



Exelon Generation®

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U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Subject: 2012 Radioactive Effluent Release Report

The attached document includes the Radioactive Effluent Release Report for Braidwood Station. This report is being submitted in accordance with 10 CFR 50.36a, "Technical specifications on effluents from nuclear power reactors," and Technical Specification 5.6.3, "Radioactive Effluent Release Report," and includes a summary of radiological liquid and gaseous effluents and solid waste released from the site from January 2012 through December 2012. In addition, a copy of the Braidwood Station Offsite Dose Calculation Manual is included in accordance with Technical Specification 5.5.1, "Offsite Dose Calculation Manual (ODCM)."

If you have any questions regarding this information, please contact Chris VanDenburgh Regulatory Assurance Manager, at (815) 417-2800.

Respectfully,

Daniel J. Enright
Site Vice President
Braidwood Station

cc: US NRC Regional Administrator, Region III
US NRC Senior Resident Inspector - Braidwood Station
NRR Project Manager - Braidwood Station
Illinois Emergency Management Agency - Division of Nuclear Safety

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BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
UNIT 1 AND 2 (Docket Numbers 50-456 and 50-457)

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**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
UNIT 1 AND 2 (Docket Numbers 50-456 and 50-457)**

General Overview/Discussion

This report quantifies the radioactive gaseous, liquid, solid radwaste releases, and summarizes the local meteorological data for the period from January 01, 2012 through December 31, 2012. This report has been prepared utilizing the methodology and parameters specified in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents found in Braidwood's Offsite Dose Calculation Manual (ODCM). It has been formatted consistent with Exelon Procedure CY-AA-170-2000 and exceeds the requirements specified in Regulatory Guide 1.21 revision 1, "MEASURING, EVALUATING, AND REPORTING RADIOACTIVITY IN SOLID WASTES AND RELEASES OF RADIOACTIVE MATERIALS IN LIQUID AND GASEOUS EFFLUENTS FROM LIGHT-WATER-COOLED NUCLEAR POWER PLANTS."

The quantity of radioactive material released from Braidwood Nuclear Power Plant was determined from in-house and vendor laboratory analysis of continuous on-line sampling media and batch sample media from all ODCM specified effluent pathways. These pathways include the Unit 1 and 2 Station Vent Stacks, Exelon Pond remediation, Turbine Building Remediation, Vacuum Breaker number one remediation, Condensate Polisher Sump, Waste Water Treatment facility, and Circulating Water Blowdown.

The volume and quantity of radioactive waste shipped offsite from Braidwood Nuclear Power Plant for processing and disposal were determined from data maintained in the radwaste shipping database. Radwaste processed for shipment was in accordance with Exelon procedure RW-AA-100, "PROCESS CONTROL PROGRAM FOR RADIOACTIVE WASTES" and consistent with the UFSAR.

Meteorological data was obtained from the 320 foot meteorological tower located on the Braidwood Station premises.

Gaseous Effluents

Gaseous radioactive releases for the 2012 timeframe are captured in the tables titled, "Summation of All Releases" for Unit 1 and 2, respectively. Radioactive noble gases released for the timeframe totaled 8.16E-01 Curies. Releases of radioiodines and particulates with a half-life greater than eight days totaled 1.58E-03 Curies. Gaseous tritium releases totaled 5.71E+02 Curies. Gaseous C-14 was calculated to total 8.31E+00 Curies. No gross alpha was detected in gaseous effluents.

Noble gases released in gaseous effluents resulted in a maximum total body dose of 8.82E-06 mrad, with a corresponding skin dose of 3.44E-05 mrad. The release of radioactive particulates, C-14, tritium, and radioiodines in gaseous effluents during the reporting period resulted in a total body dose to the maximally exposed hypothetical individual of 5.74E-01 mrem. The maximum hypothetical dose to any organ from radioactive particulates, C-14, tritium, and radioiodines was 2.23E+00 mrem.

Liquid Effluents

Liquid radioactive releases for the 2012 timeframe are captured in the table titled, "Liquid Effluents Supplemental Release Information" and in Appendix C, "Unit Specific Annual Effluent Summaries." Ninety-six liquid batch releases occurred during the reporting period. Additionally, radioactive liquid effluents were continually being released through Circulating Water Blowdown. These discharges contained 2.58E+03 Curies of tritium and 1.08E+00 Curies of fission and activation products. The resultant maximum total body dose was 4.82E-02 mrem, with a corresponding organ dose of 6.86E-02 mrem.

Meteorological Data

The Braidwood Station meteorological monitoring program produced 52,408 hours of valid data out of a possible 52,704 parameter hours during 2012 (366 days x 24 hours/day x 6 measured priority parameters), which represents an overall data recovery rate of 99.4%. Priority parameters are all parameters except dew point temperature and precipitation. For the year, winds measured at 34 ft. most frequently came from the South (10.00%) and fell into the 3.6 - 7.5 mph wind speed class (41.78%). Calms (wind speeds at or below the sensor threshold) were measured 0.12% of the time and speeds greater than 24.5 mph were measured 0.15% of the time. Stability based on the 199 - 30 ft. differential temperature most frequently fell into the neutral classification (35.77%).

Offsite Ambient Radiation Measurements

It is estimated that the average radiation dose received by an individual in the United States is about 360 mrem/yr and that nuclear power stations account for less than two parts in a thousand of this radiation. These figures are based on data in Table 8.1 of NCRP 93. The table includes the following data:

<u>Source</u>	<u>Average Individual Dose (mrem/yr)</u>
Natural sources (average in U.S.)	300
Medical (whole-body equivalent)	53
Nuclear fuel cycle	0.05
Other	<u>~7</u>
Total	About 360

The radiological effects of nuclear power station operation on the environment are characterized as "usually so small that they are masked by normal fluctuations in natural background sources and by the normal uncertainties of the measurement process." Review of the Braidwood Optically Stimulated Luminescent Dosimetry (OSLD) data yielded no measurable increase above the normal fluctuation in natural background levels.

Radioactive Solid Waste Disposal

Radioactive wastes shipped offsite are captured in the table titled, "Solid Wastes Shipped Offsite for Burial or Disposal (Not irradiated fuel)." Approximately 781 cubic meters of solid waste was shipped offsite containing approximately 39 Curies during the 2012 reporting period.

RADIOACTIVE EFFLUENT RELEASE REPORT

January - December 2012

Facility: BRAIDWOOD NUCLEAR POWER STATION

Licensee: EXELON GENERATION COMPANY, LLC

1. Regulatory Limits

a. For Fission and Activation Gases:

Dose Rate

- 1) Less than 500 mrem/year to the whole body (instantaneous limit, per site).
- 2) Less than 3,000 mrem/year to the skin (instantaneous limit, per site).

Dose Gamma Radiation

- 1) Less than or equal to 5 mrad/quarter (per unit).
- 2) Less than or equal to 10 mrad/year (per unit).

Dose Beta Radiation

- 1) Less than or equal to 10 mrad/quarter (per unit).
- 2) Less than or equal to 20 mrad/year (per unit).

b. Iodine: (summed with particulate, see below)

c. Particulates with half-lives > 8 days:

Dose Rate

- 1) Less than 1,500 mrem/year to any organ (instantaneous limit, per site).

Dose

- 1) Less than or equal to 7.5 mrem/quarter to any organ (per unit).
- 2) Less than or equal to 15 mrem/year to any organ (per unit).

d. Liquid Effluents

Dose

- 1) Less than or equal to 1.5 mrem to the whole body during any calendar quarter (per unit).
- 2) Less than or equal to 5 mrem to any organ during any calendar quarter (per unit).
- 3) Less than or equal to 3 mrem to the whole body during any calendar year (per unit).
- 4) Less than or equal to 10 mrem to any organ during any calendar year (per unit).

2. Effluent Concentration Limits

- a. Fission and Activation Gases: 10CFR20 Appendix B Table 2
- b. Iodine: 10CFR20 Appendix B Table 2
- c. Particulates: 10CFR20 Appendix B Table 2
- d. Liquid Effluents: 10 X 10CFR20 Appendix B Table 2

3. Average Energy

The ODCM limits the dose equivalent rates due to the release of noble gases to less than or equal to 500 mrem/yr to the total body, and less than or equal to 3,000 mrem/yr to the skin. Therefore, the average beta and gamma energies (\bar{E}) for gaseous effluents as described in Regulatory Guide 1.21 are not applicable.

4. Measurements and Approximations of Total Radioactivity

a. Fission and activation gases:

Before being discharged, containment batch releases are analyzed for noble gas and tritium via gamma spectroscopy and liquid scintillation, respectively. Gaseous decay tanks are analyzed for noble gases before being discharged via gamma spectroscopy. Released activity is normally calculated using volume of release, which is determined by change in tank or containment pressure.

The Auxiliary Building ventilation exhaust system is continually monitored for radioiodines and particulates. These samples are pulled every seven days and analyzed via gamma spectroscopy.

Noble gas samples are pulled and analyzed weekly by gamma spectroscopy. The average flow at the release points and nuclide specific activity concentrations are used to calculate the activity released.

Volumes and activities of effluents discharged from systems that are common to both units are divided between both units.

The secondary side of both units contain tritium. Very small amounts of tritium are continually released to the atmosphere from secondary components through packing leaks, tank vents, the main condenser, etc. Bounding calculations have been performed to show that very large leaks (1000 gpd) for extended periods (1 month) at normal secondary tritium concentrations, would provide an insignificant increase ($1.00\text{E-}5$ mrem) in offsite dose.

b. Iodines:

Radioiodines in the Auxiliary Building ventilation exhaust system are continually being collected via activated charcoal cartridges in the diverted sample process flow. The iodine cartridges are pulled weekly and analyzed via gamma spectroscopy. Radioiodine concentrations greater than the LLD are multiplied by the volume of air discharged during the sampling timeframe.

Radioiodines are analyzed in liquid effluent streams through performance of batch release tank grab samples and weekly liquid effluent composite samples. The analyses are performed via gamma spectroscopy.

Volumes and activities of effluents discharged from systems that are common to both units are divided between both units. Effluents that are unit specific are assigned to the appropriate unit.

c. Particulates, half-lives > 8 days:

Particulates in the Auxiliary Building ventilation exhaust system are continually being collected via filter media in the diverted sample process flow. Particulate filter media are pulled weekly and analyzed via gamma spectroscopy. Particulate concentrations greater than LLD are multiplied by the volume of air discharged during the sampling timeframe. A composite sample is created from 3 month's particulate sample media for Sr-89/90, Fe-55, and gross alpha analysis by an offsite vendor. The vendor supplied data are utilized in conjunction with the volume of air released through the Auxiliary Building ventilation to quantify Sr-89/90, Fe-55, and gross alpha releases.

