	< 186
1A	03/25/15	< 193
1A	04/30/15	< 181
1A	05/28/15	< 192
1A	07/02/15	< 184
1A	07/30/15	< 190
1A	08/27/15	< 188
1A	10/01/15	< 194
1A	10/29/15	< 195
1A	11/25/15	< 195
1B	12/31/14	< 172
1B	01/28/15	< 181
1B	02/25/15	< 183
1B	03/25/15	< 194
1B	04/30/15	< 190
1B	05/28/15	< 177
1B	07/02/15	< 188
1B	07/30/15	< 186
1B	08/27/15	< 189
1B	10/01/15	< 195
1B	10/29/15	< 193
1B	11/25/15	< 198
1S	12/31/14	< 168
1S	01/28/15	< 181
1S	02/25/15	< 176
1S	03/25/15	< 195
1S	04/30/15	< 182
1S	05/28/15	< 178
1S	07/02/15	< 186
1S	07/30/15	< 173
1S	08/27/15	< 185
1S	10/01/15	< 193
1S	10/29/15	< 197
1S	11/25/15	< 195
1SSE	12/31/14	< 168
1SSE	01/28/15	< 183
1SSE	02/25/15	< 180
1SSE	03/25/15	< 176
1SSE	04/30/15	< 182
1SSE	05/28/15	< 180
1SSE	07/02/15	< 187
1SSE	07/30/15	< 171
1SSE	08/27/15	< 186
1SSE	10/01/15	< 193
1SSE	10/29/15	< 196
1SSE	11/25/15	< 193
1Z	12/31/14	< 171
1Z	01/28/15	< 183
1Z	02/25/15	< 187
1Z	03/25/15	< 192
1Z	04/30/15	< 181
1Z	05/28/15	< 179
1Z	07/02/15	< 186
1Z	07/30/15	< 191
1Z	08/27/15	< 187
1Z	10/01/15	< 194

TABLE B-III.1 CONCENTRATIONS OF TRITIUM IN PRECIPITATION WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, PEACH BOTTOM ATOMIC POWER STATION, 2015

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3
1Z	10/29/15	< 194
1Z	11/25/15	< 194
4M	12/31/14	< 170
4M	01/28/15	< 180
4M	02/25/15	< 188
4M	03/25/15	< 191
4M	04/30/15	< 178
4M	05/28/15	< 182
4M	07/02/15	< 188
4M	07/30/15	< 187
4M	08/27/15	< 189
4M	10/01/15	< 191
4M	10/29/15	< 192
4M	11/25/15	< 193