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U. S. Nuclear Regulatory Commission
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Quad Cities Nuclear Power Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Annual Radiological Environmental Operating Report

Pursuant to Technical Specifications Section 5.6.2, enclosed is the 2010 Radiological Environmental Operating Report for Quad Cities Nuclear Power Station. This report contains the results of the radiological environmental and meteorological monitoring programs. In addition, the 2010 Radiological Groundwater Protection Program (RGPP) Report is included as Appendix E of the enclosure.

Should you have any questions concerning this letter, please contact Wally J. Beck at (309) 227-2800.

Respectfully,

Tim Hanley
Site Vice President
Quad Cities Nuclear Power Station

Enclosure: Annual Radiological Environmental Operating Report

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station

IE25
NRR

Enclosure

Annual Radiological Environmental Operating Report

Docket No: 50-254
50-265

QUAD CITIES NUCLEAR POWER STATION
UNITS 1 and 2

Annual Radiological
Environmental Operating Report

1 January Through 31 December 2010

Prepared By

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Environmental Services

Exelon SM
Nuclear

Quad Cities Nuclear Power Station
Cordova, IL 61242

May 2011

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I. Summary and Conclusions

In 2010, the Quad Cities Generating Station released to the environment through the radioactive effluent liquid and gaseous pathways approximately 402 curies of noble gas, fission and activation products and approximately 98 curies of tritium. The dose from both liquid and gaseous effluents was conservatively calculated for the Maximum Exposed Member of the Public. The results of those calculations and their comparison to the allowable limits were as follows:

Gaseous and liquid radiation doses to members of the public at locations								
Effluents	Applicable Organ	Estimated Dose	Age Group	Location		% of Applicable Limit	Site Limit	Unit
				Distance (meters)	Direction (toward)			
Noble Gas	Gamma - Air Dose	2.32E-03	All	1029	NNE	1.16E-02	20	mRad
Noble Gas	Beta – Air Dose	1.27E-03	All	1029	NNE	3.18E-03	40	mRad
Noble Gas	Total Body (Gamma)	4.30E-02	Child	1029	NNE	4.30E-01	10	mrem
Iodine, Particulate & Tritium	Thyroid	1.32E+00	Infant	1029	NNE	4.40E+00	30	mrem
Liquid	Total Body	5.72E-03	Adult	RDT via South Diffuser		9.53E-02	6	mrem
Liquid	Liver	1.05E-02	Teen	RDT via South Diffuser		5.25E-02	20	mrem
40CFR190	Total Body - Direct Radiation	7.43E+00	All	800	N	2.97E+01	25	mrem

The doses as a result of the radiological effluents released from the Quad Cities Generating Station were a very small percentage of the allowable limits, with the exception of 40CFR190 direct radiation which was calculated to be 29.7% of the 25 mrem/yr limit.

This report on the Radiological Environmental Monitoring Program (REMP) conducted for the Quad Cities Nuclear Power Station (QCNPS) by Exelon covers the period 01 January 2010 through 31 December 2010. During that time period, 1,425 analyses were performed on 1,519 samples. In assessing all the data gathered for this report and comparing these results with preoperational data, it was concluded that the operation of QCNPS had no adverse radiological impact on the environment.

Surface water samples were analyzed for concentrations of gross beta, tritium and gamma emitting nuclides. Ground water samples were analyzed for concentrations of tritium and gamma emitting nuclides. No fission or activation products were detected. Gross beta activities detected were consistent with those detected in previous years and consistent with the control stations.

Fish (commercially and recreationally important species) and sediment samples were analyzed for concentrations of gamma emitting nuclides. No fission or

activation products were detected in fish. A small concentration of Cs-137 was found in one of four sediment samples. Occasionally Cs-137 is detected at very low levels (just above LLD) and is not distinguishable from background levels. No other fission products or activation products were found in sediment.

Air particulate samples were analyzed for concentrations of gross beta and gamma emitting nuclides. No fission or activation products were detected.

High sensitivity I-131 analyses were performed on air samples. No I-131 was detected.

Cow milk samples were analyzed for concentrations of I-131 and gamma emitting nuclides. No I-131 was detected. Concentrations of naturally occurring isotopes were consistent with those detected in previous years. No fission or activation products were detected.

Food product samples were analyzed for concentrations of gamma emitting nuclides. No fission or activation products were detected.

Environmental gamma radiation measurements were performed quarterly using thermoluminescent dosimeters. Levels detected were consistent with those observed in previous years.

II. Introduction

The Quad Cities Nuclear Power Station (QCNPS), consisting of two 2957 MWth boiling water reactors owned and operated by Exelon Corporation, is located in Cordova, Illinois along the Mississippi River. Unit No. 1 went critical on 16 March 1972. Unit No. 2 went critical on 02 December 1973. The site is located in northern Illinois, approximately 182 miles west of Chicago, Illinois.

This report covers those analyses performed by Teledyne Brown Engineering (TBE), Mirion Technologies, and Environmental Inc. (Midwest Labs) on samples collected during the period 1 January 2010 through 31 December 2010.

A. Objective of the REMP

The objectives of the REMP are to:

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

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

B. Implementation of the Objectives

The implementation of the objectives is accomplished by:

1. Identifying significant exposure pathways.

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

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

III. Program Description

A. Sample Collection

Samples for the QCNPS REMP were collected for Exelon Nuclear by Environmental Inc. (Midwest Labs). This section describes the general sampling methods used by Environmental Inc. to obtain environmental samples for the QCNPS REMP in 2010. Sample locations and descriptions can be found in Table B–1 and Figures B–1 and B–2,

Appendix B.

Aquatic Environment

The aquatic environment was evaluated by performing radiological analyses on samples of surface water, ground water, fish, and sediment. Surface water samples were collected weekly from two locations, Q-33 and Q-34 (Control). Ground water samples were collected quarterly from two locations, Q-35 and Q-36. All water samples were collected in new containers, which were rinsed with source water prior to collection.

Fish samples comprising the edible portions of commercially and recreationally important species were collected semiannually at two locations, Q-24 and Q-29 (Control). Sediment samples composed of recently deposited substrate were collected at two locations semiannually, Q-39 and Q-40 (Control).

Atmospheric Environment

The atmospheric environment was evaluated by performing radiological analyses on samples of air particulate, airborne iodine, and milk. Airborne iodine and particulate samples were collected and analyzed at ten locations (Q-01, Q-02, Q-03, Q-04, Q-07, Q-13, Q-16, Q-37, Q-38, and Q-41). The control location was Q-07. Airborne iodine and particulate samples were obtained at each location, using a vacuum pump with charcoal and glass fiber filters attached. The pumps were run continuously and sampled air at the rate of approximately one cubic foot per minute. The air particulate filters and air iodine samples were replaced weekly and sent to the laboratory for analysis.

Milk samples were collected biweekly at one location (Q-26) from May through October, and monthly from November through April. All samples were collected in new plastic containers from the bulk tank, preserved with sodium bisulfite, and shipped promptly to the laboratory.

Food products were collected annually in July at five locations (Q-Quad 1 Control, Q-Quad 1, Q-Quad 2, Q-Quad 3, and Q-Quad 4). The control location was Q-Quad 1 - Control. Various types of broadleaf and root vegetables were collected and placed in new plastic bags, and sent to the laboratory for analysis.

Ambient Gamma Radiation

Direct radiation measurements were made using thermoluminescent dosimeters (TLD). Each location consisted of 2 TLD sets. The TLD locations were placed on and around the QCNPS site as follows:

An inner ring consisting of 15 locations (Q-101, Q-102, Q-103, Q-104, Q-105, Q-106, Q-107, Q-108, Q-109, Q-111, Q-112, Q-113, Q-114, Q-115 and Q-116). These TLD are located in 15 of the 16 meteorological sectors in the general area of the site boundary (approximately 0.1 – 3 miles from the site). There are no TLDs located in the SSW sector because this sector is located over water.

An outer ring consisting of 16 locations (Q-201, Q-202, Q-203, Q-204, Q-205, Q-206, Q-207, Q-208, Q-209, Q-210, Q-211, Q-212, Q-213, Q-214, Q-215 and Q-216). These TLDs are located in each of the 16 meteorological sectors (approximately 6.0 – 8.0 km from the site)

An other set consisting of nine locations (Q-01, Q-02, Q-03, Q-04, Q-13, Q-16, Q-37, Q-38 and Q-41). The locations are at each of the air sample stations around the site.

The balance of one location (Q-07) is the control site.

The specific TLD locations were determined by the following criteria:

1. The presence of relatively dense population;

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

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

4. Near the closest dwelling to the stack in the prevailing downwind direction.

The TLDs were exchanged quarterly and sent to Mirion Technologies for analysis.

B. Sample Analysis

This section describes the general analytical methodologies used by TBE and Environmental Inc. (Midwest Labs) to analyze the environmental samples for radioactivity for the QCNPS REMP in 2010 and the type of analyses. The analytical procedures used by the laboratories are listed in Table B-2.

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

1. Concentrations of beta emitters in surface water and air particulates.

2. Concentrations of gamma emitters in ground and surface water, air particulates, milk, fish, sediment and vegetation.

3. Concentrations of tritium in ground and surface water.

4. Concentrations of I-131 in air and milk.

5. Ambient gamma radiation levels at various site environs.

C. Data Interpretation

The radiological and direct radiation data collected prior to Quad Cities Nuclear Power Station becoming operational were used as a baseline with which these operational data were compared. For the purpose of this report, Quad Cities Nuclear Power Station was considered operational at initial criticality. In addition, data were compared to previous years' operational data for consistency and trending. Several factors were important in the interpretation of the data:

1. Lower Limit of Detection and Minimum Detectable Concentration

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

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

2. Net Activity Calculation and Reporting of Results

Net activity for a sample was calculated by subtracting background activity from the sample activity. Since the REMP measures extremely small changes in radioactivity in the environment, background variations may result in sample activity being lower than the background activity effecting a negative number. An MDC

was reported in all cases where positive activity was not detected.

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

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

For fish, sediment, air particulate and milk 11 nuclides, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, Cs-134, Cs-137 and Ba-140 and La-140 were reported.

For air iodine, one nuclide, I-131 was reported

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

D. Program Exceptions

For 2010 the QCNPS REMP had a sample recovery rate in excess of 99%. Sample anomalies and missed samples are listed in the tables below:

Table D-1 LISTING OF SAMPLE ANOMALIES

Sample Type	Location Code	Collection Date	Reason
A/I	Q-13	02/12/10	Low reading of 169.8 hours possibly due to power outage.
A/I	Q-13	04/09/10	Low reading of 87.8 hours possibly due to severe storms.
TLD	Q-214-1	06/01/10	Results were outside 3 sigma administrative trend. Duplicate TLD 214-2 in the same sector read as expected.
A/I	Q-01	06/04/10	Low timer reading due to power outage from electrical storm.
A/I	Q-07	06/18/10	Power outage at air station due to storm. Field check performed on 06/21/10.

Table D-1 LISTING OF SAMPLE ANOMALIES (continued)

Sample Type	Location Code	Collection Date	Reason
A/I	Q-13	06/25/10	Low reading of 78.7 hours due to power outage from storm.
A/I	Q-03	07/09/10	Low reading of 140.9 hours due to power outage from storm.
A/I	Q-41	07/09/10	Low reading of 102 hours due to power outage from storm.
A/I	Q-03	07/16/10	Low reading of 158.3 hours due to power outage from storms.
A/I	Q-37	07/16/10	Low reading of 157.8 hours due to power outage from storms.
A/I	Q-38	07/16/10	Low reading of 157.9 hours due to power outage from storms.
A/I	Q-37	07/23/10	Low reading of 125.9 hours due to tripped ground fault outlet; collector reset.
A/I	Q-41	08/06/10	Low reading of 86.7 hours due to power outage from storms.
A/I	Q-03	08/27/10	Air particulate filter torn; possibly by birds.
TLD	Q-202-2	09/03/10	TLD was missing during monthly check; spare #02135175 placed on 09/08/10.
A/I	Q-37	09/03/10	Low reading of 158.9 hours due to power outage from storms.
A/I	Q-38	09/03/10	Low reading of 158.9 hours due to power outage from storms.
TLD	ALL	09/31/10	3rd Quarter REMP TLDs were not sent off in a timely manner. This led to higher doses on the TLDs when read. All TLDs were consistent with the control TLDs.
A/I	Q-01, Q-02, Q-03, Q-04, Q-37, Q-38	10/03/10	Sample timer indicated 216 hours which is outside the scheduled frequency of 168 hours +/- 25% (126 – 210 hours) due to vendor availability.

Table D-1 LISTING OF SAMPLE ANOMALIES (continued)

Sample Type	Location Code	Collection Date	Reason
A/I	Q-01, Q-02, Q-03, Q-04, Q-37, Q-38	10/15/10	Sample timer indicated 119 hours which is outside the scheduled frequency of 168 hours +/- 25% (126 – 210 hours) due to vendor availability.
A/I	Q-41	10/15/10	Low reading of 160.2 hours due to work on lines in area.
A/I	Q-41	10/29/10	Low reading of 148.1 hours due to power outage from strong winds.
A/I	Q-01	11/26/10	Low reading of 124.9 hours due to power outage; station notified.
A/I	Q-01	12/03/10	Low reading of 99.9 hours due to recent power restoration.
TLD	Q-111-1	12/31/10	Results were outside 3 sigma administrative trend. TLDs 211-1 and 211-2 in the same sector read as expected.
TLD	Q-111-2	12/31/10	Results were outside 3 sigma administrative trend. TLD 112-1, which is 0.25 miles away, read as expected. TLDs 211-1 and 211-2 in the same sector read as expected

Table D-2 LISTING OF MISSED SAMPLES

Sample Type	Location Code	Collection Date	Reason
SW	Q-33	01/01/10 – 02/26/10	No sample; water frozen
SW	Q-34	01/01/10 – 02/26/10	No sample; water frozen
TLD	Q-38-2	02/12/10	Collector placed spare Q2127430 to replace TLD found missing on 02/05/10.
A/I	Q-37	04/02/10	Low reading of 9.6 hours due to tripped ground fault outlet; collector reset.

Table D-2 LISTING OF MISSED SAMPLES (continued)

Sample Type	Location Code	Collection Date	Reason
A/I	Q-37	04/09/10	Low reading of 10.5 hours due to tripped ground fault outlet.
A/I	Q-41	04/23/10	Low reading of 2.1 hours possibly due to extensive construction in area.
A/I	Q-41	06/18/10	Low reading of 29.1 hours due to power outage caused by storm. Field check performed on 06/21/10.
A/I	Q-37	06/25/10	Low reading of 1.2 hours due to power outage from storm.
A/I	Q-41	06/25/10	Low reading of 6.1 hours due to power outage from storm.
A/I	Q-37	08/20/10	Low reading of 7.3 hours due to tripped ground fault outlet; collector reset.
A/I	Q-41	10/22/10	Low reading of 4.9 hours due to power outage.
SW	Q-33	12/03/10 – 12/31/10	No sample; water frozen
SW	Q-34	12/03/10 – 12/31/10	No sample; water frozen
A/I	Q-37	12/24/10	No sample due to pump stoppage; 0.6 hours runtime not enough for viable sample; pump reset.

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

E. Program Changes

There were no changes to the program in 2010.

IV. Results and Discussion

A. Aquatic Environment

1. Surface Water

Samples were taken weekly and composited monthly at two locations (Q-33 and Q-34). Of these locations only Q-33, located downstream, could be affected by Quad Cities' effluent releases. The following analyses were performed.

Gross Beta

Samples from all locations were analyzed for concentrations of gross beta (Table C–I.1, Appendix C). Gross beta activity was detected in 16 of 20 samples. The values ranged from 4.0 to 10.1 pCi/L. Concentrations detected were consistent with those detected in previous years and the control location (Figure C–1, Appendix C). The required LLD was met.

Tritium

Quarterly composites of weekly collections were analyzed for tritium activity (Table C–I.2, Appendix C). No tritium activity was detected (Figure C–2, Appendix C). The 2000 pCi/L OCDM and contractually required 200 pCi/L LLDs were met.

Gamma Spectrometry

Samples from both locations were analyzed for gamma emitting nuclides (Table C–I.3, Appendix C). No nuclides were detected and all required LLDs were met.

2. Ground Water

Quarterly grab samples were collected at two locations (Q-35 and Q-36). Both locations could be affected by Quad Cities' effluent releases. The following analyses were performed:

Tritium

Quarterly grab samples from the locations were analyzed for tritium activity (Table C–II.1, Appendix C). No tritium activity was detected (Figure C–3, Appendix C). The 2000 pCi/L OCDM and contractually required 200 pCi/L LLDs were met.

Gamma Spectrometry

Samples from all locations were analyzed for gamma emitting nuclides (Table C–II.2, Appendix C). No nuclides were detected and all required LLDs were met.

3. Fish

Fish samples comprised of various commercially and recreationally important species were collected at two locations (Q-24 and Q-29) semiannually. Location Q-24 could be affected by Quad Cities' effluent releases. The following analysis was performed:

Gamma Spectrometry

The edible portion of fish samples from both locations was analyzed for gamma emitting nuclides (Table C–III.1, Appendix C). No nuclides were detected and all required LLDs were met.

4. Sediment

Aquatic sediment samples were collected at two locations (Q-39 and Q-40) semiannually. The location Q-39, located downstream, could be affected by Quad Cities' effluent releases. The following analysis was performed:

Gamma Spectrometry

Sediment samples from Q-39 and Q-40 were analyzed for gamma emitting nuclides (Table C–IV.1, Appendix C). Cesium-137 was detected in one of four samples at a concentration of 75 pCi/kg dry. No other nuclides were detected and all required LLDs were met.

B. Atmospheric Environment

1. Airborne

a. Air Particulates

Continuous air particulate samples were collected from ten locations on a weekly basis. The ten locations were separated into three groups: Near-field samplers within 4 km (2.5 miles) of the site (Q-01, Q-02, Q-03 and Q-04), far-field samplers between 4 and 10 km (2.5 – 6.2 miles) from the site (Q-13, Q-16, Q-37, Q-38, Q-41) and the Control sampler between 10 and 30 km (6.2 – 18.6 miles)

from the site (Q-07). The following analyses were performed:

Gross Beta

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

Detectable gross beta activity was observed at all locations. Comparison of results among the four groups aid in determining the effects, if any, resulting from the operation of QCNPS. The results from the near-field locations (Group I) ranged from 6 to 42 E–03 pCi/m^3 with a mean of 18 E–03 pCi/m^3. The results from the far-field locations (Group II) ranged from 6 to 45 E–03 pCi/m^3 with a mean of 18 E–03 pCi/m^3. The results from the Control location (Group III) ranged from 6 to 40 E–03 pCi/m^3 with a mean of 19 E–03 pCi/m^3. Comparison of the 2010 air particulate data with previous years data indicate no effects from the operation of QCNPS. In addition a comparison of the weekly mean values for 2010 indicate no notable differences among the three groups (Figures C–4 through C–6, Appendix C).

Gamma Spectrometry

Weekly samples were composited quarterly and analyzed for gamma emitting nuclides (Table C–V.3, Appendix C). No nuclides were detected and all required LLDs were met.

b. Airborne Iodine

Continuous air samples were collected from ten locations (Q-01, Q-02, Q-03, Q-04, Q-07, Q-13, Q-16, Q-37, Q-38 and Q-41) and analyzed weekly for I-131 (Table C–VI.1, Appendix C). All results were less than the MDC and the required LLD was met.

2. Terrestrial

a. Milk

Samples were collected from one location (Q-26) biweekly May through October and monthly November through April. The following analyses were performed:

Iodine-131

Milk samples from the location were analyzed for concentrations of I-131 (Table C–VII.1, Appendix C). No I-131 was detected and the LLD was met.

Gamma Spectrometry

Each milk sample was analyzed for concentrations of gamma emitting nuclides (Table C–VII.2, Appendix C). No nuclides were detected and all required LLDs were met.

b. Food Products

Food product samples were collected at four locations plus a control location (Q-Quad 1 - Control, Q-Quad 1, Q-Quad 2, Q-Quad 3, and Q-Quad 4) annually during growing season. Four locations, (Q-Quad 1, Q-Quad 2, Q-Quad 3 and Q-Quad 4) could be affected by Quad Cities' effluent releases. The following analysis was performed:

Gamma Spectrometry

Samples from all locations were analyzed for gamma emitting nuclides (Table C–VIII.1, Appendix C). No nuclides were detected and all required LLDs were met.

C. Ambient Gamma Radiation

Ambient gamma radiation levels were measured utilizing thermoluminescent dosimeters. Forty-one TLD locations were established around the site. Results of TLD measurements are listed in Tables C-IX.1 to C–IX.3, Appendix C.

Most of the TLD measurements were below 30 mR/quarter, with a range of 15 to 48 mR/quarter. A comparison of the Inner Ring, Outer Ring and Other data to the Control Location data, indicate that the ambient gamma radiation levels from all the locations were comparable.

D. Independent Spent Fuel Storage Installation

QCNPS commenced use of an Independent Spent Fuel Storage Installation (ISFSI) in Dec 2005. There were no measurable changes in ambient gamma and radiation level as a result of ISFSI operations.

E. Land Use Survey

A Land Use Survey conducted during August 2010 around QCNPS was performed by Environmental Inc. (Midwest Labs) for Exelon Nuclear to comply with the Quad Cities' Offsite Dose Calculation Manual. The purpose of the survey was to document the nearest resident and milk producing animals in each of the sixteen 22 ½ degree sectors around the site. The results from the land use census have not identified any locations, which yield a calculated dose or dose commitment, via the same pathway, that is at least 20% greater than at a location from which samples are currently being obtained. The results of this survey are summarized below.

	Distance in Miles from QCNPS		
Sector	Residence Miles	Livestock Miles	Milk Farm Miles
N	0.6	2.7	-
NNE	3.8	-	-
NE	1.3	-	-
ENE	2.9	2.9	-
E	2.0	2.7	-
ESE	2.8	3.1	3.1, 11.5
SE	2.5	3.2	-
SSE	1.1	3.6	6.6
S	0.8	1.6	-
SSW	3.2	3.4	-
SW	2.9	3.3	-
WSW	2.2	3.5	-
W	2.6	4.3	4.6
WNW	2.7	3.8	-
NW	2.6	4.7	-
NNW	2.1	2.2	-

F. Errata Data

No errata data was noted in 2010.

G. Summary of Results – Inter-Laboratory Comparison Program

The primary and secondary laboratories analyzed Performance Evaluation (PE) samples of air particulate, air iodine, milk, soil, vegetation and water matrices (Appendix D). The PE samples, supplied by Analytics Inc., Environmental Resource Associates (ERA) and DOE's Mixed Analyte Performance Evaluation Program (MAPEP), were evaluated against the following pre-set acceptance criteria:

1. Analytics Evaluation Criteria

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

2. ERA Evaluation Criteria

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

3. DOE Evaluation Criteria

   MAPEP's evaluation report provides an acceptance range with associated flag values.

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

For the primary laboratory, 16 out of 18 analytes met the specified acceptance criteria. Two analytes did not meet the specified acceptance criteria for the following reason:

1. Teledyne Brown Engineering's ERA November 2010 Sr-89 in water result of 77.8 pCi/L was higher than the known value of 68.5 pCi/L, resulting in a found to known ratio of 1.14. NCR 10-09 was initiated to investigate this failure. Since the ratio of 1.14 fell within an acceptance range of 20%, Teledyne considers this an acceptable result.

2. Teledyne Brown Engineering's ERA November 2010 Zn-65 in water result of 11.0 pCi/L was lower than the known value of 102

pCi/L. NCR 10-09 was initiated to investigate this failure. The Zn-65 result of 111 was incorrectly reported as 11.0.

For the secondary laboratory, Environmental, Inc., 14 out of 14 analytes met the specified acceptance criteria.