Volumes and activities of effluents discharged from systems that are common to both units are divided between both units. Effluents that are unit specific are assigned to the appropriate unit.

d. Liquid effluents:

Liquid effluents are categorized as either batch release or continuous release. All liquid releases are analyzed for principal gamma emitters, radioiodines, dissolved and entrained gases, gross alpha, and tritium onsite via gamma spectroscopy, gas flow proportional counting, or liquid scintillation, as appropriate. An offsite laboratory analyzes liquid composites for Sr-89/90 and Fe-55. Vendor results are applied to the applicable volume of liquids discharged during the timeframe. Volumes and activities of effluents discharged from systems or locations are divided between both units.

e. Gross alpha

Gross alpha is analyzed in both the gaseous and liquid effluent pathways. Weekly gaseous particulate media is composited for offsite vendor analysis. Gross alpha activity greater than vendor LLD values are assigned to the applicable timeframe and gaseous volume released. Liquid effluent gross alpha analysis is performed through compositing monthly discharges and gas flow proportional counting.

f. Carbon-14

Carbon-14 is assessed for continuous gaseous effluents through the use of Electric Power Research Institute's (EPRI) industry accepted production mechanism and production rate study 1021106. C-14 production is a function of each unit's full power operation and gaseous volume released. C-14 is not evaluated through laboratory sample analysis.

g. Estimated Total Error Present

Estimated total error is calculated periodically and communicated as part of the Effluent and Waste Disposal Summaries.

h. Less than the lower limit of detection (<LLD)

Samples are analyzed such that the Offsite Dose Calculation Manual (ODCM) LLD requirements are met. When a nuclide is not detected during the quarter then <LLD is reported.

5. Batch Releases

**GASEOUS EFFLUENTS
SUPPLEMENTAL RELEASE INFORMATION**

UNIT COMMON

A. Batch Release	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr.	Total
1. Total Number of Batch Releases	5	13	3	4	30
2. Total Time Period for Batch Releases (minutes)	573	1,253	380	1,380	3,586
3. Maximum Time Period for a Batch Release (minutes)	156	178	143	563	N/A
4. Average Time Period for a Batch Release (minutes)	115	96	127	153	N/A
5. Minimum Time Period for a Batch Release (minutes)	71	53	110	52	N/A

UNIT ONE

A. Batch Release	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr.	Total
1. Total Number of Batch Releases	24	40	28	29	121
2. Total Time Period for Batch Releases (minutes)	8,803	30,430	892	2,151	42,276
3. Maximum Time Period for a Batch Release (minutes)	1,560	2,860	60	522	N/A
4. Average Time Period for a Batch Release (minutes)	367	761	32	74	N/A
5. Minimum Time Period for a Batch Release (minutes)	25	12	6	6	N/A

UNIT TWO

A. Batch Release	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr.	Total
1. Total Number of Batch Releases	28	20	19	21	88
2. Total Time Period for Batch Releases (minutes)	18,973	2,076	669	10,206	31,924
3. Maximum Time Period for a Batch Release (minutes)	1,860	1,490	118	2,660	N/A
4. Average Time Period for a Batch Release (minutes)	678	104	35	486	N/A
5. Minimum Time Period for a Batch Release (minutes)	25	21	23	24	N/A

5. Batch Releases

LIQUID EFFLUENTS
SUPPLEMENTAL RELEASE INFORMATION

UNIT COMMON

A. Batch Release	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr.	Total
1. Total Number of Batch Releases	14	31	16	35	96
2. Total Time Period for Batch Releases (minutes)	40,850	9,059	3,809	8,399	62,117
3. Maximum Time Period for a Batch Release (minutes)	8,180	1,380	293	317	N/A
4. Average Time Period for a Batch Release (minutes)	2,918	292	238	240	N/A
5. Minimum Time Period for a Batch Release (minutes)	210	181	212	214	N/A
6. Average Stream Flow During Periods of Release of Effluent into a Flowing Stream (liters/min)	9.60E+06	6.83E+06	1.43E+06	2.70E+06	N/A

6. Abnormal Releases

- a. Liquid
 - Number of abnormal releases 0
 - Total Activity (Ci) released 0
- b. Gaseous
 - Number of abnormal releases 0
 - Total Activity (Ci) released 0

7. ODCM Revisions

The ODCM was revised in 2012 to change all the references of Thermoluminescent Dosimeters (TLDs) to "dosimeter". The change to the ODCM was made as part of the change from TLD technology to Optically Stimulated Luminescent Dosimetry (OSLD). The change to OSLD technology was driven by OSLDs dynamic energy response, increased sensitivity, environmental integrity, and its repeat analysis capabilities. CY-BR-170-301 revision 7 (ODCM) is included as a searchable text document on an included CD due to the size of the Portable Document Format (PDF).

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2012
GAS RELEASES
UNIT 1 (Docket Number 50-456)
SUMMATION OF ALL RELEASES

Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Est. Total Error%
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A. Fission and Activation Gas Releases

1. Total Release Activity	Ci	3.49E-02	1.24E-01	1.06E-01	1.43E-01	7.59
2. Average Release Rate	μCi/sec	4.44E-03	1.58E-02	1.33E-02	1.80E-02	
3. Percent of ODCM Limit - gamma	%	5.56E-06	3.23E-05	1.74E-05	3.29E-05	
4. Percent of ODCM Limit - beta	%	1.35E-05	5.55E-05	4.18E-05	6.16E-05	

B. Iodine Releases

1. Total Iodine	Ci	1.24E-06	4.42E-04	7.62E-08	5.15E-06	33.20
2. Average Release Rate	μCi/sec	1.58E-07	5.62E-05	9.58E-09	6.48E-07	
3. Percent of ODCM Limit	%	1.03E-05	1.17E-03	4.51E-07	5.12E-06	

C. Particulate (> 8 day half-life) Releases

1. Particulates with half-lives > 8 days	Ci	<LLD	<LLD	<LLD	1.17E-05	19.80
2. Average Release Rate	μCi/sec	<LLD	<LLD	<LLD	1.47E-06	
3. Percent of ODCM Limit	%	N/A	N/A	N/A	2.12E-03	
3. Gross Alpha Radioactivity	Ci	<LLD	<LLD	<LLD	<LLD	

D. Tritium Releases

1. Total Release Activity	Ci	2.91E+01	4.87E+01	6.16E+01	4.41E+01	8.07
2. Average Release Rate	μCi/sec	3.70E+00	6.20E+00	7.75E+00	5.55E+00	
3. Percent of ODCM Limit	%	8.28E-02	1.39E-01	1.74E-01	1.25E-01	

E. Gross Alpha Releases

1. Total Release Activity	Ci	<LLD	<LLD	<LLD	<LLD	19.80
2. Average Release Rate	μCi/sec	<LLD	<LLD	<LLD	<LLD	
3. Percent of ODCM limit	%	N/A	N/A	N/A	N/A	

F. Carbon-14 Releases

1. Total Release Activity	Ci	1.11E+00	7.70E-01	1.12E+00	1.14E+00	
2. Average Release Rate	μCi/sec	1.41E-01	9.80E-02	1.41E-01	1.43E-01	

Note: LLD Values are included in Appendix A of this report.

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2012
GAS RELEASES
UNIT 1 (Docket Number 50-456)
CONTINUOUS MODE AND BATCH MODE

Nuclides Released		Continuous Mode				Batch Mode			
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
1. Fission Gases									
Ar-41	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	7.03E-04	<LLD	6.75E-04
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	3.30E-04	<LLD	<LLD
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	2.05E-04	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-131m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD	3.49E-02	1.09E-01	1.05E-01	1.31E-01
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	1.18E-03	1.45E-03
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	1.36E-02	<LLD	1.05E-02
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	<LLD	<LLD	<LLD	<LLD	3.49E-02	1.24E-01	1.06E-01	1.43E-01
2. Iodines									
I-131	Ci	4.13E-07	4.22E-05	<LLD	<LLD	6.19E-08	1.28E-05	2.05E-08	1.68E-07
I-132	Ci	<LLD	3.20E-04	<LLD	<LLD	<LLD	6.63E-05	<LLD	<LLD
I-133	Ci	<LLD	<LLD	<LLD	4.66E-06	7.66E-07	1.43E-06	5.57E-08	3.25E-07
I-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	4.13E-07	3.62E-04	<LLD	4.66E-06	8.28E-07	8.05E-05	7.62E-08	4.94E-07
3. Particulates									
Cr-51	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	<LLD	<LLD	1.17E-05	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	3.65E-06	<LLD	<LLD	<LLD	<LLD

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2012
GAS RELEASES
UNIT 1 (Docket Number 50-456)
CONTINUOUS MODE AND BATCH MODE

Nuclides Released	Unit	Continuous Mode				Batch Mode			
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Sn-117m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ba-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Nd-147	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	<LLD	<LLD	<LLD	1.54E-05	<LLD	<LLD	<LLD	<LLD
4. Tritium	Ci	2.47E+01	4.37E+01	6.14E+01	4.29E+01	4.47E+00	5.02E+00	2.51E-01	1.24E+00
5. Gross Alpha	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
6. Carbon-14	Ci	1.11E+00	7.70E-01	1.12E+00	1.14E+00	N/A	N/A	N/A	N/A

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2012
GAS RELEASES
UNIT 2 (Docket Number 50-457)
SUMMATION OF ALL RELEASES

Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Est. Total Error%
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A. Fission and Activation Gas Releases

1. Total Activity Released	Ci	3.49E-02	1.24E-01	1.06E-01	1.43E-01	7.59
2. Average Release Rate	μCi/sec	4.44E-03	1.58E-02	1.33E-02	1.79E-02	
3. Percent of ODCM Limit - gamma	%	5.56E-06	3.23E-05	1.74E-05	3.29E-05	
4. Percent of ODCM Limit - beta	%	1.35E-05	5.55E-05	4.18E-05	6.16E-05	

B. Iodine Releases

1. Total Iodine	Ci	7.41E-06	6.70E-04	<LLD	3.55E-04	33.20
2. Average Release Rate	μCi/sec	9.43E-07	8.52E-05	<LLD	4.47E-05	
3. Percent of ODCM Limit	%	7.18E-08	7.10E-04	N/A	1.07E-05	

C. Particulate (> 8 day half-life) Releases

1. Particulates with half-lives > 8 days	Ci	<LLD	<LLD	<LLD	8.86E-05	19.80
2. Average Release Rate	μCi/sec	<LLD	<LLD	<LLD	1.11E-05	
3. Percent of ODCM Limit	%	N/A	N/A	N/A	1.60E-02	
4. Gross Alpha Radioactivity	Ci	<LLD	<LLD	<LLD	<LLD	

D. Tritium Releases

1. Total Release Activity	Ci	4.95E+01	9.09E+01	1.58E+02	8.87E+01	8.07
2. Average Release Rate	μCi/sec	6.30E+00	1.16E+01	1.99E+01	1.12E+01	
3. Percent of ODCM Limit	%	1.40E-01	2.59E-01	4.49E-01	2.52E-01	

E. Gross Alpha Releases

1. Total Release Activity	Ci	<LLD	<LLD	<LLD	<LLD	19.80
2. Average Release Rate	μCi/sec	<LLD	<LLD	<LLD	<LLD	
3. Percent of ODCM Limit	%	N/A	N/A	N/A	N/A	

F. Carbon-14 Releases

1. Total Release Activity	Ci	1.09E+00	1.12E+00	1.12E+00	8.38E-01	
2. Average Release Rate	μCi/sec	1.39E-01	1.42E-01	1.41E-01	1.05E-01	

Note: LLD Values are included in Appendix A of this report.

