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Byron Station, Units 1 and 2
Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. STN 50-454 and STN 50-455

Subject: 2010 Annual Radiological Environmental Operating Report (AREOR)

In accordance with Technical Specification 5.6.2, "Annual Radiological Environmental Operating Report," we are submitting the Annual Radiological Environmental Operating Report (AREOR) for Byron Station. This report is required to be submitted to the NRC by May 15th of each year and contains the results of the radiological environmental and meteorological monitoring programs. The Radioactive Effluent Release Report was submitted under separate cover.
Also included are the results of groundwater monitoring conducted in accordance with Exelon's Radiological Groundwater Protection Program (RGPP), which is a voluntary program implemented in 2006. This information is being reported in accordance with a nuclear industry initiative.

If you have any questions regarding this information, please contact David Gudger, Regulatory Assurance Manager, at (815) 406-2800.

Respectfully,

Timothy J. Tulon
Site Vice President
Byron Nuclear Generating Station

TJT/JG/TLH/cy

Attachments: AREOR

IE25
NRR

Docket No: 50-454
50-455

BYRON NUCLEAR GENERATING STATION
UNITS 1 and 2

Annual Radiological
Environmental Operating Report

1 January Through 31 December 2010

Prepared By

Teledyne Brown Engineering
Environmental Services

Exelon SM
Nuclear

Byron Nuclear Generating Station
Byron, IL 61010

May 2011

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I. Summary and Conclusions

This report on the Radiological Environmental Monitoring Program conducted for the Byron Nuclear Generating Station (BNGS) by Exelon covers the period 1 January 2010 through 31 December 2010. During that time period, 1,454 analyses were performed on 1,315 samples. In assessing all the data gathered for this report and comparing these results with preoperational data, it was concluded that the operation of BNGS 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. Gross beta activities detected were consistent with those detected in previous years. Tritium detected in downstream surface water was well below reportable limits and consistent with expected levels as a result of permitted liquid discharges.

Fish (commercially and/or recreationally important species) and sediment samples were analyzed for concentrations of gamma emitting nuclides. Non-plant produced Cesium-137 activity was found at one sediment location and was consistent with data from previous years. No plant produced fission or activation products were found in fish or 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 weekly air samples. All results were less than the minimum detectable activity.

Cow milk samples were analyzed for concentrations of I-131 and gamma emitting nuclides. All I-131 results were below the minimum detectable activity. No fission or activation products were found.

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.

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II. Introduction

Byron Station, a two-unit PWR station, is located about two miles east of the Rock River and approximately three miles southwest of Byron in Ogle County, Illinois. The reactors are designed to have capacities of 1280 and 1254 MW gross, respectively. Unit One loaded fuel in November 1984 and went on line February 2, 1985. Unit Two went on line January 9, 1987. The station has been designed to keep releases to the environment at levels below those specified in the codes of federal regulations.

This report covers those analyses performed by Teledyne Brown Engineering (TBE) and Global Dosimetry on samples collected during the period 1 January 2010 through 31 December 2010.

A. Objectives 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 BNGS REMP were collected for Exelon Nuclear by Environmental Inc. (Midwest Labs). This section describes the general collection methods used by Environmental Inc. to obtain environmental

samples for the BNGS REMP in 2010. Sample locations and descriptions can be found in Table B–1 and Figures B–1 through B–4, Appendix B.

Aquatic Environment

The aquatic environment was evaluated by performing radiological analyses on samples of surface water, ground water, fish, and sediment. Two gallon water samples were collected weekly from two surface water locations (BY-12 and BY-29 [Control location]) and quarterly from six ground water locations (BY-14-1, BY-18-1, BY-32, BY-35, BY-36 and BY-37). All samples were collected in new unused plastic bottles, which were rinsed with source water prior to collection. Fish samples comprising the flesh of channel catfish, freshwater drum, golden redhorse, quillback, shorthead redhorse and common carp were collected semiannually at two locations, BY-29 (control) and BY-31. Sediment samples composed of recently deposited substrate were collected at two locations semiannually, BY-12 and BY-34 (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 weekly at eight locations (BY-01, BY-04, BY-06, BY-08, BY-21, BY-22, BY-23, and BY-24). The control location was BY-08. 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 filters and air iodine samples were replaced weekly and sent to the laboratory for analysis.

Milk samples were collected biweekly at three locations (BY-20-1, BY-26-1 and BY-30-1) from May through October, and monthly from November through April. The control location was BY-26-1. All samples were collected in new unused two gallon plastic bottles from the bulk tank at each location, preserved with sodium bisulfite, and shipped promptly to the laboratory.

Food products were collected annually in September at five locations (BY-Control, BY-Quad 1, BY-Quad 2, BY-Quad 3, and BY-Quad 4). Various types of samples were collected and placed in new unused plastic bags, and sent to the laboratory for analysis.

Ambient Gamma Radiation

Direct radiation measurements were made using CaF_2 thermoluminescent dosimeters (TLD). The TLD locations were placed on and around the BNGS site as follows:

An inner ring consisting of 16 locations (BY-101, BY-102, BY-103, BY-104, BY-105, BY-106, BY-107, BY-108, BY-109, BY-110, BY-111, BY-112, BY-113, BY-114, BY-115, and BY-116) near and within the site perimeter representing fence post doses (i.e., at locations where the doses will be potentially greater than maximum annual off–site doses) from BNGS releases.

An outer ring consisting of 16 locations (BY-201, BY-202, BY-203, BY-204, BY-205, BY-206, BY-207, BY-208, BY-209, BY-210, BY-211, BY-212, BY-213, BY-214, BY-215 and BY-216) extending to approximately 5 miles from the site designed to measure possible exposures to close-in population.

A special interest set consisting of seven locations (BY-301-1, BY-302-1, BY-309-1, BY-309-2, BY-309-3, BY-309-4 and BY-314-1) to measure possible exposures from on-site storage facilities.

An other set consisting of seven locations (BY-01, BY-04, BY-06, BY-21, BY-22, BY-23 and BY-24) at locations where air samplers are present.

The balance of one location (BY-08) representing the control area.

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 BNGS, if any, would be most significant;

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

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

Two TLDs – each comprised of two CaF_2 thermoluminescent phosphors enclosed in plastic – were placed at each location located at a minimum of five feet above ground level. The TLDs were exchanged quarterly and

sent to Global Dosimetry for analysis.

B. Sample Analysis

This section describes the general analytical methodologies used by TBE to analyze the environmental samples for radioactivity for the BNGS REMP in 2010. The analytical procedures used by the laboratory 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 Byron Nuclear Generating Station becoming operational were used as a baseline with which these operational data were compared. For the purpose of this report, Byron Nuclear Generating 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 a before-the-fact estimate of a system (including instrumentation, procedure and sample type) and not as an after-the-fact criteria for the presence of activity. All analyses were designed to achieve the required BNGS detection capabilities for environmental sample analysis. The minimum detectable concentration (MDC) is defined above

with the exception that the measurement is an after-the-fact estimate of the presence of activity.

2. Net Activity Calculation and Reporting of Results

Net activity for a sample was calculated by subtracting background activity from the sample activity. Since the REMP measures extremely small changes in radioactivity in the environment, background variations may result in sample activity being lower than the background activity 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, ground water and vegetation twelve nuclides, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, I-131, Cs-134, Cs-137, Ba-140, and La-140 were reported.

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

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 BNGS 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	BY-21	01/26/10	Low timer reading due to power outage from line repair
SW	BY-12	03/30/10	First quarter tritium composite was greater than LLD due to weekly sample obtained on 3/16 directly after liquid release

Table D-1 LISTING OF SAMPLE ANOMALIES (cont'd)

Sample Type	Location Code	Collection Date	Reason
A/I	BY-01	04/13/10	Timer not functioning; estimated time and replaced
S	BY-12, BY-34	05/25/10	Sediment sample unobtainable in May due to high river conditions; collected in June
A/I	BY-06	06/01/10	Vacuum gauge broken; replaced and checked
TLD	BY-22-1	06/01/10	TLD damaged and was replaced with spare
S	BY-12	06/01/10	Cs-137 sediment sample greater was than LLD due to background
A/I	BY-06	06/22/10	Timer would not reset; replaced
SW	BY-12	06/29/10	Second quarter tritium composite was greater than LLD due to weekly sample obtained on 4/6 directly after liquid release
A/I	BY-06	08/03/10	Timer not functioning; estimated time and replaced
A/I	BY-23, BY-24	08/03/10	Low timer reading due to power outage from storms
SW	BY-12	11/30/10	Fourth quarter tritium composite was greater than LLD due to weekly sample obtained on 11/2 directly after liquid release

Table D-2 LISTING OF MISSED SAMPLES

Sample Type	Location Code	Collection Date	Reason
SW	BY-12, BY-29	01/05/10	Sample unobtainable due to ice on river
SW	BY-12, BY-29	01/12/10	Sample unobtainable due to ice on river
GW	BY-18	01/12/10	No sample; house for sale and vacant with water turned off
SW	BY-12, BY-29	01/19/10	Sample unobtainable due to ice on river
SW	BY-29	01/26/10	Sample unobtainable due to ice on river
SW	BY-12, BY-29	02/02/10	Sample unobtainable due to ice on river

Table D-2 LISTING OF MISSED SAMPLES (cont'd)

Sample Type	Location Code	Collection Date	Reason
SW	BY-29	02/08/10	Sample unobtainable due to ice on river
SW	BY-29	02/16/10	Sample unobtainable due to ice on river
SW	BY-29	02/23/10	Sample unobtainable due to ice on river
GW	BY-18	04/13/10	No sample; house for sale and vacant with water turned off
TLD	BY-103-2	06/29/10	TLD missing upon exchange, replaced with new quarter TLD
GW	BY-18	07/13/10	No sample; house for sale and vacant with water turned off
SW	BY-12, BY-29	12/07/10	Sample unobtainable due to ice on river
SW	BY-12, BY-29	12/14/10	Sample unobtainable due to ice on river
SW	BY-12, BY-29	12/21/10	Sample unobtainable due to ice on river
SW	BY-12, BY-29	12/28/10	Sample unobtainable due to ice on river

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

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

E. Program Changes

Groundwater sample location BY-18 was replaced with BY-18-1 in July 2010.

While working on changes to the REMP sample location tables for an upcoming ODCM revision, it was discovered that seven outer ring TLD locations were outside of the 3.7 - 5.0 mile (6-8 km) range required per plant specifications. In recent years, more precise measurements to the vent stack release point and REMP sample locations have been made using GPS. The existing distances were within 1/4 mile of the required distances and would generally lie within expected uncertainty based on historical location methods. On 12/29/10, TLD locations for BY-202-1,

BY-207-2, BY-208-2, BY-209-1, BY-209-4, BY-215-1, and BY-215-4 were relocated to meet the appropriate sector/distance requirements. The new distance and directions are reflected in Table B-1.

IV. Results and Discussion

A. Aquatic Environment

1. Surface Water

Samples were taken weekly and composited monthly at two locations (BY-12 and BY-29). Of these locations only BY-12 located downstream, could be affected by Byron Nuclear Generating Station's effluent releases. The following analyses were performed.

Gross Beta

Samples from both locations were analyzed for concentrations of gross beta (Table C–I.1, Appendix C). The values ranged from 3.3 to 7.5 pCi/l. Concentrations detected were consistent with those detected in previous years (Figure C–1, Appendix C).

Tritium

Quarterly composites of weekly collections were analyzed for tritium activity (Table C–I.2, Appendix C). Tritium was detected in three samples. The concentration ranged from 2050 to 3830 pCi/L (Figure C–2, Appendix C). Tritium detected in downstream surface water was well below reportable limits and consistent with expected levels as a result of permitted liquid discharges.

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 six locations (BY-14-1, BY-18-1, BY-32, BY-35, BY-36 and BY-37). These locations could be affected by Byron Nuclear Generating Station's 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 was detected, and the required LLD was met (Figures C–3 through C–6, Appendix C).

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 channel catfish, freshwater drum, golden redhorse, quillback, shorthead redhorse and common carp were collected at two locations (BY-29 and BY-31) semiannually. Location BY-31 could be affected by Byron Nuclear Generating Station's 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 (BY-12 and BY-34) semiannually. BY-12, located downstream, could be affected by Byron Nuclear Generating Station's effluent releases. The following analysis was performed:

Gamma Spectrometry

Sediment samples from both locations were analyzed for gamma emitting nuclides (Table C–IV.1, Appendix C). Cesium-137 was detected at one location. The values ranged from 90 to 181 pCi/kg dry. Concentrations detected were consistent with those detected in previous years and are not a result of plant effluents. 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 eight locations on a weekly basis. The eight locations were separated into three groups: Nearsite samplers (BY-21, BY-22, BY-23 and BY-24), Far Field samplers within 4 km of the site (BY-01, BY-04, and BY-06) and the Control sampler between 10 and 30 km from the site (BY-08). 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 three groups aid in determining the effects, if any, resulting from the operation of BNGS. The results from the Nearsite locations (Group I) ranged from 6 to 36 E–3 pCi/m^3 with a mean of 19 E–3 pCi/m^3. The results from the Far Field locations (Group II) ranged from 6 to 37 E–3 pCi/m^3 with a mean of 18 E–3 pCi/m^3. The results from the Control location (Group III) ranged from 8 to 37 E–3 pCi/m^3 with a mean of 18 E–3 pCi/m^3. Comparison of the 2010 air particulate data with previous years data indicate no effects from the operation of BNGS. In addition a comparison of the weekly mean values for 2010 indicate no notable differences among the three groups (Figures C–7 through C-11, 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 eight locations (BY-01, BY-04, BY-06, BY-08, BY-21, BY-22, BY-23, and BY-24) and analyzed weekly for I-131 (Table C–VI.1, Appendix C). No I-131 was detected and the required LLD was met.

2. Terrestrial

a. Milk

Samples were collected from three locations (BY-20-1, BY-26-1, and BY-30-1) biweekly May through October and monthly November through April. The following analyses were performed:

Iodine-131

Milk samples from all locations were analyzed for concentrations of I-131 (Table C–VII.1, Appendix C). No nuclides were detected, and all required LLDs were 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. Vegetation

Vegetation samples were collected at five locations (BY-Control, BY-Quad 1, BY-Quad 2, BY-Quad 3 and BY-Quad 4) when available. Four locations (BY-Quad 1, BY-Quad 2, BY-Quad 3 and BY-Quad 4) could be affected by Byron Nuclear Generating Station's 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 Panasonic 814 (CaF_2) thermoluminescent dosimeters. Ninety-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 TLD measurements were below 30 mR/standard quarter, with a range of 16 to 33 mR/standard quarter. A comparison of the Inner Ring,

Outer Ring, Special Interest, Other and Control Location data indicate that the ambient gamma radiation levels were comparable among the groups.

D. Land Use Survey

A Land Use Survey conducted during August 2010 around the Byron Nuclear Generating Station (BNGS) was performed by Environmental Inc. (Midwest Labs) for Exelon Nuclear to comply with the Byron Nuclear Generating Station's Offsite Dose Calculation Manual. The purpose of the survey was to document the nearest resident, livestock, and milk producing animals in each of the sixteen 22 ½ degree sectors and garden of greater than 500 square feet in each of the four 90 degree quadrants around the site. The results of this survey are summarized below.

Distance in Miles from the BNGS Vent Stacks				
Sector		Residence Miles	Livestock Miles	Milk Farm Miles
A	N	1.2	5.2	12.0
B	NNE	1.6	1.5	-
C	NE	1.1	3.0	-
D	ENE	1.4	4.2	-
E	E	1.2	3.8	-
F	ESE	1.5	1.3	-
G	SE	1.7	4.3	-
H	SSE	0.7	3.2	-
J	S	0.6	0.6	-
K	SSW	0.7	2.3	-
L	SW	0.8	1.6	-
M	WSW	1.6	1.6	4.5
N	W	1.8	3.2	-
P	WNW	1.6	5.8	-
Q	NW	0.8	3.7	-
R	NNW	0.9	1.4	5.0

E. Errata Data

2002-2009 Errata

Portions of the Annual Radiological Effluent Operating Reports (AREOR) from 2002-2009 were over-reporting quarterly and annual dose data. Each year, reports entitled "40CFR190 Uranium Fuel Cycle Dose Report" were being generated to provide annual dose summaries. These reports were being generated twice – once each for Unit 1 and Unit 2. It was recently understood that these reports automatically sum the dose from both units, thus reports on a per-unit basis are not appropriate. As a result, the 40CFR190 reports contained within the 2002-2009 AREORs were over-reporting associated dose estimates by a factor of two. Thus,

the 40CFR190 dose estimates reported between 2002 and 2009 should have been a total from both Unit 1 and Unit 2, and should have been exactly half of the total dose after adding Unit 1 and Unit 2 dose together. The error occurred due a misinterpretation of the reports provided by new dose calculation software introduced in 2002. The error continued to be carried forward in subsequent years through program responsibility changes and employee turnover.

2009 Errata

The 2009 AREOR contains two typographical errors on Page 111 of 207. In the Effluent Waste Disposal Report, Table 1A, Gaseous Effluents – Summation of all Releases, Reg Guide 1.21 – Unit 2, the total release (Ci) of fission and activation gases for the 3rd and 4th quarter of 2009 are listed as 2.33E-02 and 1.07E-02, respectively. The correct values are 2.33E-01 and 1.07E-01, respectively.

F. Summary of Results – Inter-Laboratory Comparison Program

The primary 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.

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

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT SUMMARY

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR BYRON NUCLEAR GENERATION STATION, 2010

Name of Facility: BYRON **DOCKET NUMBER: 50-454 & 50-455**

Location of Facility: BYRON, IL **REPORTING PERIOD: 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	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	GR-B	20	4	4.8 (8/11) (3.6/7.5)	4.4 (5/9) (3.3/5.1)	4.8 (8/11) (3.6/7.5)	BY-12 INDICATOR OREGON POOL OF ROCK RIVER - DOWNSTREAM 4.5 MILES SSW OF SITE	0
	H-3	8	200	2687 (3/4) (2050/3830)	<LLD	2687 (3/4) (2050/3830)	BY-12 INDICATOR OREGON POOL OF ROCK RIVER - DOWNSTREAM 4.5 MILES SSW OF SITE	3
	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

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES
FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR BYRON NUCLEAR GENERATION STATION, 2010

Name of Facility: BYRON **DOCKET NUMBER: 50-454 & 50-455**
Location of Facility: BYRON, IL **REPORTING PERIOD: 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	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	NB-95		15	<LLD	<LLD	-		0
	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

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FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR BYRON NUCLEAR GENERATION STATION, 2010

Name of Facility: BYRON **DOCKET NUMBER: 50-454 & 50-455**

Location of Facility: BYRON, IL **REPORTING PERIOD: 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
GROUND WATER (PCI/LITER)	H-3	22	200	<LLD	NA	-		0
	GAMMA	22						
	MN-54		15	<LLD	NA	-		0
	CO-58		15	<LLD	NA	-		0
	FE-59		30	<LLD	NA	-		0
	CO-60		15	<LLD	NA	-		0
	ZN-65		30	<LLD	NA	-		0
	NB-95		15	<LLD	NA	-		0

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GROUND WATER (PCI/LITER)	ZR-95		30	<LLD	NA	-		0
	I-131		15	<LLD	NA	-		0
	CS-134		15	<LLD	NA	-		0
	CS-137		18	<LLD	NA	-		0
	BA-140		60	<LLD	NA	-		0
	LA-140		15	<LLD	NA	-		0
FISH (PCI/KG WET)	GAMMA MN-54	8	130	<LLD	<LLD	-		0

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FISH (PCI/KG WET)	CO-58		130	<LLD	<LLD	-		0
	FE-59		260	<LLD	<LLD	-		0
	CO-60		130	<LLD	<LLD	-		0
	ZN-65		260	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		130	<LLD	<LLD	-		0

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FISH (PCI/KG WET)	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	NA	-		0
	CO-58		NA	<LLD	NA	-		0
	FE-59		NA	<LLD	NA	-		0
	CO-60		NA	<LLD	NA	-		0

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SEDIMENT (PCI/KG DRY)	ZN-65		NA	<LLD	NA	-		0
	NB-95		NA	<LLD	NA	-		0
	ZR-95		NA	<LLD	NA	-		0
	CS-134		150	<LLD	NA	-		0
	CS-137		180	136 (2/2) (90/181)	<LLD	136 (2/2) (90/181)	BY-12 INDICATOR OREGON POOL OF ROCK RIVER - DOWNSTREAM 4.5 MILES SSW OF SITE	0
	BA-140		NA	<LLD	NA	-		0
	LA-140		NA	<LLD	NA	-		0

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AIR PARTICULATE (E-3 PCI/CU.METER)	GR-B	416	10	19 (361/364) (6/37)	18 (52/52) (8/37)	19 (52/52) (7/36)	BY-23 INDICATOR BYRON NEARSITE SOUTH 0.6 MILES S OF SITE	0
	GAMMA	32						
	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

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AIR PARTICULATE (E-3 PCI/CU.METER)	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		150	<LLD	<LLD	-		0
	CS-137		180	<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	416	70	<LLD	<LLD	-		0
MILK (PCI/LITER)	I-131	57	1	<LLD	<LLD	-		0

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MILK (PCI/LITER)	GAMMA	57						
	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
	ZR-95		NA	<LLD	<LLD	-		0

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MILK (PCI/LITER)	CS-134		15	<LLD	<LLD	-		0
	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0
	LA-140		15	<LLD	<LLD	-		0
VEGETATION (PCI/KG WET)	GAMMA MN-54	10	NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0

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VEGETATION (PCI/KG WET)	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	I-131		60	<LLD	<LLD	-		0
	CS-134		60	<LLD	<LLD	-		0
	CS-137		80	<LLD	<LLD	-		0

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VEGETATION (PCI/KG WET)	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0
DIRECT RADIATION (MILLI-ROENTGEN/QTR.)	TLD-QUARTERLY	363	NA	24.2 (355/355) (16/33)	21.6 (8/8) (17/27)	28.3 (3/3) (23/33)	BY-103-2 INDICATOR 1.7 MILES NE	0

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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

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Byron Nuclear Generating Station, 2010

Location	Location Description	Distance & Direction From Site
A. Surface Water		
BY-12	Oregon Pool of Rock River, Downstream	4.5 miles SSW
BY-29	Byron, Upstream (control)	3.0 miles N
B. Ground/Well Water		
BY-14-1	3200 North German Church Road	1.0 miles SSE
BY-18-1	Calhoun	0.7 miles SSW
BY-32	Ron Wolford Well	1.9 miles W
BY-35	Vancko Well	1.9 miles WNW
BY-36	Blanchard Well	0.8 miles NW
BY-37	Alexander Well	2.0 miles WNW
C. Milk		
BY-20-1	Ron Snodgrass Farm	4.9 miles WSW
BY-26-1	Dennis Herbert (control)	12.8 miles N
BY-30-1	Ebert Farm	5.3 miles NNW
D. Air Particulates / Air Iodine		
BY-01	Byron	3.0 miles N
BY-04	Paynes Point	5.0 miles SE
BY-06	Oregon	4.7 miles SSW
BY-08	Leaf River (control)	7.0 miles WNW
BY-21	Byron Nearsite North	0.3 miles N
BY-22	Byron Nearsite East-Southeast	0.4 miles SE
BY-23	Byron Nearsite South	0.6 miles S
BY-24	Byron Nearsite Southwest	0.7 miles SW
E. Fish		
BY-29	Byron, Upstream (control)	3.0 miles N
BY-31	Byron, Discharge	2.6 miles WNW
F. Sediment		
BY-12	Oregon Pool of Rock River, Downstream	4.6 miles SSW
BY-34	Rock River, Upstream of Discharge (control)	2.6 miles WNW
G. Vegetation		
Quadrant 1	5186 N. Cox Road, Stillman Valley	4.8 miles ENE
Quadrant 2	6274 Brick Road, Oregon	4.7 miles SE
Quadrant 3	2002 Deer Path Rd., Byron	0.9 miles SW
Quadrant 4	722 Town Line Rd., Leaf River	4.5 miles NW
Control	5631 Fair Oak Rd., Davis Junction	12.6 miles E
H. Environmental Dosimetry - TLD		
Inner Ring		
BY-101-1 and -2		0.3 miles N
BY-102-1		1.0 miles NNE
BY-102-2		1.0 miles NNE

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Byron Nuclear Generating Station, 2010

Location	Location Description	Distance & Direction From Site
BY-103-1 and -2		1.7 miles NE
BY-103-3		0.4 miles NE
BY-104-1 and -2		1.4 miles ENE
BY-104-3		0.3 miles ENE
BY-105-1 and -2		1.3 miles E
BY-106-1 and -2		1.4 miles ESE
BY-107-1 and -2		1.4 miles SE
BY-107-3		0.4 miles SE
BY-108-1		0.7 miles SSE
BY-108-2		0.6 miles SSE
BY-109-1 and -2		0.6 miles S
BY-110-1 and -2		0.7 miles SSW
BY-111-3		0.8 miles SW
BY-111-4		0.9 miles SW
BY-112-3 and -4		0.8 miles WSW
BY-113-1 and -2		0.7 miles W
BY-114-1 and -2		0.8 miles WNW
BY-115-1 and -2		1.0 miles NW
BY-116-1 and -2		1.4 miles NNW
BY-116-3		0.9 miles NNW
Outer Ring		
BY-201-3		4.4 miles N
BY-201-4		4.4 miles N
BY-202-1		4.4 miles NNE
BY-202-2		4.8 miles NNE
BY-203-1		4.8 miles NE
BY-203-2		4.7 miles NE
BY-204-1		4.1 miles ENE
BY-204-2		4.0 miles ENE
BY-205-1 and -2		3.8 miles E
BY-206-1		4.0 miles ESE
BY-206-2		4.3 miles ESE
BY-207-1		4.2 miles SE
BY-207-2		3.9 miles SE
BY-208-1		4.0 miles SSE
BY-208-2		3.8 miles SSE
BY-209-1 and -4		4.0 miles S
BY-210-3 and -4		3.9 miles SSW
BY-211-1 and -4		4.9 miles SW
BY-212-1 and -4		4.7 miles WSW
BY-213-1		4.7 miles W
BY-213-4		4.7 miles W
BY-214-1		4.7 miles WNW
BY-214-4		4.6 miles WNW
BY-215-1		4.2 miles NW
BY-215-4		4.2 miles NW
BY-216-1		4.5 miles NNW
BY-216-2		4.7 miles NNW

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Byron Nuclear Generating Station, 2010