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

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APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT SUMMARY

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR QUAD CITIES NUCLEAR POWER STATION, 2010

NAME OF FACILITY:	QUAD CITIES				DOCKET NUMBER:	50-254 &50-265		
LOCATION OF FACILITY:	CORDOVA IL			REPORTING PERIOD:		ANNUAL 2010		
				INDICATOR LOCATIONS	CONTROL LOCATION	LOCATION WITH HIGHEST ANNUAL MEAN (M)		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	GR-B	20	4	6.2 (8/10) (4.3/10.1)	5.8 (8/10) (4.0/10.0)	6.2 (8/10) (4.3/10.1)	Q-33 INDICATOR CORDOVA 3.1 MILES SSW OF SITE	0
	H-3	8	2000	<LLD	<LLD	-		0
	GAMMA	20						
	MN-54		15	<LLD	<LLD	-		0
	CO-58		15	<LLD	<LLD	-		0
	FE-59		30	<LLD	<LLD	-		0
	CO-60		15	<LLD	<LLD	-		0
	ZN-65		30	<LLD	<LLD	-		0
	NB-95		15	<LLD	<LLD	-		0

MEAN AND RANGE BASED ON DETECTABLE MEASUREMENTS ONLY (M)
FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR QUAD CITIES NUCLEAR POWER STATION, 2010

NAME OF FACILITY:	QUAD CITIES				DOCKET NUMBER:	50-254 &50-265		
LOCATION OF FACILITY:	CORDOVA IL			REPORTING PERIOD:		ANNUAL 2010		
				INDICATOR LOCATIONS	CONTROL LOCATION	LOCATION WITH HIGHEST ANNUAL MEAN (M)		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	ZR-95		30	<LLD	<LLD	-		0
	I-131		15	<LLD	<LLD	-		0
	CS-134		15	<LLD	<LLD	-		0
	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0
	LA-140		15	<LLD	<LLD	-		0
GROUND WATER (PCI/LITER)	H-3	8	2000	<LLD	NA	-		0
	GAMMA	8						
	MN-54		15	<LLD	NA	-		0

MEAN AND RANGE BASED ON DETECTABLE MEASUREMENTS ONLY (M)
FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR QUAD CITIES NUCLEAR POWER STATION, 2010

NAME OF FACILITY:	QUAD CITIES				DOCKET NUMBER:	50-254 &50-265		
LOCATION OF FACILITY:	CORDOVA IL			REPORTING PERIOD:		ANNUAL 2010		
				INDICATOR LOCATIONS	CONTROL LOCATION	LOCATION WITH HIGHEST ANNUAL MEAN (M)		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
GROUND WATER (PCI/LITER)	CO-58		15	<LLD	NA	-		0
	FE-59		30	<LLD	NA	-		0
	CO-60		15	<LLD	NA	-		0
	ZN-65		30	<LLD	NA	-		0
	NB-95		15	<LLD	NA	-		0
	ZR-95		30	<LLD	NA	-		0
	I-131		15	<LLD	NA	-		0
	CS-134		15	<LLD	NA	-		0

MEAN AND RANGE BASED ON DETECTABLE MEASUREMENTS ONLY (M)
FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR QUAD CITIES NUCLEAR POWER STATION, 2010

NAME OF FACILITY:	QUAD CITIES				DOCKET NUMBER:	50-254 &50-265		
LOCATION OF FACILITY:	CORDOVA IL			REPORTING PERIOD:		ANNUAL 2010		
				INDICATOR LOCATIONS	*CONTROL LOCATION*	*LOCATION WITH HIGHEST ANNUAL MEAN (M)*		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
GROUND WATER (PCI/LITER)	CS-137		18	<LLD	NA	-		0
	BA-140		60	<LLD	NA	-		0
	LA-140		15	<LLD	NA	-		0
FISH (PCI/KG WET)	GAMMA MN-54	8	130	<LLD	<LLD	-		0
	CO-58		130	<LLD	<LLD	-		0
	FE-59		260	<LLD	<LLD	-		0
	CO-60		130	<LLD	<LLD	-		0
	ZN-65		260	<LLD	<LLD	-		0

MEAN AND RANGE BASED ON DETECTABLE MEASUREMENTS ONLY (M)
FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR QUAD CITIES NUCLEAR POWER STATION, 2010

NAME OF FACILITY:	QUAD CITIES				DOCKET NUMBER:	50-254 &50-265		
LOCATION OF FACILITY:	CORDOVA IL			REPORTING PERIOD:		ANNUAL 2010		
				INDICATOR LOCATIONS	CONTROL LOCATION	LOCATION WITH HIGHEST ANNUAL MEAN (M)		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
FISH (PCI/KG WET)	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		130	<LLD	<LLD	-		0
	CS-137		150	<LLD	<LLD	-		0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0
SEDIMENT (PCI/KG DRY)	GAMMA	4						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0

MEAN AND RANGE BASED ON DETECTABLE MEASUREMENTS ONLY (M)
FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR QUAD CITIES NUCLEAR POWER STATION, 2010

NAME OF FACILITY: QUAD CITIES				DOCKET NUMBER: 50-254 &50-265				
LOCATION OF FACILITY: CORDOVA IL				REPORTING PERIOD: ANNUAL 2010				
				INDICATOR LOCATIONS	CONTROL LOCATION	LOCATION WITH HIGHEST ANNUAL MEAN (M)		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SEDIMENT (PCI/KG DRY)	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		150	<LLD	<LLD	-		0
	CS-137		180	75 (1/2)	<LLD	75 (1/2)	Q-39 INDICATOR CORDOVA - DOWNSTREAM MISSISSIPPI RIVER 0.8 MILES SSW OF SITE	0
	BA-140		NA	<LLD	<LLD	-		0

MEAN AND RANGE BASED ON DETECTABLE MEASUREMENTS ONLY (M)
FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR QUAD CITIES NUCLEAR POWER STATION, 2010

NAME OF FACILITY:	QUAD CITIES				DOCKET NUMBER:	50-254 &50-265		
LOCATION OF FACILITY:	CORDOVA IL			REPORTING PERIOD:		ANNUAL 2010		
				INDICATOR LOCATIONS	CONTROL LOCATION	LOCATION WITH HIGHEST ANNUAL MEAN (M)		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SEDIMENT (PCI/KG DRY)	LA-140		NA	<LLD	<LLD	-		0
AIR PARTICULATE (E-3 PCI/CU.METER)	GR-B	511	10	18 (445/459) (6/45)	19 (49/52) (6/40)	19 (45/48) (6/45)	Q-41 INDICATOR COMANCHE 4.3 MILES NNE OF SITE	0
	GAMMA	40						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0

MEAN AND RANGE BASED ON DETECTABLE MEASUREMENTS ONLY (M)
FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR QUAD CITIES NUCLEAR POWER STATION, 2010

NAME OF FACILITY: QUAD CITIES **DOCKET NUMBER:** 50-254 &50-265
LOCATION OF FACILITY: CORDOVA IL **REPORTING PERIOD:** ANNUAL 2010

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (M) (F) RANGE	CONTROL LOCATION MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
AIR PARTICULATE (E-3 PCI/CU.METER)	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		50	<LLD	<LLD	-		0
	CS-137		60	<LLD	<LLD	-		0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0
AIR IODINE (E-3 PCI/CU.METER)	GAMMA I-131	511	70	<LLD	<LLD	-		0
MILK (PCI/LITER)	I-131	19	1	<LLD	NA	-		0
	GAMMA MN-54	19	NA	<LLD	NA	-		0

MEAN AND RANGE BASED ON DETECTABLE MEASUREMENTS ONLY (M)
FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR QUAD CITIES NUCLEAR POWER STATION, 2010

NAME OF FACILITY: QUAD CITIES				DOCKET NUMBER: 50-254 &50-265				
LOCATION OF FACILITY: CORDOVA IL				REPORTING PERIOD: ANNUAL 2010				
				INDICATOR LOCATIONS	CONTROL LOCATION	LOCATION WITH HIGHEST ANNUAL MEAN (M)		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
MILK (PCI/LITER)	CO-58		NA	<LLD	NA	-		0
	FE-59		NA	<LLD	NA	-		0
	CO-60		NA	<LLD	NA	-		0
	ZN-65		NA	<LLD	NA	-		0
	NB-95		NA	<LLD	NA	-		0
	ZR-95		NA	<LLD	NA	-		0
	CS-134		15	<LLD	NA	-		0
	CS-137		18	<LLD	NA	-		0

MEAN AND RANGE BASED ON DETECTABLE MEASUREMENTS ONLY (M)
FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR QUAD CITIES NUCLEAR POWER STATION, 2010

NAME OF FACILITY:	QUAD CITIES				DOCKET NUMBER:	50-254 &50-265		
LOCATION OF FACILITY:	CORDOVA IL			REPORTING PERIOD:		ANNUAL 2010		
				INDICATOR LOCATIONS	CONTROL LOCATION	LOCATION WITH HIGHEST ANNUAL MEAN (M)		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
MILK (PCI/LITER)	BA-140		60	<LLD	NA	-		0
	LA-140		15	<LLD	NA	-		0
VEGETATION (PCI/KG WET)	GAMMA	12						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0

MEAN AND RANGE BASED ON DETECTABLE MEASUREMENTS ONLY (M)
FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR QUAD CITIES NUCLEAR POWER STATION, 2010

NAME OF FACILITY:	QUAD CITIES			DOCKET NUMBER:		50-254 &50-265		
LOCATION OF FACILITY:	CORDOVA IL			REPORTING PERIOD:		ANNUAL 2010		
				INDICATOR LOCATIONS	CONTROL LOCATION	LOCATION WITH HIGHEST ANNUAL MEAN (M)		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
VEGETATION (PCI/KG WET)	ZR-95		NA	<LLD	<LLD	-		0
	I-131		60	<LLD	<LLD	-		0
	CS-134		60	<LLD	<LLD	-		0
	CS-137		80	<LLD	<LLD	-		0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0
DIRECT RADIATION (MILLI-ROENTGEN/QTR.)	TLD-QUARTERLY	331	NA	28.5 (323/323) (15/48)	28.5 (8/8) (18/42)	31.5 (4/4) (22/45)	Q-211-2 INDICATOR 4.5 MILES SW	0

MEAN AND RANGE BASED ON DETECTABLE MEASUREMENTS ONLY (M)
FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

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APPENDIX B

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

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TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Quad Cities Nuclear Power Station, 2010

Location	Location Description	Distance & Direction From Site
A. Surface Water		
Q-33	Cordova (indicator)	3.1 miles SSW
Q-34	Camanche, Upstream (control)	4.4 miles NNE
B. Ground/Well Water		
Q-35	McMillan Well (indicator)	1.5 miles S
Q-36	Cordova Well (indicator)	3.3 miles SSW
C. Milk - bi-weekly / monthly		
Q-26	Bill Stanley Dairy (indicator)	3.5 miles ESE
D. Air Particulates / Air Iodine		
Q-01	Onsite 1 (indicator)	0.5 miles N
Q-02	Onsite 2 (indicator)	0.4 miles ENE
Q-03	Onsite 3 (indicator)	0.6 miles S
Q-04	Nitrin (indicator)	1.7 miles NE
Q-07	Clinton (control)	8.8 miles NE
Q-13	Princeton (indicator)	4.7 miles SW
Q-16	Low Moor (indicator)	5.7 miles NNW
Q-37	Meredosia Road (indicator)	4.4 miles ENE
Q-38	Fuller Road (indicator)	4.7 miles E
Q-41	Camanche (indicator)	4.3 miles NNE
E. Fish		
Q-24	Pool #14 of Mississippi River, Downstream (indicator)	0.5 miles SW
Q-29	Mississippi River, Upstream (control)	1.0 miles N
F. Sediment		
Q-39	Cordova, Downstream on Mississippi River (indicator)	0.8 miles SSW
Q-40	North of Albany, Upstream on Mississippi River(control)	8.9 miles NE
G. Food Products		
Quadrant 1	Ken DeBaille	2.3 miles ENE
Quadrant 2	Dale Nimmic	3.0 miles ESE
Quadrant 3	Amy Johnston	1.8 miles S
Quadrant 4	Mike Fawcett	4.5 miles NW
Control	Charles Leavens	9.5 miles NE
H. Environmental Dosimetry - TLD		
Inner Ring		
Q-101-1		0.6 miles N
Q-101-2		0.9 miles N
Q-102-1		1.3 miles NNE
Q-102-3		1.4 miles NNE
Q-103-1 and -2		1.2 miles NE
Q-104-1		1.1 miles ENE
Q-104-2		0.9 miles ENE
Q-105-1 and -2		0.8 miles E
Q-106-2 and -3		0.7 miles ESE
Q-107-2		0.7 miles SE
Q-107-3		0.8 miles SE
Q-108-1		1.0 miles SSE
Q-108-2		0.9 miles SSE

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Quad Cities Nuclear Power Station, 2010

Location	Location Description	Distance & Direction From Site
H. Environmental Dosimetry – TLD (continued)		
Inner Ring		
Q-109-1		0.9 miles S
Q-109-2		1.2 miles S
Q-111-1		2.6 miles SW
Q-111-2		2.5 miles SW
Q-112-1		2.5 miles WSW
Q-112-2		2.2 miles WSW
Q-113-1 and -2		2.5 miles W
Q-114-1		2.1 miles WNW
Q-114-2		2.5 miles WNW
Q-115-1		2.6 miles NW
Q-115-2		2.3 miles NW
Q-116-1		2.3 miles NNW
Q-116-3		2.4 miles NNW
Outer Ring		
Q-202-1		4.4 miles NNE
Q-202-2		4.8 miles NNE
Q-203-1		4.7 miles NE
Q-203-2		5.0 miles NE
Q-204-1		4.7 miles ENE
Q-204-2		4.5 miles ENE
Q-205-1		4.7 miles E
Q-205-4		4.8 miles E
Q-206-1 and -2		4.8 miles ESE
Q-207-1 and -4		4.7 miles SE
Q-208-1		4.3 miles SSE
Q-208-2		4.9 miles SSE
Q-209-1 and -4		4.7 miles S
Q-210-1 and -4 *		4.1 miles SSW
Q-210-5		3.3 miles SSW
Q-211-1 and -2		4.5 miles SW
Q-212-1		5.4 miles WSW
Q-212-2		4.4 miles WSW
Q-213-1		4.3 miles W
Q-213-2		4.8 miles W
Q-214-1		4.7 miles WNW
Q-214-2		4.4 miles WNW
Q-215-1		5.0 miles NW
Q-215-2		4.2 miles NW
Q-216-1		4.6 miles NNW
Q-216-2		4.3 miles NNW
Other		
Q-01	Onsite 1 (indicator)	0.5 miles N
Q-02	Onsite 2 (indicator)	0.4 miles ENE
Q-03	Onsite 3 (indicator)	0.6 miles S
Q-04	Nitrin (indicator)	1.7 miles NE
Q-13	Princeton (indicator)	4.7 miles SW
Q-16	Low Moor (indicator)	5.7 miles NNW
Q-37	Meredosia Road (indicator)	4.4 miles ENE
Q-38	Fuller Road (indicator)	4.7 miles E
Q-41	Camanche (indicator)	4.3 miles NNE

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Quad Cities Nuclear Power Station, 2010

Location	Location Description	Distance & Direction From Site
H. Environmental Dosimetry – TLD (continued)		
Control		
Q-07	Clinton (control)	8.8 miles NE

* Removed from ODCM in December 2006 and replaced by Q-210-5. Q-210-4 is for trending only.

TABLE B-2: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Quad Cities Nuclear Power Station, 2010

Sample Medium	Analysis	Sampling Method	Analytical Procedure Number
Surface Water	Gamma Spectroscopy	Monthly composite from weekly grab samples.	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Surface Water	Gross Beta	Monthly composite from weekly grab samples.	TBE, TBE-2008 Gross Alpha and/or gross beta activity in various matrices Env. Inc., W(DS)-01 Determination of gross alpha and/or gross beta in water (dissolved solids or total residue)
Surface Water	Tritium	Quarterly composite from weekly grab samples.	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation Env. Inc., T-02 Determination of tritium in water (direct method)
Ground Water	Gamma Spectroscopy	Quarterly grab samples.	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Ground Water	Tritium	Quarterly grab samples.	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation Env. Inc., T-02 Determination of tritium in water (direct method)
Fish	Gamma Spectroscopy	Semi-annual samples collected via electroshocking or other techniques	TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Sediment	Gamma Spectroscopy	Semi-annual grab samples	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Air Particulates	Gross Beta	One-week composite of continuous air sampling through glass fiber filter paper	TBE, TBE-2008 Gross Alpha and/or gross beta activity in various matrices Env. Inc., AP-02 Determination of gross alpha and/or gross beta in air particulate filters
Air Particulates	Gamma Spectroscopy	Quarterly composite of each station	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Air Iodine	Gamma Spectroscopy	Weekly composite of continuous air sampling through charcoal filter	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., I-131-02 Determination of I-131 in charcoal canisters by gamma spectroscopy (batch method)
Milk	I-131	Bi-weekly grab sample when cows are on pasture. Monthly all other times	TBE, TBE-2012 Radioiodine in various matrices Env. Inc., I-131-01 Determination of I-131 in milk by anion exchange
Milk	Gamma Spectroscopy	Bi-weekly grab sample when cows are on pasture. Monthly all other times	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Food Products	Gamma Spectroscopy	Annual grab samples.	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
TLD	Thermoluminescence Dosimetry	Quarterly TLDs	Mirion Technologies

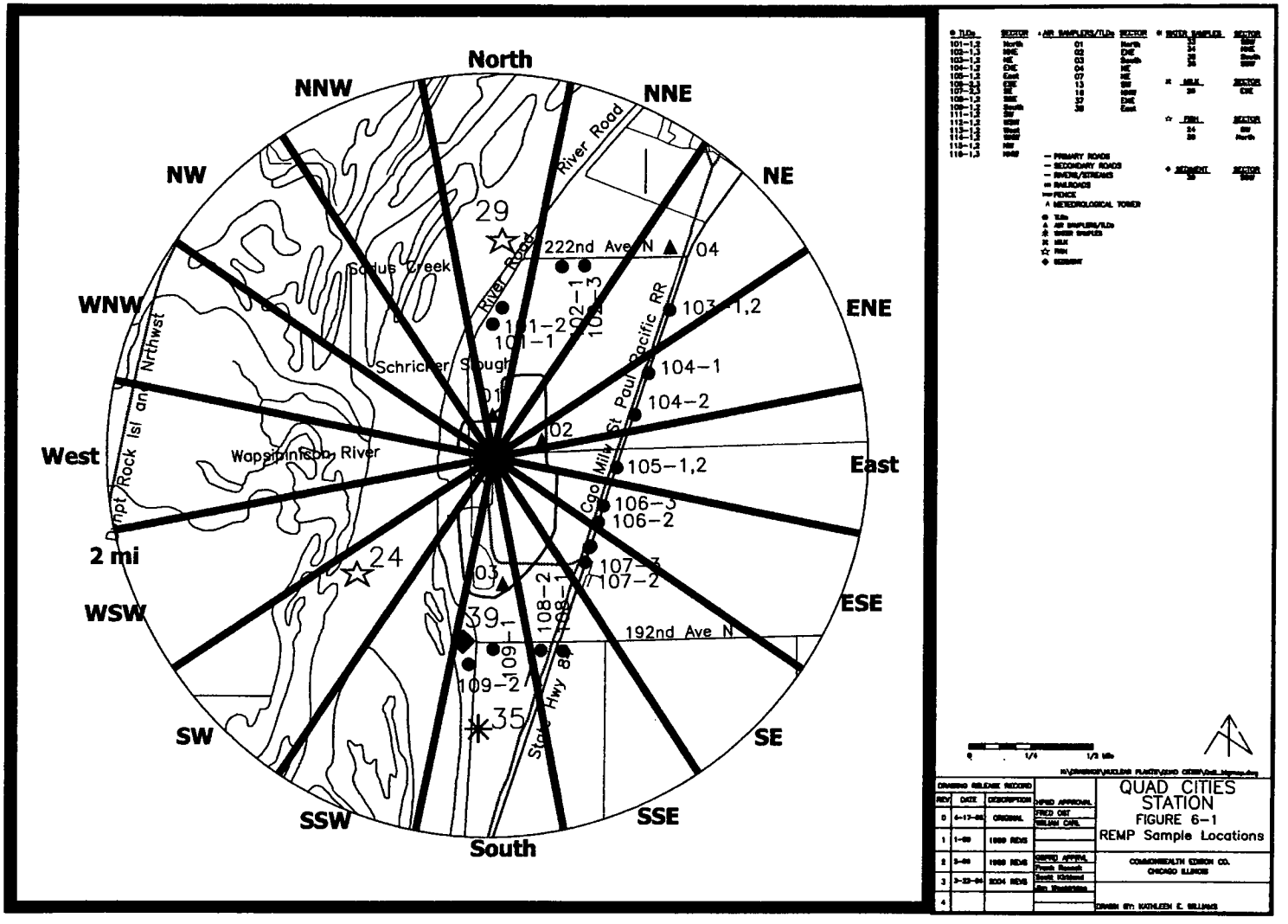

Figure B-1
Quad Cities REMP Sample Locations – 2 Mile Radius, 2010

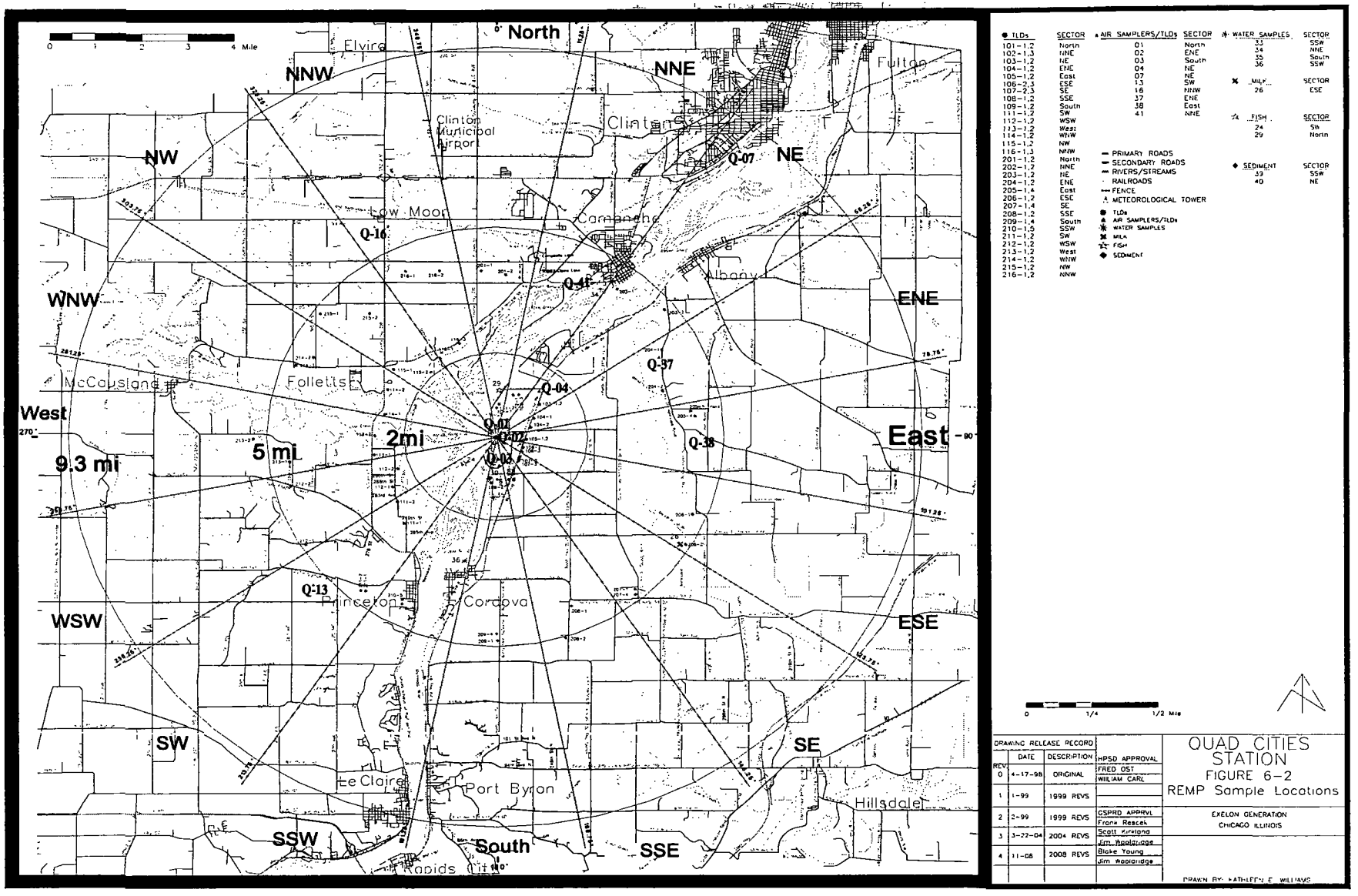

Figure B-2
Quad Cities REMP Sampling Locations – 9.3 Mile Radius, 2010

APPENDIX C

DATA TABLES AND FIGURES
PRIMARY LABORATORY

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TABLE C-I.1 **CONCENTRATIONS OF GROSS BETA IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	Q-33	Q-34
01/01/10 - 01/29/10	(1)	(1)
01/29/10 - 02/26/10	(1)	(1)
03/05/10 - 03/26/10	< 3.1	< 2.8
04/02/10 - 04/30/10	6.8 ± 2.1	5.5 ± 2.0
05/07/10 - 05/28/10	6.1 ± 2.2	6.8 ± 2.2
06/04/10 - 06/25/10	< 3.3	< 3.2
07/02/10 - 07/30/10	4.8 ± 2.0	5.6 ± 2.1
08/06/10 - 08/27/10	7.3 ± 2.2	4.0 ± 1.9
09/03/10 - 09/24/10	4.3 ± 2.5	5.2 ± 2.5
10/01/10 - 10/29/10	4.4 ± 2.7	4.6 ± 2.7
11/05/10 - 11/26/10	6.0 ± 1.9	4.6 ± 1.8
12/03/10 - 12/03/10	10.1 ± 2.2 (1)	10.0 ± 2.3 (1)
MEAN	6.2 ± 3.8	5.8 ± 3.8

TABLE C-I.2 **CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	Q-33	Q-34
03/05/10 - 03/26/10	< 174 (1)	< 170 (1)
04/02/10 - 06/25/10	< 160	< 159
07/02/10 - 09/24/10	< 196	< 200
10/01/10 - 12/03/10	< 172 (1)	< 191 (1)
MEAN	-	-