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2012
GAS RELEASES
UNIT 2 (Docket Number 50-457)
CONTINUOUS MODE AND BATCH MODE

Nuclides Released		Continuous Mode				Batch Mode			
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
1. Fission Gases									
Ar-41	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	7.03E-04	<LLD	6.75E-04
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	3.30E-04	<LLD	<LLD
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	2.05E-04	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-131m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD	3.49E-02	1.09E-01	1.05E-01	1.31E-01
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	1.18E-03	1.45E-03
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	1.36E-02	<LLD	1.05E-02
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	<LLD	<LLD	<LLD	<LLD	3.49E-02	1.24E-01	1.06E-01	1.43E-01
2. Iodines									
I-131	Ci	<LLD	3.16E-05	<LLD	<LLD	<LLD	<LLD	<LLD	2.90E-07
I-132	Ci	<LLD	5.25E-04	<LLD	3.36E-04	7.41E-06	7.41E-09	<LLD	1.51E-05
I-133	Ci	<LLD	1.13E-04	<LLD	3.63E-06	<LLD	<LLD	<LLD	<LLD
I-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	<LLD	6.70E-04	<LLD	3.40E-04	7.41E-06	7.41E-09	<LLD	1.54E-05
3. Particulates									
Cr-51	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	<LLD	<LLD	8.86E-05	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2012
GAS RELEASES
UNIT 2 (Docket Number 50-457)
CONTINUOUS MODE AND BATCH MODE

Nuclides Released	Unit	Continuous Mode				Batch Mode			
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Sn-117m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ba-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Nd-147	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Te-132	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sn-113	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	<LLD	<LLD	<LLD	8.86E-05	<LLD	<LLD	<LLD	<LLD
4. Tritium	Ci	3.80E+01	8.98E+01	1.58E+02	8.74E+01	1.15E+01	1.12E+00	1.74E-01	1.22E+00
5. Gross Alpha	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
6. Carbon-14	Ci	1.09E+00	1.12E+00	1.12E+00	8.38E-01	N/A	N/A	N/A	N/A

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2012
LIQUID RELEASES
UNIT 1 (Docket Number 50-456)
SUMMATION OF ALL RELEASES

Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Est. Total Error %
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A. Fission and Activation Products

1. Total Release	Ci	8.19E-02	4.46E-01	1.94E-03	1.19E-02	2.64
2. Average Diluted Concentration	μCi/ml	1.13E-08	1.71E-07	6.78E-10	2.90E-09	
3. Percent of applicable limit	%	*	*	*	*	

B. Tritium

1. Total Release	Ci	3.26E+02	3.23E+02	1.69E+02	4.72E+02	5.85
2. Average Diluted Concentration	μCi/ml	4.50E-05	1.23E-04	5.89E-05	1.15E-04	
3. % of Limit (1E-2 μCi/ml)	%	4.50E-01	1.23E+00	5.89E-01	1.15E+00	

C. Dissolved Noble Gases

1. Total Release	Ci	0.00E+00	8.35E-06	0.00E+00	0.00E+00	2.64
2. Average Diluted Concentration	μCi/ml	0.00E+00	3.19E-12	0.00E+00	0.00E+00	
3. % of Limit (2E-4 μCi/ml)	%	0.00E+00	1.60E-06	0.00E+00	0.00E+00	

D. Gross Alpha

1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	14.70
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E. Volume of Waste Released (prior to dilution)	liters	3.94E+05	6.10E+05	3.02E+05	6.41E+05
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F. Volume of Dilution Water	liters	1.45E+10	5.23E+09	5.72E+09	8.17E+09
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Note: LLD Values are included in Appendix A of this report.

Note: % Limit Values are included in Appendix B of this report.

*This limit is equal to 10 times the concentration values in Appendix B, Table 2, Column 2 to 10CFR20.1001-20.2402.

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2012
LIQUID RELEASES
UNIT 1 (Docket Numbers 50-456)
CONTINUOUS MODE & BATCH MODE

Nuclides Released	Unit	Continuous Mode				Batch Mode			
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Cr-51	Ci	8.15E-02	4.35E-01	<LLD	<LLD	<LLD	8.14E-04	3.11E-05	3.82E-04
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	1.05E-04	1.47E-05	1.13E-05
Fe-55	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	7.47E-06	1.12E-06	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD	4.60E-05	2.10E-03	8.68E-04	1.37E-03
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	2.61E-04	1.62E-05	2.14E-05
Co-60	Ci	<LLD	<LLD	<LLD	<LLD	3.75E-04	1.41E-03	6.77E-04	7.09E-04
Ni-63	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	5.77E-04	1.75E-04	3.42E-04
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	1.35E-04	1.33E-05	1.09E-05
Zr-95	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	7.31E-05	<LLD	<LLD
Nb-97	Ci	<LLD	<LLD	<LLD	<LLD	8.53E-06	4.25E-05	4.76E-06	4.12E-06
Zr-97	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD	7.53E-06	7.08E-05	<LLD	1.89E-06
Sn-113	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	5.30E-06	<LLD	<LLD
Sb-125	Ci	<LLD	<LLD	<LLD	<LLD	6.65E-06	1.19E-04	1.22E-04	8.43E-03
I-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ag-110	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	1.05E-04	1.63E-05	6.97E-05
H-3	Ci	8.50E+01	3.47E+01	1.93E+01	6.13E+01	2.41E+02	2.88E+02	1.49E+02	4.11E+02
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sb-124	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	2.45E-04
Ba-133	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ar-41	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-91	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	4.69E-06	<LLD	<LLD
Te-125m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	5.24E-03	<LLD	2.54E-04
I-132	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	7.80E-06	<LLD	<LLD

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2012
LIQUID RELEASES
UNIT 1 (Docket Numbers 50-456)
CONTINUOUS MODE & BATCH MODE

Nuclides Released	Unit	Continuous Mode				Batch Mode			
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Te-132	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	1.07E-05	<LLD	<LLD
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	8.35E-06	<LLD	<LLD
W-187	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	4.58E-06	<LLD	<LLD
Te-129m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	3.53E-05
Total for period	Ci	8.51E+01	3.51E+01	1.93E+01	6.13E+01	2.41E+02	2.88E+02	1.49E+02	4.11E+02

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2012
LIQUID RELEASES
UNIT 2 (Docket Number 50-457)
SUMMATION OF ALL RELEASES

Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Est. Total Error %
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A. Fission and Activation Products

1. Total Release	Ci	8.19E-02	4.46E-01	1.94E-03	1.19E-02	2.64
2. Average Diluted Concentration	μCi/ml	1.13E-08	1.71E-07	6.78E-10	2.90E-09	
3. Percent of applicable limit	%	*	*	*	*	

B. Tritium

1. Total Release	Ci	3.26E+02	3.23E+02	1.69E+02	4.72E+02	5.85
2. Average Diluted Concentration	μCi/ml	4.50E-05	1.23E-04	5.89E-05	1.15E-04	
3. % of Limit (1E-2 μCi/ml)	%	4.50E-01	1.23E+00	5.89E-01	1.15E+00	

C. Dissolved Noble Gases

1. Total Activity Released	Ci	0.00E+00	8.35E-06	0.00E+00	0.00E+00	2.64
2. Average Diluted Concentration	μCi/ml	0.00E+00	3.19E-12	0.00E+00	0.00E+00	
3. % of Limit (2E-4 μCi/ml)	%	0.00E+00	1.60E-06	0.00E+00	0.00E+00	

D. Gross Alpha

1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	14.70
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E. Volume of Waste Released (prior to dilution)	liters	3.94E+05	6.10E+05	3.02E+05	6.41E+05
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F. Volume of Dilution Water	liters	1.45E+10	5.23E+09	5.72E+09	8.17E+09
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Note: LLD Values are included in Appendix A of this report.

Note: % Limit Values are included in Appendix B of this report.

*This limit is equal to 10 times the concentration values in Appendix B, Table 2, Column 2 to 10CFR20.1001-2402.

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2012
LIQUID RELEASES
UNIT 2 (Docket Numbers 50-457)
CONTINUOUS MODE & BATCH MODE

Nuclides Released	Unit	Continuous Mode				Batch Mode			
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Cr-51	Ci	8.15E-02	4.35E-01	<LLD	<LLD	<LLD	8.14E-04	3.11E-05	3.82E-04
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	1.05E-04	1.47E-05	1.13E-05
Fe-55	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	7.47E-06	1.12E-06	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD	4.60E-05	2.10E-03	8.68E-04	1.37E-03
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	2.61E-04	1.62E-05	2.14E-05
Co-60	Ci	<LLD	<LLD	<LLD	<LLD	3.75E-04	1.41E-03	6.77E-04	7.09E-04
Ni-63	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	5.77E-04	1.75E-04	3.42E-04
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	1.35E-04	1.33E-05	1.09E-05
Zr-95	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	7.31E-05	<LLD	<LLD
Nb-97	Ci	<LLD	<LLD	<LLD	<LLD	8.53E-06	4.25E-05	4.76E-06	4.12E-06
Zr-97	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD	7.53E-06	7.08E-05	<LLD	1.89E-06
Sn-113	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	5.30E-06	<LLD	<LLD
Sb-125	Ci	<LLD	<LLD	<LLD	<LLD	6.65E-06	1.19E-04	1.22E-04	8.43E-03
I-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ag-110	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	1.05E-04	1.63E-05	6.97E-05
H-3	Ci	8.50E+01	3.47E+01	1.93E+01	6.13E+01	2.41E+02	2.88E+02	1.49E+02	4.11E+02
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sb-124	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	2.45E-04
Ba-133	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ar-41	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-91	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	4.69E-06	<LLD	<LLD
Te-125m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	5.24E-03	<LLD	2.54E-04
I-132	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	7.80E-06	<LLD	<LLD

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2012
LIQUID RELEASES
UNIT 2 (Docket Numbers 50-456)
CONTINUOUS MODE & BATCH MODE

Nuclides Released	Unit	Continuous Mode				Batch Mode			
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Te-132	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	1.07E-05	<LLD	<LLD
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	8.35E-06	<LLD	<LLD
W-187	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	4.58E-06	<LLD	<LLD
Te-129m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	3.53E-05
Total for period	Ci	8.51E+01	3.51E+01	1.93E+01	6.13E+01	2.41E+02	2.88E+02	1.49E+02	4.11E+02

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
SOLID RADIOACTIVE WASTE
UNIT 1 AND 2 COMBINED (Docket Numbers 50-456 and 50-457)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
SOLID RADIOACTIVE WASTE
UNIT 1 AND 2 COMBINED (Docket Numbers 50-456 and 50-457)

A. Solid Waste Shipped Offsite for Burial or Disposal (Not irradiated fuel)

1. Types of Waste

Types of Waste	Total Quantity (m ³)	Total Activity (Ci)	Period	Est. Total Error %
a. Spent resins, filter sludges, evaporator bottoms, etc	1.21E+02	3.53E+01	Jan - Dec 2012	25
b. Dry compressible waste, contaminated equip, etc	5.02E+02	3.69E+00	Jan - Dec 2012	25
c. Irradiated components, control rods, etc	3.00E-02	4.76E-02	Jan - Dec 2012	25
d. Other (oil, reverse osmosis reject water, soil, Lagoon sediment)	1.58E+02	2.98E-02	Jan - Dec 2012	N/A