Location	Location Description	Distance & Direction From Site
Special Interest		
BY-301-1		0.3 miles N
BY-302-1		0.1 miles NNE
BY-309-1		0.3 miles S
BY-309-2		0.4 miles S
BY-309-3		0.4 miles S
BY-309-4		0.4 miles SSW
BY-314-1		0.3 miles WNW
Other		
BY-01-1 and -2		3.0 miles N
BY-04-1 and -2		5.0 miles SE
BY-06-1 and -2		4.7 miles SSW
BY-21-1 and -2		0.3 miles N
BY-22-1 and -2		0.4 miles SE
BY-23-1 and -2		0.6 miles S
BY-24-1 and -2		0.7 miles SW
Control		
BY-08-1 and -2		7.0 miles WNW

TABLE B-2: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Byron Nuclear Generating 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
Surface Water	Gross Beta	Monthly composite from weekly grab samples.	TBE, TBE-2008 Gross Alpha and/or gross beta activity in various matrices
Surface Water	Tritium	Quarterly composite from weekly grab samples.	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation
Ground Water	Gamma Spectroscopy	Quarterly grab samples.	TBE, TBE-2007 Gamma emitting radioisotope analysis
Ground Water	Tritium	Quarterly grab samples.	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation
Fish	Gamma Spectroscopy	Semi-annual samples collected via electroshocking or other techniques	TBE-2007 Gamma emitting radioisotope analysis
Sediment	Gamma Spectroscopy	Semi-annual grab samples	TBE, TBE-2007 Gamma emitting radioisotope analysis
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
Air Particulates	Gamma Spectroscopy	Quarterly composite of each station	TBE, TBE-2007 Gamma emitting radioisotope analysis
Air Iodine	Gamma Spectroscopy	One-week composite of continuous air sampling through charcoal filter	TBE, TBE-2007 Gamma emitting radioisotope analysis
Milk	I-131	Bi-weekly grab sample when cows are on pasture. Monthly all other times	TBE, TBE-2012 Radioiodine in various matrices
Milk	Gamma Spectroscopy	Bi-weekly grab sample when cows are on pasture. Monthly all other times	TBE, TBE-2007 Gamma emitting radioisotope analysis
Vegetation	Gamma Spectroscopy	Annual grab samples.	TBE, TBE-2007 Gamma emitting radioisotope analysis
TLD	Thermoluminescence Dosimetry	Quarterly TLDs comprised of two Mirion Techologies CaF_2 elements.	Mirion Technologies

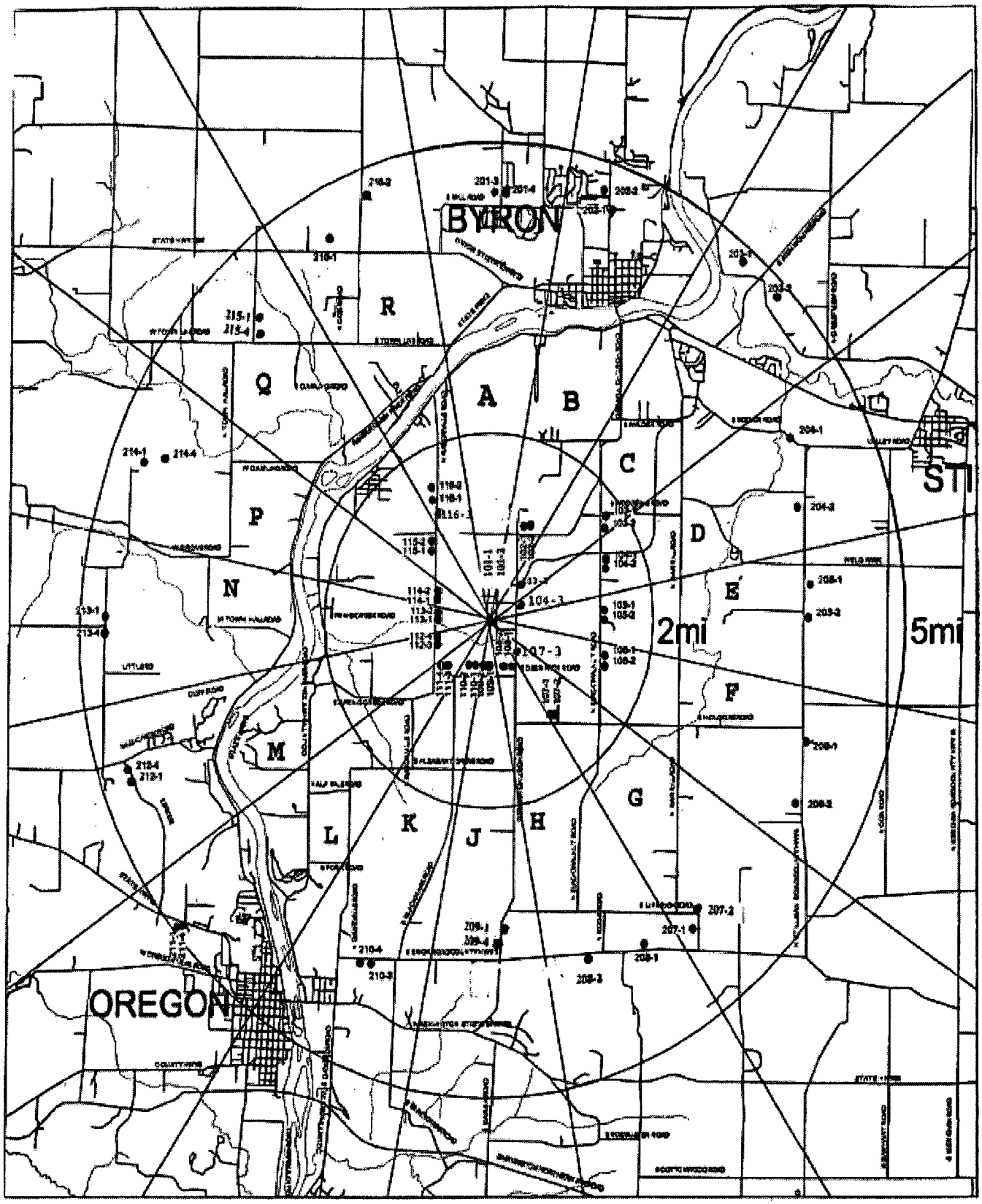


Figure B-1
Inner and Outer Ring TLD Locations of the
Byron Nuclear Generating Station, 2010

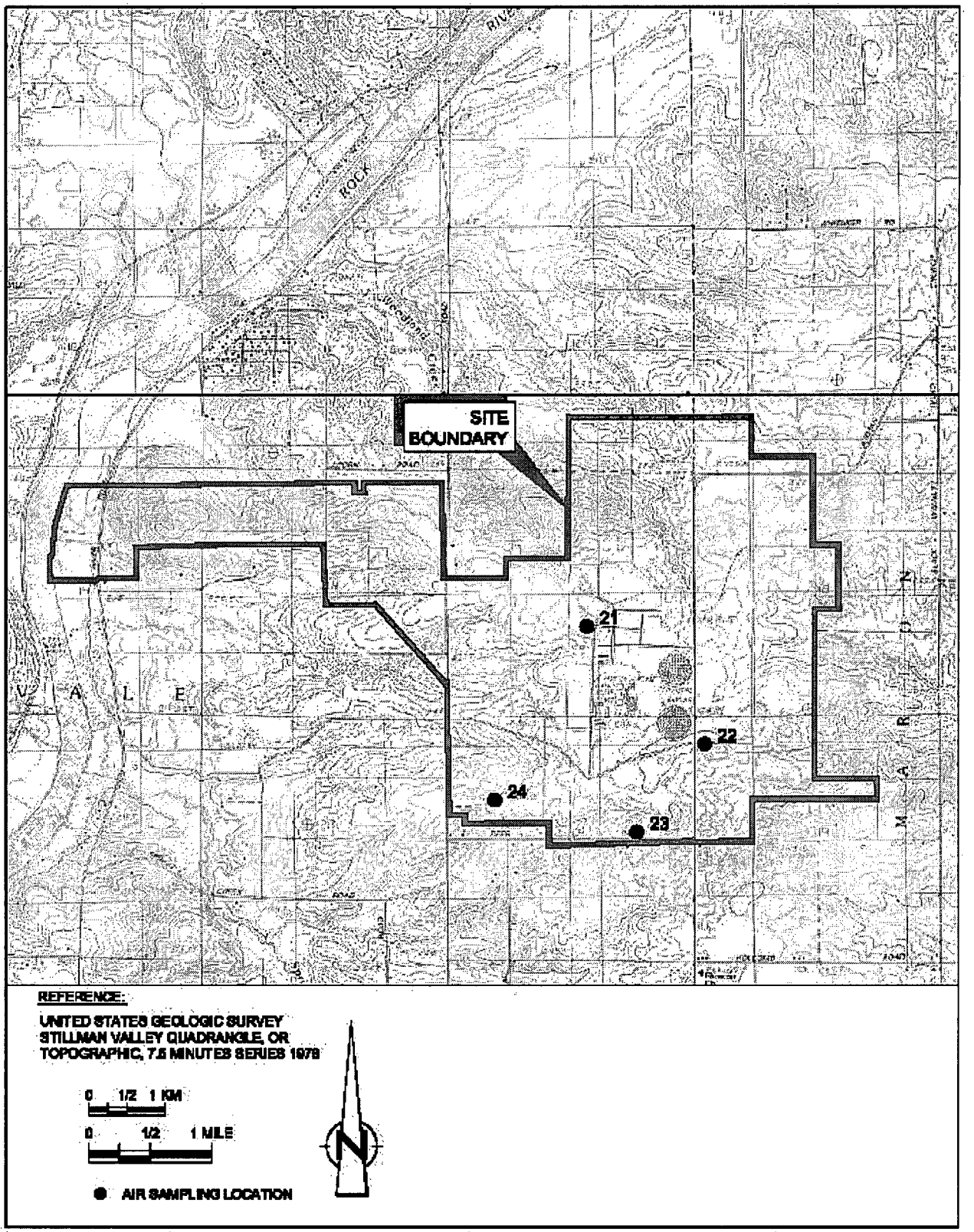
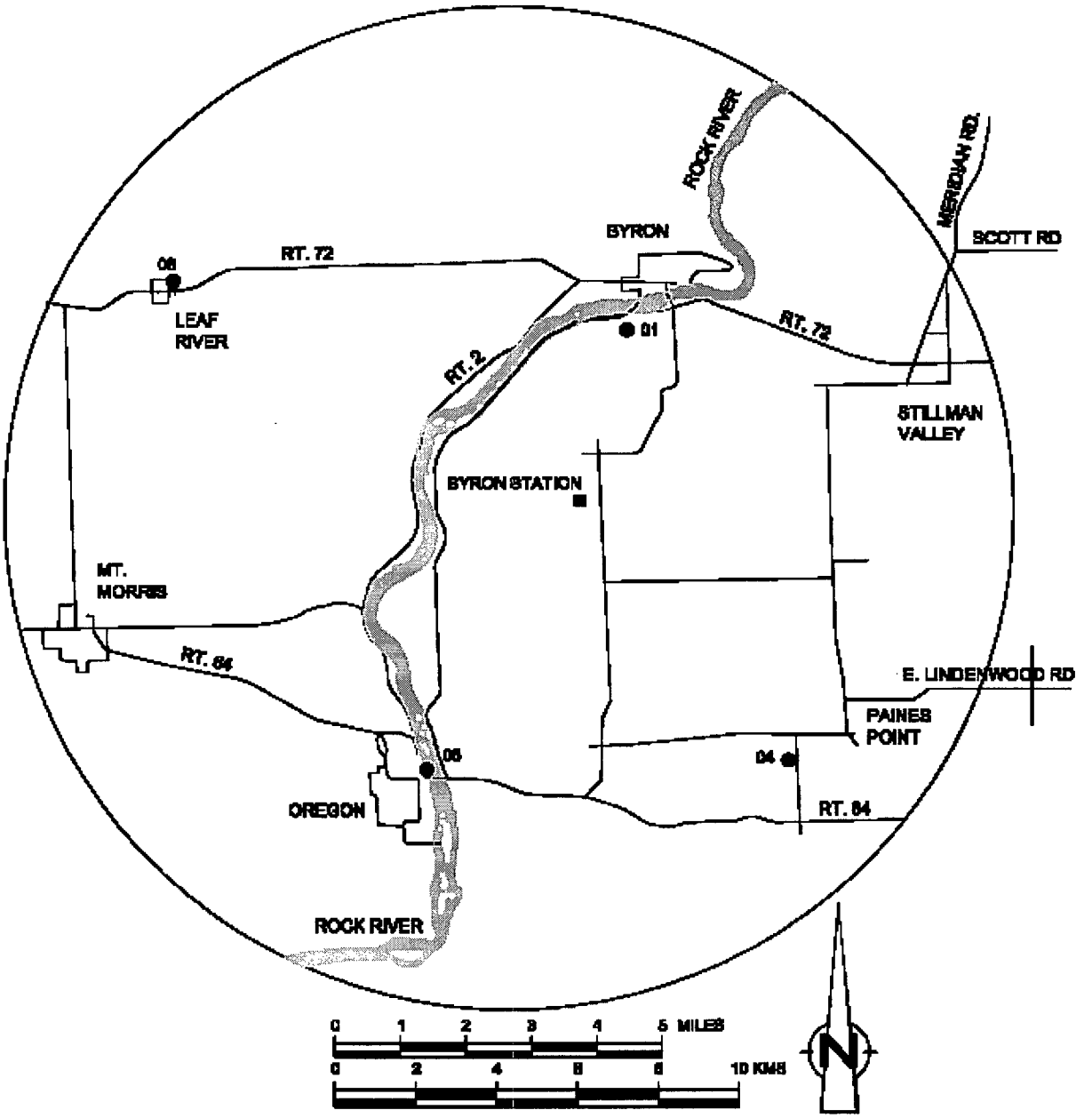


Figure B-2
Onsite Air Sampling Locations of the
Byron Nuclear Generating Station, 2010



● Air Sampling Location

■ Byron Station

Figure B-3
Offsite Air Sampling Locations of the
Byron Nuclear Generating Station, 2010

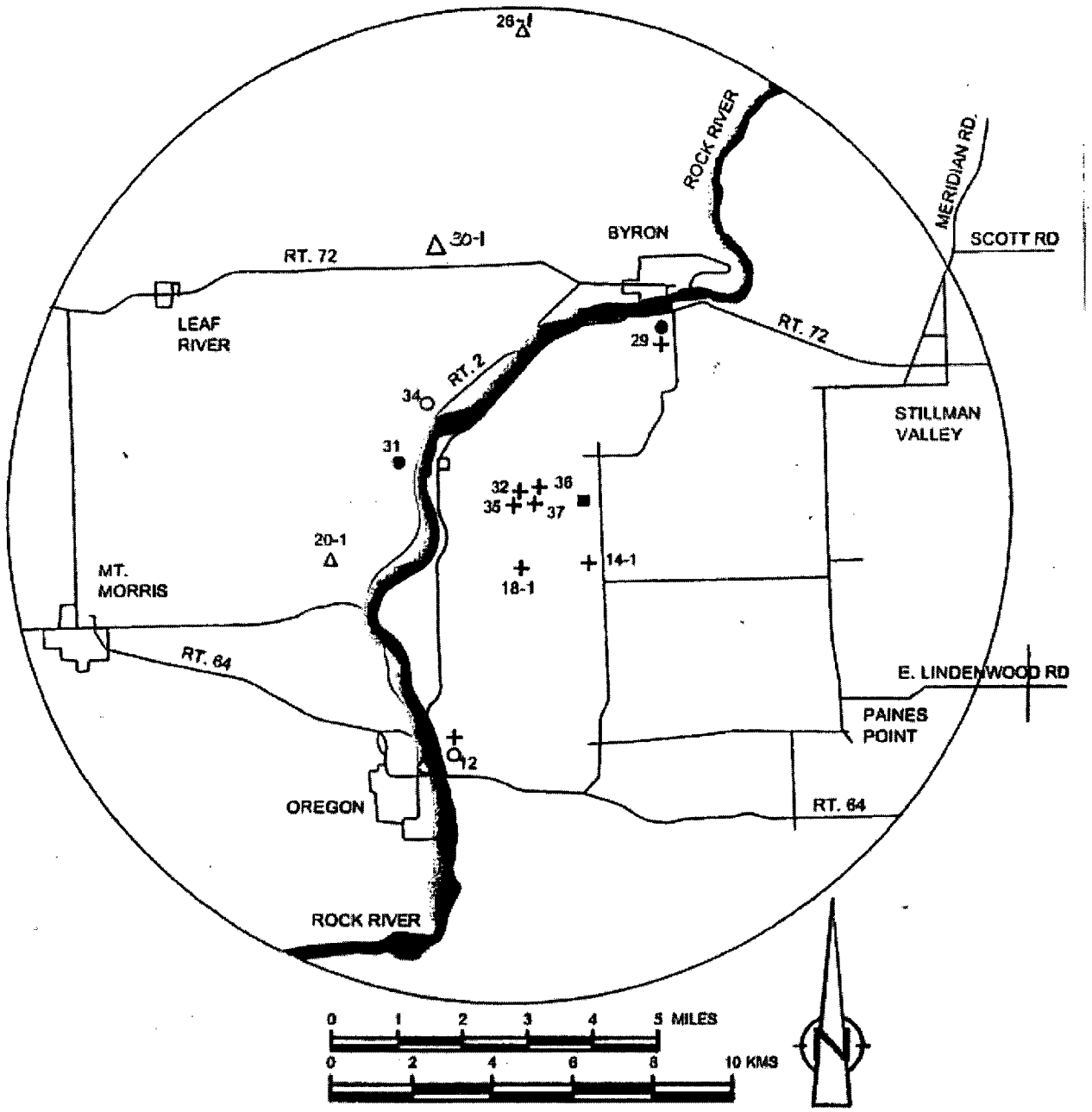


Figure B-4
Ingestion and Waterborne Exposure Pathway Sampling Locations
of the Byron Nuclear Generating Station, 2010

APPENDIX C

DATA TABLES AND FIGURES
PRIMARY LABORATORY

TABLE C-I.1 CONCENTRATIONS OF GROSS BETA IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2010

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BY-12		BY-29	
01/26/10 - 01/26/10	< 2.9	(1)		(1)
02/08/10 - 02/23/10	4.7 ± 1.4	(1)		(1)
03/02/10 - 03/30/10	5.1 ± 3.1		< 3.0	
04/06/10 - 04/27/10	< 3.5		4.0 ± 2.4	
05/04/10 - 05/25/10	4.7 ± 2.1		5.0 ± 2.2	
06/01/10 - 06/29/10	4.8 ± 2.5		< 3.4	
07/06/10 - 07/27/10	3.6 ± 2.3		< 3.3	
08/03/10 - 08/31/10	7.5 ± 2.2		5.1 ± 2.0	
09/07/10 - 09/28/10	4.0 ± 2.0		4.8 ± 2.2	
10/05/10 - 10/26/10	< 2.8		< 2.8	
11/02/10 - 11/30/10	4.0 ± 2.0		3.3 ± 1.9	
12/01/10 - 12/30/10		(1)		(1)
MEAN	4.8 ± 2.4		4.4 ± 1.6	

TABLE C-I.2 CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2010

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BY-12		BY-29	
01/26/10 - 03/30/10	2180 ± 262	(1)	< 176	(1)
04/06/10 - 06/29/10	2050 ± 256	(1)	< 169	(1)
07/06/10 - 09/28/10	< 188		< 193	
10/05/10 - 11/30/10	3830 ± 435	(1)	< 168	(1)
MEAN	2687 ± 1985		-	

* THE MEAN AND 2 STANDARD DEVIATION VALUES 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 BYRON NUCLEAR GENERATING 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
BY-12	01/26/10 - 01/26/10 (1)	< 4	< 5	< 11	< 6	< 10	< 6	< 8	< 12	< 5	< 6	< 25	< 8
	02/08/10 - 02/23/10 (1)	< 3	< 3	< 6	< 3	< 5	< 3	< 5	< 15	< 2	< 3	< 25	< 7
	03/02/10 - 03/30/10	< 1	< 1	< 3	< 1	< 3	< 2	< 3	< 10	< 1	< 1	< 15	< 5
	04/06/10 - 04/27/10	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 15	< 2	< 2	< 21	< 7
	05/04/10 - 05/25/10	< 1	< 1	< 3	< 1	< 2	< 2	< 3	< 13	< 1	< 1	< 18	< 6
	06/01/10 - 06/29/10	< 2	< 3	< 6	< 2	< 4	< 3	< 5	< 14	< 2	< 2	< 24	< 9
	07/06/10 - 07/27/10	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 9	< 2	< 2	< 18	< 6
	08/03/10 - 08/31/10	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 14	< 2	< 2	< 21	< 7
	09/07/10 - 09/28/10	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 14	< 1	< 1	< 22	< 7
	10/05/10 - 10/26/10	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 8	< 2	< 2	< 16	< 5
	11/02/10 - 11/30/10	< 1	< 1	< 2	< 1	< 2	< 1	< 2	< 9	< 1	< 1	< 12	< 3
	12/01/10 - 12/30/10 (1)	-	-	-	-	-	-	-	-	-	-	-	-
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-29	01/26/10 - 01/26/10 (1)	-	-	-	-	-	-	-	-	-	-	-	-
	02/08/10 - 02/23/10 (1)	-	-	-	-	-	-	-	-	-	-	-	-
	03/02/10 - 03/30/10	< 2	< 2	< 5	< 2	< 2	< 2	< 4	< 13	< 2	< 2	< 21	< 7
	04/06/10 - 04/27/10	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 13	< 1	< 1	< 20	< 6
	05/04/10 - 05/25/10	< 1	< 1	< 3	< 1	< 3	< 1	< 2	< 12	< 1	< 1	< 18	< 5
	06/01/10 - 06/29/10	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 14	< 2	< 2	< 22	< 7
	07/06/10 - 07/27/10	< 2	< 3	< 6	< 2	< 6	< 3	< 5	< 10	< 3	< 3	< 21	< 7
	08/03/10 - 08/31/10	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 12	< 2	< 2	< 19	< 6
	09/07/10 - 09/28/10	< 1	< 2	< 3	< 1	< 3	< 1	< 3	< 13	< 1	< 1	< 18	< 6
	10/05/10 - 10/26/10	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 10	< 2	< 2	< 17	< 6
	11/02/10 - 11/30/10	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 11	< 1	< 1	< 16	< 5
	12/01/10 - 12/30/10 (1)	-	-	-	-	-	-	-	-	-	-	-	-
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-II.1 **CONCENTRATIONS OF TRITIUM IN GROUND WATER SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2010**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BY-14-1	BY-18	BY-18-1	BY-32	BY-35	BY-36	BY-37
01/12/10 - 01/12/10	< 184	(1)		< 185	< 183	< 181	< 182
04/13/10 - 04/13/10	< 157	(1)		< 161	< 160	< 161	< 161
07/13/10 - 07/13/10	< 171	(1)	< 170 (2)	< 169	< 169	< 176	< 172
10/12/10 - 10/12/10	< 153		< 154	< 138	< 143	< 147	< 148
MEAN	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION
(2) SEE PROGRAM CHANGES SECTION FOR EXPLANATION

TABLE C-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUND WATER SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING 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
BY-14-1	01/12/10 - 01/12/10	< 3	< 3	< 7	< 3	< 6	< 4	< 6	< 10	< 3	< 3	< 24	< 7
	04/13/10 - 04/13/10	< 1	< 1	< 3	< 1	< 2	< 2	< 3	< 8	< 1	< 1	< 14	< 4
	07/13/10 - 07/13/10	< 3	< 4	< 7	< 3	< 6	< 4	< 5	< 6	< 3	< 3	< 16	< 5
	10/12/10 - 10/12/10	< 6	< 7	< 13	< 7	< 11	< 8	< 14	< 14	< 6	< 7	< 37	< 11
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-18	01/12/10 - 01/12/10 (1)	-	-	-	-	-	-	-	-	-	-	-	-
	04/13/10 - 04/13/10 (1)	-	-	-	-	-	-	-	-	-	-	-	-
	07/13/10 - 07/13/10 (1)	-	-	-	-	-	-	-	-	-	-	-	-
	10/12/10 - 10/12/10 (1)	-	-	-	-	-	-	-	-	-	-	-	-
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-18-1	01/12/10 - 01/12/10	-	-	-	-	-	-	-	-	-	-	-	-
	04/13/10 - 04/13/10	-	-	-	-	-	-	-	-	-	-	-	-
	07/13/10 - 07/13/10 (2)	< 7	< 8	< 14	< 8	< 19	< 9	< 13	< 13	< 10	< 8	< 35	< 11
	10/12/10 - 10/12/10	< 7	< 7	< 13	< 6	< 14	< 8	< 12	< 15	< 6	< 7	< 40	< 13
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-32	01/12/10 - 01/12/10	< 4	< 4	< 9	< 4	< 8	< 5	< 7	< 14	< 4	< 4	< 31	< 9
	04/13/10 - 04/13/10	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 10	< 2	< 2	< 19	< 7
	07/13/10 - 07/13/10	< 5	< 5	< 10	< 5	< 10	< 5	< 8	< 9	< 4	< 5	< 22	< 8
	10/12/10 - 10/12/10	< 6	< 5	< 10	< 5	< 11	< 7	< 10	< 13	< 5	< 6	< 28	< 10
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-35	01/12/10 - 01/12/10	< 3	< 3	< 8	< 3	< 7	< 4	< 7	< 15	< 4	< 4	< 28	< 7
	04/13/10 - 04/13/10	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 12	< 2	< 2	< 21	< 6
	07/13/10 - 07/13/10	< 5	< 6	< 11	< 6	< 12	< 6	< 9	< 10	< 6	< 6	< 28	< 7
	10/12/10 - 10/12/10	< 5	< 5	< 11	< 6	< 10	< 6	< 8	< 11	< 4	< 5	< 32	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION
(2) SEE PROGRAM CHANGES SECTION FOR EXPLANATION

TABLE C-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUND WATER SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING 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
BY-36	01/12/10 - 01/12/10	< 3	< 3	< 6	< 3	< 6	< 3	< 6	< 13	< 3	< 3	< 24	< 6
	04/13/10 - 04/13/10	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 11	< 2	< 2	< 18	< 6
	07/13/10 - 07/13/10	< 8	< 7	< 14	< 8	< 17	< 9	< 14	< 14	< 9	< 8	< 36	< 11
	10/12/10 - 10/12/10	< 3	< 3	< 6	< 3	< 5	< 3	< 5	< 7	< 3	< 3	< 17	< 5
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-37	01/12/10 - 01/12/10	< 3	< 3	< 6	< 3	< 6	< 3	< 6	< 11	< 3	< 3	< 24	< 8
	04/13/10 - 04/13/10	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 11	< 2	< 2	< 18	< 6
	07/13/10 - 07/13/10	< 7	< 8	< 13	< 7	< 16	< 8	< 15	< 13	< 8	< 9	< 37	< 10
	10/12/10 - 10/12/10	< 6	< 6	< 14	< 7	< 12	< 7	< 10	< 14	< 6	< 7	< 33	< 10
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