* THE MEAN AND 2 STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES
(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-I.3 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
Q-33	01/01/10 - 01/29/10 (1)	-	-	-	-	-	-	-	-	-	-	-	-
	01/29/10 - 02/26/10 (1)	-	-	-	-	-	-	-	-	-	-	-	-
	03/05/10 - 03/26/10	< 1	< 1	< 2	< 0	< 1	< 1	< 1	< 15	< 0	< 1	< 14	< 4
	04/02/10 - 04/30/10	< 2	< 3	< 7	< 2	< 5	< 3	< 5	< 14	< 2	< 3	< 26	< 8
	05/07/10 - 05/28/10	< 2	< 2	< 4	< 1	< 3	< 2	< 3	< 14	< 2	< 2	< 21	< 5
	06/04/10 - 06/25/10	< 1	< 1	< 3	< 1	< 3	< 2	< 3	< 7	< 1	< 1	< 13	< 4
	07/02/10 - 07/30/10	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 12	< 2	< 2	< 20	< 6
	08/06/10 - 08/27/10	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 6	< 1	< 1	< 10	< 3
	09/03/10 - 09/24/10	< 1	< 1	< 2	< 1	< 2	< 1	< 2	< 9	< 1	< 1	< 12	< 3
	10/01/10 - 10/29/10	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 11	< 2	< 2	< 18	< 6
	11/05/10 - 11/26/10	< 2	< 2	< 5	< 2	< 3	< 2	< 3	< 12	< 1	< 2	< 18	< 6
	12/03/10 - 12/03/10 (1)	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 12	< 1	< 1	< 39	< 12
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
Q-34	01/01/10 - 01/29/10 (1)	-	-	-	-	-	-	-	-	-	-	-	-
	01/29/10 - 02/26/10 (1)	-	-	-	-	-	-	-	-	-	-	-	-
	03/05/10 - 03/26/10	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 15	< 1	< 1	< 15	< 4
	04/02/10 - 04/30/10	< 2	< 2	< 6	< 2	< 5	< 3	< 4	< 12	< 2	< 2	< 22	< 7
	05/07/10 - 05/28/10	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 14	< 2	< 2	< 21	< 6
	06/04/10 - 06/25/10	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 8	< 1	< 2	< 15	< 4
	07/02/10 - 07/30/10	< 2	< 3	< 5	< 2	< 5	< 3	< 4	< 14	< 2	< 2	< 24	< 6
	08/06/10 - 08/27/10	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 11	< 2	< 2	< 18	< 5
	09/03/10 - 09/24/10	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 14	< 1	< 1	< 21	< 6
	10/01/10 - 10/29/10	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 12	< 1	< 2	< 19	< 7
	11/05/10 - 11/26/10	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 11	< 1	< 1	< 17	< 6
	12/03/10 - 12/03/10 (1)	< 1	< 1	< 3	< 1	< 2	< 1	< 3	< 10	< 1	< 1	< 42	< 13
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-II.1 **CONCENTRATIONS OF TRITIUM IN GROUND WATER SAMPLES COLLECT IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	Q-35	Q-36
01/08/10 - 01/08/10	< 164	< 164
04/09/10 - 04/09/10	< 160	< 158
07/19/10 - 07/19/10	< 159	< 163
10/08/10 - 10/08/10	< 176	< 166
MEAN	-	-

TABLE C-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUND WATER SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
Q-35	01/08/10 - 01/08/10	< 4	< 4	< 10	< 3	< 8	< 5	< 7	< 11	< 4	< 6	< 29	< 9
	04/09/10 - 04/09/10	< 4	< 4	< 9	< 4	< 8	< 4	< 8	< 13	< 4	< 4	< 29	< 9
	07/09/10 - 07/09/10	< 5	< 5	< 11	< 6	< 11	< 7	< 9	< 10	< 5	< 6	< 31	< 10
	10/08/10 - 10/08/10	< 7	< 7	< 13	< 7	< 15	< 8	< 12	< 11	< 7	< 7	< 37	< 12
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
Q-36	01/08/10 - 01/08/10	< 3	< 3	< 8	< 3	< 8	< 4	< 6	< 10	< 3	< 3	< 23	< 7
	04/09/10 - 04/09/10	< 4	< 5	< 9	< 4	< 9	< 5	< 8	< 14	< 5	< 5	< 35	< 10
	07/09/10 - 07/09/10	< 6	< 7	< 16	< 7	< 15	< 6	< 10	< 12	< 7	< 6	< 26	< 8
	10/08/10 - 10/08/10	< 6	< 5	< 13	< 6	< 14	< 7	< 10	< 13	< 6	< 7	< 29	< 10
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

TABLE C-III.1 **CONCENTRATIONS OF GAMMA EMITTERS IN FISH SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010**

RESULTS IN UNITS OF PC/KG WET ± 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
Q-24												
Channel Catfish	05/03/10	< 49	< 57	< 168	< 33	< 111	< 66	< 110	< 43	< 45	< 1220	< 341
Common Carp	05/03/10	< 51	< 67	< 146	< 57	< 118	< 73	< 112	< 41	< 49	< 1590	< 403
Channel Catfish	10/19/10	< 44	< 49	< 107	< 43	< 104	< 47	< 89	< 37	< 59	< 365	< 78
Largemouth Bass	10/19/10	< 51	< 57	< 114	< 59	< 115	< 64	< 93	< 44	< 49	< 367	< 138
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-29												
Common Carp	05/03/10	< 52	< 66	< 157	< 49	< 132	< 74	< 114	< 58	< 52	< 1790	< 503
Shorthead Redhorse	05/03/10	< 48	< 79	< 169	< 56	< 110	< 75	< 160	< 44	< 56	< 1870	< 474
Channel Catfish	10/19/10	< 53	< 59	< 129	< 50	< 119	< 68	< 100	< 55	< 58	< 425	< 94
Freshwater Drum	10/19/10	< 58	< 50	< 112	< 63	< 122	< 67	< 87	< 44	< 46	< 328	< 96
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-IV.1 CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010

RESULTS IN UNITS OF PC/KG DRY ± 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
Q-39	05/28/10	< 59	< 69	< 141	< 62	< 115	< 82	< 120	< 46	< 59	< 870	< 236
	10/29/10	< 71	< 69	< 156	< 87	< 173	< 87	< 143	< 60	75 ± 50	< 525	< 169
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-40	05/28/10	< 52	< 52	< 126	< 49	< 124	< 61	< 112	< 42	< 55	< 771	< 279
	10/29/10	< 31	< 37	< 81	< 35	< 71	< 43	< 57	< 26	< 41	< 276	< 80
	MEAN	-	-	-	-	-	-	-	-	-	-	-

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

TABLE C-V.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010

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

COLLECTION PERIOD	GROUP I				GROUP II					GROUP III
	Q-01	Q-02	Q-03	Q-04	Q-13	Q-16	Q-37	Q-38	Q-41	Q-07
01/01/10 - 01/08/10	27 ± 6	26 ± 5	24 ± 5	20 ± 5	29 ± 5	27 ± 5	< 6	22 ± 5	21 ± 5	24 ± 5
01/08/10 - 01/15/10	36 ± 4	42 ± 4	39 ± 4	37 ± 4	43 ± 5	41 ± 5	39 ± 4	38 ± 4	32 ± 4	40 ± 4
01/15/10 - 01/22/10	25 ± 5	26 ± 5	25 ± 5	25 ± 5	25 ± 5	27 ± 5	20 ± 4	24 ± 5	25 ± 5	27 ± 5
01/22/10 - 01/29/10	21 ± 4	20 ± 4	17 ± 4	17 ± 4	19 ± 4	19 ± 4	17 ± 4	11 ± 3	15 ± 4	23 ± 4
01/29/10 - 02/05/10	27 ± 5	24 ± 5	22 ± 5	26 ± 5	28 ± 5	26 ± 5	19 ± 4	19 ± 5	25 ± 5	25 ± 5
02/05/10 - 02/12/10	13 ± 4	18 ± 4	22 ± 4	14 ± 4	16 ± 4 (1)	19 ± 4	18 ± 4	22 ± 4	16 ± 4	16 ± 4
02/12/10 - 02/19/10	14 ± 4	14 ± 4	17 ± 4	12 ± 4	15 ± 4	18 ± 4	15 ± 4	12 ± 4	14 ± 4	21 ± 4
02/19/10 - 02/26/10	25 ± 5	24 ± 5	23 ± 5	19 ± 5	21 ± 5	21 ± 5	17 ± 5	22 ± 5	24 ± 5	26 ± 5
02/26/10 - 03/05/10	19 ± 5	15 ± 4	18 ± 5	14 ± 4	20 ± 5	17 ± 5	18 ± 4	15 ± 4	14 ± 4	18 ± 5
03/05/10 - 03/11/10	17 ± 4	11 ± 3	16 ± 4	14 ± 4	21 ± 5	18 ± 5	18 ± 4	13 ± 4	18 ± 5	20 ± 5
03/11/10 - 03/19/10	< 7	< 7	< 7	9 ± 5	< 5	8 ± 3	< 7	< 7	6 ± 3	6 ± 3
03/19/10 - 03/26/10	9 ± 5	12 ± 5	9 ± 5	12 ± 5	< 8	15 ± 6	10 ± 5	14 ± 6	14 ± 6	< 8
03/26/10 - 04/02/10	20 ± 5	20 ± 5	17 ± 4	14 ± 4	17 ± 4	21 ± 5	(1)	15 ± 4	20 ± 5	21 ± 5
04/02/10 - 04/09/10	12 ± 4	13 ± 4	14 ± 4	7 ± 4	14 ± 3 (1)	8 ± 4	(1)	11 ± 4	10 ± 4	9 ± 4
04/09/10 - 04/16/10	21 ± 4	21 ± 4	21 ± 4	18 ± 4	19 ± 4	13 ± 4	19 ± 4	19 ± 4	16 ± 4	28 ± 5
04/16/10 - 04/23/10	17 ± 4	14 ± 4	18 ± 4	13 ± 4	17 ± 4	19 ± 4	16 ± 4	16 ± 4	(1)	16 ± 4
04/23/10 - 04/30/10	20 ± 4	11 ± 4	12 ± 4	16 ± 4	19 ± 4	17 ± 4	18 ± 4	14 ± 4	15 ± 4	20 ± 4
04/30/10 - 05/07/10	11 ± 4	13 ± 4	11 ± 4	8 ± 3	8 ± 3	11 ± 4	8 ± 3	7 ± 3	< 5	10 ± 4
05/07/10 - 05/14/10	10 ± 4	< 5	< 5	7 ± 4	9 ± 4	8 ± 4	10 ± 4	8 ± 4	< 5	< 5
05/14/10 - 05/21/10	11 ± 4	11 ± 4	12 ± 4	12 ± 4	10 ± 4	9 ± 4	11 ± 4	11 ± 4	12 ± 4	10 ± 4
05/21/10 - 05/28/10	17 ± 4	14 ± 4	14 ± 4	12 ± 4	13 ± 4	16 ± 4	12 ± 4	12 ± 4	13 ± 4	13 ± 4
05/28/10 - 06/04/10	14 ± 4 (1)	15 ± 4	15 ± 4	14 ± 4	13 ± 4	17 ± 4	10 ± 4	11 ± 4	19 ± 4	17 ± 4
06/04/10 - 06/10/10	19 ± 5	15 ± 4	15 ± 4	11 ± 4	15 ± 5	13 ± 5	9 ± 4	11 ± 4	11 ± 5	13 ± 5
06/10/10 - 06/18/10	9 ± 4	9 ± 4	11 ± 4	9 ± 4	11 ± 3	11 ± 4	11 ± 4	11 ± 4	(1)	14 ± 4 (1)
06/18/10 - 06/25/10	9 ± 4	10 ± 4	9 ± 4	10 ± 4	12 ± 8 (1)	14 ± 4	(1)	12 ± 4	(1)	14 ± 4
06/25/10 - 07/02/10	9 ± 4	6 ± 4	8 ± 4	6 ± 4	7 ± 4	9 ± 4	7 ± 4	9 ± 4	< 6	7 ± 4
07/02/10 - 07/09/10	16 ± 5	15 ± 5	18 ± 5 (1)	14 ± 4	< 5	12 ± 4	13 ± 4	16 ± 5	19 ± 6 (1)	16 ± 4
07/09/10 - 07/16/10	14 ± 4	22 ± 5	23 ± 5 (1)	20 ± 5	22 ± 5	21 ± 5	15 ± 4 (1)	25 ± 5 (1)	17 ± 4	19 ± 4
07/16/10 - 07/23/10	19 ± 4	17 ± 4	17 ± 4	20 ± 5	19 ± 4	19 ± 4	17 ± 5 (1)	21 ± 5	22 ± 5	23 ± 5
07/23/10 - 07/30/10	11 ± 4	10 ± 4	14 ± 4	10 ± 4	17 ± 4	8 ± 4	7 ± 4	9 ± 4	11 ± 4	11 ± 4
07/30/10 - 08/06/10	21 ± 4	17 ± 4	20 ± 4	22 ± 4	19 ± 4	15 ± 4	16 ± 4	21 ± 4	11 ± 7 (1)	18 ± 4
08/06/10 - 08/13/10	26 ± 5	19 ± 4	18 ± 4	17 ± 4	12 ± 4	18 ± 4	8 ± 4	13 ± 4	23 ± 5	21 ± 5
08/13/10 - 08/20/10	19 ± 4	19 ± 4	21 ± 4	22 ± 4	15 ± 4	16 ± 4	(1)	21 ± 4	23 ± 4	20 ± 4
08/20/10 - 08/26/10	17 ± 4	16 ± 4	17 ± 4 (1)	14 ± 4	19 ± 5	21 ± 5	17 ± 4	18 ± 4	22 ± 5	21 ± 5
08/26/10 - 09/03/10	19 ± 4	16 ± 4	14 ± 4	14 ± 4	15 ± 4	18 ± 4	10 ± 4 (1)	16 ± 4 (1)	17 ± 4	14 ± 4
09/03/10 - 09/10/10	12 ± 4	12 ± 4	12 ± 4	11 ± 4	12 ± 4	12 ± 4	9 ± 4	9 ± 4	12 ± 4	12 ± 4
09/10/10 - 09/17/10	15 ± 3	16 ± 3	19 ± 3	20 ± 3	21 ± 4	20 ± 4	19 ± 3	20 ± 3	17 ± 4	< 4
09/17/10 - 09/24/10	20 ± 5	19 ± 5	17 ± 5	17 ± 5	14 ± 4	17 ± 4	19 ± 5	13 ± 5	18 ± 4	16 ± 4
09/24/10 - 10/01/10	11 ± 3	11 ± 3	14 ± 3	15 ± 3	15 ± 4	17 ± 4	15 ± 3	13 ± 3	20 ± 4	9 ± 4
10/01/10 - 10/08/10	27 ± 5 (1)	23 ± 4 (1)	23 ± 4 (1)	30 ± 5 (1)	19 ± 4	23 ± 4	16 ± 4 (1)	26 ± 5 (1)	17 ± 4	19 ± 4
10/08/10 - 10/15/10	35 ± 5	38 ± 6	37 ± 5	33 ± 5	36 ± 4	35 ± 4	31 ± 5	25 ± 5	45 ± 5 (1)	38 ± 4
10/15/10 - 10/21/10	23 ± 4 (1)	15 ± 3 (1)	20 ± 3 (1)	22 ± 3 (1)	20 ± 4	19 ± 4	20 ± 3 (1)	22 ± 4 (1)	(1)	17 ± 4
10/21/10 - 10/29/10	16 ± 5	21 ± 5	18 ± 5	17 ± 5	18 ± 4	17 ± 4	17 ± 5	19 ± 5	21 ± 5 (1)	13 ± 4
10/29/10 - 11/05/10	12 ± 3	11 ± 3	13 ± 3	14 ± 3	11 ± 3	8 ± 3	9 ± 3	18 ± 3	15 ± 3	12 ± 3
11/05/10 - 11/12/10	21 ± 4	13 ± 3	19 ± 3	18 ± 3	19 ± 4	20 ± 4	17 ± 3	15 ± 3	22 ± 5	24 ± 4
11/12/10 - 11/19/10	22 ± 5	23 ± 5	25 ± 5	27 ± 5	22 ± 4	25 ± 4	23 ± 5	32 ± 5	23 ± 4	23 ± 4
11/19/10 - 11/26/10	21 ± 6 (1)	21 ± 4	16 ± 4	22 ± 5	19 ± 4	19 ± 4	21 ± 4	26 ± 5	24 ± 5	19 ± 4
11/26/10 - 12/03/10	36 ± 6 (1)	22 ± 3	24 ± 4	26 ± 4	24 ± 4	26 ± 4	22 ± 3	20 ± 3	24 ± 4	22 ± 4
12/03/10 - 12/10/10	26 ± 5	24 ± 5	15 ± 4	26 ± 5	35 ± 6	33 ± 5	24 ± 5	27 ± 5	35 ± 6	33 ± 5
12/10/10 - 12/17/10	25 ± 5	25 ± 5	27 ± 5	27 ± 5	27 ± 5	28 ± 5	25 ± 5	27 ± 5	23 ± 5	23 ± 5
12/17/10 - 12/23/10	29 ± 5	26 ± 5	22 ± 5	27 ± 5	28 ± 6	33 ± 6	(1)	24 ± 5	25 ± 5	34 ± 6
12/23/10 - 12/31/10	13 ± 4	9 ± 4	15 ± 4	12 ± 4	16 ± 4	15 ± 4	13 ± 4	11 ± 4	11 ± 4	12 ± 4
MEAN	19 ± 14	18 ± 14	18 ± 12	17 ± 14	19 ± 14	18 ± 15	16 ± 13	17 ± 13	19 ± 14	19 ± 15

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-V.2 MONTHLY AND YEARLY MEAN VALUES OF GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010

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

GROUP I - NEAR-SITE LOCATIONS				GROUP II - FAR-FIELD LOCATIONS				GROUP III - CONTROL LOCATIONS			
COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD
01/02/10 - 01/29/10	17	42	27 ± 16	01/01/10 - 01/29/10	11	43	26 ± 18	01/01/10 - 01/29/10	23	40	28 ± 16
01/29/10 - 02/26/10	12	27	20 ± 10	01/29/10 - 02/26/10	12	28	19 ± 8	01/29/10 - 02/26/10	16	26	22 ± 9
02/26/10 - 04/02/10	9	20	14 ± 7	02/26/10 - 04/02/10	6	21	15 ± 8	02/26/10 - 04/02/10	6	21	16 ± 14
04/02/10 - 04/30/10	7	21	15 ± 8	04/02/10 - 04/30/10	8	19	15 ± 6	04/02/10 - 04/30/10	9	28	18 ± 16
04/30/10 - 05/28/10	7	17	12 ± 5	04/30/10 - 05/28/10	7	16	10 ± 5	04/30/10 - 05/28/10	10	13	11 ± 4
05/28/10 - 07/03/10	6	19	11 ± 7	05/28/10 - 07/03/10	7	19	12 ± 6	05/28/10 - 07/02/10	7	17	13 ± 7
07/03/10 - 07/30/10	10	23	16 ± 8	07/02/10 - 07/30/10	7	25	16 ± 10	07/02/10 - 07/30/10	11	23	17 ± 10
07/30/10 - 09/03/10	14	26	18 ± 6	07/30/10 - 09/03/10	8	23	17 ± 8	07/30/10 - 09/03/10	14	21	19 ± 6
09/03/10 - 10/03/10	11	20	15 ± 7	09/03/10 - 10/08/10	9	23	16 ± 7	09/03/10 - 10/08/10	9	19	14 ± 8
10/03/10 - 10/29/10	15	38	25 ± 15	10/03/10 - 10/29/10	16	45	24 ± 17	10/08/10 - 10/29/10	13	38	23 ± 26
10/29/10 - 12/03/10	11	36	20 ± 12	10/29/10 - 12/03/10	8	32	20 ± 11	10/29/10 - 12/03/10	12	24	20 ± 10
12/03/10 - 12/31/10	9	29	22 ± 13	12/03/10 - 12/31/10	11	35	24 ± 15	12/03/10 - 12/31/10	12	34	26 ± 21
01/02/10 - 12/31/10	6	42	18 ± 13	01/01/10 - 12/31/10	6	45	18 ± 14	01/01/10 - 12/31/10	6	40	19 ± 15

TABLE C-V.3 **CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010**

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

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
Q-01	01/02/10 - 04/02/10	< 3	< 4	< 10	< 2	< 7	< 4	< 5	< 2	< 3	< 117	< 50
	04/02/10 - 07/03/10	< 3	< 3	< 6	< 3	< 5	< 2	< 5	< 3	< 2	< 61	< 29
	07/03/10 - 10/03/10	< 3	< 4	< 9	< 2	< 8	< 4	< 6	< 3	< 2	< 97	< 44
	10/03/10 - 12/31/10	< 2	< 4	< 6	< 3	< 8	< 4	< 6	< 3	< 3	< 36	< 14
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-02	01/02/10 - 04/02/10	< 3	< 4	< 11	< 3	< 9	< 4	< 8	< 3	< 3	< 173	< 71
	04/02/10 - 07/03/10	< 4	< 4	< 12	< 4	< 12	< 6	< 9	< 5	< 3	< 68	< 35
	07/03/10 - 10/03/10	< 3	< 3	< 7	< 3	< 8	< 3	< 5	< 3	< 2	< 90	< 31
	10/03/10 - 12/31/10	< 2	< 3	< 6	< 3	< 6	< 2	< 5	< 2	< 2	< 26	< 13
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-03	01/02/10 - 04/02/10	< 3	< 4	< 11	< 3	< 7	< 4	< 9	< 3	< 3	< 114	< 70
	04/02/10 - 07/03/10	< 3	< 2	< 10	< 3	< 8	< 3	< 6	< 4	< 2	< 48	< 18
	07/03/10 - 10/03/10	< 3	< 4	< 11	< 3	< 9	< 4	< 7	< 3	< 3	< 105	< 42
	10/03/10 - 12/31/10	< 2	< 2	< 6	< 2	< 4	< 2	< 4	< 2	< 2	< 25	< 11
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-04	01/02/10 - 04/02/10	< 4	< 5	< 16	< 4	< 9	< 7	< 9	< 4	< 3	< 209	< 76
	04/02/10 - 07/03/10	< 3	< 5	< 9	< 3	< 5	< 3	< 7	< 3	< 3	< 55	< 17
	07/03/10 - 10/03/10	< 3	< 4	< 13	< 3	< 8	< 5	< 7	< 4	< 3	< 91	< 32
	10/03/10 - 12/31/10	< 3	< 4	< 6	< 3	< 5	< 3	< 5	< 2	< 3	< 32	< 16
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-07	01/01/10 - 04/02/10	< 3	< 5	< 12	< 3	< 9	< 4	< 8	< 3	< 3	< 164	< 41
	04/02/10 - 07/02/10	< 5	< 4	< 18	< 3	< 11	< 6	< 8	< 4	< 5	< 95	< 38
	07/02/10 - 10/01/10	< 3	< 4	< 11	< 2	< 6	< 4	< 7	< 2	< 3	< 78	< 33
	10/01/10 - 12/31/10	< 3	< 3	< 8	< 2	< 8	< 4	< 6	< 3	< 3	< 38	< 8
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-V.3 **CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010**

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

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
Q-13	01/01/10 - 04/02/10	< 4	< 5	< 14	< 3	< 9	< 5	< 8	< 3	< 3	< 204	< 61
	04/02/10 - 07/02/10	< 3	< 5	< 9	< 4	< 10	< 5	< 9	< 3	< 4	< 107	< 25
	07/02/10 - 10/01/10	< 2	< 4	< 9	< 3	< 6	< 4	< 5	< 3	< 3	< 93	< 35
	10/01/10 - 12/31/10	< 3	< 4	< 7	< 3	< 7	< 4	< 6	< 3	< 3	< 39	< 14
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-16	01/01/10 - 04/02/10	< 2	< 4	< 9	< 3	< 8	< 4	< 5	< 3	< 3	< 118	< 51
	04/02/10 - 07/02/10	< 3	< 3	< 11	< 3	< 7	< 4	< 6	< 3	< 2	< 50	< 30
	07/02/10 - 10/01/10	< 3	< 4	< 11	< 4	< 7	< 4	< 7	< 3	< 3	< 104	< 42
	10/01/10 - 12/31/10	< 2	< 3	< 6	< 3	< 6	< 3	< 4	< 2	< 2	< 20	< 5
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-37	01/02/10 - 04/02/10	< 4	< 4	< 16	< 4	< 7	< 6	< 9	< 3	< 4	< 171	< 69
	04/02/10 - 07/03/10	< 3	< 5	< 9	< 3	< 6	< 4	< 7	< 3	< 3	< 62	< 23
	07/03/10 - 10/03/10	< 4	< 5	< 7	< 3	< 9	< 5	< 8	< 4	< 3	< 102	< 31
	10/03/10 - 12/31/10	< 2	< 3	< 5	< 3	< 5	< 2	< 5	< 3	< 2	< 31	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-38	01/02/10 - 04/02/10	< 3	< 3	< 9	< 3	< 5	< 4	< 8	< 2	< 3	< 111	< 57
	04/02/10 - 07/03/10	< 5	< 6	< 11	< 4	< 9	< 5	< 8	< 4	< 4	< 69	< 20
	07/03/10 - 10/03/10	< 3	< 3	< 8	< 2	< 6	< 3	< 6	< 3	< 2	< 79	< 38
	10/03/10 - 12/31/10	< 3	< 4	< 7	< 3	< 7	< 4	< 5	< 3	< 3	< 35	< 11
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-V.3 **CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010**

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

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
Q-41	01/01/10 - 04/02/10	< 3	< 4	< 18	< 4	< 6	< 5	< 9	< 3	< 3	< 179	< 58
	04/02/10 - 07/02/10	< 5	< 5	< 11	< 3	< 8	< 5	< 9	< 3	< 3	< 94	< 31
	07/02/10 - 10/01/10	< 3	< 3	< 14	< 4	< 6	< 3	< 7	< 2	< 2	< 92	< 35
	10/01/10 - 12/31/10	< 3	< 3	< 7	< 3	< 6	< 3	< 5	< 3	< 2	< 23	< 14
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-VI-.1 CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010