2. Estimate of major nuclide composition (by waste type)

Major Nuclide Composition		%
a.	H-3	25.70
	Co-58	24.82
	Ni-63	15.35
	Co-60	8.76
	Fe-55	8.68
	Cr-51	7.71
	Sb-125	2.19
	Cs-137	1.31
	Cs-134	1.07
	Mn-54	0.90
b.	Fe-55	48.33
	Co-60	16.00
	Ni-63	14.81
	Co-58	8.37
	H-3	6.71
	Mn-54	1.17
	Cs-137	1.04
	Sb-125	0.51

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
SOLID RADIOACTIVE WASTE
UNIT 1 AND 2 COMBINED (Docket Numbers 50-456 and 50-457)

2. Estimate of major nuclide composition (by waste type) (cont.)

Major Nuclide Composition		%
c.	Co-60	57.50
	Fe-55	33.78
	Ni-63	3.64
	Mn-54	1.64
	Co-58	1.60
	Zn-65	0.90
d.	Fe-55	37.79
	H-3	25.83
	Co-60	11.47
	Co-58	10.87
	Ni-63	7.70
	Cr-51	1.36
	Mn-54	1.14
	Nb-95	0.78

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
16	Hittman Transportation	Duratek - Bear Creek Road
14	Hittman Transportation	Duratek Services - Gallaher Rd.
1	Tri-State Motor Transit	Duratek Services - Gallaher Rd.
2	Visionary Solutions, LLC	Duratek Services - Gallaher Rd.
4	Hittman Transportation	EnergySolutions LLC.

B. Irradiated Fuel Shipments (disposition)

No irradiated fuel shipments for January through December, 2012.

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C. Changes to the Process Control Program

Exelon Exelon procedure RW-AA-100 governs the radioactive waste process control program. The process control program establishes parameters which provide reasonable assurance that all Low Level Radioactive Wastes (LLRW), processed by in-plant waste process systems on-site or by on-site vendor supplied waste processing systems, meet the acceptance criteria to a Licensed Burial Facility, as required by 10CFR Part 20, 10CFR Part 61, 10CFR Part 71, 49CFR Parts 171-172, "Technical Position on Waste Form (Revision 1)" [1/91], "Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification" [5/83], and the Station Technical Specifications, as applicable. The process control program was revised in 2012. The substantial changes to the PCP allowed for the offsite storage of waste and clarified the storage of activated hardware. The first change created the option to store waste at Exelon sites that had greater storage capacity, provided the receiving plant had formal NRC approval. The second change created the option to store waste at an offsite vendor, provided that the waste met the vendor's waste acceptance criteria. The final change clarified the storage of activated hardware. Numerous non-substantial changes were made throughout the document to correct grammatical errors and to improve document readability. The implemented PCP, RW-AA-100, has been included in Attachment 2.

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
UNIT 1 AND 2 (Docket Numbers 50-456 and 50-457)

Wind Direction and Stability Classes

Braidwood Generating Station

Period of Record: January - March 2012
 Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	0	0	0	0	0	0
NNE	0	0	2	0	0	0	2
NE	0	0	2	0	0	0	2
ENE	0	4	2	0	0	0	6
E	0	0	0	0	0	0	0
ESE	0	1	0	0	0	0	1
SE	0	0	6	0	0	0	6
SSE	0	0	9	2	0	0	11
S	0	0	8	4	1	0	13
SSW	0	0	7	6	3	0	16
SW	0	0	0	3	0	0	3
WSW	0	0	7	0	0	0	7
W	0	0	3	0	0	0	3
WNW	0	8	27	5	0	0	40
NW	0	4	14	0	0	0	18
NNW	0	2	5	3	0	0	10
Variable	0	0	0	0	0	0	0
Total	0	19	92	23	4	0	138

Hours of calm in this stability class: 0

Hours of missing wind measurements in this stability class: 1

Hours of missing stability measurements in all stability classes: 3

Braidwood Generating Station

Period of Record: January - March 2012
 Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	0	1	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	3	2	0	0	0	5
ENE	0	3	3	0	0	0	6
E	0	1	0	0	0	0	1
ESE	0	4	0	0	0	0	4
SE	0	0	2	0	0	0	2
SSE	0	3	2	1	0	0	6
S	0	1	4	1	0	0	6
SSW	0	2	3	2	6	2	15
SW	0	0	3	5	3	0	11
WSW	0	1	6	2	1	0	10
W	0	3	3	2	0	0	8
WNW	0	7	6	1	0	0	14
NW	0	4	4	3	0	0	11
NNW	0	1	4	2	0	0	7
Variable	0	0	0	0	0	0	0
Total	0	33	43	19	10	2	107

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

Braidwood Generating Station

Period of Record: January - March 2012
 Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	2	0	0	0	4
NNE	0	1	0	0	0	0	1
NE	0	2	0	0	0	0	2
ENE	0	2	2	0	0	0	4
E	0	5	0	0	0	0	5
ESE	1	2	0	0	0	0	3
SE	0	1	0	1	0	0	2
SSE	0	0	4	0	0	0	4
S	0	2	3	2	0	0	7
SSW	0	2	3	5	0	1	11
SW	0	5	3	5	1	1	15
WSW	0	2	6	2	0	0	10
W	0	6	3	6	1	0	16
WNW	0	3	8	2	1	0	14
NW	0	5	3	1	0	0	9
NNW	0	5	5	3	0	0	13
Variable	0	0	0	0	0	0	0
Total	1	45	42	27	3	2	120

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

Braidwood Generating Station

Period of Record: January - March 2012
 Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	3	14	9	2	0	0	28
NNE	5	19	9	0	0	0	33
NE	14	35	31	2	0	0	82
ENE	10	51	18	0	0	0	79
E	6	11	0	0	0	0	17
ESE	1	13	5	0	0	0	19
SE	0	12	28	4	0	0	44
SSE	1	13	39	13	0	0	66
S	0	14	56	22	0	0	92
SSW	0	0	10	24	10	6	50
SW	1	7	44	18	4	2	76
WSW	2	30	37	8	0	0	77
W	4	28	52	39	5	0	128
WNW	10	21	55	39	6	0	131
NW	5	21	23	1	0	0	50
NNW	5	24	23	17	0	0	69
Variable	0	0	0	0	0	0	0
Total	67	313	439	189	25	8	1041

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

Braidwood Generating Station

Period of Record: January - March 2012
 Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	5	0	0	0	0	0	5
NNE	4	4	0	0	0	0	8
NE	8	5	0	0	0	0	13
ENE	10	6	0	0	0	0	16
E	13	4	0	0	0	0	17
ESE	12	12	5	0	0	0	29
SE	8	25	6	0	0	0	39
SSE	1	18	25	0	0	0	44
S	0	15	55	8	0	0	78
SSW	1	5	34	16	10	0	66
SW	2	5	37	7	0	0	51
WSW	5	33	9	1	0	0	48
W	5	33	2	1	0	0	41
WNW	21	23	1	0	0	0	45
NW	8	15	2	0	0	0	25
NNW	7	5	0	0	0	0	12
Variable	1	0	0	0	0	0	1
Total	111	208	176	33	10	0	538

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

Braidwood Generating Station

Period of Record: January - March 2012
 Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	4	0	0	0	0	0	4
NNE	7	0	0	0	0	0	7
NE	7	0	0	0	0	0	7
ENE	12	1	0	0	0	0	13
E	8	0	0	0	0	0	8
ESE	10	1	0	0	0	0	11
SE	3	6	1	0	0	0	10
SSE	4	1	0	0	0	0	5
S	1	2	0	0	0	0	3
SSW	1	3	0	0	0	0	4
SW	4	2	2	0	0	0	8
WSW	4	22	0	0	0	0	26
W	18	20	0	0	0	0	38
WNW	12	8	0	0	0	0	20
NW	11	0	0	0	0	0	11
NNW	4	0	0	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	110	66	3	0	0	0	179

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

Braidwood Generating Station

Period of Record: January - March 2012
 Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	0	0	0	0	0	0
NNE	3	0	0	0	0	0	3
NE	3	0	0	0	0	0	3
ENE	1	0	0	0	0	0	1
E	3	0	0	0	0	0	3
ESE	2	0	0	0	0	0	2
SE	0	0	0	0	0	0	0
SSE	1	0	0	0	0	0	1
S	0	0	0	0	0	0	0
SSW	4	2	0	0	0	0	6
SW	3	2	0	0	0	0	5
WSW	1	4	0	0	0	0	5
W	2	2	0	0	0	0	4
WNW	3	0	0	0	0	0	3
NW	3	0	0	0	0	0	3
NNW	0	0	0	0	0	0	0
Variable	1	0	0	0	0	0	1
Total	30	10	0	0	0	0	40

Hours of calm in this stability class: 3

Hours of missing wind measurements in this stability class: 1

Hours of missing stability measurements in all stability classes: 3

Braidwood Generating Station

Period of Record: January - March 2012

Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	1	1	0	0	2
NE	0	0	0	0	0	0	0
ENE	0	0	7	2	0	0	9
E	0	0	0	0	0	0	0
ESE	0	0	1	0	0	0	1
SE	0	0	1	6	0	0	7
SSE	0	0	3	9	3	0	15
S	0	0	5	3	2	3	13
SSW	0	0	1	4	4	3	12
SW	0	0	1	1	2	0	4
WSW	0	0	2	3	0	0	5
W	0	0	2	0	0	0	2
WNW	0	1	13	19	6	3	42
NW	0	0	6	10	4	0	20
NNW	0	0	3	1	3	0	7
Variable	0	0	0	0	0	0	0
Total	0	1	46	59	24	9	139

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

Braidwood Generating Station

Period of Record: January - March 2012

Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	1	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	3	1	0	0	4
ENE	0	0	4	2	0	0	6
E	0	1	2	0	0	0	3
ESE	0	3	0	0	0	0	3
SE	0	0	0	2	0	0	2
SSE	0	0	4	2	1	1	8
S	0	0	3	4	0	3	10
SSW	0	0	3	1	1	6	11
SW	0	0	3	0	2	4	9
WSW	0	1	5	4	1	1	12
W	0	0	4	1	2	0	7
WNW	0	5	3	4	2	1	15
NW	0	0	5	1	5	0	11
NNW	0	0	1	4	0	0	5
Variable	0	0	0	0	0	0	0
Total	0	10	41	26	14	16	107

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

Braidwood Generating Station

Period of Record: January - March 2012
 Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	1	1	0	0	3
NNE	0	0	2	0	0	0	2
NE	0	1	1	0	0	0	2
ENE	0	2	1	1	0	0	4
E	0	4	1	0	0	0	5
ESE	0	3	0	0	0	0	3
SE	0	0	1	0	1	0	2
SSE	0	0	1	4	1	0	6
S	0	2	0	3	1	1	7
SSW	0	2	3	2	5	2	14
SW	0	0	6	0	2	3	11
WSW	0	1	7	2	3	0	13
W	0	2	4	0	4	2	12
WNW	0	1	2	7	2	2	14
NW	0	2	2	4	2	1	11
NNW	0	2	6	0	3	0	11
Variable	0	0	0	0	0	0	0
Total	0	23	38	24	24	11	120