TABLE C-III.1 **CONCENTRATIONS OF GAMMA EMITTERS IN FISH SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING 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	Cs-134	Cs-137	Ba-140	La-140
BY-29												
Channel Catfish	05/03/10	< 41	< 58	< 126	< 36	< 101	< 52	< 96	< 44	< 51	< 623	< 218
Shorthead Redhorse	05/03/10	< 62	< 58	< 136	< 59	< 85	< 63	< 113	< 41	< 47	< 734	< 206
Freshwater Drum	10/19/10	< 43	< 50	< 122	< 40	< 115	< 51	< 82	< 41	< 50	< 326	< 122
Golden Redhorse	10/19/10	< 51	< 44	< 93	< 58	< 100	< 46	< 104	< 47	< 50	< 392	< 88
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BY-31												
Channel Catfish	05/03/10	< 39	< 60	< 126	< 26	< 134	< 67	< 138	< 62	< 55	< 957	< 261
Common Carp	05/03/10	< 53	< 62	< 140	< 48	< 104	< 70	< 92	< 52	< 51	< 825	< 269
Common Carp	10/19/10	< 42	< 52	< 112	< 55	< 107	< 48	< 94	< 42	< 56	< 280	< 92
Quillback	10/19/10	< 46	< 60	< 104	< 54	< 100	< 64	< 91	< 46	< 53	< 372	< 118
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-IV.1 **CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2010**

RESULTS IN UNITS OF PCI/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
BY-12	06/01/10	(1)	< 97	< 96	< 240	< 87	< 177	< 108	< 182	< 71	181 ± 76	(1)	< 1100	< 320
	10/25/10		< 60	< 63	< 132	< 67	< 133	< 63	< 114	< 62	90 ± 65	(1)	< 296	< 67
	MEAN		-	-	-	-	-	-	-	-	136 ± 128		-	-
BY-34	06/01/10	(1)	< 55	< 68	< 163	< 52	< 129	< 71	< 117	< 49	< 85		< 911	< 215
	10/25/10		< 36	< 35	< 73	< 43	< 69	< 43	< 57	< 33	< 37		< 172	< 56
	MEAN		-	-	-	-	-	-	-	-	-		-	-

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

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

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

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

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

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

(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 BYRON NUCLEAR GENERATING STATION, 2010

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

GROUP I - NEARSITE 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
12/29/09	02/02/10	13	36	24 ± 13	12/29/09	02/02/10	13	34	23 ± 13	12/29/09	02/02/10	19	25	21 ± 5
02/02/10	03/02/10	12	29	18 ± 9	02/02/10	03/02/10	10	21	17 ± 7	02/02/10	03/02/10	12	23	17 ± 9
03/02/10	03/30/10	9	26	16 ± 8	03/02/10	03/30/10	8	22	16 ± 9	03/02/10	03/30/10	15	19	17 ± 4
03/30/10	04/27/10	14	21	17 ± 5	03/30/10	04/27/10	12	18	16 ± 4	03/30/10	04/27/10	11	17	15 ± 5
04/27/10	06/01/10	7	20	14 ± 8	04/27/10	06/01/10	6	19	13 ± 10	04/27/10	06/01/10	9	19	14 ± 8
06/01/10	06/29/10	6	16	11 ± 5	06/01/10	06/29/10	8	14	12 ± 4	06/01/10	06/29/10	8	14	11 ± 4
06/29/10	08/03/10	13	24	18 ± 7	06/29/10	08/03/10	13	26	18 ± 8	06/29/10	08/03/10	12	21	16 ± 8
08/03/10	08/31/10	18	27	22 ± 5	08/03/10	08/31/10	16	26	21 ± 6	08/03/10	08/31/10	18	25	21 ± 6
08/31/10	09/28/10	10	24	16 ± 8	08/31/10	09/28/10	13	20	16 ± 5	08/31/10	09/28/10	14	22	17 ± 7
09/28/10	11/02/10	9	35	21 ± 17	09/28/10	11/02/10	11	37	21 ± 18	09/28/10	11/02/10	10	37	22 ± 20
11/02/10	11/30/10	19	30	24 ± 7	11/02/10	11/30/10	19	29	22 ± 5	11/02/10	11/30/10	20	27	23 ± 6
11/30/10	12/28/10	13	32	23 ± 13	11/30/10	12/28/10	13	35	24 ± 14	11/30/10	12/28/10	17	35	26 ± 15
12/29/09	12/28/10	6	36	19 ± 12	12/29/09	12/28/10	6	37	18 ± 12	12/29/09	12/28/10	8	37	18 ± 12

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

TABLE C-V.3 **CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING 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
BY-01	12/29/09 - 03/30/10	< 5	< 8	< 27	< 3	< 11	< 8	< 12	< 4	< 3	< 1380	< 646
	03/30/10 - 06/29/10	< 5	< 5	< 22	< 4	< 9	< 7	< 13	< 3	< 3	< 803	< 189
	06/29/10 - 09/28/10	< 2	< 5	< 17	< 2	< 6	< 5	< 10	< 2	< 2	< 1780	< 715
	09/28/10 - 12/28/10	< 3	< 4	< 14	< 2	< 6	< 4	< 8	< 3	< 2	< 379	< 100
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BY-04	12/29/09 - 03/30/10	< 3	< 6	< 14	< 2	< 7	< 7	< 11	< 3	< 2	< 716	< 285
	03/30/10 - 06/29/10	< 4	< 6	< 19	< 2	< 11	< 6	< 9	< 4	< 3	< 505	< 115
	06/29/10 - 09/28/10	< 3	< 6	< 22	< 3	< 8	< 8	< 15	< 3	< 3	< 2490	< 841
	09/28/10 - 12/28/10	< 3	< 4	< 17	< 4	< 8	< 7	< 8	< 3	< 3	< 487	< 119
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BY-06	12/29/09 - 03/30/10	< 3	< 5	< 21	< 2	< 8	< 7	< 10	< 2	< 2	< 918	< 224
	03/30/10 - 06/29/10	< 5	< 8	< 18	< 4	< 13	< 8	< 12	< 4	< 4	< 610	< 121
	06/29/10 - 09/28/10	< 3	< 7	< 26	< 3	< 7	< 7	< 11	< 3	< 3	< 2790	< 1350
	09/28/10 - 12/28/10	< 3	< 5	< 19	< 3	< 8	< 5	< 8	< 2	< 2	< 273	< 150
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BY-08	12/29/09 - 03/30/10	< 3	< 8	< 20	< 3	< 7	< 9	< 14	< 3	< 3	< 1030	< 473
	03/30/10 - 06/29/10	< 3	< 5	< 19	< 4	< 8	< 5	< 7	< 3	< 3	< 479	< 254
	06/29/10 - 09/28/10	< 3	< 7	< 14	< 2	< 7	< 7	< 13	< 2	< 2	< 1980	< 751
	09/28/10 - 12/28/10	< 2	< 3	< 11	< 2	< 5	< 4	< 5	< 2	< 1	< 342	< 130
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BY-21	12/29/09 - 03/30/10	< 3	< 5	< 16	< 3	< 7	< 5	< 8	< 2	< 2	< 796	< 408
	03/30/10 - 06/29/10	< 3	< 4	< 16	< 2	< 6	< 5	< 12	< 3	< 3	< 410	< 175
	06/29/10 - 09/28/10	< 3	< 7	< 27	< 3	< 5	< 7	< 11	< 2	< 2	< 1530	< 425
	09/28/10 - 12/28/10	< 3	< 5	< 13	< 3	< 9	< 5	< 9	< 3	< 3	< 460	< 197
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-V.3 **CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING 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
BY-22	12/29/09 - 03/30/10	< 4	< 6	< 20	< 4	< 6	< 9	< 13	< 4	< 4	< 1260	< 312
	03/30/10 - 06/29/10	< 3	< 9	< 19	< 5	< 12	< 7	< 13	< 4	< 4	< 746	< 209
	06/29/10 - 09/28/10	< 3	< 7	< 21	< 3	< 10	< 8	< 17	< 4	< 3	< 2650	< 1070
	09/28/10 - 12/28/10	< 3	< 5	< 20	< 4	< 9	< 5	< 11	< 3	< 3	< 514	< 208
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BY-23	12/29/09 - 03/30/10	< 4	< 8	< 25	< 2	< 12	< 8	< 15	< 4	< 4	< 1510	< 516
	03/30/10 - 06/29/10	< 3	< 6	< 15	< 2	< 9	< 6	< 11	< 4	< 2	< 507	< 176
	06/29/10 - 09/28/10	< 4	< 8	< 22	< 3	< 10	< 8	< 15	< 3	< 3	< 2740	< 904
	09/28/10 - 12/28/10	< 3	< 5	< 13	< 3	< 7	< 7	< 11	< 3	< 3	< 432	< 206
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BY-24	12/29/09 - 03/30/10	< 3	< 7	< 14	< 3	< 9	< 6	< 12	< 4	< 3	< 1110	< 434
	03/30/10 - 06/29/10	< 3	< 9	< 23	< 4	< 12	< 8	< 15	< 4	< 4	< 672	< 270
	06/29/10 - 09/28/10	< 2	< 5	< 19	< 3	< 6	< 7	< 11	< 2	< 2	< 2100	< 814
	09/28/10 - 12/28/10	< 2	< 4	< 11	< 2	< 6	< 4	< 3	< 2	< 2	< 352	< 143
	MEAN	-	-	-	-	-	-	-	-	-	-	-

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

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

COLLECTION	GROUP I				GROUP II			GROUP III
PERIOD	BY-21	BY-22	BY-23	BY-24	BY-01	BY-04	BY-06	BY-08
12/29/09 - 01/05/10	< 69	< 69	< 69	< 69	< 66	< 66	< 66	< 69
01/05/10 - 01/12/10	< 39	< 39	< 39	< 39	< 38	< 38	< 38	< 38
01/12/10 - 01/19/10	< 30	< 30	< 30	< 30	< 57	< 57	< 57	< 55
01/19/10 - 01/26/10	< 53 (1)	< 51	< 52	< 52	< 60	< 60	< 60	< 51
01/26/10 - 02/02/10	< 20	< 20	< 20	< 20	< 17	< 17	< 17	< 18
02/02/10 - 02/08/10	< 7	< 15	< 15	< 15	< 13	< 13	< 13	< 13
02/08/10 - 02/16/10	< 13	< 13	< 13	< 13	< 10	< 10	< 10	< 10
02/16/10 - 02/23/10	< 17	< 7	< 17	< 17	< 16	< 17	< 17	< 17
02/23/10 - 03/02/10	< 54	< 54	< 53	< 53	< 48	< 47	< 48	< 49
03/02/10 - 03/09/10	< 33	< 33	< 33	< 33	< 23	< 23	< 23	< 22
03/09/10 - 03/16/10	< 54	< 54	< 54	< 54	< 31	< 31	< 31	< 31
03/16/10 - 03/22/10	< 47	< 47	< 48	< 20	< 30	< 30	< 30	< 29
03/22/10 - 03/30/10	< 18	< 18	< 18	< 18	< 14	< 14	< 14	< 14
03/30/10 - 04/06/10	< 11	< 14	< 14	< 14	< 6	< 11	< 11	< 11
04/06/10 - 04/13/10	< 13	< 13	< 13	< 9	< 10 (1)	< 10	< 10	< 10
04/13/10 - 04/20/10	< 65	< 45	< 44	< 44	< 65	< 35	< 65	< 64
04/20/10 - 04/27/10	< 40	< 40	< 40	< 41	< 35	< 34	< 34	< 34
04/27/10 - 05/04/10	< 38	< 38	< 37	< 37	< 39	< 39	< 21	< 40
05/04/10 - 05/11/10	< 46	< 46	< 46	< 46	< 37	< 37	< 36	< 35
05/11/10 - 05/18/10	< 21	< 24	< 24	< 24	< 21	< 20	< 20	< 12
05/18/10 - 05/25/10	< 48	< 48	< 48	< 47	< 39	< 38	< 38	< 37
05/25/10 - 06/01/10	< 16	< 42	< 42	< 42	< 38	< 37	< 37 (1)	< 39
06/01/10 - 06/08/10	< 64	< 63	< 65	< 65	< 42	< 44	< 44	< 42
06/08/10 - 06/15/10	< 29	< 17	< 29	< 29	< 32	< 31	< 32	< 33
06/15/10 - 06/22/10	< 26	< 26	< 26	< 26	< 37	< 38	< 38 (1)	< 36
06/22/10 - 06/29/10	< 24	< 24	< 24	< 24	< 22	< 22	< 22	< 22
06/29/10 - 07/06/10	< 15	< 15	< 15	< 15	< 13	< 13	< 13	< 12
07/06/10 - 07/13/10	< 61	< 61	< 26	< 61	< 41	< 42	< 42	< 63
07/13/10 - 07/20/10	< 41	< 40	< 40	< 40	< 29	< 29	< 29	< 28
07/20/10 - 07/27/10	< 44	< 44	< 45	< 19	< 40	< 40	< 41	< 41
07/27/10 - 08/03/10	< 52	< 53	< 53 (1)	< 53 (1)	< 37	< 38	< 38 (1)	< 37
08/03/10 - 08/10/10	< 33	< 48	< 48	< 48	< 18	< 32	< 32	< 33
08/10/10 - 08/17/10	< 43	< 43	< 43	< 44	< 45	< 47	< 46	< 44
08/17/10 - 08/24/10	< 48	< 67	< 67	< 67	< 49	< 26	< 48	< 50
08/24/10 - 08/31/10	< 47	< 47	< 47	< 47	< 32	< 32	< 32	< 31
08/31/10 - 09/07/10	< 36	< 53	< 53	< 53	< 36	< 36	< 20	< 37
09/07/10 - 09/14/10	< 43	< 43	< 43	< 43	< 68	< 68	< 68	< 66
09/14/10 - 09/21/10	< 67	< 67	< 67	< 67	< 44	< 44	< 44	< 25
09/21/10 - 09/28/10	< 49	< 49	< 48	< 49	< 47	< 48	< 47	< 47
09/28/10 - 10/05/10	< 63	< 63	< 63	< 62	< 22	< 21	< 22	< 22
10/05/10 - 10/12/10	< 68	< 68	< 68	< 69	< 40	< 40	< 40	< 38
10/12/10 - 10/19/10	< 55	< 23	< 55	< 55	< 58	< 57	< 58	< 60
10/19/10 - 10/26/10	< 65	< 65	< 64	< 64	< 57	< 57	< 57	< 55
10/26/10 - 11/02/10	< 54	< 54	< 23	< 55	< 58	< 57	< 57	< 56
11/02/10 - 11/09/10	< 18	< 18	< 18	< 18	< 13	< 13	< 13	< 13
11/09/10 - 11/16/10	< 16	< 16	< 16	< 12	< 16	< 15	< 15	< 16
11/16/10 - 11/22/10	< 31	< 31	< 30	< 30	< 26	< 27	< 27	< 26
11/22/10 - 11/30/10	< 40	< 40	< 40	< 41	< 51	< 51	< 51	< 50
11/30/10 - 12/07/10	< 65	< 65	< 64	< 64	< 45	< 46	< 45	< 47
12/07/10 - 12/14/10	< 34	< 35	< 35	< 35	< 35	< 19	< 35	< 33
12/14/10 - 12/21/10	< 55	< 54	< 54	< 54	< 57	< 56	< 58	< 58
12/21/10 - 12/28/10	< 57	< 62	< 62	< 62	< 58	< 57	< 24	< 56
MEAN	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-VII.1 CONCENTRATIONS OF I-131 IN MILK SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2010

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	CONTROL FARM BY-26-1	INDICATOR FARM BY-20-1	INDICATOR FARM BY-30-1
01/05/10	< 0.3	< 0.2	< 0.4
02/02/10	< 0.7	< 0.5	< 0.5
03/02/10	< 0.7	< 0.8	< 0.8
04/06/10	< 0.7	< 0.7	< 0.8
05/04/10	< 0.7	< 0.6	< 0.7
05/18/10	< 0.6	< 0.4	< 0.8
06/01/10	< 0.7	< 0.9	< 0.7
06/15/10	< 0.7	< 0.7	< 0.8
06/29/10	< 0.8	< 0.8	< 0.9
07/13/10	< 0.9	< 0.9	< 0.9
07/27/10	< 0.9	< 0.9	< 0.8
08/10/10	< 0.7	< 0.7	< 0.9
08/24/10	< 0.5	< 0.5	< 0.6
09/07/10	< 0.5	< 0.7	< 0.5
09/21/10	< 0.6	< 0.6	< 0.6
10/05/10	< 0.8	< 0.8	< 0.9
10/19/10	< 0.5	< 0.6	< 0.6
11/02/10	< 0.8	< 0.6	< 0.6
12/07/10	< 1.0	< 0.9	< 0.9
MEAN	-	-	-

TABLE C-VII.2 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING 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
BY-20-1	01/05/10	< 5	< 6	< 14	< 6	< 11	< 5	< 9	< 5	< 4	< 44	< 15
	02/02/10	< 9	< 8	< 18	< 9	< 17	< 9	< 13	< 7	< 9	< 40	< 10
	03/02/10	< 8	< 7	< 16	< 7	< 14	< 7	< 13	< 7	< 7	< 32	< 12
	04/06/10	< 5	< 5	< 12	< 5	< 11	< 6	< 9	< 4	< 6	< 32	< 11
	05/04/10	< 3	< 4	< 9	< 4	< 8	< 4	< 6	< 3	< 3	< 27	< 9
	05/18/10	< 2	< 2	< 7	< 2	< 4	< 3	< 4	< 2	< 2	< 37	< 10
	06/01/10	< 2	< 2	< 6	< 2	< 5	< 2	< 4	< 2	< 2	< 24	< 7
	06/15/10	< 6	< 7	< 15	< 7	< 16	< 7	< 11	< 6	< 6	< 37	< 9
	06/29/10	< 5	< 6	< 11	< 7	< 14	< 5	< 9	< 4	< 6	< 28	< 8
	07/13/10	< 7	< 7	< 15	< 7	< 14	< 6	< 12	< 6	< 8	< 31	< 9
	07/27/10	< 7	< 8	< 15	< 7	< 18	< 8	< 13	< 7	< 8	< 33	< 11
	08/10/10	< 5	< 6	< 12	< 5	< 13	< 6	< 10	< 6	< 6	< 32	< 8
	08/24/10	< 5	< 5	< 11	< 6	< 11	< 5	< 8	< 5	< 5	< 27	< 7
	09/07/10	< 6	< 7	< 14	< 7	< 13	< 9	< 14	< 6	< 6	< 34	< 10
	09/21/10	< 5	< 5	< 14	< 7	< 11	< 6	< 9	< 5	< 6	< 37	< 9
	10/05/10	< 7	< 8	< 17	< 8	< 18	< 8	< 15	< 6	< 8	< 32	< 10
	10/19/10	< 7	< 7	< 17	< 6	< 17	< 6	< 11	< 5	< 7	< 40	< 10
	11/02/10	< 6	< 7	< 16	< 8	< 15	< 7	< 12	< 6	< 7	< 40	< 15
	12/07/10	< 6	< 6	< 18	< 8	< 17	< 7	< 12	< 6	< 7	< 40	< 10
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-VII.2 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING 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
BY-26-1	01/05/10	< 5	< 6	< 15	< 5	< 12	< 6	< 9	< 5	< 5	< 56	< 13
	02/02/10	< 5	< 6	< 12	< 5	< 14	< 7	< 9	< 5	< 6	< 29	< 9
	03/02/10	< 6	< 7	< 16	< 7	< 16	< 7	< 14	< 7	< 7	< 40	< 9
	04/06/10	< 5	< 5	< 12	< 5	< 12	< 5	< 9	< 4	< 5	< 36	< 11
	05/04/10	< 2	< 3	< 7	< 2	< 5	< 3	< 5	< 2	< 2	< 48	< 13
	05/18/10	< 2	< 2	< 6	< 2	< 5	< 3	< 4	< 2	< 2	< 33	< 10
	06/01/10	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 12	< 4
	06/15/10	< 4	< 4	< 9	< 4	< 9	< 4	< 6	< 3	< 4	< 19	< 5
	06/29/10	< 7	< 6	< 16	< 7	< 11	< 7	< 12	< 6	< 6	< 30	< 9
	07/13/10	< 4	< 5	< 10	< 5	< 10	< 4	< 7	< 4	< 4	< 20	< 6
	07/27/10	< 5	< 6	< 15	< 7	< 14	< 7	< 11	< 5	< 5	< 25	< 9
	08/10/10	< 5	< 5	< 14	< 6	< 12	< 5	< 9	< 4	< 5	< 31	< 8
	08/24/10	< 7	< 7	< 13	< 8	< 15	< 8	< 12	< 6	< 6	< 35	< 8
	09/07/10	< 6	< 6	< 12	< 6	< 14	< 6	< 13	< 6	< 5	< 30	< 8
	09/21/10	< 6	< 6	< 16	< 7	< 15	< 8	< 11	< 6	< 7	< 44	< 14
	10/05/10	< 7	< 7	< 16	< 8	< 14	< 7	< 13	< 6	< 7	< 32	< 6
	10/19/10	< 7	< 6	< 17	< 8	< 19	< 8	< 13	< 6	< 7	< 38	< 10
	11/02/10	< 5	< 6	< 14	< 7	< 11	< 6	< 10	< 5	< 5	< 35	< 13
	12/07/10	< 5	< 6	< 15	< 7	< 15	< 7	< 10	< 5	< 7	< 33	< 11
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-VII.2 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING 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
BY-30-1	01/05/10	< 5	< 4	< 11	< 4	< 10	< 5	< 8	< 4	< 4	< 47	< 12
	02/02/10	< 5	< 5	< 11	< 6	< 12	< 5	< 7	< 5	< 5	< 22	< 5
	03/02/10	< 7	< 7	< 14	< 7	< 16	< 6	< 13	< 6	< 8	< 36	< 11
	04/06/10	< 5	< 7	< 14	< 5	< 14	< 7	< 12	< 6	< 7	< 48	< 12
	05/04/10	< 3	< 4	< 10	< 4	< 7	< 4	< 8	< 3	< 4	< 30	< 9
	05/18/10	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 1	< 2	< 30	< 9
	06/01/10	< 2	< 3	< 6	< 2	< 5	< 3	< 5	< 2	< 2	< 28	< 7
	06/15/10	< 7	< 6	< 16	< 7	< 15	< 7	< 12	< 7	< 7	< 38	< 9
	06/29/10	< 7	< 7	< 18	< 9	< 17	< 8	< 13	< 7	< 8	< 41	< 12
	07/13/10	< 4	< 4	< 10	< 4	< 8	< 4	< 6	< 4	< 4	< 18	< 6
	07/27/10	< 8	< 8	< 18	< 7	< 14	< 9	< 10	< 6	< 8	< 28	< 11
	08/10/10	< 5	< 5	< 12	< 5	< 12	< 6	< 8	< 4	< 5	< 24	< 8
	08/24/10	< 7	< 8	< 16	< 9	< 16	< 7	< 14	< 7	< 8	< 38	< 13
	09/07/10	< 4	< 5	< 11	< 5	< 9	< 4	< 7	< 3	< 4	< 20	< 6
	09/21/10	< 6	< 7	< 14	< 7	< 15	< 7	< 11	< 5	< 6	< 40	< 11
	10/05/10	< 6	< 6	< 13	< 9	< 14	< 7	< 11	< 6	< 7	< 32	< 9
	10/19/10	< 5	< 6	< 13	< 5	< 14	< 6	< 11	< 5	< 5	< 35	< 8
	11/02/10	< 5	< 6	< 15	< 7	< 11	< 6	< 11	< 5	< 5	< 35	< 14
	12/07/10	< 7	< 6	< 17	< 9	< 15	< 8	< 11	< 7	< 8	< 40	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-VIII.1 **CONCENTRATIONS OF GAMMA EMITTERS IN VEGETATION SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING 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
BY-CONTROL													
Potatoes	08/24/10	< 6	< 6	< 17	< 7	< 13	< 7	< 11	< 55	< 5	< 6	< 79	< 22
Swiss Chard/Rhubarb	08/24/10	< 5	< 6	< 15	< 6	< 12	< 6	< 11	< 44	< 4	< 4	< 70	< 19
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-QUAD 1													
Beets	08/23/10	< 5	< 6	< 12	< 5	< 9	< 6	< 10	< 50	< 5	< 5	< 66	< 19
Cabbage	08/23/10	< 5	< 6	< 13	< 5	< 10	< 6	< 10	< 53	< 4	< 5	< 75	< 18
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-QUAD 2													
Beet greens	08/23/10	< 6	< 7	< 20	< 8	< 16	< 8	< 13	< 56	< 6	< 6	< 84	< 24
Beets	08/23/10	< 5	< 5	< 13	< 6	< 11	< 6	< 10	< 53	< 4	< 5	< 73	< 16
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-QUAD 3													
Cabbage	08/23/10	< 3	< 4	< 10	< 4	< 8	< 4	< 7	< 37	< 3	< 3	< 48	< 14
Carrots/beets	08/23/10	< 6	< 7	< 17	< 7	< 14	< 7	< 13	< 59	< 5	< 7	< 78	< 23
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-QUAD 4													
Beet greens	08/23/10	< 5	< 6	< 16	< 7	< 13	< 6	< 11	< 53	< 5	< 5	< 74	< 17
Onions/leeks	08/23/10	< 5	< 5	< 11	< 6	< 11	< 6	< 11	< 53	< 5	< 6	< 74	< 19
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