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

COLLECTION	GROUP I				GROUP II					GROUP III
PERIOD	Q-01	Q-02	Q-03	Q-04	Q-13	Q-16	Q-37	Q-38	Q-41	Q-07
01/01/10 - 01/08/10	< 39	< 37	< 38	< 38	< 49	< 21	< 60	< 60	< 49	< 17
01/08/10 - 01/15/10	< 25	< 44	< 46	< 46	< 25	< 59	< 61	< 61	< 59	< 45
01/15/10 - 01/22/10	< 38	< 38	< 38	< 38	< 42	< 42	< 23	< 43	< 42	< 20
01/22/10 - 01/29/10	< 5	< 10	< 10	< 10	< 6	< 13	< 13	< 13	< 13	< 10
01/29/10 - 02/05/10	< 44	< 44	< 44	< 44	< 47	< 47	< 44	< 19	< 47	< 25
02/05/10 - 02/12/10	< 16	< 28	< 28	< 28	< 15 (1)	< 34	< 35	< 36	< 34	< 27
02/12/10 - 02/19/10	< 42	< 42	< 42	< 42	< 30	< 30	< 30	< 31	< 13	< 17
02/19/10 - 02/26/10	< 10	< 19	< 19	< 19	< 5	< 11	< 11	< 11	< 11	< 18
02/26/10 - 03/05/10	< 21	< 38	< 38	< 38	< 21	< 49	< 49	< 51	< 49	< 37
03/05/10 - 03/11/10	< 10	< 19	< 19	< 19	< 15	< 36	< 23	< 24	< 36	< 28
03/11/10 - 03/19/10	< 34	< 19	< 34	< 34	< 17	< 40	< 53	< 55	< 40	< 25
03/19/10 - 03/26/10	< 21	< 39	< 39	< 39	< 21	< 49	< 48	< 50	< 49	< 38
03/26/10 - 04/02/10	< 10	< 10	< 5	< 10	< 6	< 13	(1)	< 13	< 13	< 10
04/02/10 - 04/09/10	< 13	< 24	< 24	< 24	< 24 (1)	< 29	(1)	< 29	< 29	< 23
04/09/10 - 04/16/10	< 34	< 34	< 34	< 19	< 15	< 35	< 34	< 35	< 36	< 34
04/16/10 - 04/23/10	< 17	< 31	< 31	< 31	< 16	< 36	< 36	< 38	(1)	< 30
04/23/10 - 04/30/10	< 9	< 9	< 9	< 9	< 12	< 27	< 27	< 28	< 27	< 5
04/30/10 - 05/07/10	< 20	< 46	< 47	< 47	< 19	< 34	< 33	< 35	< 34	< 46
05/07/10 - 05/14/10	< 32	< 32	< 32	< 32	< 19	< 44	< 42	< 43	< 44	< 18
05/14/10 - 05/21/10	< 29	< 53	< 53	< 53	< 43	< 58	< 57	< 59	< 58	< 53
05/21/10 - 05/28/10	< 28	< 28	< 28	< 28	< 25	< 13	< 24	< 24	< 24	< 15
05/28/10 - 06/04/10	< 43 (1)	< 23	< 42	< 41	< 24	< 57	< 57	< 59	< 57	< 41
06/04/10 - 06/10/10	< 23	< 23	< 23	< 23	< 56	< 56	< 12	< 42	< 57	< 31
06/10/10 - 06/18/10	< 47	< 47	< 47	< 47	< 59	< 59	< 47	< 27	(1)	< 60 (1)
06/18/10 - 06/25/10	< 32	< 31	< 32	< 32	< 43 (1)	< 44	(1)	< 19	(1)	< 45
06/25/10 - 07/02/10	< 15	< 28	< 28	< 27	< 28	< 28	< 22	< 24	< 30	< 34
07/02/10 - 07/09/10	< 21	< 48	< 48 (1)	< 48	< 36	< 36	< 39	< 49	< 69 (1)	< 43
07/09/10 - 07/16/10	< 20	< 37	< 37 (1)	< 37	< 37	< 37	< 40 (1)	< 39 (1)	< 35	< 34
07/16/10 - 07/23/10	< 42	< 26	< 41	< 42	< 40	< 40	< 53 (1)	< 41	< 22	< 42
07/23/10 - 07/30/10	< 13	< 13	< 12	< 13	< 40	< 40	< 39	< 64	< 64	< 40
07/30/10 - 08/06/10	< 34	< 34	< 32	< 34	< 47	< 46	< 45	< 43	< 59 (1)	< 46
08/06/10 - 08/13/10	< 30	< 54	< 52	< 54	< 49	< 49	< 48	< 69	< 68	< 53
08/13/10 - 08/20/10	< 34	< 34	< 33	< 19	< 42	< 42	(1)	< 42	< 43	< 33
08/20/10 - 08/26/10	< 58	< 58	< 56 (1)	< 58	< 45	< 45	< 36	< 43	< 52	< 45
08/26/10 - 09/03/10	< 62	< 63	< 60	< 62	< 41	< 41	< 49 (1)	< 51 (1)	< 27	< 23
09/03/10 - 09/10/10	< 53	< 53	< 51	< 41	< 42	< 42	< 22	< 22	< 23	< 41
09/10/10 - 09/17/10	< 33	< 33	< 32	< 8	< 5	< 10	< 12	< 13	< 15	< 10
09/17/10 - 09/24/10	< 42	< 42	< 41	< 42	< 29	< 29	< 38	< 45	< 37	< 29
09/24/10 - 10/01/10	< 25	< 25	< 24	< 25	< 52	< 22	< 34	< 31	< 46	< 53
10/01/10 - 10/08/10	< 45 (1)	< 45 (1)	< 44 (1)	< 45 (1)	< 67	< 67	< 59 (1)	< 41 (1)	< 50	< 67
10/08/10 - 10/15/10	< 69	< 70	< 67	< 67	< 47	< 35	< 27	< 50	< 37 (1)	< 47
10/15/10 - 10/21/10	< 53 (1)	< 53 (1)	< 51 (1)	< 53 (1)	< 57	< 57	< 37 (1)	< 34 (1)	(1)	< 57
10/21/10 - 10/29/10	< 55	< 55	< 54	< 24	< 17	< 18	< 24	< 10	< 23 (1)	< 18
10/29/10 - 11/05/10	< 64	< 62	< 62	< 64	< 54	< 54	< 53	< 60	< 69	< 54
11/05/10 - 11/12/10	< 21	< 20	< 20	< 21	< 47	< 46	< 29	< 30	< 20	< 46
11/12/10 - 11/19/10	< 52	< 50	< 50	< 52	< 46	< 46	< 66	< 25	< 17	< 46
11/19/10 - 11/26/10	< 69 (1)	< 55	< 55	< 65	< 64	< 69	< 69	< 69	< 68	< 63
11/26/10 - 12/03/10	< 65 (1)	< 41	< 41	< 42	< 19	< 19	< 18	< 14	< 14	< 19
12/03/10 - 12/10/10	< 33	< 59	< 58	< 60	< 33	< 33	< 34	< 36	< 34	< 58
12/10/10 - 12/17/10	< 31	< 30	< 30	< 31	< 34	< 34	< 33	< 43	< 43	< 34
12/17/10 - 12/23/10	< 16	< 8	< 15	< 16	< 13	< 30	(1)	< 25	< 30	< 19
12/23/10 - 12/31/10	< 42	< 42	< 40	< 42	< 59	< 59	< 62	< 57	< 52	< 59
MEAN	-	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCPETIONS SECTION FOR EXPLANATION

TABLE C-VII.1 **CONCENTRATIONS OF I-131 IN MILK SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	INDICATOR FARM Q-26
01/02/10	< 0.4
02/05/10	< 0.6
03/05/10	< 1.0
04/02/10	< 0.7
05/07/10	< 0.8
05/21/10	< 0.8
06/04/10	< 0.9
06/18/10	< 0.9
07/03/10	< 0.9
07/16/10	< 0.7
07/30/10	< 0.7
08/13/10	< 0.8
08/27/10	< 0.9
09/10/10	< 0.7
09/24/10	< 0.4
10/10/10	< 0.9
10/23/10	< 0.8
11/05/10	< 0.8
12/03/10	< 0.7
MEAN	-

TABLE C-VII.2 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
Q-26	01/02/10	< 4	< 5	< 13	< 4	< 10	< 5	< 8	< 3	< 5	< 45	< 14
	02/05/10	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 2	< 2	< 15	< 5
	03/05/10	< 5	< 5	< 13	< 6	< 12	< 5	< 9	< 5	< 5	< 26	< 10
	04/02/10	< 6	< 7	< 16	< 8	< 16	< 7	< 13	< 6	< 7	< 36	< 8
	05/07/10	< 5	< 5	< 12	< 5	< 11	< 6	< 9	< 4	< 5	< 38	< 11
	05/21/10	< 3	< 3	< 7	< 2	< 6	< 3	< 6	< 3	< 3	< 37	< 9
	06/04/10	< 6	< 7	< 15	< 5	< 17	< 7	< 13	< 9	< 7	< 45	< 11
	06/18/10	< 5	< 5	< 13	< 5	< 12	< 5	< 9	< 5	< 5	< 21	< 6
	07/03/10	< 5	< 6	< 13	< 6	< 13	< 6	< 10	< 5	< 6	< 29	< 9
	07/16/10	< 5	< 5	< 12	< 4	< 12	< 6	< 9	< 4	< 5	< 25	< 6
	07/30/10	< 5	< 6	< 14	< 5	< 13	< 6	< 12	< 5	< 6	< 49	< 10
	08/13/10	< 6	< 6	< 14	< 5	< 14	< 5	< 10	< 5	< 7	< 45	< 13
	08/27/10	< 5	< 6	< 15	< 6	< 12	< 6	< 11	< 5	< 5	< 48	< 12
	09/10/10	< 5	< 6	< 13	< 7	< 12	< 5	< 9	< 4	< 5	< 37	< 12
	09/24/10	< 3	< 5	< 13	< 5	< 9	< 4	< 8	< 3	< 4	< 24	< 7
	10/10/10	< 6	< 7	< 16	< 8	< 15	< 7	< 14	< 6	< 7	< 29	< 8
	10/23/10	< 6	< 6	< 13	< 6	< 12	< 5	< 11	< 4	< 6	< 25	< 9
	11/05/10	< 5	< 6	< 12	< 7	< 12	< 6	< 10	< 5	< 5	< 29	< 9
	12/03/10	< 5	< 6	< 15	< 7	< 13	< 7	< 12	< 5	< 6	< 37	< 13
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-VIII.1 **CONCENTRATIONS OF GAMMA EMITTERS IN FOOD PRODUCT SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010**

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
Q-CONTROL													
Onions	07/27/10	< 9	< 9	< 24	< 9	< 21	< 10	< 18	< 46	< 8	< 10	< 82	< 25
Rhubarb Leaves	07/27/10	< 14	< 16	< 39	< 18	< 31	< 15	< 22	< 53	< 10	< 14	< 95	< 32
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
Q-QUAD 1													
Lettuce	07/27/10	< 9	< 10	< 25	< 9	< 22	< 10	< 18	< 44	< 8	< 9	< 82	< 24
Potatoes	07/27/10	< 10	< 12	< 33	< 9	< 33	< 13	< 20	< 55	< 10	< 12	< 99	< 26
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
Q-QUAD 2													
Potatoes	07/27/10	< 5	< 6	< 14	< 5	< 13	< 6	< 10	< 27	< 5	< 5	< 48	< 13
Rhubarb Leaves	07/27/10	< 10	< 9	< 28	< 9	< 22	< 12	< 18	< 56	< 9	< 9	< 94	< 17
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
Q-QUAD 3													
Cabbage	07/27/10	< 10	< 11	< 27	< 9	< 22	< 11	< 21	< 57	< 8	< 12	< 101	< 27
Horseradish	07/27/10	< 12	< 13	< 30	< 10	< 27	< 13	< 24	< 58	< 10	< 12	< 106	< 28
Onions	07/27/10	< 9	< 10	< 24	< 8	< 19	< 10	< 19	< 56	< 9	< 11	< 94	< 25
Rhubarb Leaves	07/27/10	< 12	< 12	< 36	< 12	< 29	< 14	< 25	< 59	< 11	< 12	< 101	< 34
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
Q-QUAD 4													
Potatoes	07/27/10	< 10	< 12	< 25	< 9	< 25	< 10	< 19	< 54	< 9	< 11	< 103	< 22
Rhubarb Leaves	07/27/10	< 10	< 12	< 31	< 10	< 28	< 12	< 19	< 59	< 10	< 10	< 90	< 25
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

TABLE C-IX.1 QUARTERLY TLD RESULTS FOR QUAD CITIES NUCLEAR POWER STATION, 2010

RESULTS IN UNITS OF MILLI-ROENTGEN/QUARTER ± 2 STANDARD DEVIATIONS

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
Q-01-1	27.5 ± 17.8	29	18	39 (1)	24
Q-01-2	28.5 ± 19.4	30	18	41 (1)	25
Q-02-1	28.0 ± 19.8	27	19	42 (1)	24
Q-02-2	27.5 ± 21.1	27	17	42 (1)	24
Q-03-1	26.3 ± 20.4	27	16	40 (1)	22
Q-03-2	26.0 ± 18.6	25	17	39 (1)	23
Q-04-1	29.3 ± 18.2	30	19	41 (1)	27
Q-04-2	28.3 ± 19.3	29	18	41 (1)	25
Q-07-1	28.3 ± 20.4	29	18	42 (1)	24
Q-07-2	28.8 ± 19.8	30	19	42 (1)	24
Q-13-1	30.0 ± 21.5	32	19	44 (1)	25
Q-13-2	28.8 ± 20.7	29	19	43 (1)	24
Q-16-1	27.0 ± 19.5	28	17	40 (1)	23
Q-16-2	26.0 ± 15.1	28	17	35 (1)	24
Q-37-1	29.5 ± 21.1	29	19	44 (1)	26
Q-37-2	29.8 ± 20.1	29	21	44 (1)	25
Q-38-1	29.8 ± 21.4	27	20	45 (1)	27
Q-38-2	28.7 ± 20.5	(1)	20	40 (1)	26
Q-41-1	27.0 ± 20.4	27	17	41 (1)	23
Q-41-2	26.8 ± 18.9	26	16	39 (1)	26
Q-101-1	26.8 ± 17.3	27	17	38 (1)	25
Q-101-2	27.5 ± 21.1	27	17	42 (1)	24
Q-102-1	28.0 ± 20.4	28	18	42 (1)	24
Q-102-3	27.8 ± 17.6	28	20	40 (1)	23
Q-103-1	27.3 ± 21.8	25	18	43 (1)	23
Q-103-2	26.8 ± 19.5	27	17	40 (1)	23
Q-104-1	27.8 ± 18.7	26	19	41 (1)	25
Q-104-2	26.8 ± 18.9	26	18	40 (1)	23
Q-105-1	26.8 ± 20.4	26	17	41 (1)	23
Q-105-2	28.0 ± 20.7	27	17	42 (1)	26
Q-106-2	27.3 ± 18.1	27	17	39 (1)	26
Q-106-3	27.5 ± 15.7	27	19	38 (1)	26
Q-107-2	27.5 ± 20.0	27	17	41 (1)	25
Q-107-3	28.0 ± 19.8	28	17	41 (1)	26
Q-108-1	27.8 ± 20.7	28	18	42 (1)	23
Q-108-2	26.0 ± 16.2	27	19	37 (1)	21
Q-109-1	27.8 ± 19.8	29	18	41 (1)	23
Q-109-2	27.3 ± 19.3	28	17	40 (1)	24
Q-111-1	31.3 ± 18.1	30	20	42 (1)	33 (1)
Q-111-2	30.0 ± 20.7	26	18	42 (1)	34 (1)
Q-112-1	28.3 ± 19.8	28	19	42 (1)	24
Q-112-2	27.3 ± 22.3	26	17	43 (1)	23
Q-113-1	28.0 ± 19.2	29	19	41 (1)	23
Q-113-2	25.8 ± 16.4	28	17	36 (1)	22
Q-114-1	26.0 ± 22.0	26	15	41 (1)	22
Q-114-2	29.5 ± 18.2	32	20	41 (1)	25
Q-115-1	29.3 ± 21.6	30	19	44 (1)	24
Q-115-2	27.8 ± 20.1	27	19	42 (1)	23
Q-116-1	29.3 ± 19.3	30	19	42 (1)	26

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-IX.1 QUARTERLY TLD RESULTS FOR QUAD CITIES NUCLEAR POWER STATION, 2010

RESULTS IN UNITS OF MILLI-ROENTGEN/QUARTER ± 2 STANDARD DEVIATIONS

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
Q-116-3	28.8 ± 21.4	28	20	44 (1)	23
Q-201-1	29.8 ± 20.7	30	20	44 (1)	25
Q-201-2	29.5 ± 19.5	30	21	43 (1)	24
Q-202-1	27.0 ± 20.7	28	17	41 (1)	22
Q-202-2	26.3 ± 17.7	27	17	38 (1)	23
Q-203-1	29.0 ± 21.6	29	19	44 (1)	24
Q-203-2	30.8 ± 19.1	32	20	43 (1)	28
Q-204-1	29.5 ± 22.2	29	19	45 (1)	25
Q-204-2	31.3 ± 23.1	29	22	48 (1)	26
Q-205-1	29.8 ± 21.4	31	19	44 (1)	25
Q-205-4	30.8 ± 16.8	31	22	42 (1)	28
Q-206-1	30.0 ± 20.3	32	19	43 (1)	26
Q-206-2	28.0 ± 19.5	29	18	41 (1)	24
Q-207-1	27.0 ± 18.0	28	18	39 (1)	23
Q-207-4	29.8 ± 25.7	28	18	48 (1)	25
Q-208-1	29.5 ± 19.4	32	20	42 (1)	24
Q-208-2	28.8 ± 18.6	30	19	41 (1)	25
Q-209-1	29.0 ± 21.4	28	19	44 (1)	25
Q-209-4	28.5 ± 19.8	29	19	42 (1)	24
Q-210-1	29.8 ± 23.7	31	20	46 (1)	22
Q-210-4	29.5 ± 21.0	30	20	44 (1)	24
Q-210-5	25.8 ± 19.8	27	16	39 (1)	21
Q-211-1	30.8 ± 17.9	31	22	43 (1)	27
Q-211-2	31.5 ± 19.8	32	22	45 (1)	27
Q-212-1	30.3 ± 19.1	28	22	44 (1)	27
Q-212-2	28.5 ± 21.0	29	19	43 (1)	23
Q-213-1	28.8 ± 20.8	27	18	43 (1)	27
Q-213-2	29.3 ± 19.5	33	19	41 (1)	24
Q-214-1	31.5 ± 15.8	29	29	43 (1)	25
Q-214-2	31.0 ± 22.3	32	20	46 (1)	26
Q-215-1	30.5 ± 20.2	31	20	44 (1)	27
Q-215-2	29.8 ± 14.5	29	23	40 (1)	27
Q-216-1	29.0 ± 20.7	30	19	43 (1)	24
Q-216-2	30.8 ± 20.7	31	21	45 (1)	26

TABLE C-IX.2 MEAN QUARTERLY TLD RESULTS FOR THE INNER RING, OUTER RING, OTHER AND CONTROL LOCATION FOR QUAD CITIES NUCLEAR POWER STATION, 2010

RESULTS IN UNITS OF MILLI-ROENTGEN/QUARTER
STANDARD DEVIATIONS OF THE STATION DATA

COLLECTION PERIOD	INNER RING ± 2 S.D.	OUTER RING	OTHER	CONTROL
JAN-MAR	27.6 ± 3.0	29.8 ± 3.3	28.2 ± 3.4	29.5 ± 1.4
APR-JUN	18.1 ± 2.5	19.9 ± 4.6	18.2 ± 2.8	18.5 ± 1.4
JUL-SEP	40.9 ± 3.7	43.1 ± 4.6	41.1 ± 4.8	42.0 ± 0.0
OCT-DEC	24.5 ± 5.6	24.9 ± 3.5	24.6 ± 2.8	24.0 ± 0.0

TABLE C-IX.3 SUMMARY OF THE AMBIENT DOSIMETRY PROGRAM FOR QUAD CITIES NUCLEAR POWER STATION, 2010

RESULTS IN UNITS OF MILLI-ROENTGEN/QUARTER

LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 S.D.
INNER RING	120	15	44	27.8 ± 17.2
OUTER RING	132	16	48	29.4 ± 17.8
OTHER	71	16	45	28.0 ± 17.3
CONTROL	8	18	42	28.5 ± 18.6

INNER RING STATIONS - Q-101-1, Q-101-2, Q-102-1, Q-102-3, Q-103-1, Q-103-2, Q-104-1, Q-104-2, Q-105-1, Q-105-2, Q-106-2, Q-106-3, Q-107-2, Q-107-3, Q-108-1, Q-108-2, Q-109-1, Q-109-2, Q-111-1, Q-111-2, Q-112-1, Q-112-2, Q-113-1, Q-113-2, Q-114-1, Q-114-2, Q-115-1, Q-115-2, Q-116-1, Q-116-3

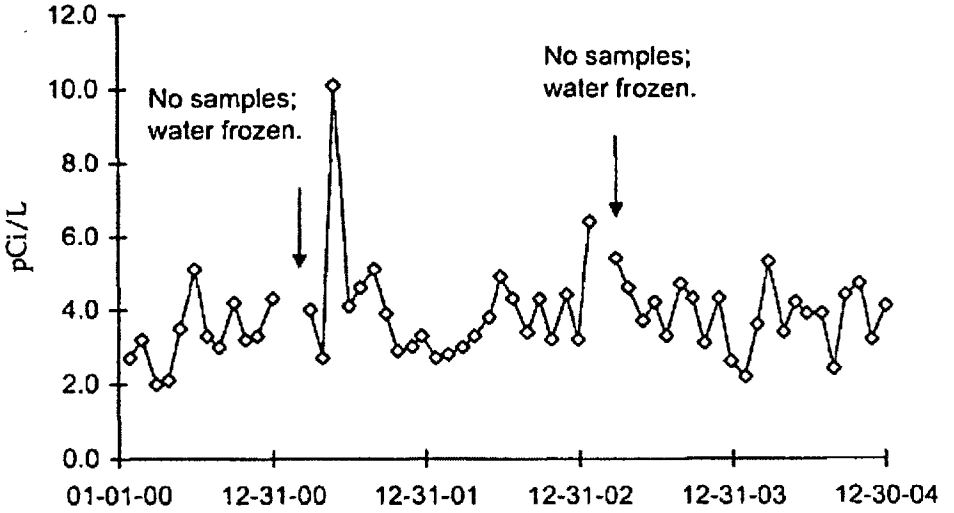
OUTER RING STATIONS - Q-201-1, Q-201-2, Q-202-1, Q-202-2, Q-203-1, Q-203-2, Q-204-1, Q-204-2, Q-205-1, Q-205-4, Q-206-1, Q-206-2, Q-207-1, Q-207-4, Q-208-1, Q-208-2, Q-209-1, Q-209-4, Q-210-1, Q-210-4, Q-210-5, Q-211-1, Q-211-2, Q-212-1, Q-212-2, Q-213-1, Q-213-2, Q-214-1, Q-214-2, Q-215-1, Q-215-2, Q-216-1, Q-216-2

OTHER STATIONS - Q-01-1, Q-01-2, Q-02-1, Q-02-2, Q-03-1, Q-03-2, Q-04-1, Q-04-2, Q-13-1, Q-13-2, Q-16-1, Q-16-2, Q-37-1, Q-37-2, Q-38-1, Q-38-2, Q-41-1, Q-41-2

CONTROL STATIONS - Q-07-1, Q-07-2

FIGURE C-1
Surface Water - Gross Beta - Stations Q-33 and Q-34 (C) Collected in the Vicinity of QCNPS, 2000 - 2004

Q-33 Cordova



Q-34 (C) Camanche

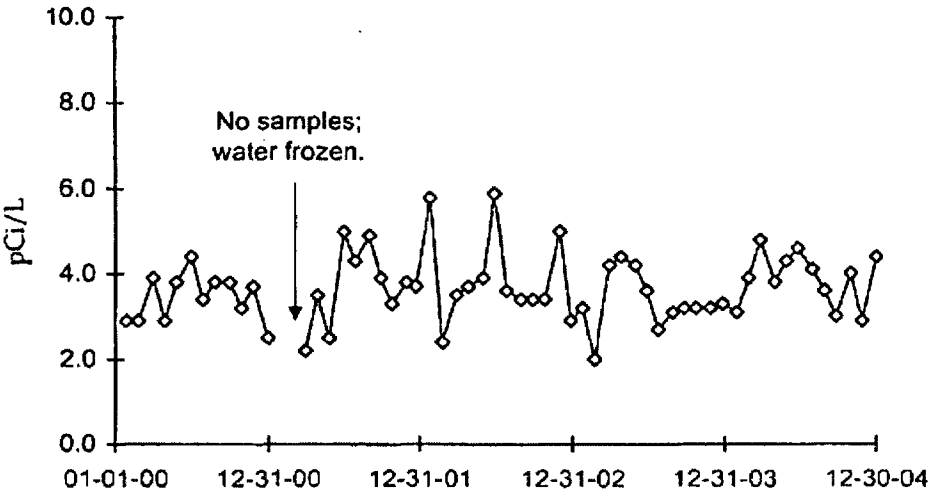
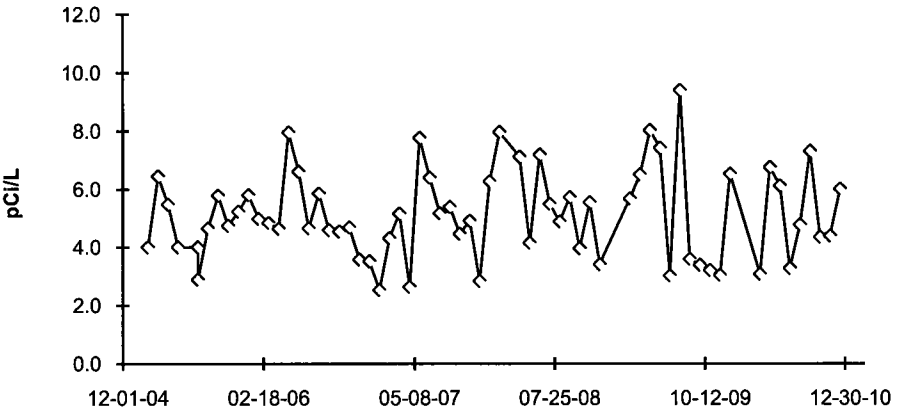
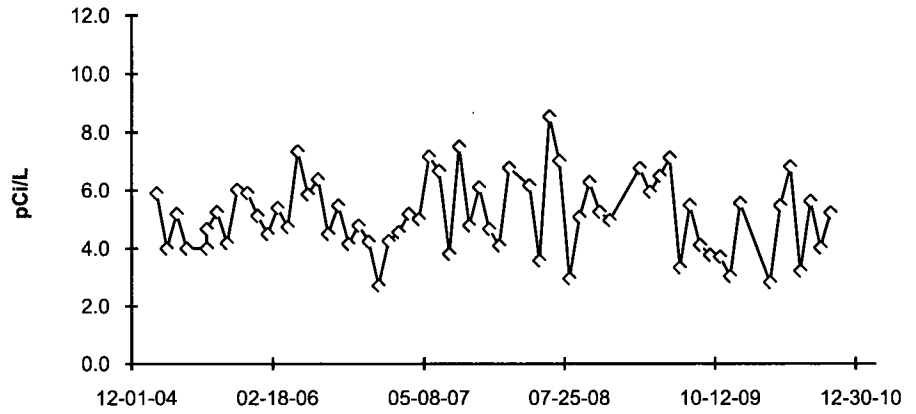