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

Braidwood Generating Station

Period of Record: January - March 2012
 Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	10	15	2	2	0	29
NNE	1	11	8	8	0	0	28
NE	1	17	26	25	3	0	72
ENE	1	18	39	27	0	0	85
E	0	8	15	1	0	0	24
ESE	0	2	6	8	4	0	20
SE	1	1	9	19	25	2	57
SSE	0	6	7	28	25	2	68
S	0	4	9	27	31	6	77
SSW	0	0	2	14	24	23	63
SW	0	6	22	37	10	4	79
WSW	1	12	27	23	6	7	76
W	3	7	22	30	38	9	109
WNW	3	7	15	39	39	29	132
NW	0	7	9	16	19	1	52
NNW	2	13	21	18	14	2	70
Variable	0	0	0	0	0	0	0
Total	13	129	252	322	240	85	1041

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

Braidwood Generating Station

Period of Record: January - March 2012
 Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	3	2	0	0	0	5
NNE	1	4	5	0	0	0	10
NE	0	6	4	2	0	0	12
ENE	1	4	7	2	0	0	14
E	1	7	12	2	0	0	22
ESE	0	2	12	10	4	0	28
SE	0	0	13	18	6	0	37
SSE	0	0	10	26	14	0	50
S	1	3	8	42	21	3	78
SSW	1	1	7	27	23	16	75
SW	0	2	12	22	10	0	46
WSW	0	6	16	17	1	0	40
W	0	4	15	16	3	0	38
WNW	0	4	13	19	1	0	37
NW	2	7	22	12	0	0	43
NNW	0	1	10	0	0	0	11
Variable	0	0	0	0	0	0	0
Total	7	54	168	215	83	19	546

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

Braidwood Generating Station

Period of Record: January - March 2012

Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)

Winds Measured at 203 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	5	3	0	0	0	8
NNE	1	0	5	0	0	0	6
NE	0	1	2	0	0	0	3
ENE	0	3	5	1	0	0	9
E	1	3	5	0	0	0	9
ESE	0	6	1	3	0	0	10
SE	1	0	6	4	0	0	11
SSE	2	2	2	0	1	0	7
S	0	0	1	2	0	0	3
SSW	0	1	5	0	1	0	7
SW	2	8	2	0	1	0	13
WSW	1	0	2	2	0	0	5
W	0	3	13	19	0	0	35
WNW	0	5	13	17	0	0	35
NW	2	4	6	3	0	0	15
NNW	2	3	2	0	0	0	7
Variable	1	0	0	0	0	0	1
Total	13	44	73	51	3	0	184

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

Braidwood Generating Station

Period of Record: January - March 2012
 Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	1	1	0	0	0	0	2
NNE	0	0	0	1	0	0	1
NE	2	2	1	0	0	0	5
ENE	0	3	1	0	0	0	4
E	0	0	1	0	0	0	1
ESE	1	1	0	0	0	0	2
SE	0	1	0	0	0	0	1
SSE	0	0	0	0	0	0	0
S	0	2	0	0	0	0	2
SSW	0	1	0	0	0	0	1
SW	2	2	4	0	0	0	8
WSW	0	4	2	1	0	0	7
W	0	0	1	2	0	0	3
WNW	0	0	2	2	0	0	4
NW	0	0	1	0	0	0	1
NNW	1	1	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	7	18	13	6	0	0	44

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

Braidwood Generating Station

Period of Record: April - June 2012

Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	7	9	5	0	0	21
NNE	0	10	12	5	0	0	27
NE	0	9	32	1	0	0	42
ENE	0	15	4	0	0	0	19
E	0	11	8	0	0	0	19
ESE	0	8	2	0	0	0	10
SE	0	11	7	0	0	0	18
SSE	0	17	9	2	0	0	28
S	0	10	16	8	0	0	34
SSW	0	5	32	26	6	0	69
SW	0	7	8	23	0	0	38
WSW	0	10	16	3	0	0	29
W	0	12	16	4	0	0	32
WNW	0	6	8	4	0	0	18
NW	0	7	17	5	0	0	29
NNW	0	7	17	7	0	0	31
Variable	0	0	0	0	0	0	0
Total	0	152	213	93	6	0	464

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: 1

Braidwood Generating Station

Period of Record: April - June 2012

Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	4	2	0	0	0	6
NNE	0	6	4	0	0	0	10
NE	0	6	11	0	0	0	17
ENE	1	4	0	0	0	0	5
E	1	2	2	0	0	0	5
ESE	0	2	2	0	0	0	4
SE	1	3	2	0	0	0	6
SSE	1	5	1	0	0	0	7
S	0	4	3	1	0	0	8
SSW	0	2	4	5	0	0	11
SW	0	4	3	5	0	0	12
WSW	0	6	1	0	0	0	7
W	0	5	2	0	0	0	7
WNW	0	3	1	1	0	0	5
NW	0	4	1	0	0	0	5
NNW	0	4	2	2	0	0	8
Variable	0	0	0	0	0	0	0
Total	4	64	41	14	0	0	123

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: 1

Braidwood Generating Station

Period of Record: April - June 2012

Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	4	3	0	0	0	7
NNE	0	2	4	2	0	0	8
NE	0	8	8	0	0	0	16
ENE	0	5	1	0	0	0	6
E	1	4	0	0	0	0	5
ESE	0	2	1	0	0	0	3
SE	0	2	1	0	0	0	3
SSE	0	1	1	0	0	0	2
S	1	3	2	2	0	0	8
SSW	1	1	0	3	1	0	6
SW	0	2	2	0	0	0	4
WSW	0	2	4	0	1	0	7
W	1	4	2	0	0	0	7
WNW	0	4	0	0	0	0	4
NW	0	4	0	0	0	0	4
NNW	0	2	2	1	0	0	5
Variable	0	0	0	0	0	0	0
Total	4	50	31	8	2	0	95

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: 1

Braidwood Generating Station

Period of Record: April - June 2012
 Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	8	20	0	0	0	28
NNE	5	9	38	2	0	0	54
NE	6	43	49	7	0	0	105
ENE	4	56	7	0	0	0	67
E	1	15	3	0	0	0	19
ESE	2	12	7	0	0	0	21
SE	3	9	7	0	0	0	19
SSE	0	14	4	0	0	0	18
S	1	13	22	7	0	0	43
SSW	0	5	27	22	15	0	69
SW	2	11	16	19	1	0	49
WSW	0	17	10	0	1	0	28
W	2	14	4	0	2	0	22
WNW	5	16	3	1	0	0	25
NW	6	9	2	1	0	0	18
NNW	4	10	10	2	0	0	26
Variable	1	0	0	0	0	0	1
Total	42	261	229	61	19	0	612

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: 1

Braidwood Generating Station

Period of Record: April - June 2012

Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)

Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	7	7	5	0	0	0	19
NNE	9	20	3	0	0	0	32
NE	10	10	4	3	0	0	27
ENE	15	28	0	0	0	0	43
E	22	14	1	0	0	0	37
ESE	9	27	1	0	0	0	37
SE	6	42	6	0	0	0	54
SSE	12	35	12	0	0	0	59
S	4	42	36	7	0	0	89
SSW	0	7	28	11	1	0	47
SW	2	12	5	0	0	0	19
WSW	2	17	2	0	0	0	21
W	9	14	4	0	0	0	27
WNW	11	17	1	0	0	0	29
NW	6	13	1	0	0	0	20
NNW	6	22	4	0	0	0	32
Variable	0	0	0	0	0	0	0
Total	130	327	113	21	1	0	592

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: 1

Braidwood Generating Station

Period of Record: April - June 2012

Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)

Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	6	0	0	0	0	0	6
NNE	9	0	0	0	0	0	9
NE	7	0	0	0	0	0	7
ENE	11	0	0	0	0	0	11
E	20	1	0	0	0	0	21
ESE	19	11	0	0	0	0	30
SE	7	14	0	0	0	0	21
SSE	2	9	0	0	0	0	11
S	2	5	0	0	0	0	7
SSW	3	6	2	0	0	0	11
SW	6	2	1	0	0	0	9
WSW	6	12	0	0	0	0	18
W	11	3	0	0	0	0	14
WNW	14	0	0	0	0	0	14
NW	11	0	0	0	0	0	11
NNW	10	2	0	0	0	0	12
Variable	0	0	0	0	0	0	0
Total	144	65	3	0	0	0	212

Hours of calm in this stability class: 12

Hours of missing wind measurements in this stability class: 0

Hours of missing stability measurements in all stability classes: 1

Braidwood Generating Station

Period of Record: April - June 2012

Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)

Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	0	0	0	0	0	2
NNE	3	0	0	0	0	0	3
NE	5	0	0	0	0	0	5
ENE	8	1	0	0	0	0	9
E	7	0	0	0	0	0	7
ESE	4	0	0	0	0	0	4
SE	2	1	0	0	0	0	3
SSE	2	0	0	0	0	0	2
S	0	0	0	0	0	0	0
SSW	1	1	0	0	0	0	2
SW	1	0	0	0	0	0	1
WSW	7	0	0	0	0	0	7
W	2	0	0	0	0	0	2
WNW	3	0	0	0	0	0	3
NW	2	0	0	0	0	0	2
NNW	1	0	0	0	0	0	1
Variable	1	0	0	0	0	0	1
Total	51	3	0	0	0	0	54

Hours of calm in this stability class: 17

Hours of missing wind measurements in this stability class: 0

Hours of missing stability measurements in all stability classes: 1

Braidwood Generating Station

Period of Record: April - June 2012

Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	4	7	4	1	0	16
NNE	0	3	9	7	5	0	24
NE	0	5	12	25	1	0	43
ENE	0	4	7	2	0	0	13
E	0	2	19	7	0	0	28
ESE	0	2	4	4	1	0	11
SE	0	5	11	5	0	0	21
SSE	0	6	18	4	3	1	32
S	0	3	10	13	13	1	40
SSW	0	5	4	32	18	6	65
SW	0	3	5	11	8	0	27
WSW	0	8	10	13	0	0	31
W	0	8	4	12	2	2	28
WNW	0	2	5	10	1	3	21
NW	0	3	8	18	6	3	38
NNW	0	1	8	13	3	1	26
Variable	0	0	0	0	0	0	0
Total	0	64	141	180	62	17	464

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: 1

Braidwood Generating Station

Period of Record: April - June 2012

Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 203 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	1	3	1	0	0	0	5
NNE	0	1	5	2	0	0	8
NE	0	2	6	6	1	0	15
ENE	0	4	2	2	0	0	8
E	0	0	2	3	0	0	5
ESE	1	1	1	4	0	0	7
SE	0	2	2	1	0	0	5
SSE	1	1	2	1	1	0	6
S	0	0	4	3	2	1	10
SSW	0	3	2	4	1	0	10
SW	0	2	4	1	3	0	10
WSW	1	3	1	1	0	0	6
W	0	2	2	2	0	0	6
WNW	0	3	2	0	1	1	7
NW	0	2	3	0	1	0	6
NNW	0	0	5	2	2	0	9
Variable	0	0	0	0	0	0	0
Total	4	29	44	32	12	2	123