TABLE C-IX.1 QUARTERLY TLD RESULTS FOR BYRON NUCLEAR GENERATING 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
BY-01-1	22 ± 6	24	20	25	19
BY-01-2	21 ± 8	25	17	23	18
BY-04-1	24 ± 9	27	20	29	21
BY-04-2	23 ± 7	25	21	27	20
BY-06-1	21 ± 10	27	17	24	17
BY-06-2	21 ± 6	23	18	24	19
BY-08-1	22 ± 10	25	17	27	18
BY-08-2	22 ± 9	26	17	25	18
BY-21-1	21 ± 7	25	17	23	20
BY-21-2	21 ± 8	25	16	24	19
BY-22-1	25 ± 10	29	19(1)	29	23
BY-22-2	27 ± 9	33	22	27	25
BY-23-1	25 ± 8	27	20	29	22
BY-23-2	24 ± 8	28	21	27	21
BY-24-1	24 ± 7	28	20	26	22
BY-24-2	24 ± 8	28	20	27	21
BY-101-1	20 ± 6	22	17	23	18
BY-101-2	20 ± 8	24	16	23	18
BY-102-1	26 ± 6	26	25	30	23
BY-102-2	26 ± 7	28	22	30	25
BY-103-1	24 ± 8	27	20	27	21
BY-103-2	28 ± 10	33	(1)	29	23
BY-103-3	24 ± 5	27	22	25	22
BY-104-1	25 ± 8	27	21	29	22
BY-104-2	26 ± 6	26	23	30	24
BY-104-3	25 ± 8	28	20	28	22
BY-105-1	25 ± 4	27	23	27	24
BY-105-2	27 ± 6	28	25	30	24
BY-106-1	25 ± 6	26	21	28	23
BY-106-2	25 ± 5	27	23	28	23
BY-107-1	27 ± 8	28	22	31	25
BY-107-2	26 ± 6	28	23	29	24
BY-107-3	23 ± 9	27	19	27	20
BY-108-1	26 ± 7	28	22	30	24
BY-108-2	23 ± 6	24	20	27	21
BY-109-1	25 ± 8	28	20	28	22
BY-109-2	25 ± 7	28	21	27	23
BY-110-1	23 ± 10	27	18	27	19
BY-110-2	23 ± 8	27	20	26	20
BY-111-3	25 ± 8	27	21	30	22
BY-111-4	25 ± 10	28	20	30	21
BY-112-3	24 ± 7	27	21	27	21
BY-112-4	25 ± 7	27	22	28	21
BY-113-1	25 ± 8	27	21	29	22
BY-113-2	22 ± 6	25	21	24	19
BY-114-1	24 ± 11	27	18	30	20
BY-114-2	25 ± 11	24	20	33	22
BY-115-1	26 ± 10	27	22	32	21
BY-115-2	24 ± 5	24	22	27	21
BY-116-1	23 ± 10	27	18	28	19
BY-116-2	22 ± 7	25	18	25	20

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-IX.1 QUARTERLY TLD RESULTS FOR BYRON NUCLEAR GENERATING 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
BY-116-3	23 ± 8	26	19	27	20
BY-201-3	24 ± 10	28	19	28	20
BY-201-4	24 ± 4	26	23	26	22
BY-202-1	26 ± 6	28	24	29	23
BY-202-2	26 ± 10	32	22	28	22
BY-203-1	20 ± 8	23	16	24	17
BY-203-2	23 ± 7	26	19	26	21
BY-204-1	23 ± 9	26	18	27	19
BY-204-2	25 ± 6	27	22	28	23
BY-205-1	25 ± 6	27	21	27	24
BY-205-2	23 ± 7	25	20	27	21
BY-206-1	25 ± 7	28	21	27	23
BY-206-2	25 ± 8	27	21	30	22
BY-207-1	26 ± 5	26	24	29	24
BY-207-2	25 ± 6	28	21	26	24
BY-208-1	26 ± 6	27	22	29	24
BY-208-2	25 ± 6	26	22	29	23
BY-209-1	26 ± 10	27	21	32	23
BY-209-4	25 ± 9	26	21	31	23
BY-210-3	25 ± 7	27	20	28	24
BY-210-4	24 ± 8	27	20	27	21
BY-211-1	25 ± 8	28	21	29	22
BY-211-4	24 ± 7	28	20	26	23
BY-212-1	26 ± 10	30	22	30	21
BY-212-4	27 ± 8	27	25	32	23
BY-213-1	25 ± 7	27	21	29	23
BY-213-4	25 ± 6	27	21	28	24
BY-214-1	24 ± 7	27	20	27	22
BY-214-4	25 ± 9	28	21	30	22
BY-215-1	26 ± 8	28	22	30	23
BY-215-4	26 ± 8	28	22	31	23
BY-216-1	27 ± 5	28	23	29	26
BY-216-2	25 ± 8	28	20	29	23
BY-301-1	22 ± 8	25	19	25	18
BY-302-1	24 ± 7	29	20	24	23
BY-309-1	23 ± 7	25	18	25	23
BY-309-2	24 ± 6	26	21	27	22
BY-309-3	25 ± 9	27	21	30	21
BY-309-4	21 ± 8	22	17	26	19
BY-314-1	21 ± 8	25	17	24	19

TABLE C-IX.2 MEAN QUARTLY TLD RESULTS FOR THE INNER RING, OUTER RING, SPECIAL INTEREST, OTHER AND CONTROL LOCATIONS FOR BYRON NUCLEAR GENERATING STATION, 2010

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

COLLECTION PERIOD	INNER RING ± 2 S.D.	OUTER RING	SPECIAL INTEREST	OTHER	CONTROL
JAN-MAR	26.7 ± 3.6	27.2 ± 3.0	25.6 ± 4.3	26.7 ± 5.0	25.5 ± 1.4
APR-JUN	20.7 ± 4.1	21.1 ± 3.5	19.0 ± 3.5	19.1 ± 3.7	17.0 ± 0.0
JUL-SEP	28.0 ± 4.6	28.4 ± 3.7	25.9 ± 4.2	26.0 ± 4.4	26.0 ± 2.8
OCT-DEC	21.6 ± 3.8	22.4 ± 3.4	20.7 ± 4.1	20.5 ± 4.2	18.0 ± 0.0

TABLE C-IX.3 SUMMARY OF THE AMBIENT DOSIMETRY PROGRAM FOR BYRON NUCLEAR GENERATING STATION, 2010

RESULTS IN UNITS OF MILLI-ROENTGEN/QUARTER

LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 S.D.
INNER RING	143	16	33	24.3 ± 7.5
OUTER RING	128	16	32	24.8 ± 7.0
SPECIAL INTEREST	28	17	30	22.8 ± 7.2
OTHER	56	16	33	23.1 ± 7.9
CONTROL	8	17	27	21.6 ± 8.9

INNER RING STATIONS - BY-101-1, BY-101-2, BY-102-1, BY-102-2, BY-103-1, BY-103-2, BY-103-3, BY-104-1, BY-104-2, BY-104-3, BY-105-1, BY-105-2, BY-106-1, BY-106-2, BY-107-1, BY-107-2, BY-107-3, BY-108-1, BY-108-2, BY-109-1, BY-109-2, BY-110-1, BY-110-2, BY-111-3, BY-111-4, BY-112-3, BY-112-4, BY-113-1, BY-113-2, BY-114-1, BY-114-2, BY-115-1, BY-115-2, BY-116-1, BY-116-2, BY-116-3

OUTER RING STATIONS - BY-201-3, BY-201-4, BY-202-1, BY-202-2, BY-203-1, BY-203-2, BY-204-1, BY-204-2, BY-205-1, BY-205-2, BY-206-1, BY-206-2, BY-207-1, BY-207-2, BY-208-1, BY-208-2, BY-209-1, BY-209-4, BY-210-3, BY-210-4, BY-211-1, BY-211-4, BY-212-1, BY-212-4, BY-213-1, BY-213-4, BY-214-1, BY-214-4, BY-215-1, BY-215-4, BY-216-1, BY-216-2

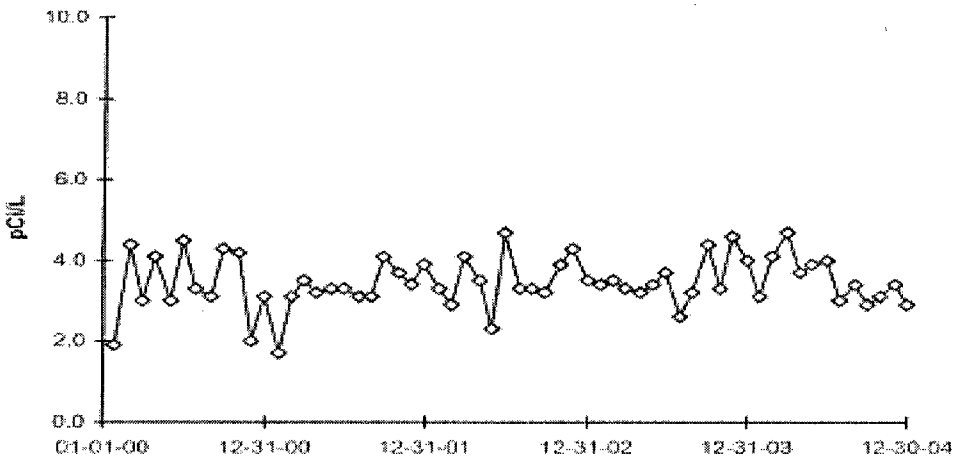
SPECIAL INTEREST STATIONS - BY-301-1, BY-302-1, BY-309-1, BY-309-2, BY-309-3, BY-309-4, BY-314-1

OTHER STATIONS - BY-01-1, BY-01-2, BY-04-1, BY-04-2, BY-06-1, BY-06-2, BY-21-1, BY-21-2, BY-22-1, BY-22-2, BY-23-1, BY-23-2, BY-24-1, BY-24-2

CONTROL STATIONS - BY-08-1, BY-08-2

FIGURE C-1
Surface Water - Gross Beta - Station BY-12 and BY-29 (C) Collected in the Vicinity of BNGS, 2000 - 2004

BY-12 Oregon Pool of Rock River, Downstream



BY-29 (C) Byron, Upstream

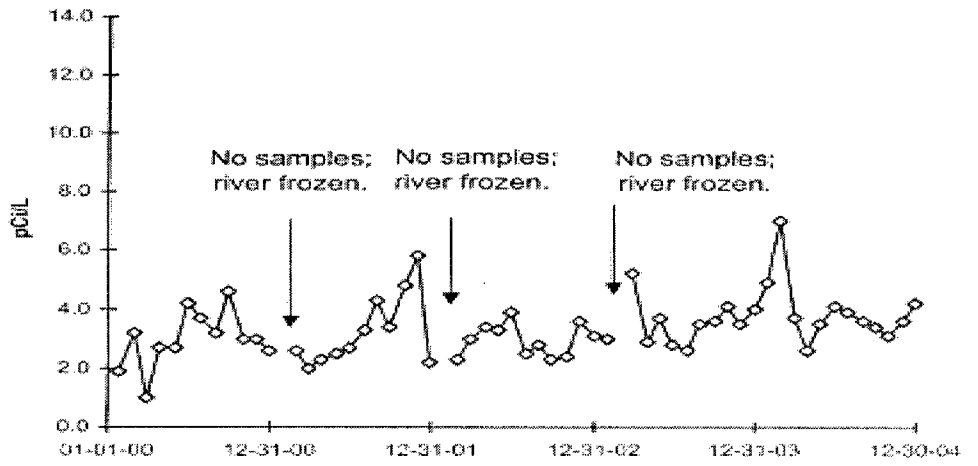
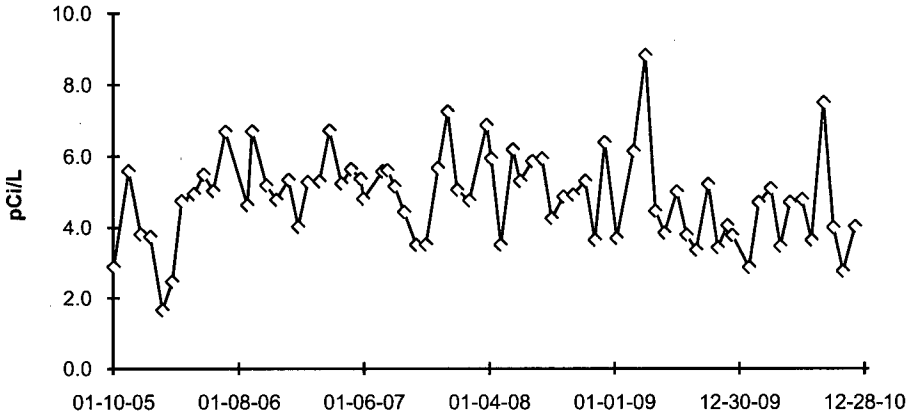
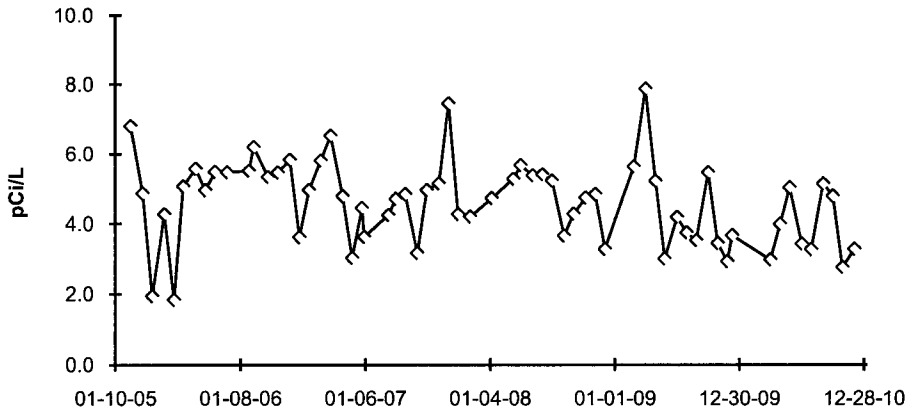


FIGURE C-1 (cont.)
Surface Water - Gross Beta - Station BY-12 and BY-29 (C)
Collected in the Vicinity of BNGS, 2005 - 2010

BY-12 Oregon Pool of Rock River, Downstream



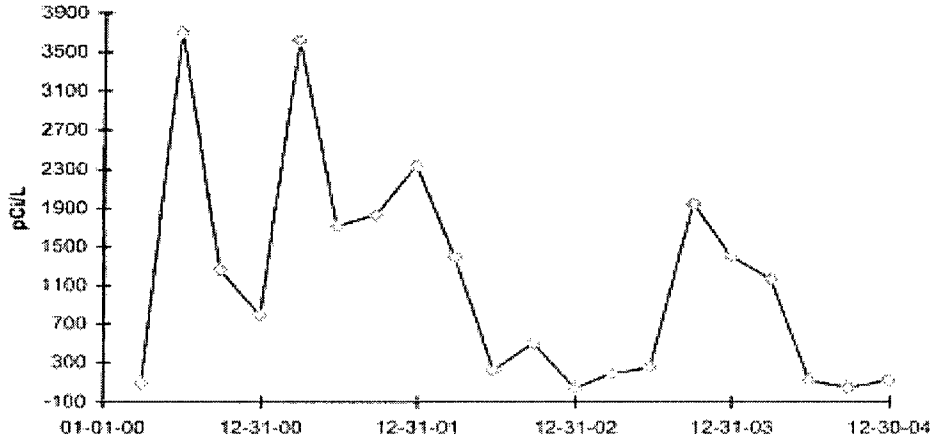
BY-29 (C) Byron, Upstream



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

FIGURE C-2
Surface Water - Tritium - Stations BY-12 and BY-29 (C) Collected in the Vicinity of BNGS, 2000 - 2004

BY-12 Oregon Pool of Rock River, Downstream



BY-29(C) Byron, Upstream

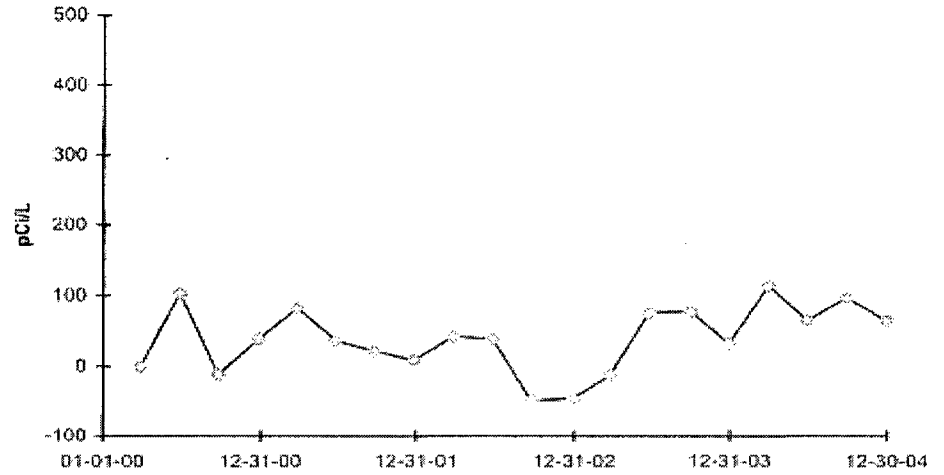
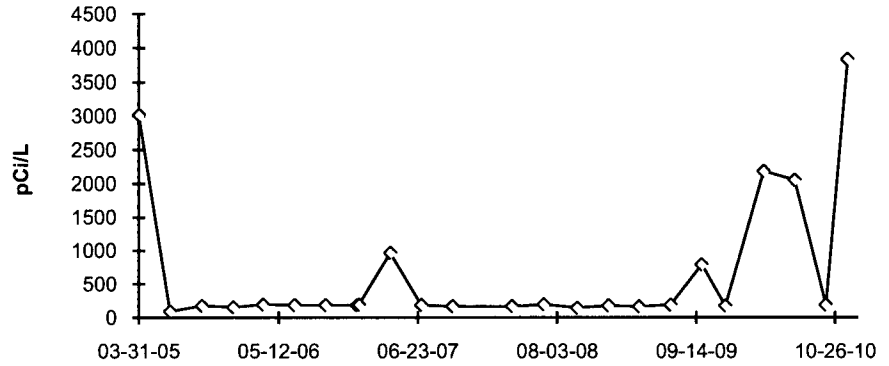
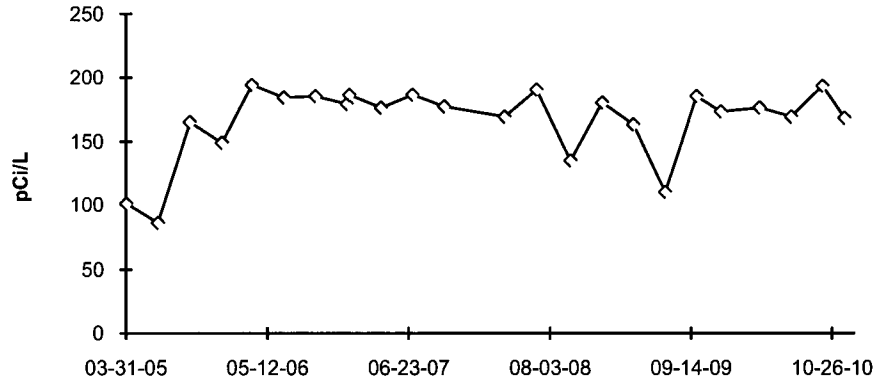


FIGURE C-2 (cont.)
Surface Water - Tritium - Stations BY-12 and BY-29 (C)
Collected in the Vicinity of BNGS, 2005 - 2010

BY-12 Oregon Pool of Rock River, Downstream



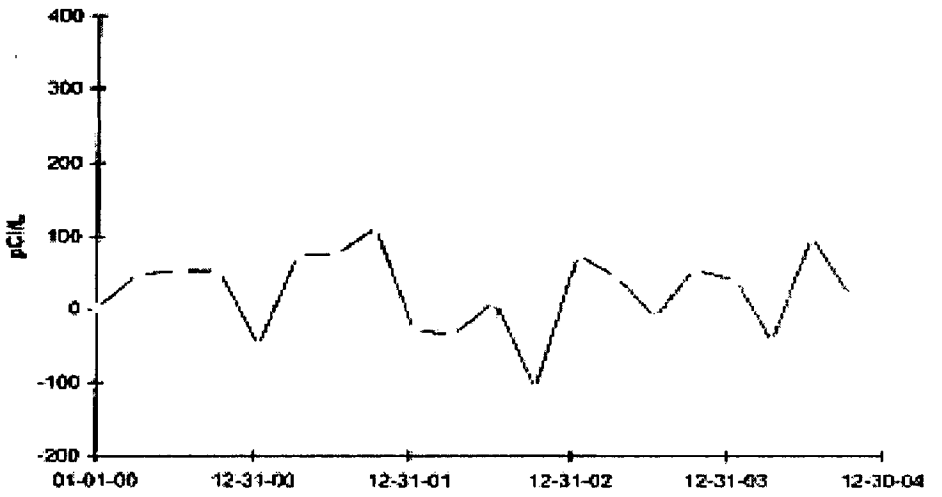
BY-29 (C) Byron, Upstream



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

FIGURE C-3
Ground Water - Tritium - Stations BY-14-1 and BY-18 Collected in the Vicinity of BNGS, 2000 - 2004

BY-14-1 3200 N. German Church Road



BY-18 McCoy Farmstead Well

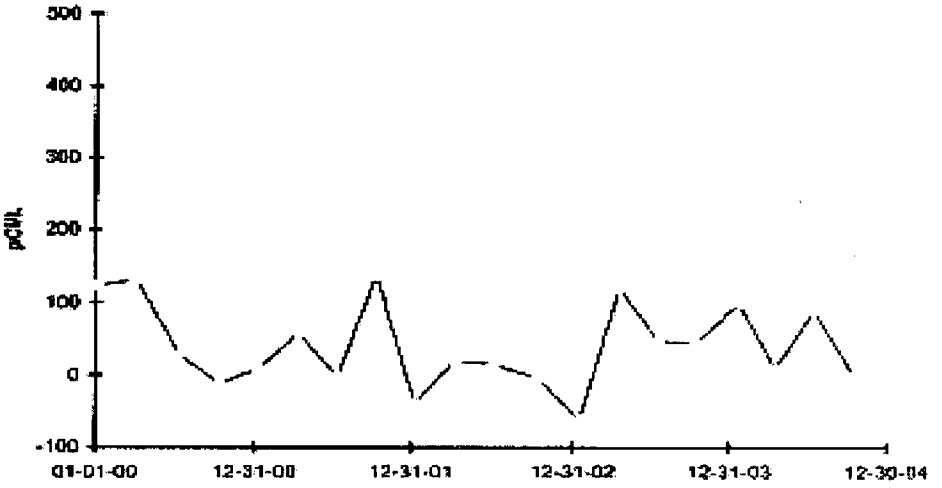
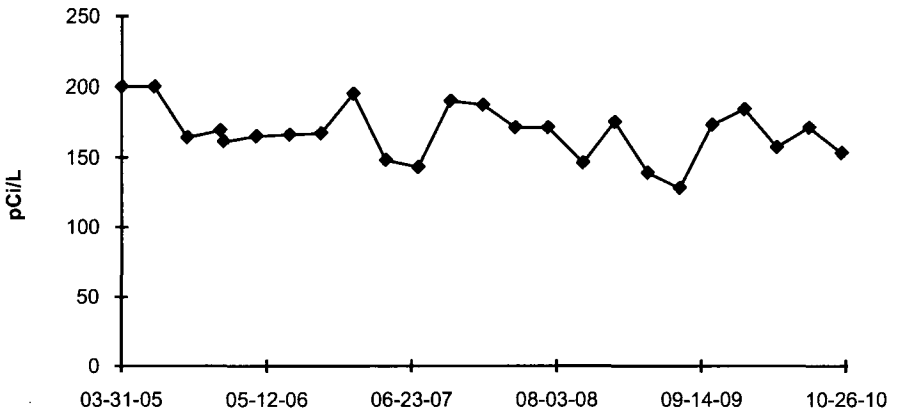
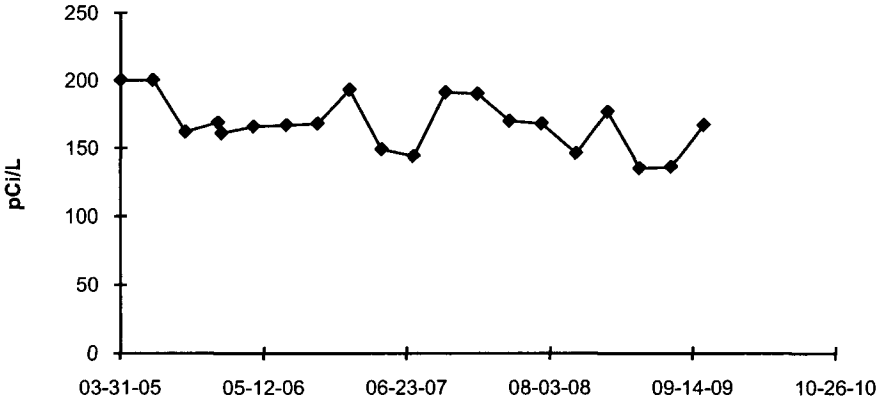


FIGURE C-3 (cont.)
Ground Water - Tritium - Stations BY-14-1 and BY-18
Collected in the Vicinity of BNGS, 2005 - 2010

BY-14-1 3200 N. German Church Road



BY-18 McCoy Farmstead Well



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

FIGURE C-4
Ground Water - Tritium - Stations BY-18-1 Collected in the Vicinity of BNGS, 2010

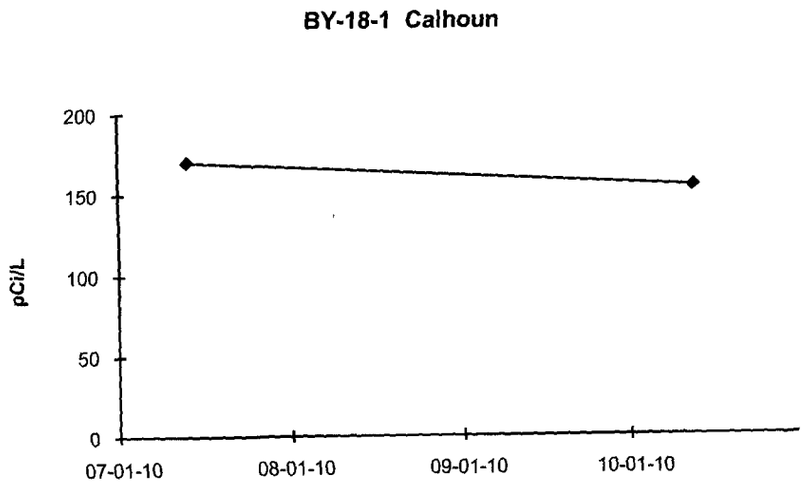


FIGURE C-5
Ground Water - Tritium - Station BY-32
Collected in the Vicinity of BNGS, 2000 - 2004
BY-32 Wolford Well