FIGURE C-1 (cont.)
Surface Water - Gross Beta - Stations Q-33 and Q-34 (C)
Collected in the Vicinity of QCNPS, 2005 - 2010

Q-33 Cordova



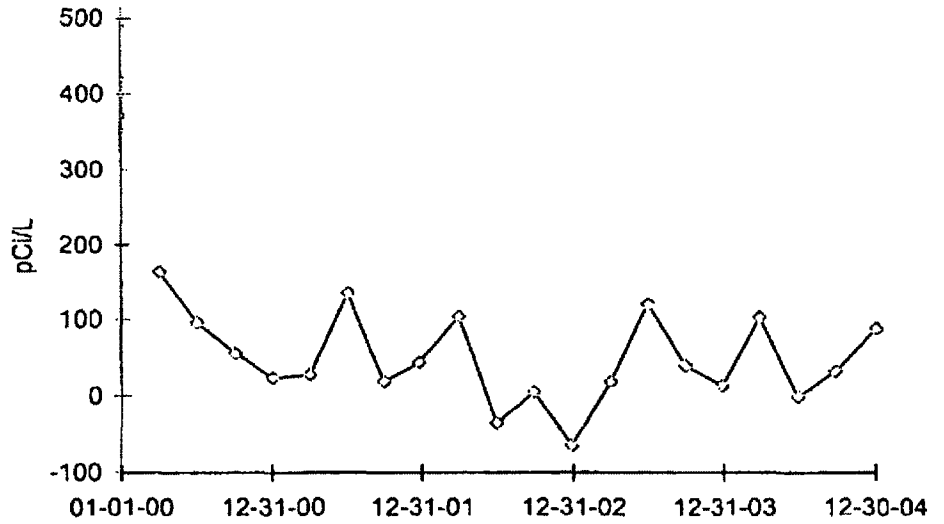
Q-34 (C) Camanche



DUE TO VENDOR CHANGE, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JULY 2005

FIGURE C-2
Surface Water - Tritium - Stations Q-33 and Q-34 (C) Collected in the Vicinity of QCNPS, 2000 - 2004

Q-33 Cordova



Q-34 (C) Camanche

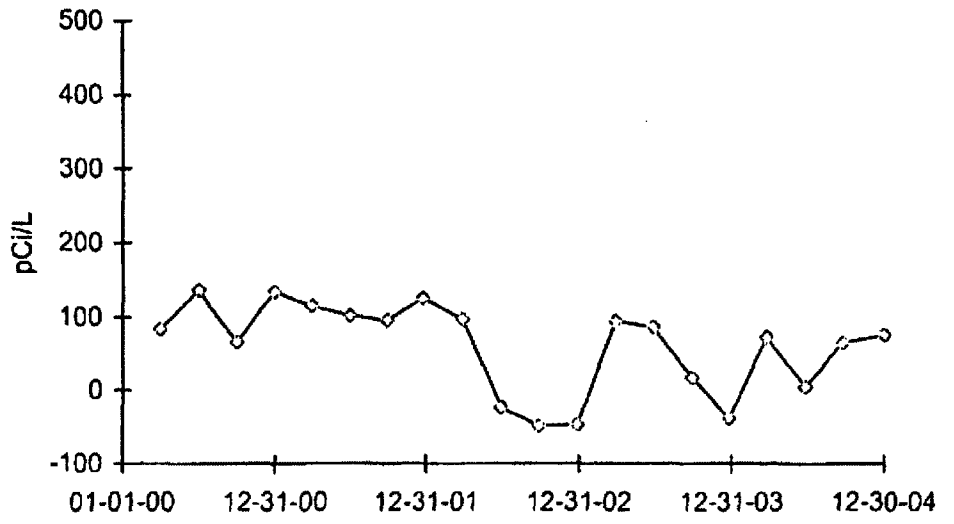
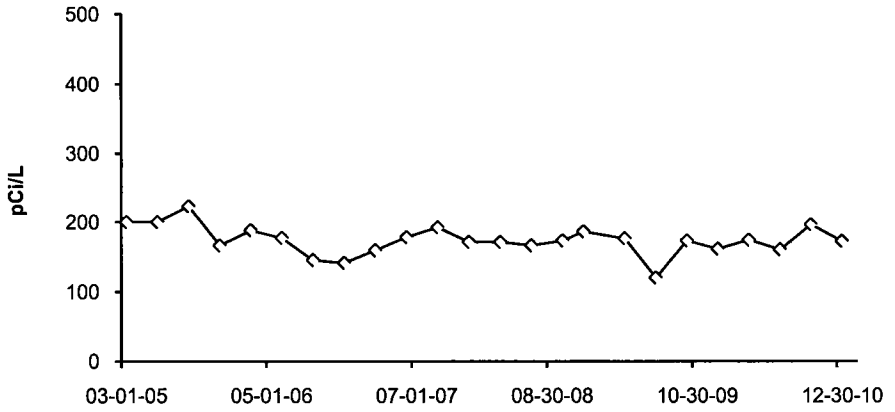
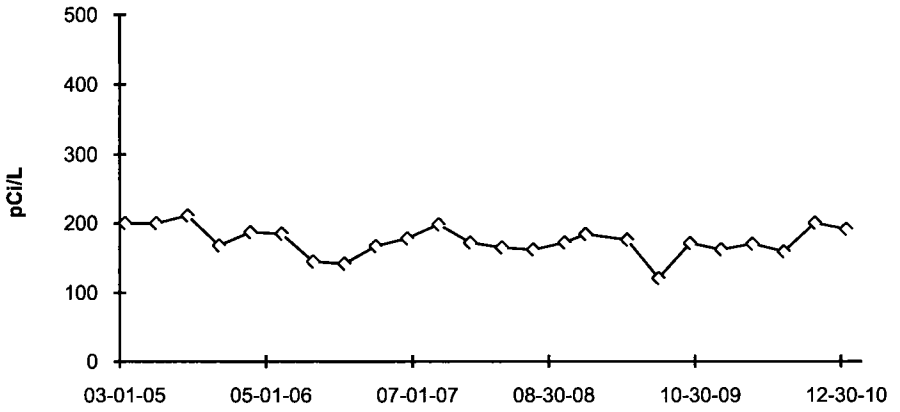


FIGURE C-2 (cont.)
Surface Water - Tritium - Stations Q-33 and Q-34 (C)
Collected in the Vicinity of QCNPS, 2005 - 2010

Q-33 Cordova

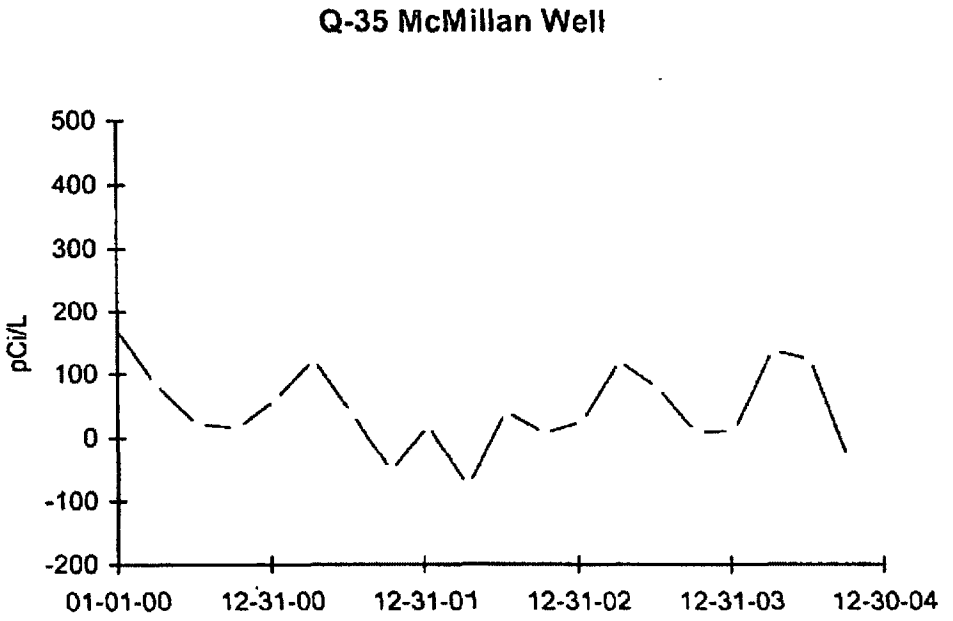


Q-34 (C) Camanche



DUE TO VENDOR CHANGE, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JULY 2005

FIGURE C-3
Ground Water - Tritium - Stations Q-35 and Q-36 Collected in the Vicinity of QCNPS, 2000 - 2004



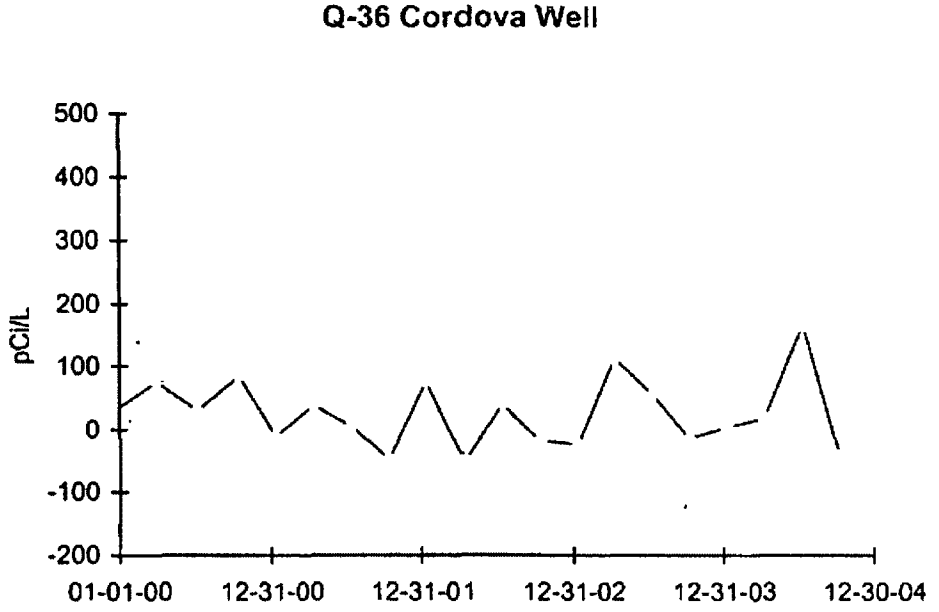
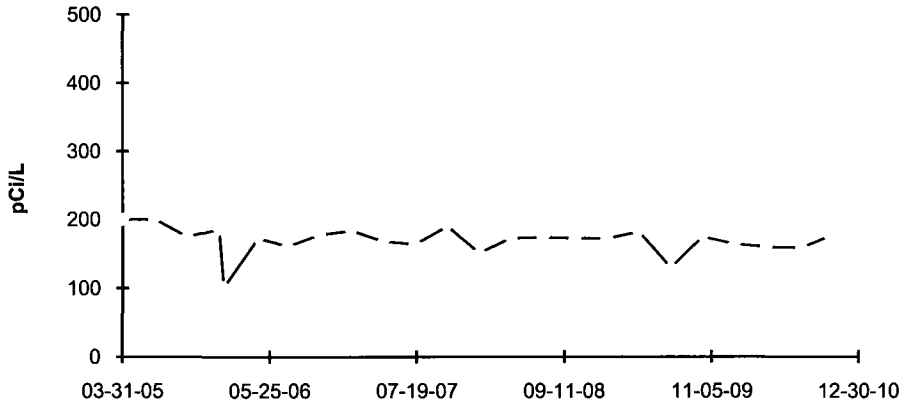
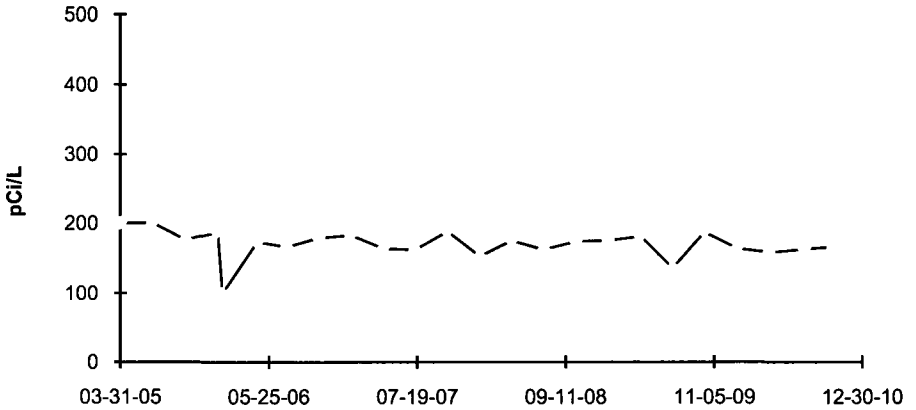


FIGURE C-3 (cont.)
Ground Water - Tritium - Stations Q-35 and Q-36 Collected in the Vicinity of QCNPS, 2005 - 2010

Q-35 McMillan Well



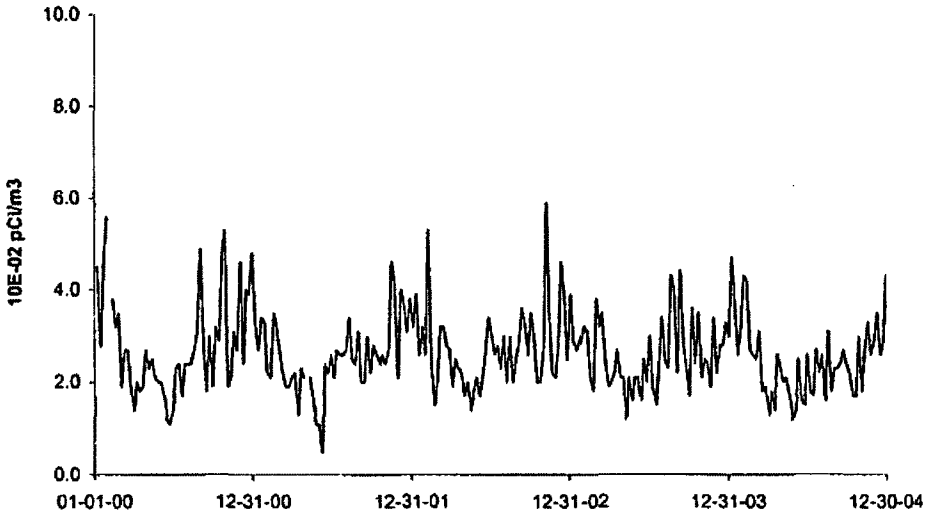
Q-36 Cordova Well



DUE TO VENDOR CHANGE, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JULY 2005

FIGURE C-4
Air Particulates - Gross Beta- Stations Q-01 and Q-02 Collected in the Vicinity of QCNPS, 2000 - 2004

Q-01 Onsite No. 1



Q-02 Onsite No. 2

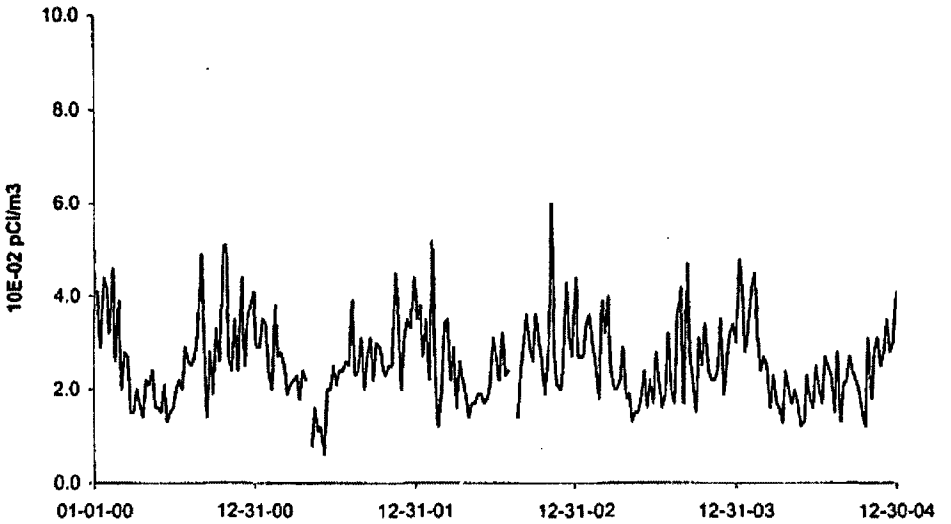
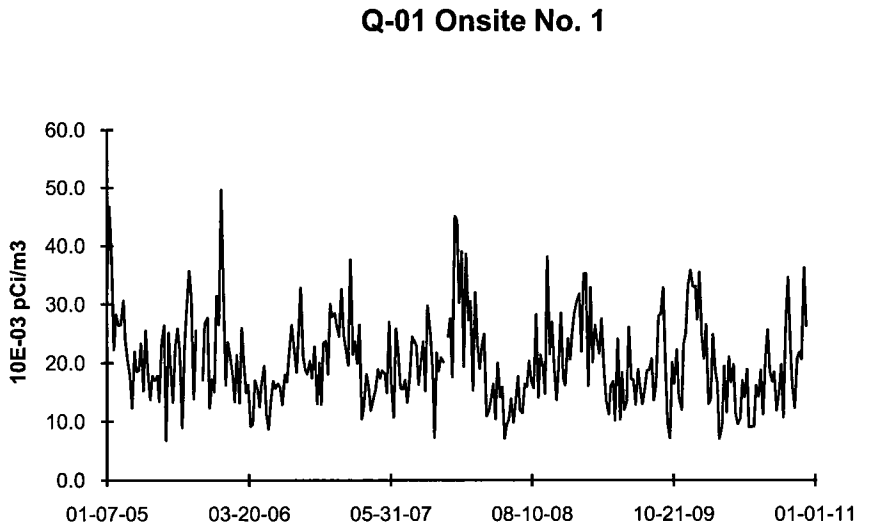
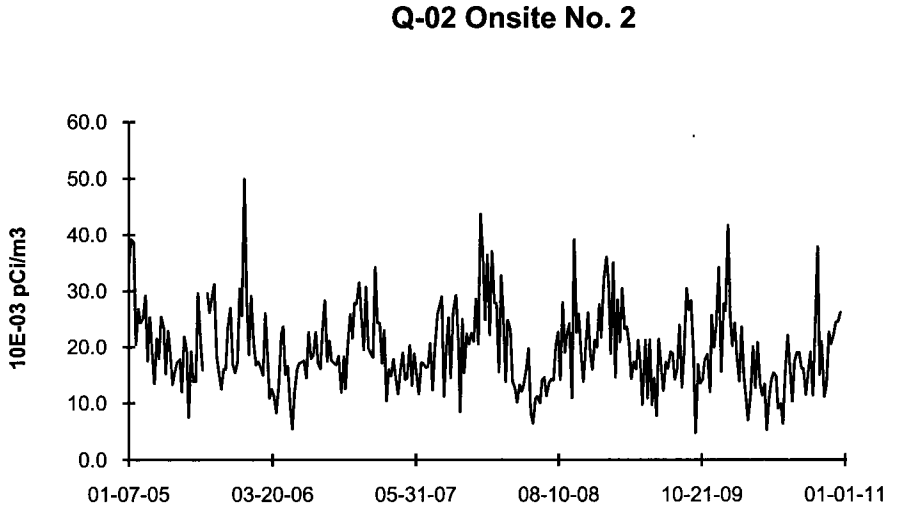


FIGURE C-4 (cont.)
Air Particulates - Gross Beta- Stations Q-01 and Q-02 Collected in the Vicinity of QCNPS, 2005 - 2010



Station Q-01 lost power 10-07-05 - 10-21-05.

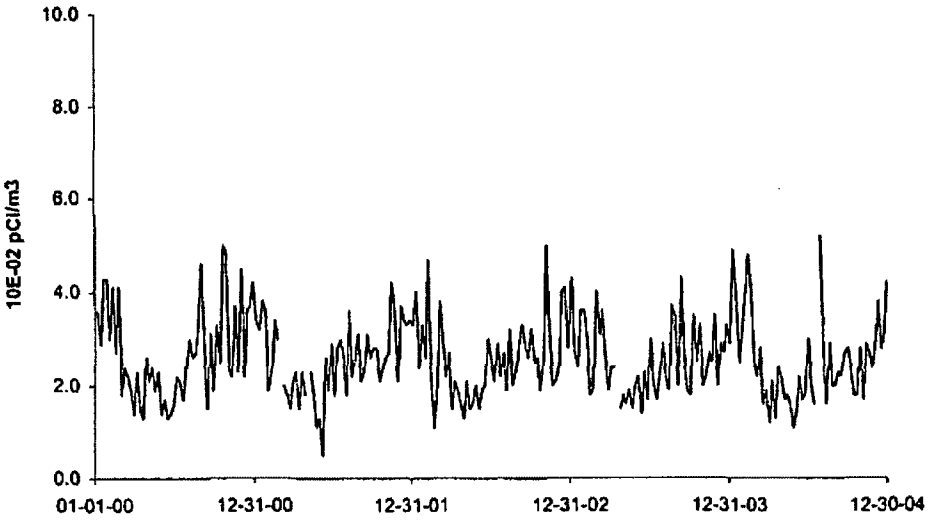


Station Q-02 lost power 08-19-05 - 08-26-05.