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: 1

Braidwood Generating Station

Period of Record: April - June 2012

Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 203 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	0	2	2	0	0	4
NNE	0	3	3	1	2	0	9
NE	0	1	9	5	0	0	15
ENE	0	2	2	2	0	0	6
E	0	2	6	0	0	0	8
ESE	1	0	1	2	0	0	4
SE	0	1	1	0	0	0	2
SSE	0	1	2	1	0	0	4
S	0	0	2	1	2	1	6
SSW	0	1	1	1	1	1	5
SW	0	3	2	0	0	0	5
WSW	0	0	2	2	0	1	5
W	0	3	2	3	0	0	8
WNW	0	1	4	0	0	0	5
NW	0	1	2	0	0	0	3
NNW	0	3	0	2	1	0	6
Variable	0	0	0	0	0	0	0
Total	1	22	41	22	6	3	95

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: 1

Braidwood Generating Station

Period of Record: April - June 2012
 Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	4	12	15	1	0	32
NNE	1	3	8	18	1	0	31
NE	1	9	20	66	11	0	107
ENE	2	9	49	15	0	0	75
E	0	0	9	14	1	0	24
ESE	0	2	8	15	1	0	26
SE	2	3	6	5	1	0	17
SSE	0	0	11	5	2	0	18
S	1	1	10	20	6	6	44
SSW	1	4	7	30	14	20	76
SW	0	4	13	17	7	1	42
WSW	1	8	10	6	0	1	26
W	1	5	11	3	2	2	24
WNW	0	4	13	2	2	2	23
NW	2	7	8	3	0	0	20
NNW	3	5	6	10	2	0	26
Variable	1	0	0	0	0	0	1
Total	16	68	201	244	51	32	612

Hours of calm in this stability class: 0

Hours of missing wind measurements in this stability class: 1

Hours of missing stability measurements in all stability classes: 1

Braidwood Generating Station

Period of Record: April - June 2012

Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)

Winds Measured at 203 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	2	14	10	0	0	26
NNE	0	5	6	3	0	0	14
NE	0	3	29	8	3	0	43
ENE	1	5	27	1	0	0	34
E	1	5	25	5	1	0	37
ESE	0	4	13	22	0	0	39
SE	0	1	23	31	2	0	57
SSE	0	10	14	34	3	0	61
S	1	6	11	63	13	2	96
SSW	0	1	4	27	10	2	44
SW	0	4	11	4	0	0	19
WSW	0	3	11	7	0	0	21
W	0	2	10	4	0	0	16
WNW	0	0	27	6	1	0	34
NW	0	3	11	8	1	0	23
NNW	0	6	13	10	0	0	29
Variable	0	0	0	0	0	0	0
Total	3	60	249	243	34	4	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: 1

Braidwood Generating Station

Period of Record: April - June 2012

Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)

Winds Measured at 203 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	1	10	1	0	0	12
NNE	1	3	7	0	0	0	11
NE	0	1	6	0	0	0	7
ENE	0	5	11	0	0	0	16
E	0	5	8	3	0	0	16
ESE	0	0	7	9	0	0	16
SE	0	2	17	14	0	0	33
SSE	0	3	7	6	0	0	16
S	1	3	4	4	0	0	12
SSW	0	2	2	5	0	0	9
SW	0	4	5	2	1	0	12
WSW	0	2	6	4	0	0	12
W	0	2	10	0	0	0	12
WNW	1	1	8	2	0	0	12
NW	0	1	18	0	0	0	19
NNW	0	0	9	0	0	0	9
Variable	0	0	0	0	0	0	0
Total	3	35	135	50	1	0	224

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: 1

Braidwood Generating Station

Period of Record: April - June 2012

Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)

Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	2	0	0	0	3
NNE	0	3	0	0	0	0	3
NE	0	1	1	0	0	0	2
ENE	0	4	2	0	0	0	6
E	0	1	6	0	0	0	7
ESE	0	1	4	2	0	0	7
SE	0	0	3	2	0	0	5
SSE	1	2	1	1	0	0	5
S	0	5	2	0	0	0	7
SSW	0	2	2	0	0	0	4
SW	0	1	0	0	0	0	1
WSW	1	3	2	1	0	0	7
W	2	1	4	0	0	0	7
WNW	0	0	2	0	0	0	2
NW	0	0	1	0	0	0	1
NNW	0	1	3	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	4	26	35	6	0	0	71

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: 1

Braidwood Generating Station

Period of Record: July - September 2012
 Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	4	10	4	0	0	18
NNE	0	2	7	0	0	0	9
NE	0	9	20	0	0	0	29
ENE	1	2	0	0	0	0	3
E	0	3	0	0	0	0	3
ESE	0	10	1	0	0	0	11
SE	0	16	4	0	0	0	20
SSE	0	25	5	0	0	0	30
S	0	34	7	0	0	0	41
SSW	0	15	21	8	0	0	44
SW	0	8	19	7	0	0	34
WSW	0	20	11	0	0	0	31
W	0	34	17	0	0	0	51
WNW	0	11	9	0	0	0	20
NW	0	14	12	1	0	0	27
NNW	0	18	22	0	0	0	40
Variable	1	1	0	0	0	0	2
Total	2	226	165	20	0	0	413

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

Braidwood Generating Station

Period of Record: July - September 2012

Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	2	5	1	0	0	8
NNE	0	8	3	0	0	0	11
NE	0	3	2	0	0	0	5
ENE	0	3	0	0	0	0	3
E	0	3	0	0	0	0	3
ESE	1	11	0	0	0	0	12
SE	0	6	0	0	0	0	6
SSE	1	8	1	0	0	0	10
S	0	9	2	0	0	0	11
SSW	0	4	4	1	1	0	10
SW	0	6	1	1	0	0	8
WSW	0	8	2	0	0	0	10
W	2	8	4	0	0	0	14
WNW	0	4	0	0	0	0	4
NW	0	7	0	0	0	0	7
NNW	0	7	6	0	0	0	13
Variable	1	0	0	0	0	0	1
Total	5	97	30	3	1	0	136

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

Braidwood Generating Station

Period of Record: July - September 2012

Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	10	4	0	0	0	15
NNE	1	7	3	0	0	0	11
NE	1	7	5	0	0	0	13
ENE	2	2	2	0	0	0	6
E	1	0	0	0	0	0	1
ESE	1	4	0	0	0	0	5
SE	2	1	0	0	0	0	3
SSE	1	6	0	0	0	0	7
S	2	5	1	0	0	0	8
SSW	2	6	5	2	0	0	15
SW	1	4	5	1	0	0	11
WSW	0	1	5	0	0	0	6
W	0	7	3	0	0	0	10
WNW	3	4	0	0	0	0	7
NW	1	3	0	0	0	0	4
NNW	1	6	6	0	0	0	13
Variable	0	0	0	0	0	0	0
Total	20	73	39	3	0	0	135

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

Braidwood Generating Station

Period of Record: July - September 2012
 Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	5	23	22	0	0	0	50
NNE	4	31	11	0	0	0	46
NE	9	33	9	0	0	0	51
ENE	10	25	3	0	0	0	38
E	14	12	0	0	0	0	26
ESE	7	13	0	0	0	0	20
SE	4	4	3	0	0	0	11
SSE	2	11	3	0	0	0	16
S	1	13	6	2	1	0	23
SSW	0	8	12	3	1	0	24
SW	0	20	21	3	0	0	44
WSW	2	16	4	0	0	0	22
W	3	8	6	0	0	0	17
WNW	7	5	3	0	0	0	15
NW	6	7	1	0	0	0	14
NNW	3	31	19	0	0	0	53
Variable	0	0	0	0	0	0	0
Total	77	260	123	8	2	0	470

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

Braidwood Generating Station

Period of Record: July - September 2012
 Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	6	7	0	1	0	0	14
NNE	14	25	3	0	0	0	42
NE	11	14	0	0	0	0	25
ENE	23	12	0	0	0	0	35
E	21	4	0	0	0	0	25
ESE	23	11	0	0	0	0	34
SE	8	37	1	0	0	0	46
SSE	16	50	2	0	0	0	68
S	3	62	23	3	0	0	91
SSW	2	25	24	0	0	0	51
SW	3	21	16	0	0	0	40
WSW	7	20	2	0	0	0	29
W	9	8	1	0	0	0	18
WNW	13	6	0	0	0	0	19
NW	14	4	0	0	0	0	18
NNW	8	14	1	0	0	0	23
Variable	1	0	0	0	0	0	1
Total	182	320	73	4	0	0	579

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

Braidwood Generating Station

Period of Record: July - September 2012

Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)

Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	1	0	0	0	0	2
NNE	7	6	0	0	0	0	13
NE	3	1	0	0	0	0	4
ENE	10	1	0	0	0	0	11
E	24	3	0	0	0	0	27
ESE	27	1	0	0	0	0	28
SE	9	10	0	0	0	0	19
SSE	7	2	0	0	0	0	9
S	7	3	0	0	0	0	10
SSW	7	9	1	0	0	0	17
SW	6	9	0	0	0	0	15
WSW	23	8	0	0	0	0	31
W	37	2	0	0	0	0	39
WNW	30	1	0	0	0	0	31
NW	7	0	0	0	0	0	7
NNW	3	0	0	0	0	0	3
Variable	2	0	0	0	0	0	2
Total	210	57	1	0	0	0	268

Hours of calm in this stability class: 23

Hours of missing wind measurements in this stability class: 0

Hours of missing stability measurements in all stability classes: 3

Braidwood Generating Station

Period of Record: July - September 2012
 Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	3	0	0	0	0	0	3
NNE	2	1	0	0	0	0	3
NE	4	0	0	0	0	0	4
ENE	14	0	0	0	0	0	14
E	6	0	0	0	0	0	6
ESE	4	0	0	0	0	0	4
SE	4	0	0	0	0	0	4
SSE	3	0	0	0	0	0	3
S	2	0	0	0	0	0	2
SSW	4	0	0	0	0	0	4
SW	8	1	0	0	0	0	9
WSW	13	6	0	0	0	0	19
W	13	1	0	0	0	0	14
WNW	11	0	0	0	0	0	11
NW	3	0	0	0	0	0	3
NNW	7	0	0	0	0	0	7
Variable	0	0	0	0	0	0	0
Total	101	9	0	0	0	0	110

Hours of calm in this stability class: 69

Hours of missing wind measurements in this stability class: 0

Hours of missing stability measurements in all stability classes: 3

Braidwood Generating Station

Period of Record: July - September 2012

Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 203 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	2	6	7	0	0	15
NNE	0	2	2	1	0	0	5
NE	0	5	10	13	0	0	28
ENE	0	1	5	0	0	0	6
E	1	3	1	0	0	0	5
ESE	0	4	10	0	0	0	14
SE	0	7	13	1	0	0	21
SSE	0	14	21	2	0	0	37
S	0	16	14	5	0	2	37
SSW	0	8	17	10	4	0	39
SW	0	3	11	15	3	0	32
WSW	0	9	10	6	0	0	25
W	0	6	34	10	0	0	50
WNW	0	10	12	8	0	0	30
NW	0	8	11	11	5	0	35
NNW	0	5	18	9	0	0	32
Variable	1	1	0	0	0	0	2
Total	2	104	195	98	12	2	413