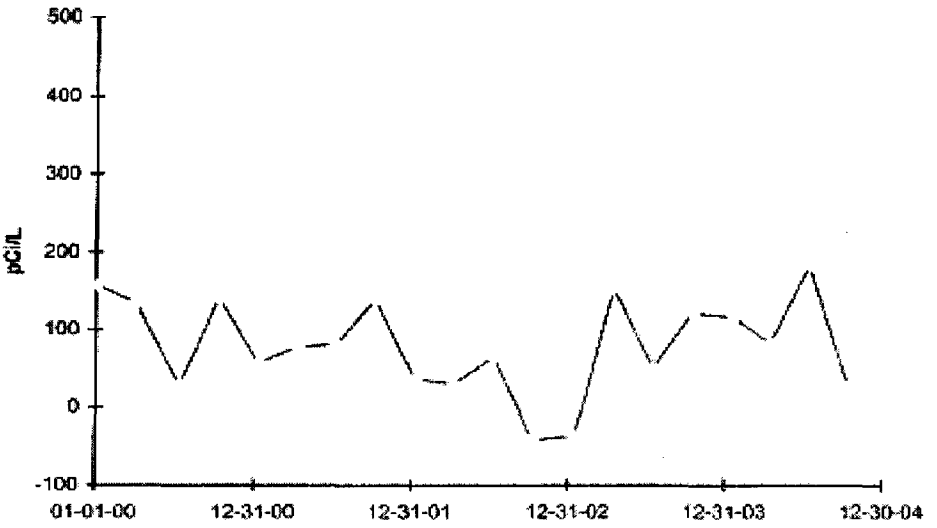
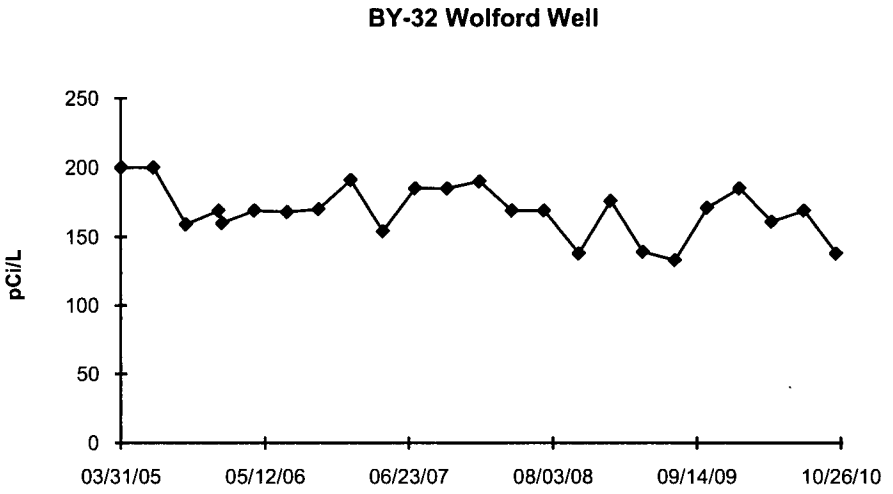


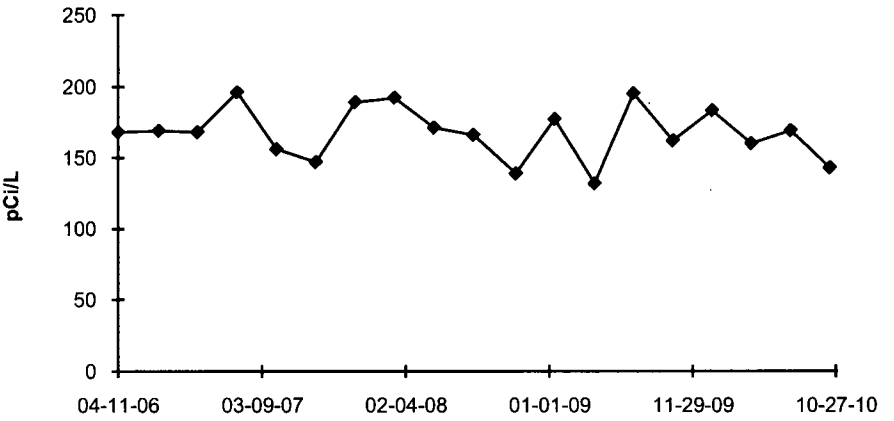
FIGURE C-5 (cont.)
Ground Water - Tritium - Station BY-32
Collected in the Vicinity of BNGS, 2005 - 2010



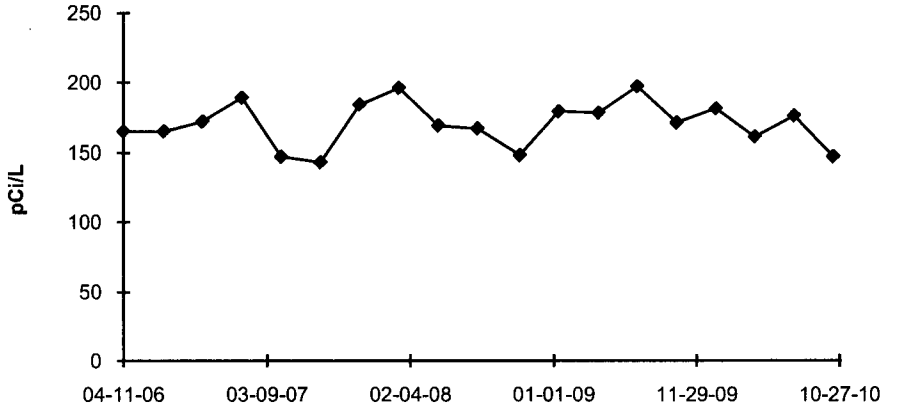
DUE TO VENDOR CHANGE IN 2005, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JUNE 2005

FIGURE C-6
Ground Water - Tritium - Stations BY-35 and BY-36
Collected in the Vicinity of BNGS, 2006 - 2010

BY-35

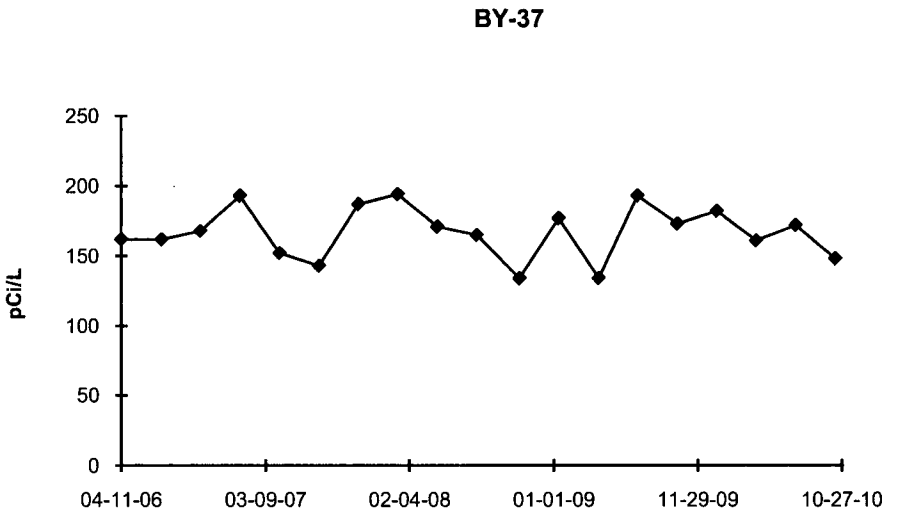


BY-36



NEW STATIONS IN 2006

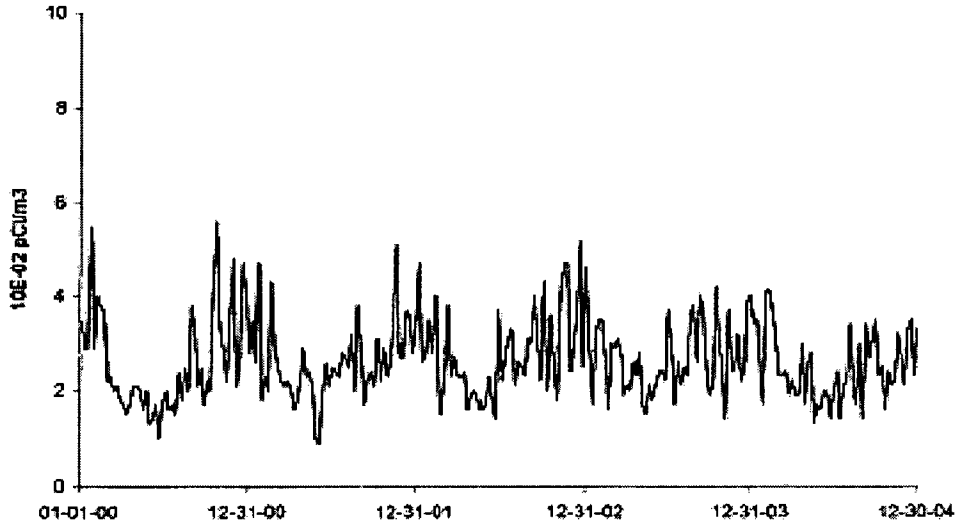
FIGURE C-7
Ground Water - Tritium - Stations BY-37
Collected in the Vicinity of BNGS, 2006 - 2010



NEW STATION IN 2006

FIGURE C-8
Air Particulates - Gross Beta - Stations BY-08 (C) and BY-21 Collected in the Vicinity of BNGS, 2000 - 2004

BY-08 (C) Leaf River



BY-21 Byron Nearsite N

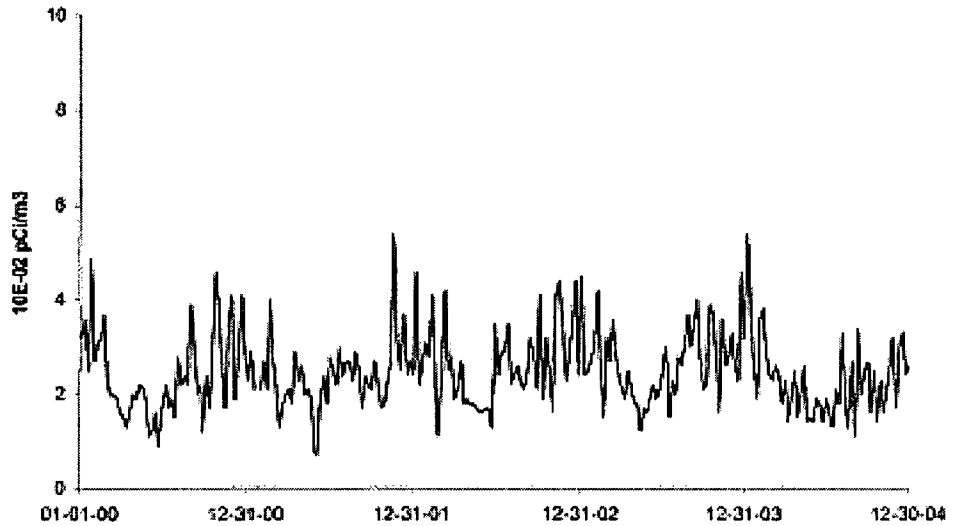
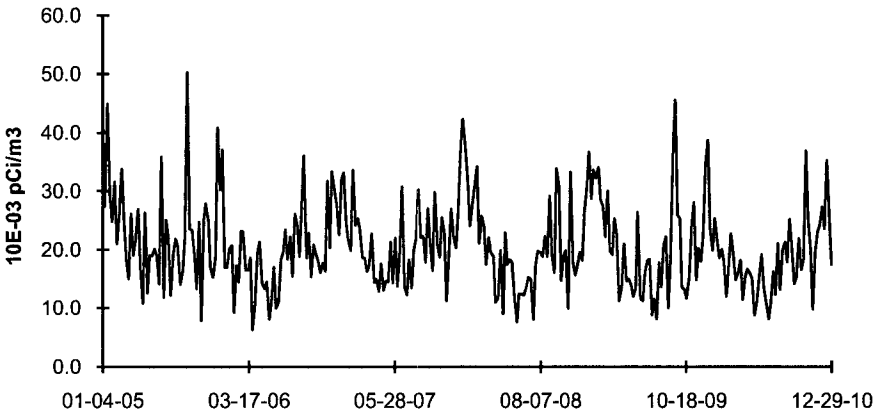
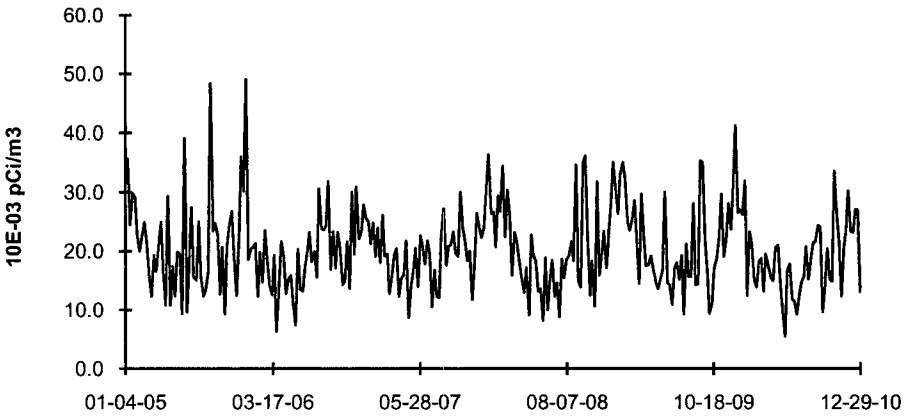


FIGURE C-8 (cont.)
Air Particulates - Gross Beta - Stations BY-08 (C) and BY-21 Collected in the Vicinity of BNGS, 2005 - 2010

BY-08 (C) Leaf River



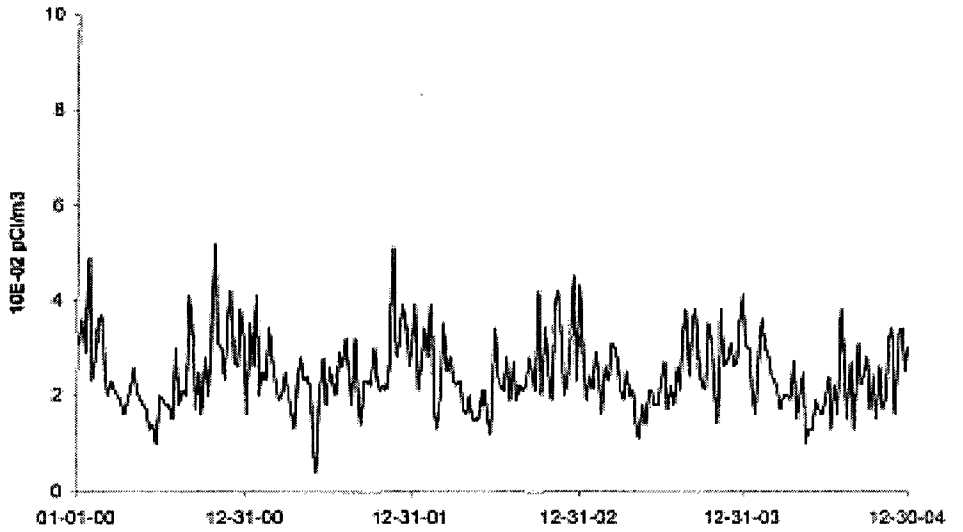
BY-21 Byron Nearsite N



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 BY-22 and BY-23 Collected in the Vicinity of BNGS, 2000 - 2004

BY-22 Byron Nearsite ESE



BY-23 Byron Nearsite S

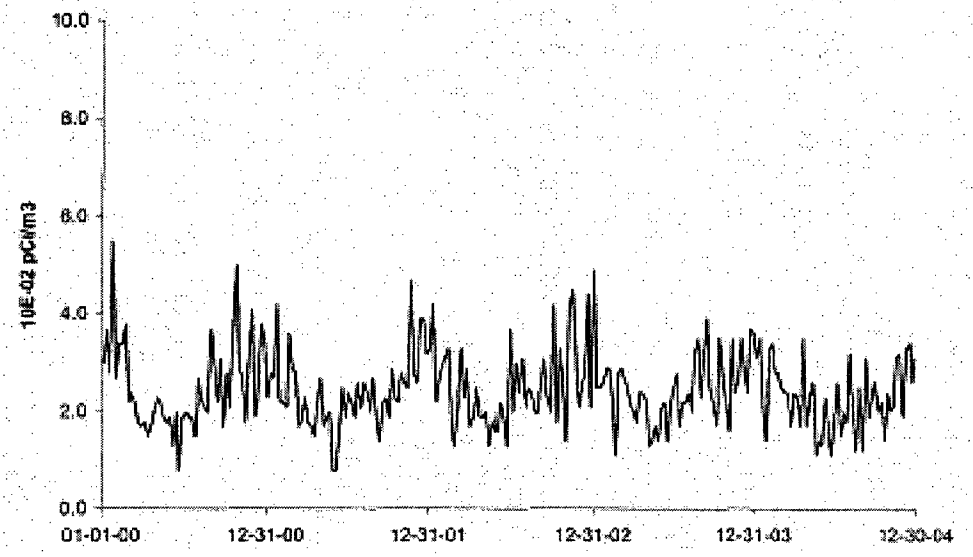
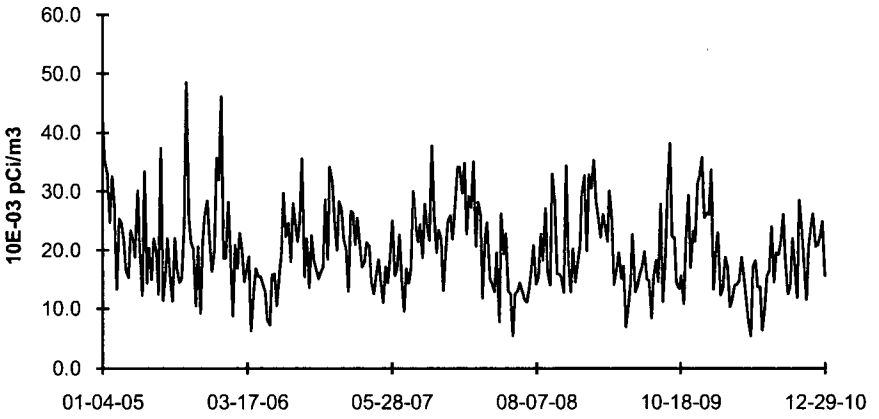
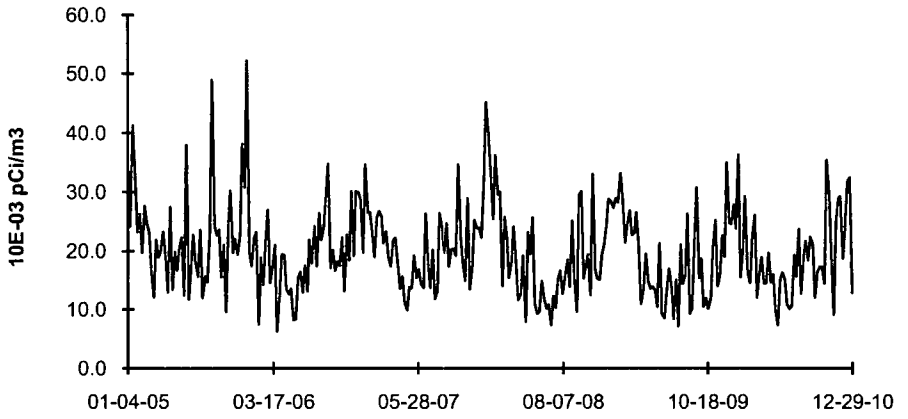


FIGURE C-9 (cont.)
Air Particulates - Gross Beta - Stations BY-22 and BY-23 Collected in the Vicinity of BNGS, 2005 - 2010

BY-22 Byron Nearsite ESE



BY-23 Byron Nearsite S



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

FIGURE C-10
Air Particulates - Gross Beta - Station BY-24
Collected in the Vicinity of BNGS, 2000 - 2004
BY-24 Byron Nearsite SW

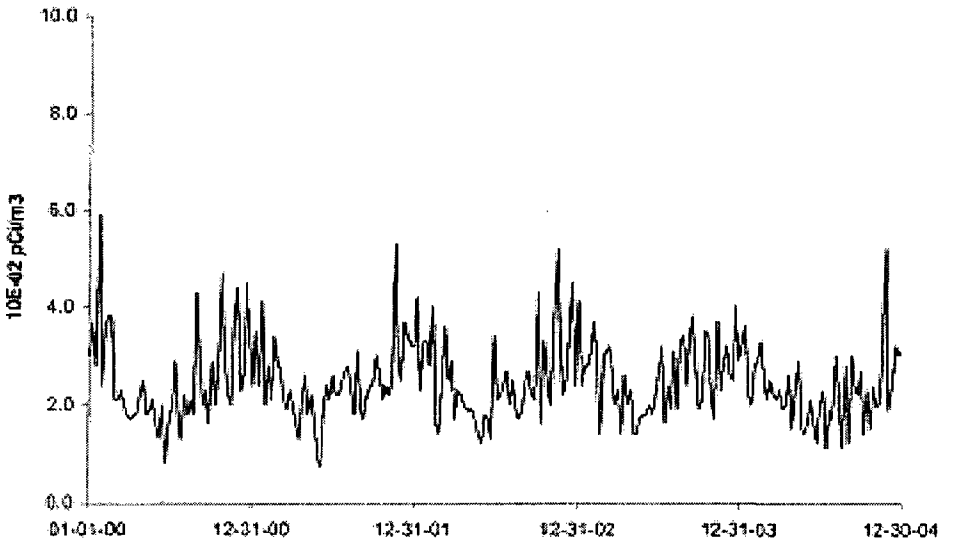
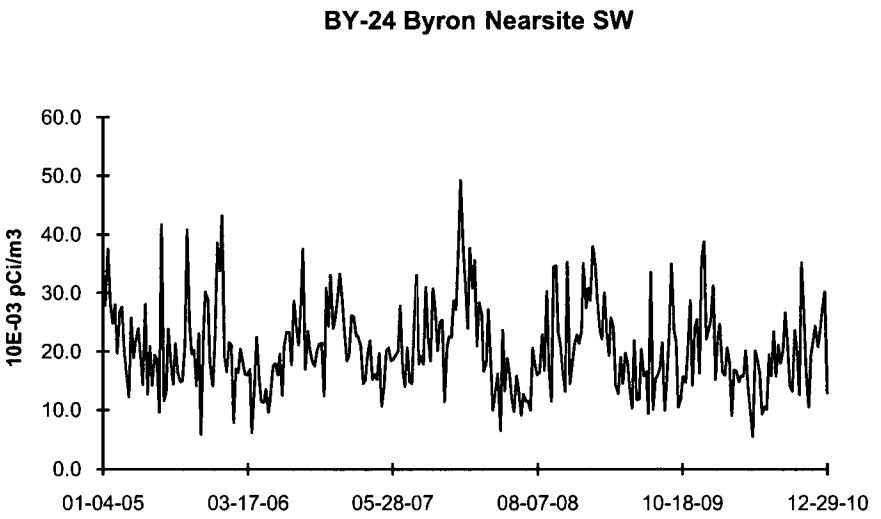


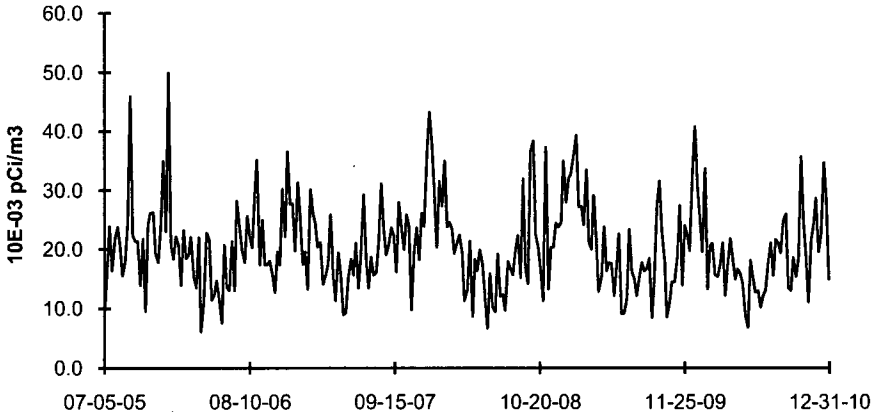
FIGURE C-10 (cont.)
Air Particulates - Gross Beta - Station BY-24
Collected in the Vicinity of BNGS, 2005 - 2010



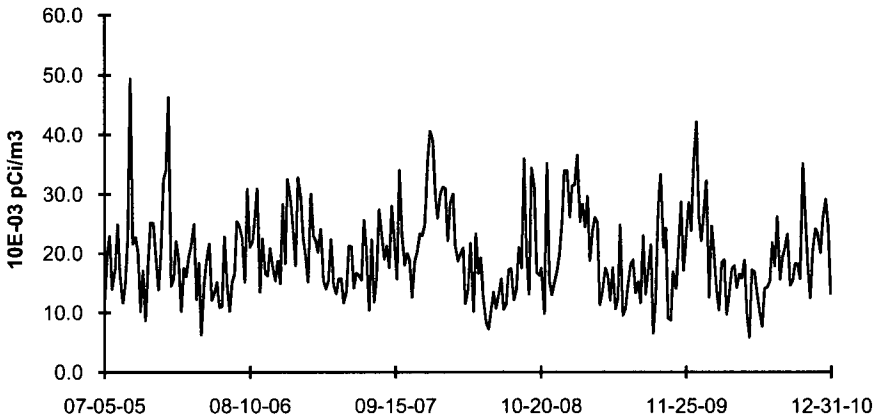
DUE TO VENDOR CHANGE IN 2005, THE REPORTED UNITS CHANGED FROM E-02 PCI/M3 TO E-03 PCI/M3

FIGURE C-11
Air Particulates - Gross Beta - Stations BY-01 and BY-04 Collected in the Vicinity of BNGS, 2005 - 2010

BY-01

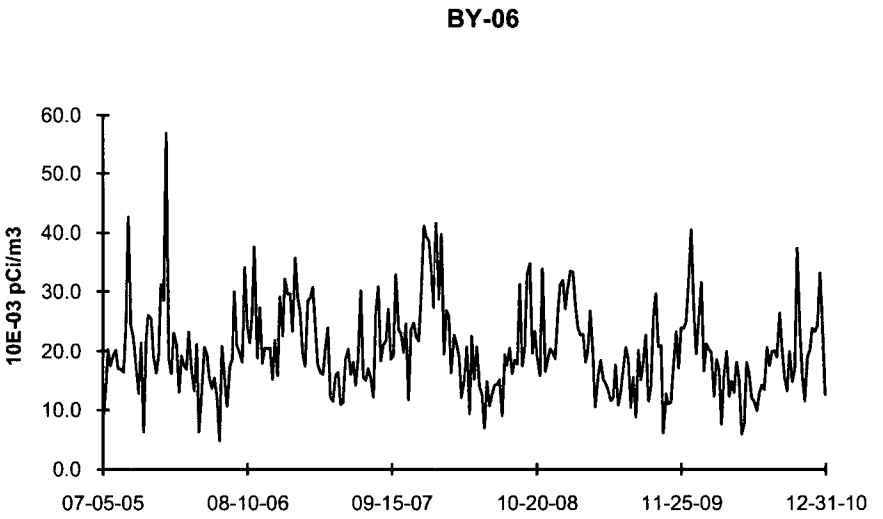


BY-04



AIR PARTICULATE GROSS BETA ANALYSES OF FAR FIELD LOCATIONS STARTED IN JULY 2005

FIGURE C-12
Air Particulates - Gross Beta - Station BY-06
Collected in the Vicinity of BNGS, 2005 - 2010



AIR PARTICULATE GROSS BETA ANALYSES OF FAR FIELD LOCATIONS STARTED IN JULY 2005

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APPENDIX D

INTER-LABORATORY COMPARISON PROGRAM

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	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	0.854	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.