DUE TO VENDOR CHANGE IN 2005, THE REPORTED UNITS CHANGED FROM E-02 PCI/M3 TO E-03 PCI/M3

FIGURE C-5
Air Particulates - Gross Beta- Stations Q-03 and Q-04 Collected in the Vicinity of QCNPS, 2000 - 2004

Q-03 Onsite No. 3



Q-04 Nitrin

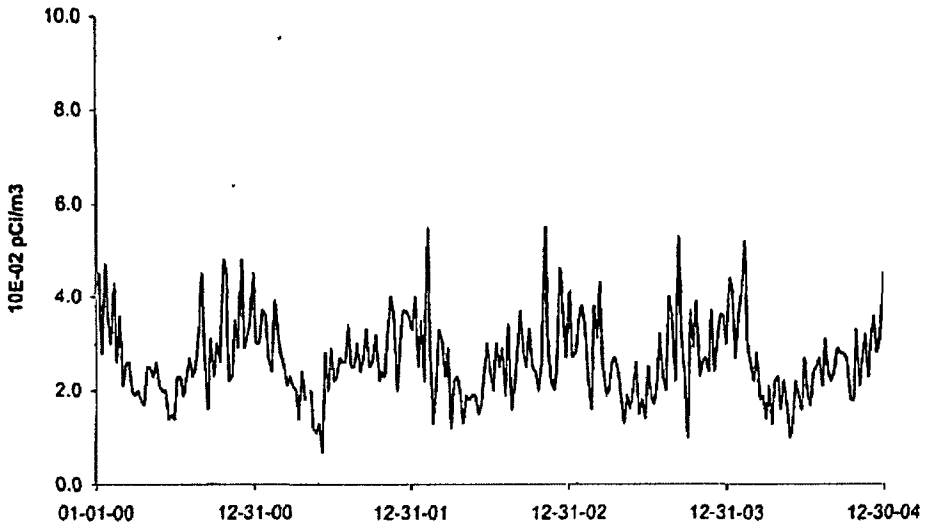
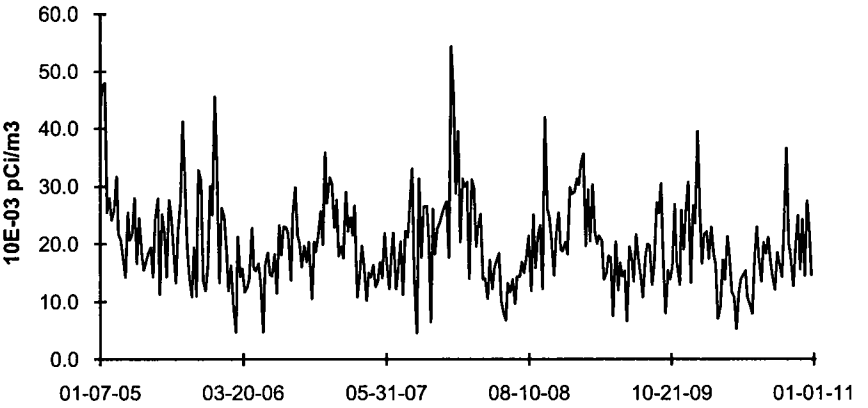
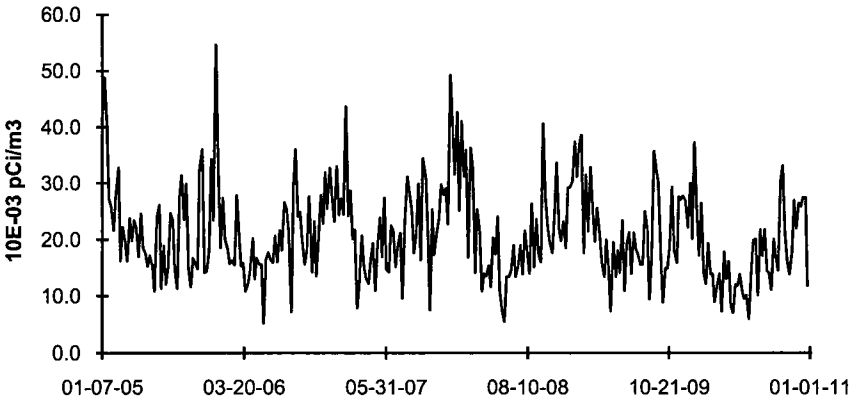


FIGURE C-5 (cont.)
Air Particulates - Gross Beta- Stations Q-03 and Q-04 Collected in the Vicinity of QCNPS, 2005 - 2010

Q-03 Onsite No. 3



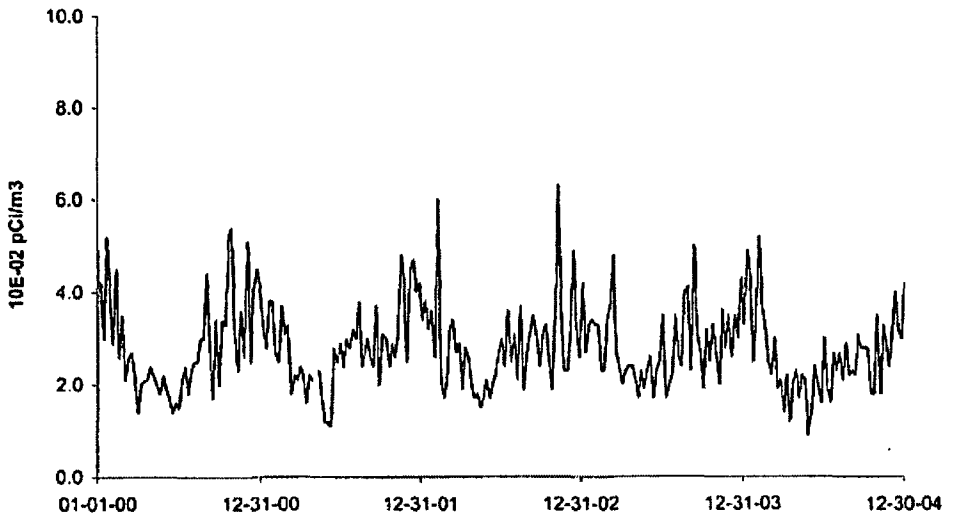
Q-04 Nitrin



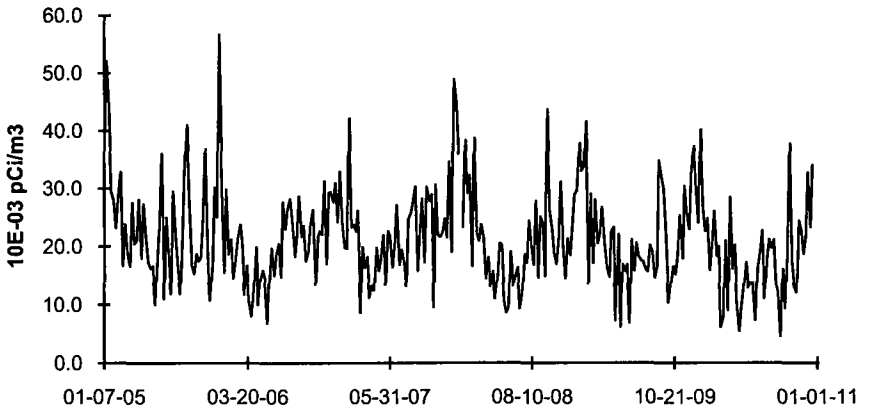
DUE TO VENDOR CHANGE IN 2005, THE REPORTED UNITS CHANGED FROM E-02 PCI/M3 TO E-03 PCI/M3

FIGURE C-6
Air Particulates - Gross Beta- Stations Q-07 (C) Collected in the Vicinity of QCNPS, 2000 - 2010

Q-07 (C) Clinton



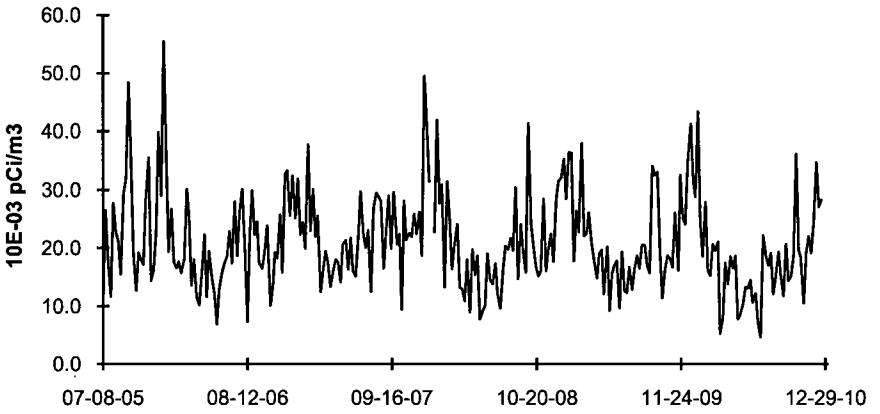
Q-07 (C) Clinton



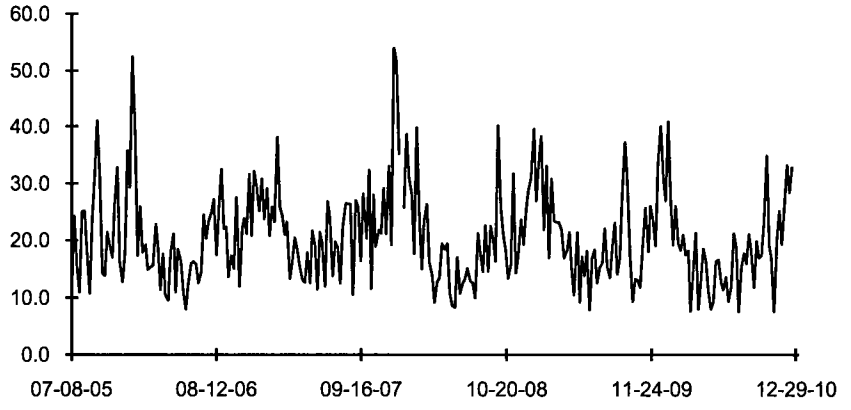
DUE TO VENDOR CHANGE IN 2005, THE REPORTED UNITS CHANGED FROM E-02 PCI/M3 TO E-03 PCI/M3

FIGURE C-7
Air Particulates - Gross Beta- Stations Q-13 and Q-16 Collected in the Vicinity of QCNPS, 2005 - 2010

Q-13 Princeton



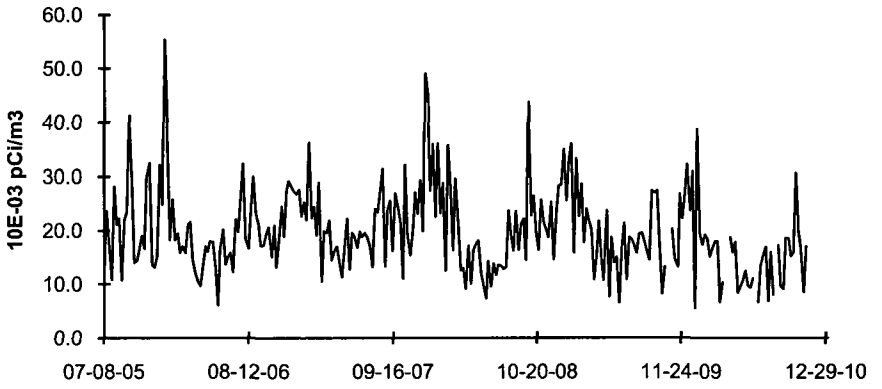
Q-16 Low Moor



AIR PARTICULATE GROSS BETA ANALYSES OF FAR FIELD LOCATIONS STARTED IN JULY 2005
DUE TO VENDOR CHANGE IN 2005, THE REPORTED UNITS CHANGED FROM E-02 PCI/M3 TO E-03 PCI/M3

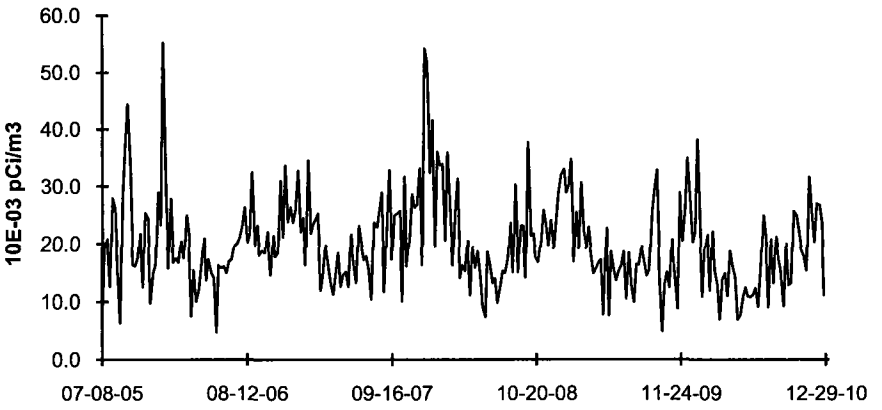
FIGURE C-8
Air Particulates - Gross Beta- Stations Q-37 and Q-38 Collected in the Vicinity of QCNPS, 2005 - 2010

Q-37 Meredosia Road



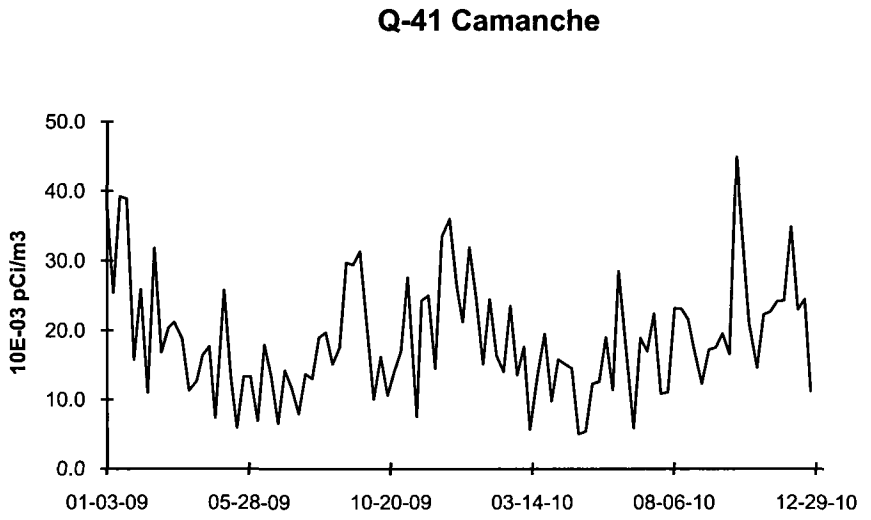
STATION Q-37 YEILDED AN INSUFFICIENT RUN TIME FOR SAMPLE TO BE OBTAINED 10/23/09 - 10/30/09

Q-38 Fuller Road



AIR PARTICULATE GROSS BETA ANALYSES OF FAR FIELD LOCATIONS STARTED IN JULY 2005
DUE TO VENDOR CHANGE IN 2005, THE REPORTED UNITS CHANGED FROM E-02 PCI/M3 TO E-03 PCI/M3

FIGURE C-9
Air Particulates - Gross Beta- Stations Q-41
Collected in the Vicinity of QCNPS, 2009 - 2010



APPENDIX D

INTER-LABORATORY COMPARISON PROGRAM

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TABLE D-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2010
(PAGE 1 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
March 2010	E6978-396	Milk	Sr-89	pCi/L	89.3	92.8	0.96	A
			Sr-90	pCi/L	13.8	12.7	1.09	A
	E6979-396	Milk	I-131	pCi/L	65.2	74.0	0.88	A
			Ce-141	pCi/L	241	261	0.92	A
			Cr-51	pCi/L	388	361	1.07	A
			Cs-134	pCi/L	157	178	0.88	A
			Cs-137	pCi/L	150	158	0.95	A
			Co-58	pCi/L	143	143	1.00	A
			Mn-54	pCi/L	202	207	0.98	A
			Fe-59	pCi/L	146	137	1.07	A
			Zn-65	pCi/L	247	254	0.97	A
			Co-60	pCi/L	177	183	0.97	A
	E6981-396	AP	Ce-141	pCi	211	185	1.14	A
			Cr-51	pCi	304	255	1.19	A
			Cs-134	pCi	142	125	1.14	A
			Cs-137	pCi	131	111	1.18	A
			Co-58	pCi	119	101	1.18	A
			Mn-54	pCi	162	146	1.11	A
			Fe-59	pCi	110	97	1.14	A
			Zn-65	pCi	217	179	1.21	W
			Co-60	pCi	145	129	1.12	A
	E6980-396	Charcoal	I-131	pCi	80.2	85.6	0.94	A
June 2010	E7132-396	Milk	Sr-89	pCi/L	82.0	93.4	0.88	A
			Sr-90	pCi/L	15.8	16.7	0.95	A
	E7133-396	Milk	I-131	pCi/L	83.5	96.9	0.86	A
			Ce-141	pCi/L	107	110	0.97	A
			Cr-51	pCi/L	325	339	0.96	A
			Cs-134	pCi/L	114	126	0.90	A
			Cs-137	pCi/L	144	150	0.96	A
			Co-58	pCi/L	92.3	101	0.91	A
			Mn-54	pCi/L	165	169	0.98	A
			Fe-59	pCi/L	121	119	1.02	A
			Zn-65	pCi/L	197	206	0.96	A
			Co-60	pCi/L	190	197	0.96	A
	E7135-396	AP	Ce-141	pCi	88.4	91.6	0.97	A
			Cr-51	pCi	292	282	1.04	A
			Cs-134	pCi	101	105	0.96	A
			Cs-137	pCi	132	125	1.06	A
			Co-58	pCi	87.3	84.0	1.04	A
			Mn-54	pCi	150	140	1.07	A
			Fe-59	pCi	105	98.6	1.06	A
			Zn-65	pCi	168	171	0.98	A
			Co-60	pCi	170	163	1.04	A
	E7134-396	Charcoal	I-131	pCi	76.4	79.9	0.96	A

TABLE D-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2010
(PAGE 2 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
September 2010	E7229-396	Milk	Sr-89	pCi/L	85.0	92.8	0.92	A
			Sr-90	pCi/L	12.6	14.7	0.86	A
	E7230-396	Milk	I-131	pCi/L	80.2	94.1	0.85	A
			Ce-141	pCi/L	130	130	1.00	A
			Cr-51	pCi/L	235	234	1.00	A
			Cs-134	pCi/L	83.2	93.0	0.89	A
			Cs-137	pCi/L	95.1	94.5	1.01	A
			Co-58	pCi/L	77.3	73.7	1.05	A
			Mn-54	pCi/L	121	119	1.02	A
			Fe-59	pCi/L	96.4	91.1	1.06	A
			Zn-65	pCi/L	216	204	1.06	A
			Co-60	pCi/L	172	171	1.01	A
	E7232-396	AP	Ce-141	pCi	122	119	1.03	A
			Cr-51	pCi	228	214	1.07	A
			Cs-134	pCi	79.9	85.3	0.94	A
			Cs-137	pCi	93.8	86.7	1.08	A
			Co-58	pCi	71.5	67.6	1.06	A
			Mn-54	pCi	113	110	1.03	A
			Fe-59	pCi	73.8	83.6	0.88	A
			Zn-65	pCi	186	187	0.99	A
			Co-60	pCi	163	157	1.04	A
	E7231-396	Charcoal	I-131	pCi/L	62.3	59.9	1.04	A
December 2010	E7375-396	Milk	Sr-89	pCi/L	92.7	98.0	0.95	A
			Sr-90	pCi/L	13.5	13.5	1.00	A
	E7376-396	Milk	I-131	pCi/L	87.9	96.9	0.91	A
			Ce-141	pCi/L	not provided by Analytics for this study			
			Cr-51	pCi/L	389	456	0.85	A
			Cs-134	pCi/L	137	157	0.87	A
			Cs-137	pCi/L	172	186	0.92	A
			Co-58	pCi/L	84.3	90.2	0.93	A
			Mn-54	pCi/L	120	120	1.00	A
			Fe-59	pCi/L	134	131	1.02	A
			Zn-65	pCi/L	162	174	0.93	A
			Co-60	pCi/L	284	301	0.94	A
	E7378-396	AP	Ce-141	pCi	not provided by Analytics for this study			
			Cr-51	pCi	387	365	1.06	A
			Cs-134	pCi	135	126	1.07	A
			Cs-137	pCi	157	149	1.05	A
			Co-58	pCi	73.6	72.3	1.02	A
			Mn-54	pCi	88.7	96	0.92	A
			Fe-59	pCi	127	105	1.21	W
			Zn-65	pCi	151	139	1.09	A
			Co-60	pCi	249	241	1.03	A

TABLE D-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2010
(PAGE 3 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
December 2010	E7377-396	Charcoal	I-131	pCi	79.6	84.2	0.95	A

(a) Teledyne Brown Engineering reported result.

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

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

(d) Analytics evaluation based on TBE internal QC limits: A= Acceptable. Reported result falls within ratio limits of 0.80-1.20. W-Acceptable with warning. Reported result falls within 0.70-0.80 or 1.20-1.30. N = Not Acceptable. Reported result falls outside the ratio limits of < 0.70 and > 1.30.

TABLE D-2 **ERA ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM**
TELEDYNE BROWN ENGINEERING, 2010
(PAGE 1 OF 1)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Control Limits	Evaluation (c)
May 2010	RAD-81	Water	Sr-89	pCi/L	64.4	60.4	48.6 - 68.2	A
			Sr-90	pCi/L	37.8	41.3	30.4 - 47.4	A
			Ba-133	pCi/L	66.4	65.9	54.9 - 72.5	A
			Cs-134	pCi/L	66.43	71.6	58.4 - 78.8	A
			Cs-137	pCi/L	137.33	146	131 - 163	A
			Co-60	pCi/L	83.33	84.5	76.0 - 95.3	A
			Zn-65	pCi/L	177	186	167 - 219	A
			Gr-A	pCi/L	26.37	32.9	16.9 - 42.6	A
			Gr-B	pCi/L	28.77	37.5	24.7 - 45.0	A
			I-131	pCi/L	26.27	26.4	21.9 - 31.1	A
			H-3	pCi/L	12967	12400	10800 - 13600	A
November 2010	RAD-83	Water	Sr-89	pCi/L	77.8	68.5	55.8 - 76.7	N (1)
			Sr-90	pCi/L	39.3	43.0	31.7 - 49.3	A
			Ba-133	pCi/L	70.3	68.9	57.5 - 75.8	A
			Cs-134	pCi/L	39.9	43.2	34.5 - 47.5	A
			Cs-137	pCi/L	117	123	111 - 138	A
			Co-60	pCi/L	53.5	53.4	48.1 - 61.3	A
			Zn-65	pCi/L	11.0	102	91.8 - 122	N (2)
			Gr-A	pCi/L	35.1	42.3	21.9 - 53.7	A
			Gr-B	pCi/L	35.5	36.6	24.0 - 44.2	A
			I-131	pCi/L	27.9	27.5	22.9 - 32.3	A
			H-3	pCi/L	13233	12900	11200 - 14200	A

(1) Sr-89 TBE to known ratio of 1.14 fell within acceptable range of ± 20%. No action required. NCR 10-09

(2) Zn-65 result of 111 was incorrectly reported as 11.0. No action required. NCR 10-09

(a) Teledyne Brown Engineering reported result.

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

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

TABLE D-3 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
TELEDYNE BROWN ENGINEERING, 2010
(PAGE 1 OF 2)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
March 2010	10-MaW22	Water	Cs-134	Bq/L	-0.0942		(1)	A
			Cs-137	Bq/L	58.5	60.6	42.4 - 78.8	A
			Co-57	Bq/L	27.2	28.3	19.8 - 36.8	A
			Co-60	Bq/L	0.0226		(1)	A
			H-3	Bq/L	104	90.8	63.6 - 118.0	A
			Mn-54	Bq/L	26.6	26.9	18.8 - 35.0	A
			Sr-90	Bq/L	0.1029		(1)	A
			Zn-65	Bq/L	42.0	40.7	28.5 - 52.9	A
	10-GrW22	Water	Gr-A	Bq/L	0.5173	0.676	0.00 - 1.352	A
			Gr-B	Bq/L	3.98	3.09	1.55 - 4.64	A
	10-MaS22	Soil	Cs-134	Bq/kg	665	733	513 - 953	A
			Cs-137	Bq/kg	800	779	545 - 1013	A
			Co-57	Bq/kg	508	522	365 - 679	A
			Co-60	Bq/kg	648	622	435 - 809	A
			Mn-54	Bq/kg	893	849	594 - 1104	A
			K-40	Bq/kg	597	559	391 - 727	A
			Sr-90	Bq/kg	221	288	202 - 374	W
			Zn-65	Bq/kg	-4.97		(1)	A
	10-RdF22	AP	Cs-134	Bq/sample	1.81	2.13	1.49 - 2.77	A
			Cs-137	Bq/sample	1.70	1.53	1.07 - 1.99	A
			Co-57	Bq/sample	0.0056		(1)	A
			Co-60	Bq/sample	2.65	2.473	1.731 - 3.215	A
			Mn-54	Bq/sample	3.70	3.02	2.11 - 3.93	W
			Sr-90	Bq/sample	0.0523		(1)	A
			Zn-65	Bq/sample	-0.0627		(1)	A
	10-GrF22	AP	Gr-A	Bq/sample	0.1533	0.0427	0.00 - 0.854	A
			Gr-B	Bq/sample	1.240	1.29	0.65 - 1.94	A
	10-RdV22	Vegetation	Cs-134	Bq/sample	4.48	4.39	3.07 - 5.71	A
			Cs-137	Bq/sample	3.43	3.06	2.14 - 3.98	A
			Co-57	Bq/sample	-0.0117		(1)	A
			Co-60	Bq/sample	3.55	3.27	2.29 - 4.25	A
			Mn-54	Bq/sample	0.007		(1)	A
			Sr-90	Bq/sample	-0.0002		(1)	A
			Zn-65	Bq/sample	8.12	7.10	4.97 - 9.23	A
September 2010	10-MaW23	Water	Cs-134	Bq/L	27.1	31.4	22.0 - 40.8	A
			Cs-137	Bq/L	41.8	44.2	30.9 - 57.5	A
			Co-57	Bq/L	33.2	36.0	25.2 - 46.8	A
			Co-60	Bq/L	26.5	28.3	19.8 - 36.8	A
			H-3	Bq/L	500	453.4	317.4 - 589.4	A
			Mn-54	Bq/L	0.024		(1)	A
			Sr-90	Bq/L	8.10	8.3	5.8 - 10.8	A
			Zn-65	Bq/L	30.8	31.0	21.7 - 40.3	A
	10-GrW23	Water	Gr-A	Bq/L	2.36	1.92	0.58 - 3.26	A
			Gr-B	Bq/L	6.37	4.39	2.20 - 6.59	A

TABLE D-3 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
TELEDYNE BROWN ENGINEERING, 2010
(PAGE 2 OF 2)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
September 2010	10-MaS23	Soil	Cs-134	Bq/kg	837	940	658 - 1222	A
			Cs-137	Bq/kg	680	670	469 - 871	A
			Co-57	Bq/kg	2.78		(1)	A
			Co-60	Bq/kg	350	343	240 - 446	A
			Mn-54	Bq/kg	853	820	574 - 1066	A
			K-40	Bq/kg	721	699	489 - 909	A
			Sr-90	Bq/kg	2.24		(1)	A
			Zn-65	Bq/kg	287	265	186 - 345	A
	10-RdF23	AP	Cs-134	Bq/sample	2.31	2.98	2.09 - 3.87	W
			Cs-137	Bq/sample	-0.025		(1)	A
			Co-57	Bq/sample	3.64	4.08	2.86 - 5.380	A
			Co-60	Bq/sample	2.81	2.92	2.04 - 3.80	A
			Mn-54	Bq/sample	3.19	3.18	2.23- 4.13	A
			Sr-90	Bq/sample	1.01	1.01	0.71 - 1.31	A
			Zn-65	Bq/sample	0.0310		(1)	A
	10-GrF23	AP	Gr-A	Bq/sample	0.004		(1)	A
			Gr-B	Bq/sample	0.473	0.50	0.25 - 0.75	A
	10-RdV23	Vegetation	Cs-134	Bq/sample	4.90	4.79	3.35 - 6.23	A
			Cs-137	Bq/sample	6.78	5.88	4.12 - 7.64	A
			Co-57	Bq/sample	10.2	8.27	5.79 - 10.75	W
			Co-60	Bq/sample	0.00		(1)	A
			Mn-54	Bq/sample	7.36	6.287	4.401 - 8.173	A
			Sr-90	Bq/sample	2.53	2.63	1.84 - 3.42	A
			Zn-65	Bq/sample	6.40	5.3900	3.77 - 7.01	A

(1) False positive test.

(a) Teledyne Brown Engineering reported result.