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

Braidwood Generating Station

Period of Record: July - September 2012
 Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	0	5	2	0	0	7
NNE	0	2	2	2	0	0	6
NE	0	4	2	4	0	0	10
ENE	0	2	1	0	0	0	3
E	0	5	1	0	0	0	6
ESE	1	4	4	0	0	0	9
SE	0	5	1	0	0	0	6
SSE	0	6	3	2	0	0	11
S	0	5	5	1	0	1	12
SSW	0	2	4	1	1	0	8
SW	0	5	2	1	0	0	8
WSW	1	6	3	1	0	0	11
W	0	7	3	3	0	0	13
WNW	0	2	0	0	0	0	2
NW	0	3	4	0	0	0	7
NNW	0	6	7	2	0	0	15
Variable	1	0	0	0	0	0	1
Total	3	64	47	19	1	1	135

Hours of calm in this stability class: 0

Hours of missing wind measurements in this stability class: 1

Hours of missing stability measurements in all stability classes: 3

Braidwood Generating Station

Period of Record: July - September 2012

Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	6	4	3	0	0	13
NNE	1	5	2	1	0	0	9
NE	1	2	7	5	0	0	15
ENE	1	1	2	2	0	0	6
E	0	2	1	0	0	0	3
ESE	2	2	1	0	0	0	5
SE	0	3	1	0	0	0	4
SSE	1	2	3	0	0	0	6
S	1	3	4	0	0	0	8
SSW	0	4	6	4	1	0	15
SW	1	4	4	1	0	0	10
WSW	0	2	2	3	0	0	7
W	1	6	5	1	0	0	13
WNW	0	4	1	1	0	0	6
NW	0	3	0	0	0	0	3
NNW	1	3	5	3	0	0	12
Variable	0	0	0	0	0	0	0
Total	10	52	48	24	1	0	135

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

Braidwood Generating Station

Period of Record: July - September 2012
 Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	12	18	14	0	0	45
NNE	3	11	15	5	0	0	34
NE	4	9	31	14	0	0	58
ENE	2	15	23	3	0	0	43
E	5	13	13	2	0	0	33
ESE	2	7	9	0	0	0	18
SE	2	2	4	5	0	0	13
SSE	0	4	10	3	0	0	17
S	0	4	8	8	0	3	23
SSW	0	2	14	12	3	2	33
SW	2	11	14	10	0	0	37
WSW	0	9	11	2	0	0	22
W	1	6	2	5	0	0	14
WNW	0	4	3	2	1	0	10
NW	1	14	6	0	0	0	21
NNW	1	8	23	16	1	0	49
Variable	0	0	0	0	0	0	0
Total	24	131	204	101	5	5	470

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

Braidwood Generating Station

Period of Record: July - September 2012
 Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	1	8	8	0	1	0	18
NNE	1	2	18	2	1	0	24
NE	0	5	24	3	0	0	32
ENE	0	8	26	0	0	0	34
E	2	9	25	2	0	0	38
ESE	2	1	15	2	0	0	20
SE	1	5	29	19	0	0	54
SSE	0	11	29	12	1	0	53
S	2	6	34	49	5	0	96
SSW	0	3	26	29	0	0	58
SW	0	5	33	17	0	0	55
WSW	0	3	16	2	0	0	21
W	1	4	12	0	1	0	18
WNW	0	3	8	1	0	0	12
NW	0	12	12	1	0	0	25
NNW	0	6	13	3	0	0	22
Variable	1	0	0	0	0	0	1
Total	11	91	328	142	9	0	581

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

Braidwood Generating Station

Period of Record: July - September 2012
 Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	3	2	0	0	0	7
NNE	1	3	2	4	0	0	10
NE	0	1	6	1	0	0	8
ENE	0	7	4	1	0	0	12
E	0	9	11	1	0	0	21
ESE	1	2	10	8	0	0	21
SE	0	3	16	6	0	0	25
SSE	2	7	8	0	0	0	17
S	0	6	3	1	0	0	10
SSW	1	7	8	0	0	0	16
SW	0	10	12	2	0	0	24
WSW	0	11	16	0	0	0	27
W	0	6	13	1	0	0	20
WNW	2	5	14	2	0	0	23
NW	0	6	28	0	0	0	34
NNW	1	1	11	0	0	0	13
Variable	0	0	0	0	0	0	0
Total	10	87	164	27	0	0	288

Hours of calm in this stability class: 0

Hours of missing wind measurements in this stability class: 3

Hours of missing stability measurements in all stability classes: 3

Braidwood Generating Station

Period of Record: July - September 2012
 Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	3	2	2	2	0	0	9
NNE	0	7	1	1	0	0	9
NE	3	3	2	1	0	0	9
ENE	2	4	2	0	0	0	8
E	5	3	3	1	0	0	12
ESE	1	1	7	1	0	0	10
SE	1	2	1	0	0	0	4
SSE	2	6	0	0	0	0	8
S	1	4	0	0	0	0	5
SSW	5	10	4	0	0	0	19
SW	1	9	3	0	0	0	13
WSW	1	6	5	1	0	0	13
W	0	5	12	4	0	0	21
WNW	2	4	8	3	0	0	17
NW	1	5	5	0	0	0	11
NNW	1	4	4	0	0	0	9
Variable	0	0	0	0	0	0	0
Total	29	75	59	14	0	0	177

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

Braidwood Generating Station

Period of Record: October - December 2012
 Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	0	1	0	0	0	1
NNE	0	0	1	0	0	0	1
NE	0	0	3	0	0	0	3
ENE	0	1	0	0	0	0	1
E	0	4	0	0	0	0	4
ESE	0	0	0	0	0	0	0
SE	0	0	2	0	0	0	2
SSE	0	0	4	1	0	0	5
S	0	0	2	0	0	0	2
SSW	0	0	1	10	1	0	12
SW	0	0	0	3	0	0	3
WSW	0	0	0	1	0	0	1
W	0	1	0	2	0	0	3
WNW	0	5	5	0	0	0	10
NW	0	4	6	0	0	0	10
NNW	0	0	4	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	0	15	29	17	1	0	62

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: 32

Braidwood Generating Station

Period of Record: October - December 2012
 Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	0	2	1	0	0	3
NNE	0	0	0	1	0	0	1
NE	0	2	0	0	0	0	2
ENE	0	1	0	0	0	0	1
E	0	1	0	0	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	1	1	0	0	0	2
S	0	0	0	1	0	0	1
SSW	0	0	4	0	0	0	4
SW	0	0	0	4	0	0	4
WSW	0	0	0	0	0	0	0
W	0	4	1	2	0	0	7
WNW	0	2	2	0	0	0	4
NW	0	4	2	0	0	0	6
NNW	0	0	2	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	0	15	14	9	0	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: 32

Braidwood Generating Station

Period of Record: October - December 2012
 Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	0	5	1	0	0	6
NNE	0	0	0	0	0	0	0
NE	0	1	2	0	0	0	3
ENE	0	4	0	0	0	0	4
E	1	1	0	0	0	0	2
ESE	0	0	0	0	0	0	0
SE	0	0	1	0	0	0	1
SSE	0	0	1	2	0	0	3
S	0	0	2	2	0	0	4
SSW	0	0	6	6	3	0	15
SW	0	1	1	3	0	0	5
WSW	0	3	1	1	0	0	5
W	0	7	0	0	0	0	7
WNW	0	7	1	0	0	0	8
NW	0	1	3	1	0	0	5
NNW	0	1	1	1	0	0	3
Variable	0	0	0	0	0	0	0
Total	1	26	24	17	3	0	71

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: 32

Braidwood Generating Station

Period of Record: October - December 2012
 Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	7	28	27	3	0	0	65
NNE	3	29	20	7	0	0	59
NE	7	23	11	1	0	0	42
ENE	11	7	0	0	0	0	18
E	5	16	0	0	0	0	21
ESE	2	8	0	0	0	0	10
SE	1	26	9	1	0	0	37
SSE	1	49	24	8	0	0	82
S	0	14	58	28	8	1	109
SSW	2	10	20	32	14	0	78
SW	1	17	23	16	3	0	60
WSW	2	19	11	1	1	0	34
W	2	38	22	5	0	0	67
WNW	13	52	39	6	2	0	112
NW	4	27	24	5	0	0	60
NNW	7	40	26	13	0	0	86
Variable	0	0	0	0	0	0	0
Total	68	403	314	126	28	1	940

Hours of calm in this stability class: 0

Hours of missing wind measurements in this stability class: 21

Hours of missing stability measurements in all stability classes: 32

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Braidwood Generating Station

Period of Record: October - December 2012
 Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	7	18	15	0	0	0	40
NNE	4	28	5	0	0	0	37
NE	11	11	0	1	0	0	23
ENE	14	7	0	0	0	0	21
E	10	10	4	0	0	0	24
ESE	8	7	3	0	0	0	18
SE	5	57	14	0	0	0	76
SSE	9	63	18	0	0	0	90
S	5	47	86	23	1	0	162
SSW	3	12	35	13	6	0	69
SW	3	19	26	2	0	0	50
WSW	9	22	4	0	0	0	35
W	24	37	5	2	0	0	68
WNW	18	18	2	6	0	0	44
NW	11	11	1	2	0	0	25
NNW	8	45	10	2	0	0	65
Variable	0	0	0	0	0	0	0
Total	149	412	228	51	7	0	847

Hours of calm in this stability class: 2

Hours of missing wind measurements in this stability class: 4

Hours of missing stability measurements in all stability classes: 32

Braidwood Generating Station

Period of Record: October - December 2012
 Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	2	0	0	0	0	2
NNE	0	0	0	0	0	0	0
NE	2	0	0	0	0	0	2
ENE	7	0	0	0	0	0	7
E	18	0	0	0	0	0	18
ESE	17	8	0	0	0	0	25
SE	3	9	0	0	0	0	12
SSE	8	5	0	0	0	0	13
S	1	1	0	0	0	0	2
SSW	2	5	2	0	0	0	9
SW	3	0	0	0	0	0	3
WSW	2	4	0	0	0	0	6
W	1	8	0	0	0	0	9
WNW	6	5	0	0	0	0	11
NW	6	0	0	0	0	0	6
NNW	5	2	0	0	0	0	7
Variable	0	0	0	0	0	0	0
Total	81	49	2	0	0	0	132

Hours of calm in this stability class: 7

Hours of missing wind measurements in this stability class: 0

Hours of missing stability measurements in all stability classes: 32

Braidwood Generating Station

Period of Record: October - December 2012
 Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	0	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	4	0	0	0	0	0	4
E	7	0	0	0	0	0	7
ESE	7	0	0	0	0	0	7
SE	0	1	0	0	0	0	1
SSE	3	0	0	0	0	0	3
S	2	0	0	0	0	0	2
SSW	2	0	0	0	0	0	2
SW	2	0	0	0	0	0	2
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	3	0	0	0	0	0	3
NW	4	0	0	0	0	0	4
NNW	1	0	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	36	1	0	0	0	0	37