APPENDIX E

EFFLUENT REPORT

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Table of Contents (cont.)

SUMMARY

Calculations based on gaseous and liquid effluents and meteorological data indicate that public dose due to radioactive material attributable to Byron Station during the period does not exceed regulatory or Offsite Dose Calculation Manual (ODCM) limits.

The Total Effective Dose Equivalent (TEDE) due to licensed activities at Byron Station calculated for the maximum exposed individual for the period is 2.60E-01 mrem. The annual limit on TEDE is 100 mrem.

The assessment of radiation doses to the public is performed in accordance with the ODCM. The results of these analyses confirm that the station is operating in compliance with 10CFR50 Appendix I, 10CFR20 and 40CFR190.

There were no additional operational controls implemented which affected the areas of radiological effluents in 2010.

There were no measurements which exceeded the reporting levels, including any which would not have been attributable to station effluents.

The results of the current radiological environmental monitoring program are approximately the same as those found during the pre-operational studies conducted at Byron Station.

INTRODUCTION

Liquid effluents from Byron Station are released to the Rock River in controlled batches after radioassay of each batch. Gaseous effluents are released to the atmosphere and are calculated on the basis of analyses of weekly grab samples and grab samples of batch releases prior to the release of noble gases as well as continuously collected composite samples of iodine and particulate radioactivity sampled during the course of the year. The results of effluent analyses are summarized on a monthly basis. Airborne concentrations of noble gases, I-131, and particulate radioactivity in offsite areas are calculated using isotopic composition of effluents and meteorological data. C-14 concentration in offsite areas is calculated based on industry-approved methodology for estimation of the amount released and meteorological data.

Environmental monitoring is conducted by sampling at indicator and control (background) locations in the vicinity of Byron Station to measure changes in radiation or radioactivity levels that may be attributable to station operation. If significant changes attributable to Byron Station are measured, these changes are correlated with effluent releases. An environmental monitoring program is conducted which also includes all potential pathways at the site. Gaseous pathways include ground plane (direct), inhalation, vegetation, meat, and milk. Liquid pathways include potable water and freshwater fish. The critical pathway for 2010 gaseous dose was vegetation. The critical pathway for 2010 liquid dose was freshwater fish.

1.0 EFFLUENTS

1.1 Gaseous Effluents to the Atmosphere

Measured concentrations and isotopic composition of noble gases, radioiodine, tritium and particulate radioactivity released to the atmosphere during the year, are listed in Table 1.1-1.

A total of 7.88E-01 curies of fission and activation gases were released with a maximum average quarterly release rate of 3.92E-02 µCi/sec.

A total of 6.98E-06 curies of 1-131 were released during the year with a maximum average quarterly release rate of 8.88E-07 µCi/sec.

A total of 7.90E-05 curies were released as airborne particulate matter with a maximum average quarterly release rate of 3.97E-06 µCi/sec.

Gross alpha-emitting radionuclides were below detectable limits.

A total of 8.91E+00 curies of other (C-14, Br-82) radioisotopes were released with a maximum average quarterly release rate of 2.82E-01 µCi/sec.

A total of 6.16E+01 curies of tritium were released with a maximum average quarterly release rate of 2.39E+00 µCi/sec.

1.2 Liquids Released to Rock River

A total of 2.82E+10 liters of radioactive liquid wastes containing 1.10E-02 curies of fission and activation products were discharged with a maximum quarterly average concentration of 1.23E-09 µCi/ml.

A total of 2.04E+03 curies of tritium were discharged with a maximum quarterly average concentration of 2.30E-04 uCi/ml.

A total of 1.07E-03 curies of dissolved and entrained gases were discharged with a maximum quarterly average concentration of 3.24E-10 uCi/ml.

Quarterly release totals of principal radionuclides in liquid effluents are given in Table 1.2-1.

2.0 SOLID RADIOACTIVE WASTE

Solid radioactive wastes were shipped by truck. For detail, refer to Byron Station 2010 Annual Radiological Effluent Release Report.

3.0 DOSE TO MAN

3.1 Gaseous Effluent Pathways

Table 3.1-1 summarizes the doses resulting from releases of airborne radioactivity via the different exposure pathways.

3.1.1 Noble Gases

3.1.1.1 Gamma Dose Rates

Offsite Gamma air and whole body dose rates are shown in Table 3.1-1 and were calculated based on measured release rates, isotopic composition of the noble gases, and average meteorological data for the period. Dose rates based on concurrent meteorological data are shown in Table 3.4-1. Based on measured effluents and average meteorological data, the maximum gamma air dose was 4.58E-05 mrad, and 9.07E-06 mrad based on concurrent meteorological data. (Table 3.4-1).

3.1.1.2 Beta Air and Skin Dose Rates

The range of beta particles in air is relatively small (on the order of a few meters or less); consequently, plumes of gaseous effluents may be considered "semi-infinite" for purpose of calculating the dose from beta radiation incident on the skin. However, the actual dose to sensitive skin tissues is difficult to calculate due to the effect of the beta particle energies, thickness of inert skin and clothing covering sensitive tissues. For purposes of this report the skin is taken to have a thickness of 7.0 mg/cm^2 and an occupancy factor of 1.0 is used. The skin dose based on concurrent meteorological data for the year was 1.13E-05 mrem.

The maximum offsite beta air dose for the year based on measured effluents and average meteorological data was 1.37E-05 mrad. The beta air dose based on concurrent meteorological data was 1.13E-05 mrad.

3.1.2 Radioactive Iodine & Particulate

The human thyroid exhibits a significant capacity to concentrate ingested or inhaled iodine. I-131 released during routine operation of the station may be made available to man resulting in a dose to the thyroid. C-14 is also included in this category. C-14 exhibits a capacity to concentrate in bone. C-14 is released in gaseous form and is absorbed into vegetation through photosynthesis. The principal pathways of interest for C-14 are the consumption of vegetation by humans and milk from which animals have ingested C-14 through the consumption of vegetation. With the addition of C-14 to plant effluents, human dose in this category is primarily driven by the release of C-14 from the plant.

The hypothetical dose to the maximum exposed individual living near the station via ingestion of milk and vegetation was calculated. The source of milk and vegetation was assumed to be at the nearest site boundary with the cows pastured and vegetation grown from May through October. The maximum dose from radioactive iodine and particulate (including C-14) to any organ was 7.26E-01 mrem (child/bone) based on measured effluents and average meteorological data and 7.53E-01 mrem based on concurrent meteorological data. The maximum dose from radioactive iodine and particulate (including C-14) to the whole body was 1.49E-01 mrem (child) based on measured effluents and average meteorological data and 1.55E-01 mrem based on concurrent meteorological data.

3.13 Gaseous Total Dose

The maximum total dose from gaseous releases to any organ was 7.26E-01 mrem (child/bone). The maximum total dose from gaseous releases to the whole body was 1.49E-01 mrem (child).

3.2 Liquid Effluent Pathways

The principal pathways through the aquatic environment for potential doses to man from liquid waste are ingestion of potable water and eating aquatic foods. Liquid dose was calculated based on the ingestion of potable water and sport fish. It should be noted, however, there were no communities within 10 km downstream of the plant using the Rock River for drinking water. NRC-developed equations were used to calculate the doses to the whole body, bone, liver, thyroid, kidney, lung, lower GI tract, and skin. Specific parameters for use in the equations are given in the Exelon Offsite Dose Calculation Manual (ODCM). The maximum dose from liquid releases to any organ was 1.59E-01 mrem (adult/gilli). The maximum dose from liquid releases to the whole body was 1.32E-01 mrem (adult).

3.3 Total Dose

The maximum total dose to any organ via both gaseous and liquid effluents to any organ is 7.29E-01 mrem (child/bone). The maximum dose to the whole body via both gaseous and liquid effluents is 2.60E-01 mrem (child).

3.4 Assessment of Dose to Member of Public

Byron Station did not exceed any of the dose limits as shown below based on concurrent or historical meteorological data.

- The RETS limits on dose or dose commitment to a member of the public due to radioactive materials in liquid effluents from each reactor is 1.5 mrem to the whole body or 5 mrem to any organ during any calendar quarter and 3 mrem to the whole body or 10 mrem to any organ during a calendar year.

- The RETS limits on air dose in noble gases released in gaseous effluents to a member of the public from each reactor is 5 mrad for gamma radiation or 10 mrad for beta radiation during any calendar quarter and 10 mrad for gamma radiation or 20 mrad for beta radiation during a calendar year.

- The RETS limits on dose to a member of the public due to radioactive iodine & particulate with half-lives greater than eight days in gaseous effluents released from each reactor is 7.5 mrem to any organ during any calendar quarter and 15 mrem during a calendar year.

- The 10CFR20 limit on Total Effective Dose Equivalent to individual members of the public is 100 mrem during a calendar year.

4.0 SITE METEOROLOGY

Detailed records of the site meteorological measurements taken during each calendar quarter of the year are maintained by the meteorological vendor, retained on site, and are available upon request. The data are presented as cumulative joint frequency distributions of the wind direction for the 250' level and wind speed class by atmospheric stability class determined from the temperature difference between the 250' and 30' levels. Data recovery for all measurements on the meteorological tower was 99.9% during 2010.

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APPENDIX E-1

DATA TABLES AND FIGURES

Table 1.1-1

Byron Station Unit One 2010

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 1A
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES
Unit 1

REPORT FOR 2010	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Gases						
1. Total Release	Ci	4.34E-02	8.69E-02	1.61E-01	9.18E-02	3.83E-01
2. Avg. Release Rate	uCi/sec	5.58E-03	1.10E-02	2.03E-02	1.15E-02	1.21E-02
Iodine-131						
1. Total Release	Ci	(1)	4.42E-06	(1)	(1)	4.42E-06
2. Avg. Release Rate	uCi/sec	(1)	5.62E-07	(1)	(1)	1.40E-07
Particulates Half Life >= 8 days						
1. Total Release	Ci	1.22E-05	7.60E-06	2.85E-06	(1)	2.26E-05
2. Avg. Release Rate	uCi/sec	1.57E-06	9.67E-07	3.59E-07	(1)	7.18E-07
Others						
1. Total Release	Ci	1.10E+00	1.11E+00	1.12E+00	1.12E+00	4.46E+00
2. Avg. Release Rate	uCi/sec	1.41E-01	1.41E-01	1.41E-01	1.41E-01	1.41E-01
Tritium						
1. Total Release	Ci	7.21E+00	7.36E+00	1.77E+00	3.59E+00	1.99E+01
2. Avg. Release Rate	uCi/sec	9.27E-01	9.36E-01	2.23E-01	4.52E-01	6.32E-01
Gross Alpha						
1. Total Release	Ci	(1)	(1)	(1)	(1)	(1)
2. Avg. Release Rate	uCi/sec	(1)	(1)	(1)	(1)	(1)

(1) Less than minimum detectable activity which meets the lower limit of detection (LLD) requirements of TRM Section 3.11

Table 1.1-1 (cont.)

Byron Station Unit Two 2010

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 1A
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES
Unit 2

REPORT FOR 2010	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Gases						
1. Total Release	Ci	8.26E-02	8.79E-02	1.50E-01	8.49E-02	4.05E-01
2. Avg. Release Rate	uCi/sec	1.06E-02	1.12E-02	1.89E-02	1.07E-02	1.28E-02
Iodine-131						
1. Total Release	Ci	(1)	2.56E-06	(1)	(1)	2.56E-06
2. Avg. Release Rate	uCi/sec	(1)	3.26E-07	(1)	(1)	8.13E-08
Particulates Half Life >= 8 days						
1. Total Release	Ci	4.67E-07	1.00E-05	1.43E-05	3.16E-05	5.64E-05
2. Avg. Release Rate	uCi/sec	6.01E-08	1.28E-06	1.80E-06	3.97E-06	1.79E-06
Others						
1. Total Release	Ci	1.10E+00	1.11E+00	1.12E+00	1.12E+00	4.45E+00
2. Avg. Release Rate	uCi/sec	1.41E-01	1.41E-01	1.41E-01	1.41E-01	1.41E-01
Tritium						
1. Total Release	Ci	1.13E+01	5.84E+00	1.17E+01	1.29E+01	4.17E+01
2. Avg. Release Rate	uCi/sec	1.46E+00	7.43E-01	1.47E+00	1.62E+00	1.32E+00
Gross Alpha						
1. Total Release	Ci	(1)	(1)	(1)	(1)	(1)
2. Avg. Release Rate	uCi/sec	(1)	(1)	(1)	(1)	(1)

(1) Less than minimum detectable activity which meets the lower limit of detection (LLD) requirements of TRM Section 3.11

Table 1.2-1

Byron Station Unit One 2010

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 2A
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES
Unit 1

REPORT FOR 2010	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Products						
1. Total Release	Ci	2.05E-03	1.67E-03	1.32E-03	4.77E-04	5.52E-03
2. Avg. Diluted Conc.	uCi/ml	6.13E-10	5.38E-10	3.41E-10	1.25E-10	3.91E-10
Tritium						
1. Total Release	Ci	3.83E+02	3.25E+02	5.88E+01	2.52E+02	1.02E+03
2. Avg. Diluted Conc.	uCi/ml	1.15E-04	1.04E-04	1.52E-05	6.61E-05	7.20E-05
Dissolved and Entrained Gases						
1. Total Release	Ci	1.50E-05	5.05E-04	(1)	1.32E-05	5.33E-04
2. Avg. Diluted Conc.	uCi/ml	4.50E-12	1.62E-10	(1)	3.46E-12	3.77E-11
Gross Alpha Radioactivity						
1. Total Release	Ci	(1)	(1)	(1)	(1)	(1)
2. Avg. Diluted Conc.	uCi/ml	(1)	(1)	(1)	(1)	(1)
Volume of liquid waste	liters	3.34E+09	3.11E+09	3.87E+09	3.80E+09	1.41E+10

(1) Less than minimum detectable activity which meets the lower limit of detection (LLD) requirements of TRM Section 3.11

Table 1.2-1 (cont.)

Byron Station Unit Two 2010

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 2A
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES
Unit 2

REPORT FOR 2010	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Products						
1. Total Release	Ci	2.05E-03	1.67E-03	1.32E-03	4.77E-04	5.52E-03
2. Avg. Diluted Conc.	uCi/ml	6.13E-10	5.38E-10	3.41E-10	1.25E-10	3.91E-10
Tritium						
1. Total Release	Ci	3.83E+02	3.25E+02	5.88E+01	2.52E+02	1.02E+03
2. Avg. Diluted Conc.	uCi/ml	1.15E-04	1.04E-04	1.52E-05	6.61E-05	7.20E-05
Dissolved and Entrained Gases						
1. Total Release	Ci	1.50E-05	5.05E-04	(1)	1.32E-05	5.33E-04
2. Avg. Diluted Conc.	uCi/ml	4.50E-12	1.62E-10	(1)	3.46E-12	3.77E-11
Gross Alpha Radioactivity						
1. Total Release	Ci	(1)	(1)	(1)	(1)	(1)
2. Avg. Diluted Conc.	uCi/ml	(1)	(1)	(1)	(1)	(1)
Volume of liquid waste	liters	3.34E+09	3.11E+09	3.87E+09	3.80E+09	1.41E+10

(1) Less than minimum detectable activity which meets the lower limit of detection (LLD) requirements of TRM Section 3.11

Table 3.1-1

Byron Station 2010

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

GASEOUS DOSE SUMMARY

Unit 1 & 2

Report for: 2010
Unit Range - From: 1 To: 2

=== I&P DOSE LIMIT ANALYSIS ========== ANNUAL 2010 =========

Annual - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
2010 - Admin. Any Organ	CHILD	BONE	7.26E-01	1.13E+01	6.45E+00
2010 - Admin. Total Body	CHILD	TBODY	1.49E-01	1.05E+01	1.42E+00
2010 - T.Spc. Any Organ	CHILD	BONE	7.26E-01	1.50E+01	4.84E+00

Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA
Critical Pathway: Vegetation
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	0.00E+00
C-14	1.00E+02
CO-58	1.90E-06
CO-60	3.15E-02
I-131	1.70E-04
I-132	4.08E-06

2010 - T.Spc. Total Body	CHILD	TBODY	1.49E-01	1.50E+01	9.92E-01

Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA
Critical Pathway: Vegetation
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	2.34E+00
C-14	9.75E+01
CO-58	1.62E-05
CO-60	1.63E-01
I-131	4.79E-04
I-132	1.95E-05

Table 3.1-1 (cont.)

Byron Station 2010

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

GASEOUS DOSE SUMMARY

Unit 1 & 2

Report for: 2010
Unit Range - From: 1 To: 2

=== NG DOSE LIMIT ANALYSIS ========== ANNUAL 2010 =========

Annual - Limit	Dose (mrad)	Limit (mrad)	Max % of Limit
2010 - Admin. Gamma	4.58E-05	7.50E+00	6.10E-04
2010 - Admin. Beta	1.37E-05	1.50E+01	9.10E-05
2010 - T.Spc. Gamma	4.58E-05	1.00E+01	4.58E-04

Receptor: 4 Composite Crit. Receptor - NG
Distance: 0.00 (meters) Compass Point: NA

Nuclide	Percentage
AR-41	6.47E+01
KR-85M	6.46E-02
XE-135	6.65E-01
XE-133M	1.67E-01
KR-88	1.93E+00
XE-133	3.24E+01

2010 - T.Spc. Beta	1.37E-05	2.00E+01	6.83E-05

Receptor: 4 Composite Crit. Receptor - NG
Distance: 0.00 (meters) Compass Point: NA

Nuclide	Percentage
AR-41	1.88E+01
KR-85M	8.52E-02
XE-135	7.02E-01
XE-133M	6.23E-01
KR-88	3.07E-01
XE-133	7.95E+01

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

Unit 1 & 2

Report for: 2010
Unit Range - From: 1 To: 2

=== MAXIMUM DOSE ANALYSIS ================================== ANNUAL 2010 =========

Dose Type	Age Group	Organ	Dose (mrem)
Any Organ	CHILD	BONE	7.29E-01

Liquid Receptor: 0 Liquid Receptor
Gaseous Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA

Liquid Dose: 2.97E-03 % of Total: 4.07E-01
Critical Pathway: Fresh Water Fish - Sport (FFSP)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	0.00E+00
CR-51	0.00E+00
MN-54	0.00E+00
FE-59	1.44E+00
CO-58	0.00E+00
CO-60	0.00E+00
NB-95	1.22E-01
TE-125M	9.82E+01
TE-132	2.91E-01
I-132	1.12E-03

Gaseous Dose: 7.26E-01 % of Total: 9.95E+01
Critical Pathway: Vegetation (VEG)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	0.00E+00
C-14	1.00E+02
CO-58	1.90E-06
CO-60	3.15E-02
I-131	1.70E-04
I-132	4.08E-06

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

Unit 1 & 2

=== MAXIMUM DOSE ANALYSIS ========== ANNUAL 2010 =========

Dose Type	Age Group	Organ	Dose (mrem)
Total Body	CHILD	TBODY	2.60E-01

Liquid Receptor: 0 Liquid Receptor
Gaseous Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA

Liquid Dose: 1.11E-01 % of Total: 4.27E+01
Critical Pathway: Fresh Water Fish - Sport (FFSP)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	9.87E+01
CR-51	1.24E-04
MN-54	1.07E-02
FE-59	3.09E-02
CO-58	5.68E-01
CO-60	3.54E-01
NB-95	9.04E-04
TE-125M	3.50E-01
TE-132	4.16E-03
I-132	2.53E-05

Gaseous Dose: 1.49E-01 % of Total: 5.72E+01
Critical Pathway: Vegetation (VEG)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	2.34E+00
C-14	9.75E+01
CO-58	1.62E-05
CO-60	1.63E-01
I-131	4.79E-04
I-132	1.95E-05

Table 3.2-1

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

LIQUID DOSE SUMMARY

Unit 1 & 2

2010

Report for: 2010
Unit Range - From: 1 To: 2
Liquid Receptor

=== PERIOD DOSE BY ORGAN AND AGE GROUP (mrem) ========== ANNUAL 2010 =========

Agegrp	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	TB
ADULT	2.13E-03	1.32E-01	1.32E-01	1.40E-01	1.31E-01	1.59E-01	0.00E+00	1.32E-01
TEEN	2.31E-03	9.97E-02	9.89E-02	9.84E-02	9.83E-02	1.18E-01	0.00E+00	9.96E-02
CHILD	2.97E-03	1.11E-01	1.10E-01	1.10E-01	1.10E-01	1.17E-01	0.00E+00	1.11E-01
INFANT	7.51E-06	4.86E-02	4.86E-02	4.86E-02	4.86E-02	4.86E-02	0.00E+00	4.86E-02

=== SITE DOSE LIMIT ANALYSIS ========== ANNUAL 2010 =========

Annual - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
2010 - Admin. Any Organ	ADULT	GILLI	1.59E-01	7.50E+00	2.11E+00
2010 - Admin. Total Body	ADULT	TBODY	1.32E-01	2.25E+00	5.88E+00
2010 - T.Spc. Any Organ	ADULT	GILLI	1.59E-01	1.00E+01	1.59E+00

Critical Pathway: Fresh Water Fish - Sport (FFSP)

Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	8.26E+01
CR-51	1.98E-02
MN-54	1.12E-01
FE-59	1.68E-01
CO-58	3.29E+00
CO-60	1.93E+00
NB-95	6.46E+00
TE-125M	5.25E+00
TE-132	1.26E-01
I-132	7.95E-06

2010 - T.Spc. Total Body	ADULT	TBODY	1.32E-01	3.00E+00	4.41E+00

Critical Pathway: Fresh Water Fish - Sport (FFSP)

Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	9.90E+01
CR-51	9.44E-05
MN-54	8.33E-03
FE-59	2.31E-02
CO-58	4.37E-01
CO-60	2.72E-01
NB-95	6.86E-04
TE-125M	2.11E-01
TE-132	3.01E-03
I-132	1.77E-05

Table 3.4-1

The following are the maximum annual calculated cumulative offsite doses resulting from Byron airborne releases in 2010 based on concurrent meteorological data:

Unit 1:

Dose	*Maximum Value*	*Sector Affected*
gamma air [1]	4.080×10^{-6} mrad	South-Southeast
beta air [2]	5.300×10^{-6} mrad	South-Southeast
whole body [3]	7.675×10^{-2} mrem	South-Southeast
skin [4]	5.230×10^{-6} mrem	South-Southeast
organ [5] (child-bone)	3.767×10^{-1} mrem	South-Southeast

Unit 1 Compliance Status

10 CFR 50 Appendix I	**Yearly Objective**		**% of Appendix I**
gamma air	10.0	mrad	0.00
beta air	20.0	mrad	0.00
whole body	5.0	mrem	1.54
skin	15.0	mrem	0.00
organ	15.0	mrem	2.51

Unit 2:

Dose	*Maximum Value*	*Sector Affected*
gamma air [1]	4.870×10^{-6} mrad	South-Southeast
beta air [2]	5.730×10^{-6} mrad	South-Southeast
whole body [3]	7.812×10^{-2} mrem	South-Southeast
skin [4]	6.090×10^{-6} mrem	South-Southeast
organ [5] (child-bone)	3.762×10^{-1} mrem	South-Southeast

Unit 2 Compliance Status

10 CFR 50 Appendix I	**Yearly Objective**		**% of Appendix I**
gamma air	10.0	mrad	0.00
beta air	20.0	mrad	0.00
whole body	5.0	mrem	1.56
skin	15.0	mrem	0.00
organ	15.0	mrem	2.51

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(1) Gamma Air Dose - GASPAR II, NUREG-0597
(2) Beta Air Dose - GASPAR II, NUREG-0597
(3) Whole Body Dose - GASPAR II, NUREG-0597
(4) Skin Dose - GASPAR II, NUREG-0597
(5) Inhalation and Food Pathways Dose - GASPAR II, NUREG-0597

Data recovery: 99.9%

APPENDIX F

METEOROLOGICAL DATA

Byron Generating Station

Period of Record: January - March 2010
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	1	1	0	0	0	0	2
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	1	1	0	0	0	0	2

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: January - March 2010
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	1	0	0	0	1
ENE	0	0	1	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	1	0	0	0	1
SE	0	0	1	0	0	0	1
SSE	0	0	0	0	0	0	0
S	0	0	1	1	0	0	2
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	1	0	0	1
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	5	2	0	0	7

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: January - March 2010
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	3	0	0	3
NNE	0	0	2	2	0	0	4
NE	0	0	0	2	0	0	2
ENE	0	0	0	0	0	0	0
E	0	0	1	0	0	0	1
ESE	0	1	1	0	0	0	2
SE	0	0	3	1	0	0	4
SSE	0	0	0	0	0	0	0
S	0	0	0	2	0	0	2
SSW	0	0	0	4	0	0	4
SW	0	0	0	0	0	0	0
WSW	0	0	0	1	0	0	1
W	0	0	3	2	1	0	6
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	1	1	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	0	2	11	17	1	0	31

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: January - March 2010
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	7	35	81	20	0	0	143
NNE	5	15	32	68	0	0	120
NE	6	20	16	29	0	0	71
ENE	5	11	14	14	0	0	44
E	7	26	27	1	0	0	61
ESE	2	14	26	8	0	0	50
SE	7	22	25	1	0	0	55
SSE	5	10	10	0	0	0	25
S	5	8	5	12	1	0	31
SSW	4	15	12	7	0	0	38
SW	3	11	19	2	0	0	35
WSW	5	14	27	17	0	0	63
W	11	27	46	37	11	0	132
WNW	8	60	48	7	0	0	123
NW	6	47	70	4	0	0	127
NNW	4	24	61	23	0	0	112
Variable	0	0	0	0	0	0	0
Total	90	359	519	250	12	0	1230