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

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

TABLE D-4 **ERA (a) STATISTICAL SUMMARY PROFICIENCY TESTING PROGRAM[a]**
ENVIRONMENTAL, INC., 2010
(Page 1 of 1)

Lab Code	Date	Analysis	Concentration (pCi/L) Laboratory Result[b]	ERA Result[c]	Control Limits	Acceptance
STW-1205	04/05/10	Sr-89	63.0 ± 5.7	60.4	48.6 - 68.2	Pass
STW-1205	04/05/10	Sr-90	37.4 ± 2.4	41.3	30.4 - 47.4	Pass
STW-1206	04/05/10	Ba-133	63.6 ± 3.3	65.9	54.9 - 72.5	Pass
STW-1206	04/05/10	Co-60	83.3 ± 2.9	84.5	76.0 - 95.3	Pass
STW-1206	04/05/10	Cs-134	71.0 ± 3.4	71.6	58.4 - 78.8	Pass
STW-1206	04/05/10	Cs-137	145.5 ± 5.1	146.0	131.0 - 163.0	Pass
STW-1206	04/05/10	Zn-65	194.9 ± 7.8	186.0	167.0 - 219.0	Pass
STW-1207	04/05/10	Gr. Alpha	26.5 ± 1.7	32.9	16.9 - 42.6	Pass
STW-1207	04/05/10	Gr. Beta	34.5 ± 1.6	37.5	24.7 - 45.0	Pass
STW-1208	04/05/10	I-131	22.7 ± 0.8	26.4	21.9 - 31.1	Pass
STW-1210	04/05/10	H-3	12955 ± 332	12400.0	10800 - 13600	Pass
STW-1224	10/04/10	Sr-89	65.3 ± 5.7	68.5	55.8 - 76.7	Pass
STW-1224	10/04/10	Sr-90	39.9 ± 2.3	43.0	31.7 - 49.3	Pass
STW-1225	10/04/10	Ba-133	67.2 ± 4.3	68.9	57.5 - 75.8	Pass
STW-1225	10/04/10	Co-60	53.2 ± 3.3	53.4	48.1 - 61.3	Pass
STW-1225	10/04/10	Cs-134	47.3 ± 5.1	43.2	34.5 - 47.5	Pass
STW-1225	10/04/10	Cs-137	118.0 ± 5.9	123.0	111.0 - 138.0	Pass
STW-1225	10/04/10	Zn-65	107.0 ± 8.7	102.0	91.8 - 122.0	Pass
STW-1226	10/04/10	Gr. Alpha	30.7 ± 2.9	42.3	21.9 - 53.7	Pass
STW-1226	10/04/10	Gr. Beta	32.7 ± 0.8	36.6	24.0 - 44.2	Pass
STW-1227	10/04/10	I-131	28.6 ± 1.1	27.5	22.9 - 32.3	Pass
STW-1229	10/04/10	H-3	13682 ± 352	12900.0	11200 - 14200	Pass

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

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

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

TABLE D-5 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)[a] ENVIRONMENTAL, INC., 2010

			Concentration [b]			
Lab Code [c]	Date	Analysis	Laboratory result	Known Activity	Control Limits [d]	Acceptance
STVE-1199	03/01/10	Co-57	0.01 ± 0.03	0.00	-	Pass
STVE-1199	03/01/10	Co-60	3.39 ± 0.12	3.27	2.29 - 4.25	Pass
STVE-1199	03/01/10	Cs-134	4.74 ± 0.15	4.39	3.07 - 5.71	Pass
STVE-1199	03/01/10	Cs-137	3.32 ± 0.17	3.06	2.14 - 3.98	Pass
STVE-1199	03/01/10	Mn-54	0.01 ± 0.05	0.00	-	Pass
STVE-1199	03/01/10	Zn-65	8.03 ± 0.33	7.10	4.97 - 9.23	Pass
STW-1200	03/01/10	Gr. Alpha	0.40 ± 0.05	0.68	0.00 - 1.35	Pass
STW-1200	03/01/10	Gr. Beta	3.03 ± 0.07	3.09	1.55 - 4.64	Pass
STW-1201	03/01/10	Co-57	28.90 ± 0.40	28.30	19.80 - 36.80	Pass
STW-1201	03/01/10	Co-60	0.06 ± 0.05	0.00	-	Pass
STW-1201	03/01/10	Cs-134	-0.03 ± 0.09	0.00	-	Pass
STW-1201	03/01/10	Cs-137	60.60 ± 0.60	60.60	42.40 - 78.80	Pass
STW-1201	03/01/10	H-3	93.20 ± 18.30	90.80	63.60 - 118.00	Pass
STW-1201	03/01/10	Mn-54	27.80 ± 0.40	26.90	18.80 - 35.00	Pass
STW-1201	03/01/10	Sr-90	-0.10 ± 0.60	0.00	-	Pass
STW-1201	03/01/10	Zn-65	42.70 ± 0.80	40.70	28.50 - 52.90	Pass
STSO-1202	03/01/10	Co-57	520.00 ± 10.80	522.00	365.00 - 679.00	Pass
STSO-1202	03/01/10	Co-60	599.10 ± 2.80	622.00	435.00 - 809.00	Pass
STSO-1202	03/01/10	Cs-134	666.10 ± 4.70	733.00	513.00 - 953.00	Pass
STSO-1202	03/01/10	Cs-137	774.40 ± 4.50	779.00	545.00 - 1013.00	Pass
STSO-1202	03/01/10	K-40	562.00 ± 15.30	559.00	391.00 - 727.00	Pass
STSO-1202	03/01/10	Mn-54	866.20 ± 4.60	849.00	594.00 - 1104.00	Pass
STSO-1202	03/01/10	Sr-90	225.50 ± 11.80	288.00	202.00 - 374.00	Pass
STSO-1202	03/01/10	Zn-65	-1.23 ± 1.96	0.00	-	Pass
STAP-1203	03/01/10	Co-57	0.01 ± 0.02	0.00	-	Pass
STAP-1203	03/01/10	Co-60	2.63 ± 0.19	2.47	1.73 - 3.22	Pass
STAP-1203	03/01/10	Cs-134	2.21 ± 0.34	2.13	1.49 - 2.77	Pass
STAP-1203	03/01/10	Cs-137	1.66 ± 0.22	1.53	1.07 - 1.99	Pass
STAP-1203	03/01/10	Mn-54	3.42 ± 0.26	3.02	2.11 - 3.93	Pass
STAP-1203	03/01/10	Sr-90	0.02 ± 0.06	0.00	-	Pass
STAP-1203	03/01/10	Zn-65	-0.05 ± 0.11	0.00	-	Pass
STAP-1204	03/01/10	Gr. Alpha	0.13 ± 0.03	0.43	0.00 - 0.85	Pass
STAP-1204	03/01/10	Gr. Beta	1.46 ± 0.07	1.29	0.65 - 1.94	Pass

TABLE D-5 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)[a] ENVIRONMENTAL, INC., 2010

			Concentration [b]			
Lab Code [c]	Date	Analysis	Laboratory result	Known Activity	Control Limits [d]	Acceptance
STW-1211	08/01/10	Co-57	36.40 ± 4.80	36.00	25.20 - 46.80	Pass
STW-1211	08/01/10	Co-60	28.30 ± 1.00	28.30	19.80 - 36.80	Pass
STW-1211	08/01/10	Cs-134	29.30 ± 2.10	31.40	22.00 - 40.80	Pass
STW-1211	08/01/10	Cs-137	44.60 ± 1.80	44.20	30.90 - 57.50	Pass
STW-1211	08/01/10	H-3	503.60 ± 12.80	453.40	317.40 - 589.40	Pass
STW-1211	08/01/10	K-40	38.50 ± 2.50	38.90	27.20 - 50.60	Pass
STW-1211	08/01/10	Mn-54	0.10 ± 0.30	0.00	-	Pass
STW-1211	08/01/10	Sr-90	9.20 ± 1.30	8.30	5.80 - 10.80	Pass
STW-1211	08/01/10	Zn-65	32.80 ± 3.00	31.00	21.70 - 40.30	Pass
STW-1212	08/01/10	Gr. Alpha	1.54 ± 0.09	1.92	0.58 - 3.26	Pass
STW-1212	08/01/10	Gr. Beta	4.13 ± 0.15	4.39	2.20 - 6.59	Pass
STVE-1213	08/01/10	Co-57	9.60 ± 0.54	8.27	5.79 - 10.75	Pass
STVE-1213	08/01/10	Co-60	0.05 ± 0.08	0.00	-	Pass
STVE-1213	08/01/10	Cs-134	4.83 ± 0.26	4.79	3.35 - 6.23	Pass
STVE-1213	08/01/10	Cs-137	6.45 ± 0.66	5.88	4.12 - 7.64	Pass
STVE-1213	08/01/10	Mn-54	7.12 ± 0.66	6.29	4.40 - 8.17	Pass
STVE-1213	08/01/10	Zn-65	6.05 ± 0.74	5.39	3.77 - 7.01	Pass
STSO-1214	08/01/10	Co-57	0.10 ± 1.60	0.00	-	Pass
STSO-1214	08/01/10	Co-60	370.00 ± 6.00	343.00	240.00 - 446.00	Pass
STSO-1214	08/01/10	Cs-134	1005.00 ± 21.00	940.00	658.00 - 1222.00	Pass
STSO-1214	08/01/10	Cs-137	755.00 ± 15.00	670.00	469.00 - 871.00	Pass
STSO-1214	08/01/10	K-40	783.00 ± 54.00	699.00	489.00 - 909.00	Pass
STSO-1214	08/01/10	Mn-54	942.00 ± 15.00	820.00	574.00 - 1066.00	Pass
STSO-1214	08/01/10	Sr-90	3.50 ± 8.00	0.00	-	Pass
STSO-1214	08/01/10	Zn-65	310.00 ± 18.00	265.00	186.00 - 345.00	Pass
STAP-1215	08/01/10	Co-57	4.47 ± 0.21	4.08	2.86 - 5.30	Pass
STAP-1215	08/01/10	Co-60	3.15 ± 0.30	2.92	2.04 - 3.80	Pass
STAP-1215	08/01/10	Cs-134	3.03 ± 0.17	2.98	2.09 - 3.87	Pass
STAP-1215	08/01/10	Cs-137	0.01 ± 0.05	0.00	-	Pass
STAP-1215	08/01/10	Mn-54	3.69 ± 0.39	3.18	2.23 - 4.13	Pass
STAP-1215	08/01/10	Sr-90	1.00 ± 0.12	1.01	0.71 - 1.31	Pass
STAP-1215	08/01/10	Zn-65	0.03 ± 0.15	0.00	-	Pass

TABLE D-5 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)[a] ENVIRONMENTAL, INC., 2010

			Concentration [b]			
Lab Code [c]	Date	Analysis	Laboratory result	Known Activity	Control Limits [d]	Acceptance
STAP-1216	08/01/10	Gr. Alpha	0.01 ± 0.01	0.00	-	Pass
STAP-1216	08/01/10	Gr. Beta	0.54 ± 0.05	0.50	0.25 - 0.75	Pass

[a] *Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the Department of Energy's Mixed Analyte Performance Evaluation Program, Idaho Operations office, Idaho Falls, Idaho*

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

[c] *Laboratory codes as follows: STW (water), STAP (air filter), STSO (soil), STVE (vegetation).*

[d] *MAPEP results are presented as the known values and expected laboratory precision (1 sigma, 1 determination) and control limits as defined by the MAPEP.*

[e] *Included in the testing series as a "false positive".*

APPENDIX E

ANNUAL RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM REPORT (ARGPPR)

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Docket No: 50-254
50-265

QUAD CITIES NUCLEAR POWER STATION
UNITS 1 and 2

Annual Radiological
Groundwater Protection Program Report

1 January Through 31 December 2010

Prepared By

Teledyne Brown Engineering
Environmental Services

Exelon SM
Nuclear

Quad Cities Nuclear Power Station
Cordova, IL 61242

May 2011

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Appendices

I. Summary and Conclusions

This report on the Radiological Groundwater Protection Program (RGPP) conducted for the Quad Cities Nuclear Power Station (QCNPS) by Exelon Nuclear covers the period 01 January 2010 through 31 December 2010.

In 2006, Exelon undertook a Fleetwide Assessment of groundwater at and in the vicinity of its nuclear power generating facilities for the presence of radionuclides. The data collected from the Quad Cities Station as part of the Fleetwide Assessment was summarized in a report entitled "Hydrogeologic Investigation Report, Fleetwide Assessment, Quad Cities Generation Station, Cordova, Illinois", dated September 2006. This report was submitted to the Illinois Environmental Protection Agency (IEPA) in September 2006. The Quad Cities Hydrogeologic Investigation Report concluded that tritium had not migrated off Site at detectable concentrations.

Following the Fleetwide Assessment, Exelon continued groundwater monitoring for radionuclides at the Site. As a result of this monitoring, Exelon detected higher than expected tritium levels in the vicinity of the station's Service Building and Turbine Building. Quad Cities undertook supplemental investigative activities to determine and characterize the source of the tritium. These investigative activities included completion of an aquifer pumping test, installation of sentinel monitoring wells in the vicinity of the Service Building and Turbine Building, and several additional rounds of hydraulic monitoring and groundwater sampling. The collected groundwater data was utilized to assist with an extensive underground piping inspection program to locate the source of the tritium.

In May 2008, during the underground piping inspection program, Exelon located a small leak in the Unit 1 Residual Heat Removal (RHR) suction line located near the Service Building/ Turbine Building area. The line was isolated and through further testing, Exelon determined it to be a source of the monitored tritium levels. In June 2008, the line was repaired, thereby eliminating this source of tritiated water.

In a letter dated June 5, 2008, Exelon informed the Illinois Environmental Protection Agency (IEPA) of its plan to prepare a Migration Control Plan (MCP) to minimize migration of the tritium plume offsite. The MCP was submitted to the IEPA July 17, 2008. The MCP listed Monitored Natural Attenuation as the preferred remediation option.

This report covers groundwater samples, collected from the environment on station property in 2010. During that time period, RGPP samples were collected from 54 locations.

2010 sample locations included twenty-seven designated monitoring wells, two surface water monitoring points, eight production wells (three of which are used for site drinking water) and 17 sentinel wells. Two additional sentinel wells (QC-GP-16 & QC-GP-17) were installed May 2010 along the west wall of the service bldg. in the vicinity of the contaminated condensate storage tanks. Sample frequency and analysis varies with well designation. Typical frequency / analysis include quarterly for tritium, annually for gamma, and biannual for Sr-90. Samples from the twenty-seven designated monitoring wells were collected by a contractor (Environmental Inc.) and analyzed by a contract lab (Teledyne Brown). The remaining sample locations are collected quarterly (at a minimum) by site personnel and analyzed for tritium by Teledyne Brown or onsite by station personnel.

Tritium concentrations ranged from less than the LLD of 200 pCi/L at the site boundaries up to 534,000 pCi/L in a sentinel well. Tritium concentrations ranged from less than the LLD of 200 pCi/L to 431 pCi/L in surface water monitoring locations.

Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective Lower Limits of Detection (LLDs) as specified in the Offsite Dose Calculation Manual (ODCM) in any of the groundwater samples. In the case of tritium, Exelon specified that it's laboratories achieve a lower limit of detection 10 times lower than that required by federal regulation. Most of the tritium that was detected in groundwater at the Station is on the south and west side of the Reactor / Turbine buildings.

Strontium-90 was not detected at concentrations greater than the Lower Limit of Detection (LLD) of 1.0 pCi/L.

In assessing all the data gathered for this report, it was concluded that the operation of QCNPS had no adverse radiological impact on the environment offsite of QCNPS.

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II. Introduction

The Quad Cities Nuclear Power Station (QCNPS), consisting of two 2957 MWth boiling water reactor owned and operated by Exelon Corporation, is located in Cordova, Illinois along the Mississippi River. Unit No. 1 went critical on 16 March 1972. Unit No. 2 went critical on 02 December 1973. The site is located in northern Illinois, approximately 182 miles west of Chicago, Illinois.

A. Objective of the RGPP

The long-term objectives of the RGPP are as follows:

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

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

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

4. Report new leaks, spills, or other detections with potential radiological significance to stakeholders in a timely manner.

5. Regularly assess analytical results to identify adverse trends.

6. Take necessary corrective actions to protect groundwater resources.

B. Implementation of the Objectives

The objectives identified have been implemented at Quad Cities Nuclear Power Station as discussed below:

1. Exelon and its consultant identified locations as described in the Phase 1 study. Phase 1 studies were conducted by Conestoga Rovers and Associates (CRA) and the results and conclusions were made available to state and federal regulators in station specific reports.

2. The Quad Cities Nuclear Power Station reports describe the local hydrogeologic regime. Periodically, the flow patterns on the

surface and shallow subsurface are updated based on ongoing measurements.

3. Quad Cities Nuclear Power Station will continue to perform routine sampling and radiological analysis of water from selected locations.

4. Quad Cities Nuclear Power Station has implemented procedures to identify and report leaks, spills, or other detections with potential radiological significance in a timely manner.

5. Quad Cities Nuclear Power Station staff and consulting hydrogeologist assess analytical results on an ongoing basis to identify adverse trends.

C. Program Description

1. Sample Collection

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

Groundwater and Surface Water

Samples of water are collected, managed, transported and analyzed in accordance with approved procedures following regulatory methods. Both groundwater and surface 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, analysis, and shipment of samples, as well as in documentation of sampling events. Analytical laboratories are subject to internal quality assurance programs, inter-laboratory cross-check programs, as well as nuclear industry audits. Station personnel review and evaluate all analytical data deliverables after initial review by the contractor.

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

III. Program Description

This section covers those analyses performed by Teledyne Brown Engineering (TBE) on samples collected in 2010.

A. Sample Analysis

This section describes the general analytical methodologies used by TBE and station personnel to analyze the environmental samples for radioactivity for the Quad Cities Nuclear Power Station RGPP in 2010.

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 and surface water.

3. Concentrations of tritium in groundwater and surface water.

B. Data Interpretation

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

1. Lower Limit of Detection and Minimum Detectable Concentration

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

2. Laboratory Measurements Uncertainty

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

Statistically, the exact value of a measurement is expressed as a range with a stated level of confidence. The convention is to report results with a 95% level of confidence. The uncertainty comes from calibration standards, sample volume or weight measurements, sampling uncertainty and other factors. Exelon reports the uncertainty of a measurement created by statistical process (counting error) 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 Annual Radiological Environmental Operating Report (AREOR).

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

For groundwater and surface water 14 nuclides, Be-7, K-40, 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 were reported.

IV. Results and Discussion

A. Groundwater Results

Groundwater

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

Tritium

Samples from all locations were analyzed for tritium activity (Table B–I.1 & B-III.1 Appendix B). Tritium values ranged from the detection limit to 534,000 pCi/l. All samples obtained at the site boundaries were less then the detection limit of 200 pCi/L. The location most representative of potential offsite user of drinking water was <200 pCi/L.

Strontium

Strontium-90 was not detected above the Lower Limit of Detection (LLD) of 1.0 pCi/L (Table B–I.1 Appendix B)

Gamma Emitters

Naturally occurring Potassium-40 was detected in five of 17 samples. The concentrations ranged from 34 pCi/liter to 126 pCi/liter. No other gamma emitting nuclides were detected (Table

B–I.2, Appendix B)

B. Surface Water Results

Surface Water

Tritium

Samples from two locations were analyzed for tritium activity (Table B–II.1 Appendix B). Tritium was detected above the detection limit of 200 pCi/l in three of 4 samples. The concentrations ranged from 227 to 431 pCi/L.

Strontium

Strontium-90 was not detected above the Lower Limit of Detection (LLD) of 1.0 pCi/L (Table B–II.1 Appendix B)

Gamma Emitters

No gamma emitting nuclides were detected. (Table B–II.2, Appendix B)

C. Summary of Results – Inter-Laboratory Comparison Program

Inter-Laboratory Comparison Program results for TBE are presented in the Annual Radiological Environmental Operating Report.

D. Leaks, Spills, and Releases

No leaks, spills or releases were identified during the year.

E. Trends

Total plume activity decreased during 2010 from 630,000 pCi/L January 2010 to 375,000 pCi/L January 2011.

F. Investigations

Currently no investigations are on-going.

G. Actions Taken

1. Compensatory Actions

   There have been no station events requiring compensatory actions at the Quad Cities Nuclear Power Station in 2010.

2. Installation of Monitoring Wells

   Two new wells were installed during the year to provide additional monitoring in a susceptible area.

3. Actions to Recover/Reverse Plumes

   No actions were required to recover or reverse groundwater plumes. Quad Cities Station Migration Control Plan (MCP) continues to employ Monitored Natural Attenuation for remediation of H-3 plume.

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APPENDIX A

LOCATION DESIGNATION

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TABLE A-1: Radiological Groundwater Protection Program - Sampling Locations, Quad Cities Nuclear Power Station, 2010

Site	Site Type
MW-QC-1	Monitoring Well
MW-QC-2	Monitoring Well
MW-QC-101I	Monitoring Well
MW-QC-101S	Monitoring Well
MW-QC-102D	Monitoring Well
MW-QC-102I	Monitoring Well
MW-QC-102S	Monitoring Well
MW-QC-103I	Monitoring Well
MW-QC-104S	Monitoring Well
MW-QC-105I	Monitoring Well
MW-QC-106I	Monitoring Well
MW-QC-106S	Monitoring Well
MW-QC-107I	Monitoring Well
MW-QC-108D	Monitoring Well
MW-QC-108I	Monitoring Well
MW-QC-108S	Monitoring Well
MW-QC-109I	Monitoring Well
MW-QC-109S	Monitoring Well
MW-QC-110I	Monitoring Well
MW-QC-111D1	Monitoring Well
MW-QC-111D2	Monitoring Well
MW-QC-111I	Monitoring Well
MW-QC-112I	Monitoring Well
MW-QC-113I	Monitoring Well
MW-QC-114I	Monitoring Well
MW-QC-115S	Monitoring Well
MW-QC-116S	Monitoring Well
SURFACE WATER #1	Surface Water
SURFACE WATER #2	Surface Water
WELL #1	Production Well
WELL #5	Production Well
WELL #6 LITTLE FISH	Production Well
WELL #7 BIG FISH WELL	Production Well
WELL #8 FIRE TRAINING WELL	Production Well
WELL #10 FISH HOUSE WELL	Production Well
WELL #11 SPRAY CANAL WELL	Production Well
STP SAND POINT WELL	Production Well
QC-GP-1	Sentinel Well
QC-GP-2	Sentinel Well
QC-GP-3	Sentinel Well
QC-GP-4	Sentinel Well
QC-GP-5	Sentinel Well
QC-GP-6	Sentinel Well
QC-GP-7	Sentinel Well
QC-GP-8	Sentinel Well
QC-GP-9	Sentinel Well
QC-GP-10	Sentinel Well
QC-GP-11	Sentinel Well
QC-GP-12	Sentinel Well
QC-GP-13	Sentinel Well
QC-GP-14	Sentinel Well
QC-GP-15	Sentinel Well
QC-GP-16	Sentinel Well
QC-GP-17	Sentinel Well

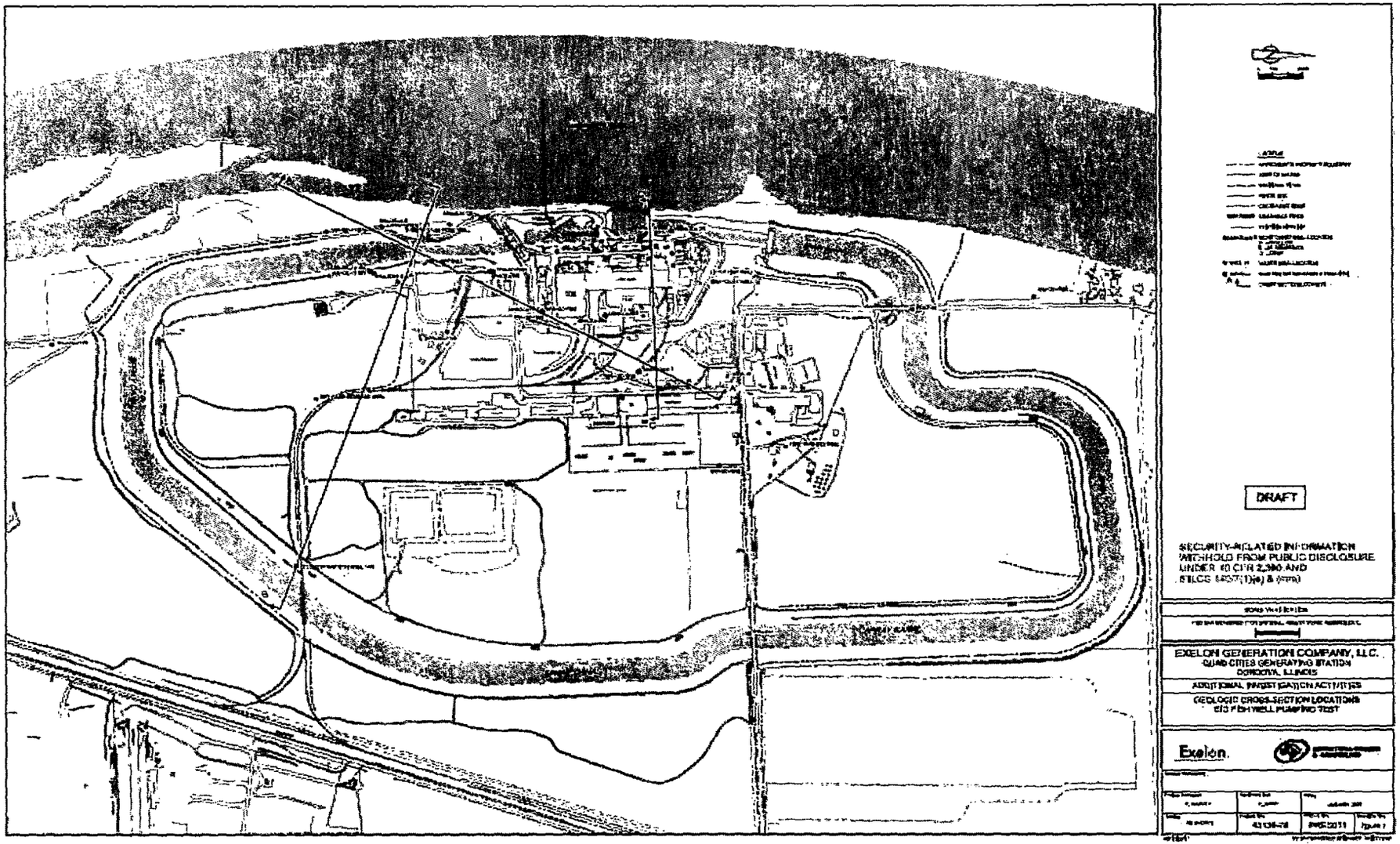

FIGURE A-1
Sampling Locations Near the Site Boundary of the Quad Cities Nuclear Power Station, 2010