Hours of calm in this stability class: 2
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: January - March 2010
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	18	13	3	0	0	37
NNE	5	13	7	0	0	0	25
NE	4	12	6	0	0	0	22
ENE	3	11	16	1	0	0	31
E	6	14	5	0	0	0	25
ESE	4	14	15	15	0	0	48
SE	3	14	14	9	0	0	40
SSE	3	8	11	11	0	0	33
S	3	6	2	5	0	0	16
SSW	4	2	22	2	0	0	30
SW	3	10	8	0	0	0	21
WSW	8	14	7	0	0	0	29
W	7	28	1	0	0	0	36
WNW	16	57	3	0	0	0	76
NW	8	46	14	0	0	0	68
NNW	4	31	19	0	0	0	54
Variable	0	0	0	0	0	0	0
Total	84	298	163	46	0	0	591

Hours of calm in this stability class: 2
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: January - March 2010
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	4	4	1	0	0	0	9
NNE	2	1	5	0	0	0	8
NE	2	0	0	0	0	0	2
ENE	4	2	3	0	0	0	9
E	5	5	2	0	0	0	12
ESE	1	3	9	2	0	0	15
SE	1	6	3	1	0	0	11
SSE	1	8	9	0	0	0	18
S	0	1	0	0	0	0	1
SSW	3	0	0	0	0	0	3
SW	5	8	0	0	0	0	13
WSW	8	3	0	0	0	0	11
W	20	21	0	0	0	0	41
WNW	19	7	0	0	0	0	26
NW	10	12	0	0	0	0	22
NNW	5	6	0	0	0	0	11
Variable	0	0	0	0	0	0	0
Total	90	87	32	3	0	0	212

Hours of calm in this stability class: 2
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: January - March 2010
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	0	0	0	0	0	1
NNE	1	0	0	0	0	0	1
NE	1	0	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	4	7	1	0	0	0	12
ESE	0	2	2	0	0	0	4
SE	0	0	0	0	0	0	0
SSE	1	0	0	0	0	0	1
S	1	0	0	0	0	0	1
SSW	1	1	0	0	0	0	2
SW	1	1	0	0	0	0	2
WSW	0	0	0	0	0	0	0
W	9	2	0	0	0	0	11
WNW	11	0	0	0	0	0	11
NW	20	3	0	0	0	0	23
NNW	4	2	0	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	55	18	3	0	0	0	76

Hours of calm in this stability class: 2
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: January - March 2010
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	1	0	0	0	0	1
NNW	0	1	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	2	0	0	0	0	2

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: January - March 2010
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	1	0	0	1
ENE	0	0	0	1	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	2	0	0	0	2
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	1	1	0	2
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	1	0	1
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	2	3	2	0	7

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: January - March 2010
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	0	3	0	0	4
NNE	0	0	0	1	1	0	2
NE	0	0	0	4	0	0	4
ENE	0	0	0	0	0	0	0
E	0	0	1	0	0	0	1
ESE	0	0	2	0	0	0	2
SE	0	0	0	4	0	0	4
SSE	0	0	0	0	0	0	0
S	0	0	0	0	2	0	2
SSW	0	0	0	2	2	0	4
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	1	0	1
W	0	0	3	0	3	0	6
WNW	0	0	0	0	0	0	0
NW	0	0	0	1	0	0	1
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	1	6	15	9	0	31

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: January - March 2010
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	6	13	42	53	18	1	133
NNE	2	12	19	43	56	4	136
NE	4	9	13	25	28	5	84
ENE	3	10	12	9	11	0	45
E	3	15	18	21	9	0	66
ESE	2	3	12	23	5	2	47
SE	6	4	20	18	1	2	51
SSE	4	12	12	5	1	0	34
S	4	4	3	3	7	1	22
SSW	1	11	6	14	8	0	40
SW	4	6	8	11	3	0	32
WSW	4	6	18	28	7	0	63
W	3	11	34	33	23	8	112
WNW	6	29	49	25	4	0	113
NW	3	37	45	57	2	0	144
NNW	1	10	33	50	15	0	109
Variable	0	0	0	0	0	0	0
Total	56	192	344	418	198	23	1231

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: January - March 2010
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	10	12	26	4	0	52
NNE	1	6	7	16	3	0	33
NE	0	2	16	9	2	0	29
ENE	1	6	12	8	0	0	27
E	2	10	11	14	2	1	40
ESE	0	2	6	13	6	6	33
SE	0	3	9	5	11	14	42
SSE	1	8	5	10	8	8	40
S	0	1	3	0	3	9	16
SSW	5	1	5	14	11	0	36
SW	0	2	2	7	3	0	14
WSW	1	2	6	20	0	0	29
W	2	1	9	2	0	0	14
WNW	3	8	24	8	0	0	43
NW	1	7	29	39	0	0	76
NNW	0	3	17	48	0	0	68
Variable	0	1	0	0	0	0	1
Total	17	73	173	239	53	38	593

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: January - March 2010
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	13	10	0	0	25
NNE	0	1	1	4	0	0	6
NE	0	0	3	1	5	0	9
ENE	0	2	1	2	1	0	6
E	0	6	4	2	2	0	14
ESE	1	1	1	0	0	4	7
SE	0	2	3	1	5	4	15
SSE	0	0	4	5	8	0	17
S	0	1	0	5	5	0	11
SSW	1	0	1	1	0	0	3
SW	0	1	0	1	0	0	2
WSW	0	0	4	1	0	0	5
W	1	0	5	2	0	0	8
WNW	0	1	8	10	0	0	19
NW	0	2	20	21	0	0	43
NNW	0	1	13	10	0	0	24
Variable	0	0	0	0	0	0	0
Total	3	20	81	76	26	8	214

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: January - March 2010
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	9	6	0	0	16
NNE	0	0	1	0	0	0	1
NE	1	2	0	0	0	0	3
ENE	0	5	0	0	0	0	5
E	0	1	0	3	1	0	5
ESE	0	1	2	0	1	2	6
SE	0	1	1	1	0	2	5
SSE	0	0	1	1	0	0	2
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	1	0	3	0	0	4
WNW	0	2	2	3	0	0	7
NW	0	0	6	9	0	0	15
NNW	0	1	4	4	0	0	9
Variable	0	0	0	0	0	0	0
Total	1	15	26	30	2	4	78

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: April - June 2010
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	1	0	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	1	0	0	1
W	0	0	0	3	4	0	7
WNW	0	0	0	0	0	0	0
NW	0	0	0	2	0	0	2
NNW	0	0	0	3	0	0	3
Variable	0	0	0	0	0	0	0
Total	0	0	2	9	4	0	15

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 7

Byron Generating Station

Period of Record: April - June 2010
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	6	0	0	0	6
NNE	0	0	3	0	0	0	3
NE	0	0	2	0	0	0	2
ENE	0	0	1	0	0	0	1
E	0	0	8	0	0	0	8
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	1	0	0	1
WSW	0	0	0	2	0	0	2
W	0	0	1	1	0	0	2
WNW	0	0	0	0	0	0	0
NW	0	1	0	3	0	0	4
NNW	0	0	0	2	0	0	2
Variable	0	0	0	0	0	0	0
Total	0	1	21	9	0	0	31

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 7

Byron Generating Station

Period of Record: April - June 2010
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	5	1	0	0	7
NNE	0	0	4	1	0	0	5
NE	0	1	2	1	0	0	4
ENE	0	1	1	0	0	0	2
E	0	3	2	0	0	0	5
ESE	0	2	2	0	0	0	4
SE	0	0	0	3	0	0	3
SSE	0	0	1	0	0	0	1
S	0	2	1	0	1	0	4
SSW	0	0	5	3	0	0	8
SW	0	0	4	5	0	0	9
WSW	0	0	1	2	0	0	3
W	0	0	2	4	0	1	7
WNW	0	0	4	1	0	0	5
NW	0	0	1	0	0	0	1
NNW	0	3	0	1	0	0	4
Variable	0	0	0	0	0	0	0
Total	0	13	35	22	1	1	72

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 7

Byron Generating Station

Period of Record: April - June 2010
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	5	30	19	9	0	0	63
NNE	1	21	28	13	0	0	63
NE	3	14	19	9	1	0	46
ENE	3	16	25	14	0	0	58
E	10	51	41	3	0	0	105
ESE	6	20	20	15	8	0	69
SE	0	16	7	16	2	0	41
SSE	0	21	29	5	3	0	58
S	3	12	32	14	14	2	77
SSW	0	13	35	14	8	1	71
SW	0	14	30	10	3	0	57
WSW	3	11	12	5	6	0	37
W	3	13	14	21	6	0	57
WNW	5	17	34	30	1	0	87
NW	1	15	25	14	0	0	55
NNW	5	33	19	5	0	0	62
Variable	0	1	0	0	0	0	1
Total	48	318	389	197	52	3	1007

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 7

Byron Generating Station

Period of Record: April - June 2010
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	27	15	0	0	0	45
NNE	6	13	8	1	0	0	28
NE	7	13	11	3	0	0	34
ENE	4	12	20	0	0	0	36
E	8	43	24	1	0	0	76
ESE	4	15	30	9	9	0	67
SE	2	18	23	5	0	0	48
SSE	4	18	35	12	0	0	69
S	3	25	22	19	1	0	70
SSW	1	16	29	11	0	0	57
SW	3	22	14	1	0	0	40
WSW	10	13	10	4	0	0	37
W	5	22	14	0	1	0	42
WNW	11	19	15	1	0	0	46
NW	9	19	7	0	0	0	35
NNW	6	17	3	1	0	0	27
Variable	1	1	0	0	0	0	2
Total	87	313	280	68	11	0	759

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 7

Byron Generating Station

Period of Record: April - June 2010
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	8	3	0	0	0	0	11
NNE	5	3	0	0	0	0	8
NE	1	1	1	0	0	0	3
ENE	3	0	1	0	0	0	4
E	7	21	0	0	0	0	28
ESE	7	9	5	0	0	0	21
SE	4	11	2	0	0	0	17
SSE	8	11	15	2	0	0	36
S	8	14	11	1	0	0	34
SSW	6	7	2	0	0	0	15
SW	3	9	0	0	0	0	12
WSW	2	1	0	0	0	0	3
W	4	4	0	0	0	0	8
WNW	9	1	1	0	0	0	11
NW	8	2	0	0	0	0	10
NNW	7	3	0	0	0	0	10
Variable	0	0	0	0	0	0	0
Total	90	100	38	3	0	0	231

Hours of calm in this stability class: 3
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 7

Byron Generating Station

Period of Record: April - June 2010
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	0	0	0	0	0	2
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	1	1	0	0	0	0	2
ESE	1	6	0	0	0	0	7
SE	0	1	1	0	0	0	2
SSE	0	1	1	0	0	0	2
S	3	2	0	0	0	0	5
SSW	5	0	0	0	0	0	5
SW	3	0	0	0	0	0	3
WSW	1	0	0	0	0	0	1
W	2	0	0	0	0	0	2
WNW	7	0	0	0	0	0	7
NW	12	0	0	0	0	0	12
NNW	6	0	0	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	43	11	2	0	0	0	56

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 7

Byron Generating Station

Period of Record: April - June 2010
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	1	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	1	0	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	1	0	1
W	0	0	0	2	2	3	7
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	2	0	2
NNW	0	0	0	0	3	0	3
Variable	0	0	0	0	0	0	0
Total	0	0	1	3	8	3	15

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 7

Byron Generating Station

Period of Record: April - June 2010
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	3	2	0	0	5
NNE	0	0	3	2	0	0	5
NE	0	0	0	1	0	0	1
ENE	0	0	0	1	0	0	1
E	0	0	3	5	0	0	8
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	1	0	1
WSW	0	0	0	1	1	0	2
W	0	0	0	1	1	0	2
WNW	0	0	0	0	0	0	0
NW	0	0	1	0	3	0	4
NNW	0	0	0	0	2	0	2
Variable	0	0	0	0	0	0	0
Total	0	0	10	13	8	0	31

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 7

Byron Generating Station

Period of Record: April - June 2010
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	4	1	1	0	6
NNE	0	1	4	2	0	0	7
NE	0	0	1	2	0	0	3
ENE	0	2	0	1	0	0	3
E	0	1	2	1	0	0	4
ESE	0	1	2	1	0	0	4
SE	0	0	0	0	3	0	3
SSE	0	0	0	1	0	0	1
S	0	0	0	1	1	1	3
SSW	0	2	5	1	1	0	9
SW	0	0	1	4	3	1	9
WSW	0	0	1	0	2	0	3
W	0	0	2	1	3	1	7
WNW	0	0	4	0	1	0	5
NW	0	0	1	0	0	0	1
NNW	0	1	2	0	1	0	4
Variable	0	0	0	0	0	0	0
Total	0	8	29	16	16	3	72

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 7

Byron Generating Station

Period of Record: April - June 2010
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	18	25	4	5	1	56
NNE	2	12	16	23	15	0	68
NE	2	8	14	18	8	2	52
ENE	1	8	10	15	11	0	45
E	4	34	37	35	6	1	117
ESE	1	15	12	16	13	13	70
SE	1	12	6	6	11	7	43
SSE	2	10	19	19	4	4	58
S	0	6	12	24	9	18	69
SSW	0	8	29	19	9	12	77
SW	1	8	19	21	9	5	63
WSW	1	3	8	8	4	6	30
W	1	8	15	10	15	7	56
WNW	1	10	18	22	23	3	77
NW	3	10	7	29	13	3	65
NNW	3	20	12	17	6	2	60
Variable	0	1	0	0	0	0	1
Total	26	191	259	286	161	84	1007

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 7

Byron Generating Station

Period of Record: April - June 2010
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	6	10	19	0	0	36
NNE	1	2	17	19	0	0	39
NE	0	2	8	9	4	0	23
ENE	2	8	12	20	1	0	43
E	2	4	28	29	9	0	72
ESE	1	5	8	24	28	15	81
SE	0	3	6	15	16	4	44
SSE	3	2	4	8	27	8	52
S	0	2	7	22	21	12	64
SSW	0	1	13	36	17	4	71
SW	0	3	5	23	7	0	38
WSW	0	2	19	15	7	0	43
W	1	2	18	23	0	1	45
WNW	0	5	8	19	4	0	36
NW	0	4	15	20	1	0	40
NNW	0	4	12	14	1	0	31
Variable	0	1	0	0	0	0	1
Total	11	56	190	315	143	44	759

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 7

Byron Generating Station

Period of Record: April - June 2010
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	1	4	1	0	0	7
NNE	0	3	4	2	0	0	9
NE	0	4	5	2	0	0	11
ENE	1	1	2	1	0	0	5
E	0	1	6	7	2	0	16
ESE	0	1	10	7	10	1	29
SE	0	1	5	4	2	0	12
SSE	0	1	7	1	5	3	17
S	1	4	2	12	8	6	33
SSW	0	3	7	9	6	2	27
SW	0	2	3	4	0	0	9
WSW	1	1	1	8	0	0	11
W	1	2	5	8	0	0	16
WNW	1	1	1	1	0	0	4
NW	2	2	7	1	0	0	12
NNW	0	6	8	2	0	0	16
Variable	0	0	0	0	0	0	0
Total	8	34	77	70	33	12	234

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 7

Byron Generating Station

Period of Record: April - June 2010
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	2	0	2	0	0	5
NNE	0	2	1	1	0	0	4
NE	2	3	0	0	0	0	5
ENE	1	1	0	0	0	0	2
E	1	3	0	1	0	0	5
ESE	0	0	1	3	0	0	4
SE	0	0	1	0	1	0	2
SSE	0	0	0	1	1	1	3
S	0	0	0	0	0	0	0
SSW	0	0	2	0	0	0	2
SW	0	2	2	0	0	0	4
WSW	0	2	2	0	0	0	4
W	0	2	0	3	0	0	5
WNW	0	2	0	0	0	0	2
NW	0	0	1	0	0	0	1
NNW	0	2	5	2	0	0	9
Variable	0	0	0	0	0	0	0
Total	5	21	15	13	2	1	57

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 7

Byron Generating Station

Period of Record: July - September 2010
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	1	0	0	0	2
NNE	0	1	1	0	0	0	2
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	5	0	0	0	5
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	1	3	0	0	0	4
SW	0	0	0	0	0	0	0
WSW	0	0	2	0	2	0	4
W	0	0	2	1	5	0	8
WNW	0	0	0	2	0	0	2
NW	0	4	5	0	0	0	9
NNW	0	2	3	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	0	9	22	3	7	0	41

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2010
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	1	0	0	0	3
NNE	0	1	2	0	0	0	3
NE	0	0	1	0	0	0	1
ENE	0	1	1	0	0	0	2
E	0	3	0	0	0	0	3
ESE	0	1	1	0	0	0	2
SE	0	0	2	0	0	0	2
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	2	0	0	0	2
SW	0	1	3	0	0	0	4
WSW	0	1	0	0	0	0	1
W	0	0	2	0	1	0	3
WNW	0	0	1	2	0	0	3
NW	0	1	1	2	0	0	4
NNW	0	1	3	0	0	0	4
Variable	0	1	0	0	0	0	1
Total	0	13	20	4	1	0	38

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2010
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	1	1	0	0	3
NNE	0	0	1	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	0	4	0	0	0	0	4
ESE	0	0	2	0	0	0	2
SE	0	1	2	0	0	0	3
SSE	0	0	1	0	0	0	1
S	0	2	8	0	0	0	10
SSW	0	2	5	0	0	0	7
SW	0	3	6	1	0	0	10
WSW	0	1	2	2	1	0	6
W	0	4	2	0	0	0	6
WNW	0	0	5	2	2	0	9
NW	0	5	5	0	0	0	10
NNW	0	2	0	1	0	0	3
Variable	1	0	0	0	0	0	1
Total	1	26	40	7	3	0	77

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2010
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	6	29	10	1	0	0	46
NNE	6	25	3	0	0	0	34
NE	2	4	0	0	0	0	6
ENE	2	10	2	0	0	0	14
E	5	28	1	0	0	0	34
ESE	1	13	2	0	0	0	16
SE	2	23	7	0	0	0	32
SSE	1	26	10	0	0	0	37
S	3	23	55	5	0	0	86
SSW	4	38	44	18	0	0	104
SW	7	31	31	5	0	0	74
WSW	3	28	16	5	0	0	52
W	6	30	9	8	4	0	57
WNW	9	24	27	8	0	0	68
NW	2	37	20	1	0	0	60
NNW	4	30	9	3	0	0	46
Variable	3	0	0	0	0	0	3
Total	66	399	246	54	4	0	769

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2010
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	8	22	3	0	0	0	33
NNE	6	10	0	0	0	0	16
NE	5	8	3	0	0	0	16
ENE	8	12	2	0	0	0	22
E	12	16	0	0	0	0	28
ESE	5	12	3	0	0	0	20
SE	9	17	4	0	0	0	30
SSE	12	22	19	0	0	0	53
S	13	45	64	11	0	0	133
SSW	18	28	27	16	4	0	93
SW	19	20	6	3	0	0	48
WSW	16	24	5	1	0	0	46
W	17	20	13	2	0	0	52
WNW	14	22	9	0	0	0	45
NW	20	19	1	0	0	0	40
NNW	9	36	4	0	0	0	49
Variable	4	0	0	0	0	0	4
Total	195	333	163	33	4	0	728

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2010
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	5	8	0	0	0	0	13
NNE	4	1	0	0	0	0	5
NE	2	1	0	0	0	0	3
ENE	8	3	0	0	0	0	11
E	10	21	0	0	0	0	31
ESE	4	23	0	0	0	0	27
SE	2	36	0	0	0	0	38
SSE	5	37	12	0	0	0	54
S	9	42	4	0	0	0	55
SSW	17	8	2	0	0	0	27
SW	16	6	0	0	0	0	22
WSW	11	3	0	0	0	0	14
W	24	10	1	0	0	0	35
WNW	17	7	0	0	0	0	24
NW	10	6	0	0	0	0	16
NNW	8	13	0	0	0	0	21
Variable	2	0	0	0	0	0	2
Total	154	225	19	0	0	0	398

Hours of calm in this stability class: 8
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2010
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	2	0	0	0	0	3
NNE	0	1	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	1	0	0	0	0	0	1
E	2	2	0	0	0	0	4
ESE	3	8	0	0	0	0	11
SE	7	13	0	0	0	0	20
SSE	8	15	2	0	0	0	25
S	17	15	1	0	0	0	33
SSW	5	1	0	0	0	0	6
SW	4	0	0	0	0	0	4
WSW	5	1	0	0	0	0	6
W	5	0	0	0	0	0	5
WNW	5	0	0	0	0	0	5
NW	8	2	0	0	0	0	10
NNW	5	1	0	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	76	61	3	0	0	0	140

Hours of calm in this stability class: 5
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2010
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	1	0	0	0	2
NNE	0	0	1	1	0	0	2
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	5	0	0	5
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	3	0	0	0	3
SW	0	0	1	0	0	0	1
WSW	0	0	0	2	0	2	4
W	0	0	1	1	0	6	8
WNW	0	0	0	0	1	1	2
NW	0	0	9	0	1	0	10
NNW	0	0	0	4	0	0	4
Variable	0	0	0	0	0	0	0
Total	0	1	16	13	2	9	41

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2010
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	2	0	0	0	3
NNE	0	0	2	1	0	0	3
NE	0	0	0	0	0	0	0
ENE	0	1	1	1	0	0	3
E	0	2	1	0	0	0	3
ESE	0	1	0	1	0	0	2
SE	0	0	0	2	0	0	2
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	2	0	0	0	2
SW	0	0	3	0	1	0	4
WSW	0	0	1	0	0	0	1
W	0	0	1	1	0	1	3
WNW	0	0	0	0	2	1	3
NW	0	1	1	1	2	0	5
NNW	0	0	0	3	0	0	3
Variable	0	1	0	0	0	0	1
Total	0	7	14	10	5	2	38

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2010
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	0	0	0	0	1
NNE	0	0	1	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	0	3	1	0	0	0	4
ESE	0	0	0	2	0	0	2
SE	0	0	1	3	0	0	4
SSE	0	0	0	0	0	0	0
S	0	0	2	6	0	0	8
SSW	0	1	4	3	0	0	8
SW	0	0	6	2	0	0	8
WSW	0	1	3	1	2	2	9
W	0	2	2	1	0	0	5
WNW	0	2	0	5	1	3	11
NW	0	3	2	4	1	0	10
NNW	0	0	1	1	2	0	4
Variable	0	1	0	0	0	0	1
Total	0	15	23	28	6	5	77

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2010
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	18	20	3	0	1	44
NNE	2	12	14	4	0	0	32
NE	1	7	4	0	0	0	12
ENE	1	2	4	1	0	0	8
E	1	17	11	3	0	0	32
ESE	1	9	9	3	0	0	22
SE	2	8	16	8	1	0	35
SSE	1	13	16	8	1	0	39
S	0	14	18	51	4	0	87
SSW	1	17	31	29	11	3	92
SW	2	20	19	24	15	2	82
WSW	4	15	17	12	4	1	53
W	1	16	23	4	9	7	60
WNW	2	11	16	19	10	3	61
NW	1	11	30	19	1	0	62
NNW	1	12	21	8	4	0	46
Variable	2	0	0	0	0	0	2
Total	25	202	269	196	60	17	769

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2010
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	4	22	17	0	0	46
NNE	0	4	8	4	0	0	16
NE	0	12	9	3	0	0	24
ENE	0	6	8	2	0	0	16
E	0	15	10	4	0	0	29
ESE	2	3	5	8	1	0	19
SE	1	6	8	10	1	0	26
SSE	0	8	10	7	9	0	34
S	3	4	12	53	41	4	117
SSW	2	16	26	28	31	13	116
SW	1	10	18	16	6	3	54
WSW	4	10	20	16	4	0	54
W	2	10	25	21	3	0	61
WNW	2	7	15	14	3	0	41
NW	2	5	13	17	1	0	38
NNW	1	4	20	13	0	0	38
Variable	0	0	0	0	0	0	0
Total	23	124	229	233	100	20	729

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2010
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	5	16	0	0	23
NNE	0	0	2	2	0	0	4
NE	1	4	3	0	0	0	8
ENE	0	1	8	0	0	0	9
E	0	6	11	8	2	0	27
ESE	0	1	4	6	6	0	17
SE	1	0	5	8	7	0	21
SSE	0	2	14	18	8	0	42
S	3	5	11	24	29	0	72
SSW	2	0	6	20	2	0	30
SW	0	1	4	9	3	0	17
WSW	1	5	8	9	0	0	23
W	0	6	7	14	0	0	27
WNW	0	4	10	17	0	0	31
NW	0	4	16	13	0	0	33
NNW	0	4	9	8	0	0	21
Variable	0	0	0	0	0	0	0
Total	8	45	123	172	57	0	405

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2010
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	2	0	7	0	0	10
NNE	1	1	3	3	0	0	8
NE	0	0	0	1	0	0	1
ENE	1	0	0	0	0	0	1
E	0	0	2	1	0	0	3
ESE	1	0	0	4	3	0	8
SE	1	1	5	3	2	0	12
SSE	1	2	3	7	5	0	18
S	0	2	1	4	9	1	17
SSW	0	0	2	13	0	0	15
SW	1	2	2	6	0	0	11
WSW	0	1	11	1	0	0	13
W	0	4	7	2	0	0	13
WNW	0	2	3	4	0	0	9
NW	0	2	2	0	0	0	4
NNW	0	0	2	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	7	19	43	56	19	1	145

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: October - December 2010
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	2	0	0	0	2
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	1	0	0	0	1
WSW	0	1	7	0	0	0	8
W	0	0	4	3	0	0	7
WNW	0	2	1	0	0	0	3
NW	0	0	1	0	0	0	1
NNW	0	0	1	1	0	0	2
Variable	0	0	0	0	0	0	0
Total	0	3	17	4	0	0	24

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December 2010
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	2	0	0	3
NNE	0	0	1	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	3	1	0	0	0	4
WSW	0	2	2	1	0	0	5
W	0	3	1	2	1	0	7
WNW	0	3	1	0	0	0	4
NW	0	1	1	0	0	0	2
NNW	0	1	1	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	0	13	9	5	1	0	28

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December 2010
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	4	3	2	0	0	9
NNE	0	0	2	0	0	0	2
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	1	2	0	0	3
SW	0	0	0	0	0	0	0
WSW	0	4	2	5	0	0	11
W	0	0	0	3	1	0	4
WNW	0	2	2	4	0	0	8
NW	0	1	1	1	0	0	3
NNW	0	2	3	3	0	0	8
Variable	0	0	0	0	0	0	0
Total	0	13	14	20	1	0	48

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December 2010
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	5	11	47	14	8	0	85
NNE	0	9	6	0	0	0	15
NE	0	7	5	0	0	0	12
ENE	4	4	13	6	0	0	27
E	2	10	6	0	0	0	18
ESE	3	12	14	11	6	0	46
SE	0	7	10	8	1	0	26
SSE	4	3	23	22	0	0	52
S	0	9	18	18	0	0	45
SSW	0	1	21	19	3	0	44
SW	2	7	17	17	9	1	53
WSW	3	12	19	43	6	2	85
W	3	17	38	50	8	4	120
WNW	4	31	65	43	1	0	144
NW	3	34	35	3	0	0	75
NNW	1	20	33	17	7	0	78
Variable	0	0	0	0	0	0	0
Total	34	194	370	271	49	7	925

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December 2010
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	5	23	15	0	0	0	43
NNE	6	6	5	1	0	0	18
NE	2	12	6	0	0	0	20
ENE	2	4	5	8	0	0	19
E	7	24	6	0	0	0	37
ESE	1	8	4	1	1	0	15
SE	1	1	11	11	0	0	24
SSE	3	13	46	39	5	0	106
S	1	16	31	14	1	0	63
SSW	2	18	15	14	0	0	49
SW	5	36	4	10	2	0	57
WSW	4	13	9	3	0	0	29
W	5	37	15	8	0	0	65
WNW	8	27	17	1	0	0	53
NW	7	35	16	1	0	0	59
NNW	4	30	19	0	0	0	53
Variable	0	0	0	0	0	0	0
Total	63	303	224	111	9	0	710

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December 2010
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	5	9	3	0	0	0	17
NNE	2	0	0	0	0	0	2
NE	3	3	0	0	0	0	6
ENE	2	0	1	0	0	0	3
E	9	6	0	0	0	0	15
ESE	2	4	3	0	0	0	9
SE	2	4	4	0	0	0	10
SSE	3	18	12	0	0	0	33
S	0	19	7	2	0	0	28
SSW	4	15	2	0	0	0	21
SW	6	9	0	0	0	0	15
WSW	3	3	0	0	0	0	6
W	6	3	0	0	0	0	9
WNW	18	9	0	0	0	0	27
NW	15	13	0	0	0	0	28
NNW	2	18	0	0	0	0	20
Variable	1	0	0	0	0	0	1
Total	83	133	32	2	0	0	250

Hours of calm in this stability class: 3
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December 2010
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	0	0	0	0	0	1
NNE	1	0	0	0	0	0	1
NE	1	0	0	0	0	0	1
ENE	0	2	0	0	0	0	2
E	5	3	0	0	0	0	8
ESE	7	1	2	0	0	0	10
SE	3	2	11	0	0	0	16
SSE	5	11	7	0	0	0	23
S	15	16	3	0	0	0	34
SSW	9	7	0	0	0	0	16
SW	13	2	0	0	0	0	15
WSW	13	0	0	0	0	0	13
W	17	2	0	0	0	0	19
WNW	14	1	0	0	0	0	15
NW	21	4	0	0	0	0	25
NNW	9	2	0	0	0	0	11
Variable	0	0	0	0	0	0	0
Total	134	53	23	0	0	0	210

Hours of calm in this stability class: 8
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December 2010
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	1	0	0	1
NNE	0	0	1	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	1	0	0	1
WSW	0	0	4	2	0	0	6
W	0	0	0	6	3	0	9
WNW	0	0	2	1	0	0	3
NW	0	0	1	0	0	0	1
NNW	0	0	0	1	1	0	2
Variable	0	0	0	0	0	0	0
Total	0	0	8	12	4	0	24

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December 2010
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	1	2	0	3
NNE	0	0	1	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	4	1	0	0	5
WSW	0	1	1	1	1	0	4
W	0	2	1	2	1	1	7
WNW	0	1	3	1	0	0	5
NW	0	0	1	0	0	0	1
NNW	0	1	0	1	0	0	2
Variable	0	0	0	0	0	0	0
Total	0	5	11	7	4	1	28

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December 2010
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	5	2	0	2	0	9
NNE	0	0	3	0	0	0	3
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	2	0	2
SW	0	0	1	0	0	0	1
WSW	0	1	4	1	4	0	10
W	0	0	0	3	2	0	5
WNW	0	1	2	3	1	0	7
NW	0	2	0	2	0	0	4
NNW	0	1	0	4	2	0	7
Variable	0	0	0	0	0	0	0
Total	0	10	12	13	13	0	48

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December 2010
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	7	12	62	4	12	98
NNE	3	8	9	3	2	0	25
NE	0	2	5	3	0	0	10
ENE	1	1	7	6	1	1	17
E	1	3	9	9	4	0	26
ESE	2	10	7	9	8	8	44
SE	1	4	9	5	8	4	31
SSE	3	4	2	21	17	7	54
S	0	3	13	8	17	1	42
SSW	1	1	8	19	9	5	43
SW	1	3	17	6	9	14	50
WSW	0	4	14	19	39	7	83
W	1	3	32	27	44	13	120
WNW	1	13	25	48	38	2	127
NW	2	20	25	35	6	0	88
NNW	0	13	14	18	13	10	68
Variable	0	0	0	0	0	0	0
Total	18	99	208	298	219	84	926

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December 2010
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	4	13	28	5	0	50
NNE	0	1	12	15	2	0	30
NE	1	2	6	9	2	0	20
ENE	1	5	6	6	7	0	25
E	0	7	13	10	2	0	32
ESE	0	1	3	5	5	1	15
SE	0	0	4	3	5	9	21
SSE	0	0	4	9	44	28	85
S	1	4	3	21	26	11	66
SSW	0	1	6	28	15	7	57
SW	1	1	28	15	3	13	61
WSW	0	3	9	18	1	0	31
W	0	3	19	19	10	2	53
WNW	1	4	20	16	3	0	44
NW	1	4	21	39	4	0	69
NNW	1	8	9	30	4	0	52
Variable	0	0	0	0	0	0	0
Total	7	48	176	271	138	71	711

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December 2010
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	9	10	2	0	24
NNE	0	2	5	9	3	0	19
NE	0	4	1	2	0	0	7
ENE	1	3	4	0	0	0	8
E	1	3	3	3	2	0	12
ESE	0	1	1	4	3	0	9
SE	0	1	2	1	1	0	5
SSE	1	2	1	8	2	2	16
S	0	1	3	9	15	1	29
SSW	1	0	5	12	8	0	26
SW	0	1	3	12	1	0	17
WSW	1	0	1	13	0	0	15
W	0	1	3	7	0	0	11
WNW	0	1	5	3	0	0	9
NW	0	0	4	16	0	0	20
NNW	1	0	8	15	2	0	26
Variable	0	0	0	0	0	0	0
Total	6	23	58	124	39	3	253

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December 2010
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	2	5	7	0	0	15
NNE	1	6	2	1	0	0	10
NE	0	8	0	0	0	0	8
ENE	0	4	0	0	0	0	4
E	0	2	0	1	0	0	3
ESE	1	2	3	1	0	0	7
SE	0	2	7	3	1	0	13
SSE	1	4	3	2	6	3	19
S	0	1	1	6	5	3	16
SSW	1	1	1	11	6	0	20
SW	0	2	1	6	2	0	11
WSW	0	3	4	5	0	0	12
W	3	4	4	15	0	0	26
WNW	1	5	6	12	0	0	24
NW	1	4	1	9	0	0	15
NNW	2	3	2	8	0	0	15
Variable	0	0	0	0	0	0	0
Total	12	53	40	87	20	6	218

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

APPENDIX G

ANNUAL RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM REPORT (ARGPPR)

Docket No: 50-454
50-455

BYRON NUCLEAR GENERATING 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

Byron Nuclear Generating Station
Byron, IL 61010

May 2011

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Appendices

I. Summary and Conclusions

In 2006, Exelon instituted a comprehensive monitoring program to evaluate the impact of station operations on groundwater in the vicinity of Byron Nuclear Generating Station. The monitoring was conducted in two phases. Phase 1 of the monitoring was part of a comprehensive study initiated by Exelon to determine whether groundwater or surface water at and in the vicinity of Byron Nuclear Generating Station had been adversely impacted by any releases of radionuclides. Phase 1 was conducted by Conestoga Rovers and Associates (CRA) and the conclusions were made available to state and federal regulators as well as the public.

Phase 2 of the RGPP was conducted by Exelon corporate and station personnel to initiate follow up of Phase 1 and begin long-term monitoring at groundwater locations selected during Phase 1. This is the fifth in a series of annual reports on the status of the Radiological Groundwater Protection Program (RGPP) conducted at Byron Nuclear Generating Station. This report covers groundwater samples, collected from the environment, both on and off station property in 2010. During that time period, 67 analyses were performed on 25 samples from 13 locations.

In accordance with Byron's Radiological Groundwater Protection Program, gamma-emitting radionuclides associated with licensed plant operations were not sampled in 2010. In the case of tritium, Exelon specified that its laboratories achieve a lower limit of detection 10 times lower than that required by federal regulation.

In 2010, thirteen (13) Radiological Groundwater Protection Program (RGPP) monitoring wells were sampled. The samples were obtained in May and October and analyzed for tritium. In addition, a baseline study of hard-to-detect radioisotopes was performed in accordance with Nuclear Energy Institute (NEI) 07-07, Groundwater Protection Initiative, for the samples obtained in May. Of these samples, two wells contained levels of tritium above the lower limit of detection (LLD) of 200 pCi/L. They were: AR-4 (1250 pCi/L in May, 1170 pCi/L in October) and AR-11 (1120 pCi/L in May, 947 pCi/L in October). Both of these wells are near the Circulating Water Blowdown piping, where historical leakage through vacuum breakers was known to have occurred. Well AR-4 has shown an overall steady decrease in tritium concentration since first sampled in 2006. Well AR-11 has also shown an overall decrease in tritium since 2006. The dose consequence from tritium present in these sample wells is negligible.

Gross Alpha and Gross Beta analyses in the dissolved and suspended fractions were performed on groundwater samples during the first sampling in 2010. Gross Alpha (dissolved) was not detected in any of 3 groundwater locations.

Gross Alpha (suspended) was detected in 1 of 3 groundwater locations at a concentration of 1.4 pCi/L. Gross Beta (dissolved) was detected in 2 of 3 groundwater locations. The concentrations ranged from 6.8 to 35.1 pCi/L. Gross Beta (suspended) was detected in 2 of 3 groundwater locations. The concentrations ranged from 2.1 to 3.3 pCi/L. The concentrations of Gross Alpha and Gross Beta, which are slightly above detectable levels, are considered to be background and are not the result of plant effluents.

Hard-To-Detect analyses were performed on a select group of groundwater locations to establish background levels. The analyses included Fe-55, Ni-63, Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240, U-233/234, U-235 and U-238. The isotope of U-233/234 was detected in one of three groundwater monitoring locations at a concentration of 0.3 pCi/L. This concentration of U-233/234, which is slightly above detectable level, is considered to be background and is not the result of plant effluents.

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

II. Introduction

The Byron Station, a two-unit PWR station, is located about two miles east of the Rock River and approximately three miles southwest of Byron in Ogle County, Illinois. The reactors are designed to have capacities of 1280 and 1254 MW gross, respectively. Unit One loaded fuel in November 1984 and went on line February 2, 1985. Unit Two went on line January 9, 1987.

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

A. Objectives 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 Byron Nuclear Generating 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 as well as the public.

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

3. Byron Nuclear Generating Station will continue to perform routine sampling and radiological analysis of water from selected locations.

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

5. Byron Nuclear Generating 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 Figure A–1, Appendix A.

Groundwater

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

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

D. Characteristics of Tritium (H-3)

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

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

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

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

III. Program Description

A. Sample Analysis

This section describes the general analytical methodologies used by TBE to analyze the environmental samples for radioactivity for the Byron Nuclear Generating Station RGPP in 2010.

In order to achieve the stated objectives, the current program includes the following analyses (as required by procedure):

1. Concentrations of gamma emitters in groundwater.

2. Concentrations of strontium in groundwater.

3. Concentrations of tritium in groundwater.

4. Concentrations of Am-241 in groundwater.

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

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

7. Concentrations of U-233/234, U-235 and U-238 in groundwater.

8. Concentrations of Fe-55 in groundwater.

9. Concentrations of Ni-63 in groundwater

B. Data Interpretation

The radiological data collected prior to Byron Nuclear Generating Station becoming operational were used as a baseline with which these operational data were compared. For the purpose of this report, Byron Nuclear Generating 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 AREOR.

C. Background Analysis

A pre-operational radiological environmental monitoring program (pre-operational REMP) was conducted to establish background radioactivity levels prior to operation of the Station. The environmental media sampled and analyzed during the pre-operational REMP were atmospheric radiation, fall-out, domestic water, surface water, marine life, and foodstuffs. The results of the monitoring were detailed in the report entitled, Environmental Radiological Monitoring for Byron Nuclear Generating Nuclear Power Station, Commonwealth Edison Company, Annual Report 1984, April 1985.

The pre-operational REMP contained analytical results from samples collected from the surface water and groundwater. All groundwater samples listed in the pre-Operational REMP report were <200 pCi/L.

1. Background Concentrations of Tritium

The purpose of the following discussion is to summarize background measurements of tritium in various media performed by others. Additional detail may be found by consulting references (CRA 2006).

a. Tritium Production

Tritium is created in the environment from naturally occurring processes both cosmic and subterranean, as well as from anthropogenic (i.e., man-made) sources. In the upper atmosphere, "Cosmogenic" tritium is produced from the bombardment of stable nuclides and combines with oxygen to form tritiated water, which will then enter the hydrologic cycle. Below ground, "lithogenic" tritium is produced by the bombardment of natural lithium present in crystalline rocks by neutrons produced by the radioactive decay of naturally

abundant uranium and thorium. Lithogenic production of tritium is usually negligible compared to other sources due to the limited abundance of lithium in rock. The lithogenic tritium is introduced directly to groundwater.

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

b. Precipitation Data

Precipitation samples are routinely collected at stations around the world for the analysis of tritium and other radionuclides. Two publicly available databases that provide tritium concentrations in precipitation are Global Network of Isotopes in Precipitation (GNIP) and USEPA's RadNet database. GNIP provides tritium precipitation concentration data for samples collected world wide from 1960 to 2006. RadNet provides tritium precipitation concentration data for samples collected at stations through out the U.S. from 1960 up to and including 2006. Based on GNIP data for sample stations located in the U.S. Midwest, tritium concentrations peaked around 1963. This peak, which approached 10,000 pCi/L for some stations, coincided with the atmospheric testing of thermonuclear weapons. Tritium concentrations in surface water showed a sharp decline up until 1975 followed by a gradual decline since that time. Tritium concentrations in Midwest precipitation have typically been below 100 pCi/L since around 1980. Tritium concentrations in wells may still be above the 200 pCi/L detection limit from the external causes described above. Water from previous years and decades is naturally captured in groundwater, so some well water sources today are affected by the surface water from the 1960s that was elevated in tritium.

c. Surface Water Data

Tritium concentrations are routinely measured in large surface water bodies, including Lake Michigan and the

Mississippi River. Illinois surface water data were typically less than 100 pCi/L.

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

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

IV. Results and Discussion

A. Groundwater Results

Groundwater

Samples were collected from on and off-site wells throughout the year 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, Appendix B). Tritium values ranged from less than the detection limit to 1,250 pCi/L. Within the station boundary, concentrations of tritium at the bottom of the Galena-Platteville aquifer ranged from 947 to 1,250 pCi/L. Outside of the station boundary, tritium concentrations were all less than detection limit (<200 pCi/L). This is based on evaluation of groundwater sample results obtained as part of the Byron Station REMP. Of the thirteen wells sampled in 2010, two contained levels of tritium above the lower limit of detection (LLD) of 200 pCi/L. They were: AR-4 (1,250 and 1,170 pCi/L), and AR-11 (1,120 and 947 pCi/L). Both wells have shown an overall decrease in tritium concentration since first sampled in 2006. The tritium detected in groundwater samples has been isolated to the Galena-Platteville aquifer, which is isolated from the deeper regional groundwater aquifer by the semi-confining Glenwood Formation.

Groundwater quality data from production wells and monitoring wells at the station located below this aquifer do not indicate concentrations of tritium greater than the LLD of 200 pCi/L. As such, the tritium impact is limited to the Galena-Platteville aquifer.

Strontium

Strontium-90 was not analyzed in 2010.

Gross Alpha and Gross Beta (dissolved and suspended)

Gross Alpha and Gross Beta analyses in the dissolved and suspended fractions were performed on groundwater surface water samples during the second sampling in 2010. Gross Alpha (dissolved) was not detected in any of 3 groundwater locations. Gross Alpha (suspended) was detected in 1 of 3 groundwater locations at a concentration of 1.4 pCi/L. Gross Beta (dissolved) was detected in 2 of 3 groundwater locations. The concentrations ranged from 6.8 to 35.1 pCi/L. Gross Beta (suspended) was detected in 2 of 3 groundwater locations. The concentrations ranged from 2.1 to 3.3 pCi/L. The concentrations detected are considered to be background and not the result of plant effluents.

Gamma Emitters

Gamma-emitting radionuclides associated with licensed plant operations were not analyzed in 2010.

Hard-To-Detect

Hard-To-Detect analyses were performed on a select group of groundwater locations to establish background levels. The analyses included Fe-55, Ni-63, Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240, U-233/234, U-235, and U-238. The isotope of U-233/234 was detected in one groundwater water monitoring location at a concentration of 0.3 pCi/L. The concentration detected is considered to be background and not the result of plant effluents (Table B-I.2, Appendix B).

B. Drinking Water Well Survey

No drinking water well surveys were conducted in 2010.

C. Summary of Results – Inter-Laboratory Comparison Program

Inter-Laboratory Comparison Program results for TBE are presented in

the AREOR.

D. Leaks, Spills, and Releases

There are no new previously unidentified leaks or plumes at Byron Station. There have been no new leaks, spills or releases at Byron Station in 2010.

E. Trends

Wells AR-4 and AR-11 have shown an overall decrease in tritium concentration since first sampled in 2006.

F. Investigations

No investigations were initiated in 2010 due to anomalous sample results.

G. Actions Taken

1. Compensatory Actions

   No compensatory actions were initiated in 2010.

2. Installation of Monitoring Wells

   No new monitoring wells were installed in 2010.

3. Actions to Recover/Reverse Plumes

   No actions were undertaken to recover/reverse plumes in 2010.

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APPENDIX A

LOCATION DESIGNATION

TABLE A-1: Radiological Groundwater Protection Program - Sampling Locations, Distance and Direction, Byron Nuclear Generating Station, 2010

Site	Site Type	Temporary/Permanent	Distance and Direction
AR-1	Monitoring Well	Permanent	0.36 miles/NNW
AR-10	Monitoring Well	Permanent	0.28 miles/NE
AR-11	Monitoring Well	Permanent	1.36 miles/WNW
AR-2	Monitoring Well	Permanent	0.6 miles/NW
AR-3	Monitoring Well	Permanent	0.8 miles/NW
AR-4	Monitoring Well	Permanent	1.36 miles/WNW
AR-5	Monitoring Well	Permanent	1.92 miles/WNW
AR-6	Monitoring Well	Permanent	2.04 miles/WNW
AR-7	Monitoring Well	Permanent	0.04 miles/W
AR-8	Monitoring Well	Permanent	0.12 miles/S
AR-9	Monitoring Well	Permanent	0.24 miles/E
CAR-1	Monitoring Well	Permanent	2.25 miles/WNW
CAR-2	Monitoring Well	Permanent	1.52 miles/WNW
CAR-3	Monitoring Well	Permanent	0.16 miles/SE
DF-24 (EPA well)	Monitoring Well	Permanent	1.36 miles/WNW
GW-9	Monitoring Well	Permanent	0.9 miles/WNW
MW-1 (EPA well)	Monitoring Well	Permanent	0.6 miles/NW
MW-3 (EPA well)	Monitoring Well	Permanent	0.8 miles/NW
TW-13	Monitoring Well	Permanent	2.3 miles/WNW
TW-14	Monitoring Well	Permanent	2.25 miles/WNW
TW-15	Monitoring Well	Permanent	2.2 miles/WNW
Well 7	Monitoring Well	Permanent	0.4 miles/SE

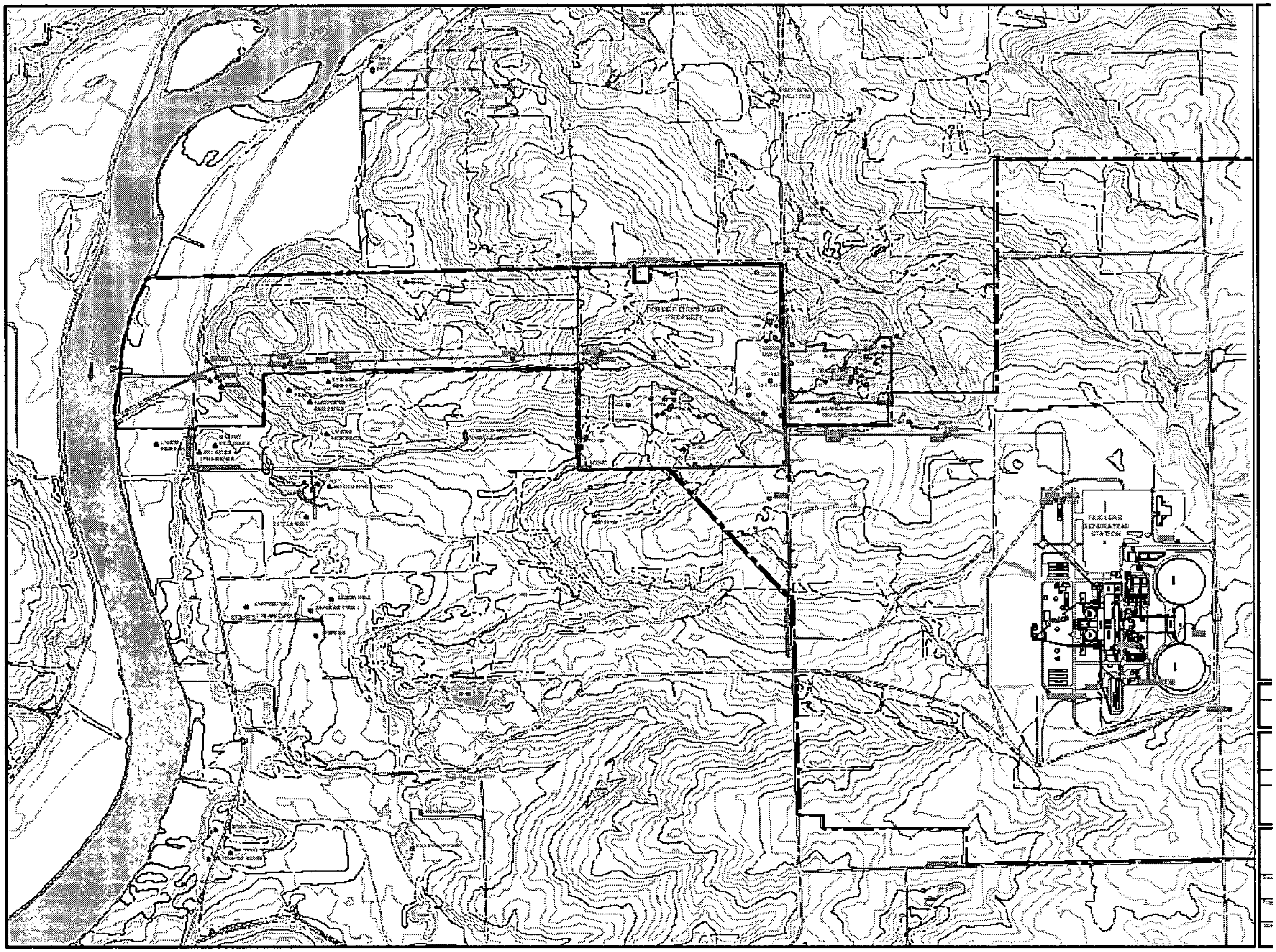

Figure A-1
Monitoring Well Locations, Byron Nuclear Generating Station, 2010

APPENDIX B

DATA TABLES

TABLE B-I.1 CONCENTRATIONS OF TRITIUM, GROSS ALPHA, AND GROSS BETA IN GROUND WATER SAMPLE COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, BYRON NUCLEAR GENERATING STATION, 2010

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	GR-A (DIS)	GR-A (SUS)	GR-B (DIS)	GR-B (SUS)
AR-1	05/17/10	< 154				
AR-1	10/22/10	< 159				
AR-10	05/17/10	< 157	< 4.4	< 2.9	35.1 ± 8.6	< 4.0
AR-10	10/22/10	< 160				
AR-11	05/20/10	1120 ± 162				
AR-11	10/21/10	947 ± 149				
AR-2	05/19/10	< 160				
AR-2	10/20/10	< 163				
AR-3	05/19/10	< 156				
AR-3	10/20/10	< 162				
AR-4	05/19/10	1250 ± 173	< 1.6	< 1.3	< 3.1	2.1 ± 1.2
AR-4	10/21/10	1170 ± 168				
AR-7	05/17/10	179 ± 103	< 2.9	1.4 ± 0.9	6.8 ± 3.5	3.3 ± 1.3
AR-7	10/21/10	< 171				
AR-8	05/17/10	< 150				
AR-8	10/21/10	< 163				
AR-9	05/17/10	< 150				
AR-9	10/22/10	< 161				
CAR-1	10/20/10	(1)				
CAR-1	10/20/10	< 157				
CAR-3	05/17/10	< 158				
CAR-3	10/21/10	< 160				
DF-24	05/19/10	< 157				
DF-24	10/21/10	< 157				
TW-13	05/19/10	< 153				
TW-13	10/21/10	< 161				

(1) WELL NOT SAMPLED IN MAY DUE TO WELL BEING DRY AT TIME OF COLLECTION

TABLE B-I.2 CONCENTRATIONS OF HARD TO DETECTS IN GROUND WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, BYRON NUCLEAR GENERATING STATION, 2010

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	AM-241	CM-242	CM-243/244	PU-238	PU-239/240	U-233/234	U-235	U-238	FE-55	NI-63
BY-AR-10	5/17/2010	< 0.10	< 0.10	< 0.04	< 0.2	< 0.1	< 0.03	< 0.06	< 0.07	< 181	< 4.5
BY-AR-4	5/19/2010	< 0.07	< 0.04	< 0.04	< 0.2	< 0.1	0.28 ± 0.13	< 0.04	< 0.10	< 168	< 4.4
BY-AR-7	5/17/2010	< 0.02	< 0.02	< 0.06	< 0.1	< 0.1	< 0.08	< 0.05	< 0.04	< 147	< 4.4

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