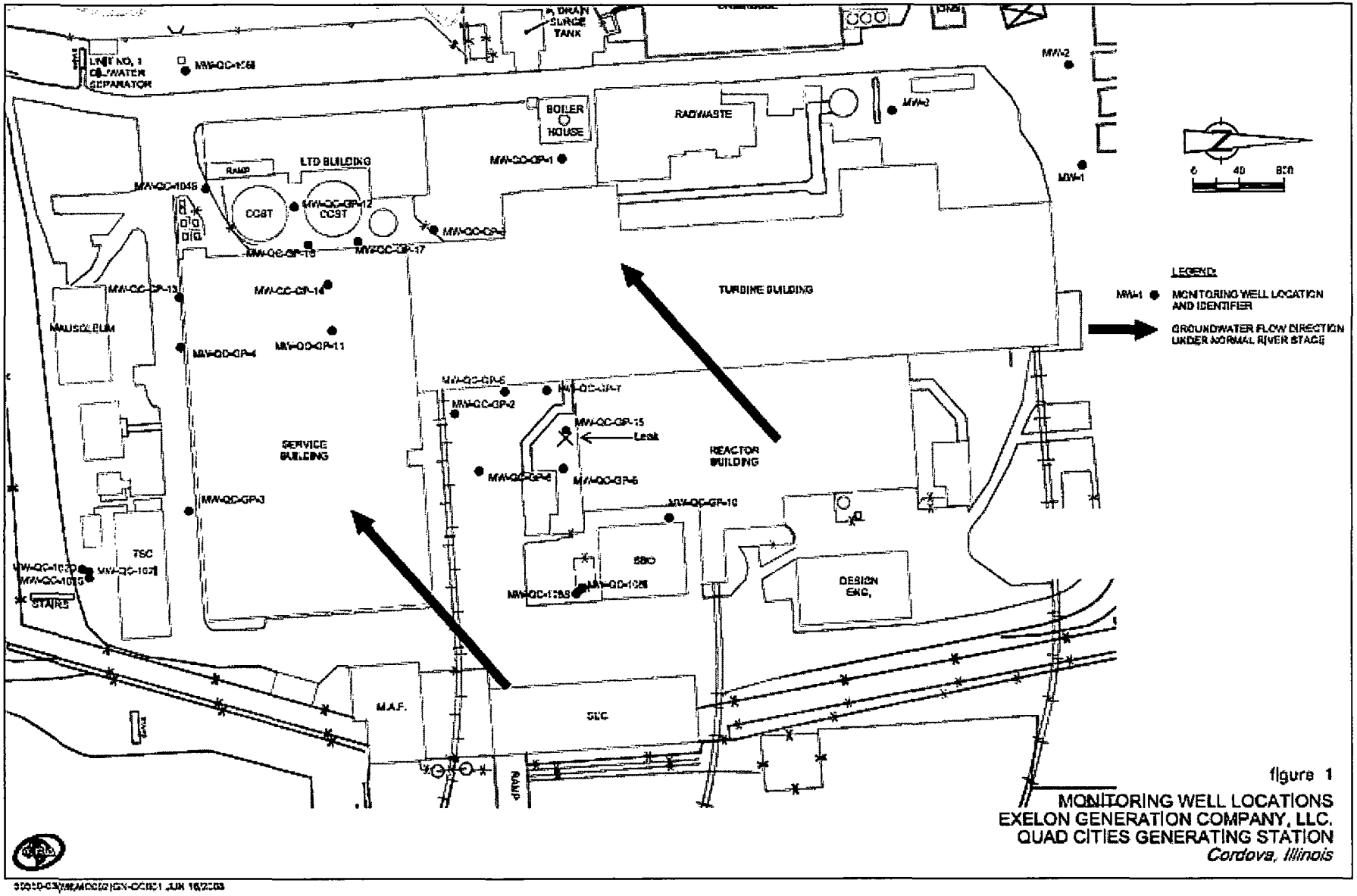

FIGURE A-2
Sentinel Monitoring Point Locations, Quad Cities Nuclear Power Station, 2010

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APPENDIX B

DATA TABLES

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TABLE B-I.1 CONCENTRATIONS OF TRITIUM AND STRONTIUM IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	SR-90
MW-QC-1	03/09/10	< 165	
MW-QC-1	06/02/10	< 170	
MW-QC-1	08/31/10	< 183	< 0.3
MW-QC-1	12/07/10	< 168	
MW-QC-101I	03/09/10	< 166	
MW-QC-101I	06/02/10	< 171	
MW-QC-101I	08/31/10	< 173	< 0.4
MW-QC-101S	03/09/10	< 166	
MW-QC-101S	06/02/10	< 152	
MW-QC-101S	08/31/10	< 175	< 0.5
MW-QC-102D	03/09/10	5770 ± 624	
MW-QC-102D	06/02/10	5510 ± 596	
MW-QC-102D	08/31/10	5240 ± 581	< 0.5
MW-QC-102D	12/07/10	3380 ± 387	
MW-QC-102I	03/09/10	399 ± 120	
MW-QC-102I	06/02/10	1160 ± 172	
MW-QC-102I	08/31/10	643 ± 149	< 0.4
MW-QC-102I	12/07/10	448 ± 118	
MW-QC-102S	03/09/10	< 166	
MW-QC-102S	06/02/10	< 174	
MW-QC-102S	08/31/10	< 196	< 0.6
MW-QC-102S	12/07/10	< 155	
MW-QC-103I	03/09/10	< 167	
MW-QC-103I	06/02/10	< 169	
MW-QC-103I	08/31/10	< 183	< 0.6
MW-QC-103I	12/07/10	< 157	
MW-QC-104S	03/09/10	306 ± 117	
MW-QC-104S	06/02/10	< 170	
MW-QC-104S	08/31/10	< 166	< 0.6
MW-QC-104S	12/07/10	2220 ± 272	
MW-QC-105I	03/09/10	3400 ± 388	
MW-QC-105I	06/02/10	1250 ± 183	
MW-QC-105I	08/31/10	257 ± 138	< 0.6
MW-QC-105I	12/07/10	49900 ± 5030	
MW-QC-105I	12/07/10	50600 ± 5100	
MW-QC-106I	03/09/10	< 167	
MW-QC-106I	06/02/10	< 168	
MW-QC-106I	08/31/10	< 179	< 0.4
MW-QC-106I	12/07/10	< 158	
MW-QC-106S	03/09/10	< 163	
MW-QC-106S	06/02/10	< 164	
MW-QC-106S	08/31/10	< 191	< 0.7
MW-QC-106S	12/07/10	< 174	
MW-QC-107I	03/09/10	< 167	
MW-QC-107I	06/01/10	< 166	

TABLE B-I.1 CONCENTRATIONS OF TRITIUM AND STRONTIUM IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	SR-90
MW-QC-107I	08/31/10	< 189	< 0.3
MW-QC-108D	03/10/10	6080 ± 656	
MW-QC-108D	06/03/10	5220 ± 566	
MW-QC-108D	09/01/10	4490 ± 504	< 0.8
MW-QC-108D	12/08/10	1860 ± 243	
MW-QC-108I	03/10/10	1420 ± 198	
MW-QC-108I	06/03/10	1870 ± 239	
MW-QC-108I	09/01/10	1640 ± 229	< 0.5
MW-QC-108I	12/08/10	178 ± 111	
MW-QC-108I	12/08/10	242 ± 108	
MW-QC-108S	03/10/10	< 165	
MW-QC-108S	06/03/10	< 167	
MW-QC-108S	09/01/10	< 188	< 0.4
MW-QC-108S	12/08/10	< 158	
MW-QC-109I	03/09/10	< 167	
MW-QC-109I	06/02/10	< 170	
MW-QC-109I	08/31/10	< 192	< 0.5
MW-QC-109I	12/07/10	< 169	
MW-QC-109S	03/09/10	< 167	
MW-QC-109S	06/02/10	< 170	
MW-QC-109S	08/31/10	< 190	< 0.4
MW-QC-109S	12/07/10	< 167	
MW-QC-110I	03/10/10	< 165	
MW-QC-110I	06/03/10	< 168	
MW-QC-110I	09/01/10	< 168	< 0.7
MW-QC-111D1	03/10/10	< 166	
MW-QC-111D1	06/03/10	< 168	
MW-QC-111D1	09/01/10	< 197	< 0.5
MW-QC-111D2	03/10/10	< 169	
MW-QC-111D2	06/03/10	< 170	
MW-QC-111D2	09/01/10	< 188	< 0.9
MW-QC-111I	03/10/10	< 164	
MW-QC-111I	06/03/10	< 164	
MW-QC-111I	09/01/10	< 190	< 0.7
MW-QC-112I	03/09/10	< 163	
MW-QC-112I	06/01/10	< 169	
MW-QC-112I	08/30/10	< 191	< 0.4
MW-QC-112I	12/06/10	< 168	
MW-QC-113I	03/10/10	< 160	
MW-QC-113I	06/03/10	< 173	
MW-QC-113I	09/01/10	< 192	< 0.65
MW-QC-114I	03/10/10	< 168	
MW-QC-114I	06/03/10	< 172	
MW-QC-114I	09/01/10	< 174	< 0.5
MW-QC-115S	03/09/10	< 166	

TABLE B-I.1 CONCENTRATIONS OF TRITIUM AND STRONTIUM IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	SR-90
MW-QC-115S	06/01/10	< 169	
MW-QC-115S	08/31/10	< 173	< 0.4
MW-QC-116S	03/09/10	< 161	
MW-QC-116S	06/01/10	< 169	
MW-QC-116S	08/31/10	< 167	< 0.4
MW-QC-2	03/09/10	< 169	
MW-QC-2	06/02/10	< 166	
MW-QC-2	08/31/10	< 173	< 0.72
MW-QC-2	12/07/10	< 167	

TABLE B-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Be-7	K-40	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-QC-1	08/31/10	< 16	59 ± 26	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< 14	< 1	< 1	< 20	< 7
MW-QC-101I	08/31/10	< 20	< 35	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 15	< 2	< 2	< 23	< 6
MW-QC-101S	08/31/10	< 13	< 18	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 9	< 1	< 1	< 15	< 4
MW-QC-102D	08/31/10	< 16	< 29	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 13	< 1	< 2	< 19	< 6
MW-QC-102I	08/31/10	< 16	< 15	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< 12	< 1	< 2	< 19	< 6
MW-QC-102S	08/31/10	< 19	< 15	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 13	< 2	< 2	< 22	< 7
MW-QC-103I	08/31/10	< 15	< 10	< 1	< 1	< 3	< 1	< 3	< 2	< 3	< 11	< 1	< 1	< 17	< 5
MW-QC-104S	08/31/10	< 19	< 15	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 14	< 2	< 2	< 21	< 7
MW-QC-105I	08/31/10	< 17	< 14	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 13	< 1	< 2	< 20	< 6
MW-QC-106I	08/31/10	< 11	< 16	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 9	< 1	< 1	< 13	< 4
MW-QC-106S	08/31/10	< 16	< 33	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 12	< 1	< 1	< 19	< 6
MW-QC-107I	08/31/10	< 16	< 29	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 12	< 1	< 2	< 18	< 6
MW-QC-108D	09/01/10	< 16	< 26	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 11	< 1	< 1	< 17	< 6
MW-QC-108I	09/01/10	< 16	< 14	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 11	< 1	< 1	< 17	< 5
MW-QC-108S	09/01/10	< 16	< 32	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 11	< 1	< 2	< 19	< 5
MW-QC-109I	08/31/10	< 17	34 ± 22	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 13	< 1	< 2	< 20	< 6
MW-QC-109S	08/31/10	< 13	104 ± 20	< 1	< 1	< 3	< 1	< 2	< 2	< 3	< 11	< 1	< 1	< 16	< 4
MW-QC-110I	09/01/10	< 16	< 14	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 12	< 1	< 1	< 19	< 6
MW-QC-111D1	09/01/10	< 12	< 17	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 9	< 1	< 1	< 14	< 4
MW-QC-111D2	09/01/10	< 18	< 32	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 14	< 1	< 2	< 21	< 7
MW-QC-111I	09/01/10	< 13	< 26	< 1	< 1	< 3	< 1	< 2	< 1	< 3	< 10	< 1	< 1	< 15	< 5
MW-QC-112I	08/30/10	< 16	37 ± 25	< 2	< 2	< 4	< 1	< 3	< 2	< 3	< 15	< 1	< 2	< 20	< 6
MW-QC-113I	09/01/10	< 16	< 30	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< 12	< 1	< 2	< 19	< 6
MW-QC-114I	09/01/10	< 16	< 14	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 13	< 1	< 1	< 19	< 6
MW-QC-115S	08/31/10	< 14	< 10	< 1	< 1	< 3	< 1	< 3	< 2	< 3	< 12	< 1	< 1	< 17	< 5
MW-QC-116S	08/31/10	< 18	< 15	< 2	< 2	< 4	< 1	< 3	< 2	< 3	< 15	< 1	< 2	< 22	< 7
MW-QC-2	08/31/10	< 15	126 ± 23	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 12	< 1	< 1	< 18	< 5

TABLE B-II.1 CONCENTRATIONS OF TRITIUM AND STRONTIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	SR-90
Surface Water #1	06/01/10	< 171	
Surface Water #1	08/31/10	431 ± 127	< 0.5
Surface Water #2	06/01/10	227 ± 117	
Surface Water #2	08/31/10	342 ± 122	< 0.3

TABLE B-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2010**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
Surface Water #1	08/31/10	< 16	< 13	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 14	< 1	< 1	< 20	< 7
Surface Water #2	08/31/10	< 15	< 33	< 1	< 2	< 3	< 1	< 3	< 2	< 3	< 13	< 1	< 1	< 18	< 6

TABLE B-III.1 **CONCENTRATIONS OF TRITIUM IN GROUNDWATER SAMPLES COLLECTED AND ANALYZED BY QUAD CITIES STATION PERSONNEL, 2010**

RESULTS IN UNITS OF PCI/LITER

SITE	COLLECTION DATE	ACTIVITY	AQUIFER
QC-GP-1	01/14/10	2,540	Shallow Aquifer
QC-GP-1	02/15/10	5,590	Shallow Aquifer
QC-GP-1	03/09/10	4,920	Shallow Aquifer
QC-GP-1	04/05/10	51,500	Shallow Aquifer
QC-GP-1	05/03/10	6,710	Shallow Aquifer
QC-GP-1	06/04/10	28,900	Shallow Aquifer
QC-GP-1	07/14/10	50,100	Shallow Aquifer
QC-GP-1	08/16/10	47,700	Shallow Aquifer
QC-GP-1	10/25/10	53,700	Shallow Aquifer
QC-GP-2	01/14/10	<2,000	Shallow Aquifer
QC-GP-2	02/15/10	<2,000	Shallow Aquifer
QC-GP-2	03/09/10	2,130	Shallow Aquifer
QC-GP-2	04/05/10	<2,000	Shallow Aquifer
QC-GP-2	05/03/10	<2,000	Shallow Aquifer
QC-GP-2	06/04/10	<2,000	Shallow Aquifer
QC-GP-2	07/14/10	<2,000	Shallow Aquifer
QC-GP-2	08/16/10	<2,000	Shallow Aquifer
QC-GP-2	10/25/10	<2,000	Shallow Aquifer
QC-GP-3	01/14/10	<2,000	Shallow Aquifer
QC-GP-3	02/15/10	<2,000	Shallow Aquifer
QC-GP-3	03/09/10	<2,000	Shallow Aquifer
QC-GP-3	04/05/10	<2,000	Shallow Aquifer
QC-GP-3	05/03/10	<2,000	Shallow Aquifer
QC-GP-3	06/04/10	<2,000	Shallow Aquifer
QC-GP-3	07/14/10	<2,000	Shallow Aquifer
QC-GP-3	08/16/10	<2,000	Shallow Aquifer
QC-GP-3	10/25/10	<2,000	Shallow Aquifer
QC-GP-4	01/04/10	71,700	Shallow Aquifer
QC-GP-4	01/14/10	77,700	Shallow Aquifer
QC-GP-4	02/15/10	111,000	Shallow Aquifer
QC-GP-4	03/09/10	130,000	Shallow Aquifer
QC-GP-4	04/05/10	112,000	Shallow Aquifer
QC-GP-4	05/03/10	77,600	Shallow Aquifer
QC-GP-4	06/04/10	63,600	Shallow Aquifer
QC-GP-4	07/14/10	78,600	Shallow Aquifer
QC-GP-4	08/16/10	55,700	Shallow Aquifer
QC-GP-4	10/25/10	40,100	Shallow Aquifer
QC-GP-5	01/14/10	2,510	Shallow Aquifer
QC-GP-5	02/15/10	3,210	Shallow Aquifer
QC-GP-5	03/09/10	3,090	Shallow Aquifer
QC-GP-5	04/05/10	3,140	Shallow Aquifer
QC-GP-5	05/03/10	2,510	Shallow Aquifer
QC-GP-5	06/04/10	2,490	Shallow Aquifer
QC-GP-5	07/14/10	2,040	Shallow Aquifer
QC-GP-5	08/16/10	2,180	Shallow Aquifer
QC-GP-5	10/25/10	2,610	Shallow Aquifer
QC-GP-6	01/14/10	<2,000	Shallow Aquifer
QC-GP-6	02/15/10	<2,000	Shallow Aquifer
QC-GP-6	03/09/10	<2,000	Shallow Aquifer
QC-GP-6	04/05/10	<2,000	Shallow Aquifer
QC-GP-6	05/03/10	<2,000	Shallow Aquifer
QC-GP-6	06/04/10	<2,000	Shallow Aquifer
QC-GP-6	07/14/10	<2,000	Shallow Aquifer
QC-GP-6	08/16/10	<2,000	Shallow Aquifer

TABLE B-III.1 **CONCENTRATIONS OF TRITIUM IN GROUNDWATER SAMPLES COLLECTED AND ANALYZED BY QUAD CITIES STATION PERSONNEL, 2010**

RESULTS IN UNITS OF PCI/LITER

SITE	COLLECTION DATE	ACTIVITY	AQUIFER
QC-GP-6	10/25/10	<2,000	Shallow Aquifer
QC-GP-7	01/14/10	4,410	Shallow Aquifer
QC-GP-7	02/15/10	5,910	Shallow Aquifer
QC-GP-7	03/09/10	5,050	Shallow Aquifer
QC-GP-7	04/05/10	7,260	Shallow Aquifer
QC-GP-7	05/03/10	9,140	Shallow Aquifer
QC-GP-7	06/04/10	10,200	Shallow Aquifer
QC-GP-7	07/14/10	6,820	Shallow Aquifer
QC-GP-7	08/16/10	4,020	Shallow Aquifer
QC-GP-7	10/25/10	<2,000	Shallow Aquifer
QC-GP-8	01/14/10	<2,000	Shallow Aquifer
QC-GP-8	02/15/10	<2,000	Shallow Aquifer
QC-GP-8	03/09/10	<2,000	Shallow Aquifer
QC-GP-8	04/05/10	<2,000	Shallow Aquifer
QC-GP-8	05/03/10	<2,000	Shallow Aquifer
QC-GP-8	06/04/10	<2,000	Shallow Aquifer
QC-GP-8	07/14/10	<2,000	Shallow Aquifer
QC-GP-8	08/16/10	<2,000	Shallow Aquifer
QC-GP-8	10/25/10	<2,000	Shallow Aquifer
QC-GP-9	01/14/10	15,600	Shallow Aquifer
QC-GP-9	02/15/10	14,700	Shallow Aquifer
QC-GP-9	03/09/10	72,800	Shallow Aquifer
QC-GP-9	04/05/10	36,000	Shallow Aquifer
QC-GP-9	05/03/10	27,500	Shallow Aquifer
QC-GP-9	06/04/10	35,600	Shallow Aquifer
QC-GP-9	07/14/10	15,900	Shallow Aquifer
QC-GP-9	08/16/10	9,760	Shallow Aquifer
QC-GP-9	10/25/10	<2,000	Shallow Aquifer
QC-GP-10	01/14/10	<2,000	Shallow Aquifer
QC-GP-10	02/15/10	<2,000	Shallow Aquifer
QC-GP-10	03/09/10	<2,000	Shallow Aquifer
QC-GP-10	04/05/10	<2,000	Shallow Aquifer
QC-GP-10	05/03/10	<2,000	Shallow Aquifer
QC-GP-10	06/04/10	<2,000	Shallow Aquifer
QC-GP-10	07/14/10	<2,000	Shallow Aquifer
QC-GP-10	08/16/10	<2,000	Shallow Aquifer
QC-GP-10	10/25/10	<2,000	Shallow Aquifer
QC-GP-11	01/04/10	<2,000	Shallow Aquifer
QC-GP-11	01/14/10	2,830	Shallow Aquifer
QC-GP-11	02/15/10	2,030	Shallow Aquifer
QC-GP-11	03/09/10	3,730	Shallow Aquifer
QC-GP-11	04/05/10	12,800	Shallow Aquifer
QC-GP-11	05/03/10	12,800	Shallow Aquifer
QC-GP-11	06/04/10	3,480	Shallow Aquifer
QC-GP-11	07/14/10	3,870	Shallow Aquifer
QC-GP-11	08/16/10	4,240	Shallow Aquifer
QC-GP-11	10/25/10	2,970	Shallow Aquifer
QC-GP-12	02/15/10	<2,000	Shallow Aquifer
QC-GP-12	03/09/10	<2,000	Shallow Aquifer
QC-GP-12	04/05/10	<2,000	Shallow Aquifer
QC-GP-12	05/03/10	<2,000	Shallow Aquifer
QC-GP-12	06/04/10	<2,000	Shallow Aquifer
QC-GP-12	07/14/10	<2,000	Shallow Aquifer
QC-GP-12	08/16/10	<2,000	Shallow Aquifer

TABLE B-III.1 **CONCENTRATIONS OF TRITIUM IN GROUNDWATER SAMPLES COLLECTED AND ANALYZED BY QUAD CITIES STATION PERSONNEL, 2010**

RESULTS IN UNITS OF PCI/LITER

SITE	COLLECTION DATE	ACTIVITY	AQUIFER
QC-GP-12	10/25/10	<2,000	Shallow Aquifer
QC-GP-13	01/04/10	205,000	Shallow Aquifer
QC-GP-13	01/14/10	259,000	Shallow Aquifer
QC-GP-13	02/15/10	534,000	Shallow Aquifer
QC-GP-13	03/09/10	308,000	Shallow Aquifer
QC-GP-13	04/05/10	442,000	Shallow Aquifer
QC-GP-13	05/03/10	236,000	Shallow Aquifer
QC-GP-13	06/04/10	232,000	Shallow Aquifer
QC-GP-13	07/14/10	198,000	Shallow Aquifer
QC-GP-13	08/16/10	181,000	Shallow Aquifer
QC-GP-13	10/25/10	115,000	Shallow Aquifer
QC-GP-14	01/04/10	348,000	Shallow Aquifer
QC-GP-14	01/14/10	346,000	Shallow Aquifer
QC-GP-14	02/15/10	382,000	Shallow Aquifer
QC-GP-14	03/09/10	285,000	Shallow Aquifer
QC-GP-14	04/05/10	68,100	Shallow Aquifer
QC-GP-14	05/03/10	57,600	Shallow Aquifer
QC-GP-14	06/04/10	227,000	Shallow Aquifer
QC-GP-14	07/14/10	236,000	Shallow Aquifer
QC-GP-14	08/16/10	193,000	Shallow Aquifer
QC-GP-14	10/25/10	128,000	Shallow Aquifer
QC-GP-15	01/14/10	3,070	Shallow Aquifer
QC-GP-15	02/15/10	<2,000	Shallow Aquifer
QC-GP-15	03/09/10	<2,000	Shallow Aquifer
QC-GP-15	04/05/10	<2,000	Shallow Aquifer
QC-GP-15	05/03/10	<2,000	Shallow Aquifer
QC-GP-15	06/04/10	<2,000	Shallow Aquifer
QC-GP-15	07/14/10	<2,000	Shallow Aquifer
QC-GP-15	08/16/10	<2,000	Shallow Aquifer
QC-GP-15	10/25/10	<2,000	Shallow Aquifer
QC-GP-16	05/25/10	47,100	Shallow Aquifer
QC-GP-16	06/04/10	101,000	Shallow Aquifer
QC-GP-16	07/14/10	10,800	Shallow Aquifer
QC-GP-16	08/16/10	38,700	Shallow Aquifer
QC-GP-16	10/25/10	88,900	Shallow Aquifer
QC-GP-17	05/25/10	8,340	Shallow Aquifer
QC-GP-17	06/04/10	19,400	Shallow Aquifer
QC-GP-17	07/14/10	4,550	Shallow Aquifer
QC-GP-17	08/16/10	4,340	Shallow Aquifer
QC-GP-17	10/25/10	14,500	Shallow Aquifer
Well #1	03/08/10	<200	
Well #1	06/28/10	<200	
Well #1	09/15/10	<200	
Well #5	03/08/10	<200	
Well #5	06/28/10	<200	
Well #5	09/15/10	<200	
Well #6	03/08/10	<200	
Well #7	01/14/10	<200	
Well #7	03/08/10	<200	
Well #7	06/28/10	<200	
Well #7	09/15/10	<200	
Well #7	12/07/10	<200	
Well #8	03/08/10	<200	
Well #10	06/28/10	<200	

TABLE B-III.1 **CONCENTRATIONS OF TRITIUM IN GROUNDWATER SAMPLES COLLECTED AND ANALYZED BY QUAD CITIES STATION PERSONNEL, 2010**

RESULTS IN UNITS OF PCI/LITER

SITE	COLLECTION DATE	ACTIVITY	AQUIFER
Well #10	09/15/10	<200	
Well #11	03/08/10	<200	
STP Sand Point	03/08/10	<200	