Hours of calm in this stability class: 15

Hours of missing wind measurements in this stability class: 0

Hours of missing stability measurements in all stability classes: 32

Braidwood Generating Station

Period of Record: October - December 2012
 Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	1	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	4	0	0	4
ENE	0	0	1	0	0	0	1
E	0	1	3	0	0	0	4
ESE	0	0	0	0	0	0	0
SE	0	0	0	4	0	0	4
SSE	0	0	0	1	2	0	3
S	0	0	0	2	0	0	2
SSW	0	0	0	3	7	3	13
SW	0	0	0	0	2	0	2
WSW	0	0	0	0	2	0	2
W	0	0	1	0	1	0	2
WNW	0	0	7	2	2	0	11
NW	0	0	5	6	1	0	12
NNW	0	0	0	1	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	1	17	24	17	3	62

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: 32

Braidwood Generating Station

Period of Record: October - December 2012
 Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	1	0	1	0	2
NNE	0	0	0	1	1	0	2
NE	0	1	1	0	0	0	2
ENE	0	0	1	0	0	0	1
E	0	1	0	0	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	1	1	0	0	2
S	0	0	0	2	0	0	2
SSW	0	0	0	3	0	1	4
SW	0	0	0	1	2	0	3
WSW	0	0	0	0	0	0	0
W	0	0	4	0	3	0	7
WNW	0	0	2	2	0	0	4
NW	0	2	2	2	0	0	6
NNW	0	0	1	1	0	0	2
Variable	0	0	0	0	0	0	0
Total	0	4	13	13	7	1	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: 32

Braidwood Generating Station

Period of Record: October - December 2012
 Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	0	1	5	0	1	7
NNE	0	0	0	0	0	0	0
NE	0	0	2	1	0	0	3
ENE	0	3	0	0	0	0	3
E	0	1	1	0	0	0	2
ESE	0	0	1	0	0	0	1
SE	0	0	0	1	0	0	1
SSE	0	0	0	1	2	0	3
S	0	0	1	6	3	3	13
SSW	0	0	0	4	3	0	7
SW	0	1	1	2	1	0	5
WSW	0	0	1	0	1	0	2
W	0	3	6	0	0	0	9
WNW	0	3	4	1	0	0	8
NW	0	1	0	1	4	0	6
NNW	0	1	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	13	18	22	14	4	71

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: 32

Braidwood Generating Station

Period of Record: October - December 2012
 Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	3	13	34	9	0	1	60
NNE	2	9	22	12	6	2	53
NE	0	7	24	12	1	2	46
ENE	3	9	5	2	0	0	19
E	1	8	9	8	0	0	26
ESE	0	6	5	3	1	0	15
SE	1	8	17	12	5	0	43
SSE	0	12	34	19	16	0	81
S	0	10	15	45	29	17	116
SSW	1	6	12	19	26	17	81
SW	1	13	16	14	4	1	49
WSW	1	6	12	8	1	1	29
W	0	4	28	17	3	2	54
WNW	1	14	39	36	7	9	106
NW	1	8	33	18	7	11	78
NNW	2	12	37	17	12	2	82
Variable	0	0	0	0	0	0	0
Total	17	145	342	251	118	65	938

Hours of calm in this stability class: 0

Hours of missing wind measurements in this stability class: 23

Hours of missing stability measurements in all stability classes: 32

Braidwood Generating Station

Period of Record: October - December 2012
 Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction -----	Wind Speed (in mph)						Total -----
	1-3 -----	4-7 -----	8-12 -----	13-18 -----	19-24 -----	> 24 -----	
N	0	4	26	22	0	0	52
NNE	0	7	23	6	0	0	36
NE	0	5	22	0	1	0	28
ENE	0	5	9	0	0	0	14
E	0	8	15	3	4	0	30
ESE	0	7	5	1	4	0	17
SE	2	3	22	36	3	0	66
SSE	0	7	44	42	4	0	97
S	0	7	20	76	43	11	157
SSW	1	5	16	43	9	7	81
SW	3	10	24	20	1	0	58
WSW	0	8	13	5	0	0	26
W	1	6	20	9	4	0	40
WNW	1	8	32	11	1	2	55
NW	0	15	12	12	0	5	44
NNW	0	3	28	13	2	0	46
Variable	0	0	0	0	0	0	0
Total	8	108	331	299	76	25	847

Hours of calm in this stability class: 0

Hours of missing wind measurements in this stability class: 6

Hours of missing stability measurements in all stability classes: 32

Braidwood Generating Station

Period of Record: October - December 2012
 Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	7	1	0	0	9
NNE	0	0	1	1	0	0	2
NE	1	1	1	0	0	0	3
ENE	0	3	1	0	0	0	4
E	0	3	5	0	0	0	8
ESE	0	0	10	9	0	0	19
SE	1	4	14	5	0	0	24
SSE	0	5	7	1	0	0	13
S	0	1	4	0	0	0	5
SSW	0	4	7	0	0	0	11
SW	1	3	3	2	0	0	9
WSW	0	0	2	0	0	0	2
W	0	0	4	1	0	0	5
WNW	0	2	1	8	0	0	11
NW	0	1	3	9	0	0	13
NNW	0	0	1	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	3	28	71	37	0	0	139

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: 32

Braidwood Generating Station

Period of Record: October - December 2012
 Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
 Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	1	0	0	0	1
NNE	0	1	0	0	0	0	1
NE	1	1	0	0	0	0	2
ENE	0	0	0	0	0	0	0
E	1	0	1	0	0	0	2
ESE	1	0	0	0	0	0	1
SE	0	1	3	1	0	0	5
SSE	0	4	0	1	0	0	5
S	1	6	1	0	0	0	8
SSW	4	7	1	0	0	0	12
SW	0	6	1	0	0	0	7
WSW	1	2	0	0	0	0	3
W	1	0	1	0	0	0	2
WNW	0	2	0	0	0	0	2
NW	0	0	0	0	0	0	0
NNW	0	0	1	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	10	30	10	2	0	0	52

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: 32

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
UNIT 1 AND 2 (Docket Numbers 50-456 and 50-457)

APPENDIX A

LLD Tables

BRAIDWOOD NUCLEAR POWER STATION
 RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
 UNIT 1 AND 2 (Docket Numbers 50-456 and 50-457)
 LLD VALUES FOR GASEOUS RELEASES

<u>Isotope</u>	<u>LLD (μCi/ml)</u>
Gross Alpha	4.23E-15
H-3	1.03E-06
Mn-54	2.0088E-12
Co-58	2.1342E-12
Fe-59	3.6772E-12
Co-60	3.0908E-12
Zn-65	4.1135E-12
Kr-87	7.2110E-06
Kr-88	9.8565E-06
Sr-89	2.52E-14
Sr-90	2.96E-15
Mo-99	1.3778E-12
I-131	9.9535E-13
I-133	1.6119E-12
Xe-133	6.9644E-06
Xe-133m	3.0068E-05
Cs-134	1.7883E-12
Xe-135	3.9110E-06
Cs-137	2.3130E-12
Xe-138	4.7485E-05
Ce-141	2.3020E-12
Ce-144	9.2665E-12

NOTE: LLD Value for total activity released is based on LLD values for individual isotopes used in the calculation.

BRAIDWOOD NUCLEAR POWER STATION
 RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
 UNIT 1 AND 2 (Docket Numbers 50-456 and 50-457)
 LLD VALUES FOR LIQUID RELEASES

<u>Isotope</u>	<u>LLD (μCi/ml)</u>
Gross Alpha	3.75E-08
H-3	1.03E-06
Mn-54	5.7971E-08
Fe-55	5.48E-07
Co-58	7.1666E-08
Fe-59	1.4173E-07
Co-60	7.2917E-08
Zn-65	1.5384E-07
Sr-89	2.77E-08
Sr-90	7.68E-09
Mo-99	4.9570E-07
I-131	1.0602E-07
Xe-133	1.7443E-07
Cs-134	5.6641E-08
Cs-137	6.9026E-08
Kr-87	1.8974E-07
Kr-88	2.0446E-07
Ce-141	9.2767E-08
Ce-144	3.6519E-07
Xe-133m	4.1250E-07
Xe-135	5.1217E-08
Xe-138	5.3951E-06
Ba-140	3.4227E-08
Zr-95	1.8271E-08
Nb-95	1.4388E-08

NOTE: LLD Value for Total Activity Released is based on LLD Values for individual isotopes used in the calculation.

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
UNIT 1 AND 2 (Docket Numbers 50-456 and 50-457)

APPENDIX B

Supplemental Information

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
UNIT 1 AND 2 (Docket Numbers 50-456 and 50-457)

Instrument Issues

On 3/19/12, the weekly ODCM Exelon Pond compositor did not have the needed two liters of sample to perform the required analysis. Remediation had ceased within that sampling timeframe due to low Exelon Pond level. Approximately 2,836,451 gallons of Exelon Pond water were released to Circulating Water Blowdown prior to its securement. Water from the Exelon Pond had been trending less than 200 pCi/L tritium for the entirety of 2012 as monitored for RGPP. Additionally, remediated Exelon Pond water was composited downstream as part of Circulating Water Blowdown. This issue was entered into the Corrective Action Program as IR 1342983.

On 4/9/12, it was found that the Exelon Pond composite sample jug was without sample. A composited sample was not obtained from the time period 4/2/12 10:50 through 4/9/12 13:40. The Exelon Pond remediates at a rate of 1000 gallons per minute. The flow totalizer indicated a release of 50,000 gallons, therefore, the pump would have been running for approximately 50 minutes. The compositor is programmed to take a sample of the process flow every 90 minutes. The Exelon Pond pump was not running long enough to initiate the first sample. Water from the Exelon Pond had been trending less than 200 pCi/L tritium for the entirety of 2012 as monitored for RGPP. Additionally, remediated Exelon Pond water was composited downstream as part of Circulating Water Blowdown. This issue was entered into the Corrective Action Program as IR 1351826.

On 4/15/12, the weekly ODCM Exelon Pond compositor did not have the needed two liters of sample to perform the required analysis. Exelon Pond remediation was terminated until the solenoid operated sample valve was repaired. Water from the Exelon Pond had been trending less than 200 pCi/L tritium for the entirety of 2012 as monitored for RGPP. Additionally, remediated Exelon Pond water was composited downstream as part of Circulating Water Blowdown. This issue was entered into the Corrective Action Program as IR 1354481.

During A1R16, an LCO was entered for a planned bus outage affecting the 1PR28J and 1PR30J gaseous effluent monitors. Radiation Protection established the requisite sampling for the effluent stream to ensure continuous sampling. On 4/27/12 it was found that the compensatory sampling was inoperable. The portable air sampling pump's fuse had blown at some time between 4/27/12 00:00 and 4/27/12 08:00. The sample pump was replaced and functioned without incident afterward. ODCM Table 12.2-3 note 40 requires continuous collection of particulate and iodine samples via alternate sampling equipment when the 1PR28J is inoperable. Particulate and iodine concentrations were evaluated during the timeframe before and timeframe after the sampling pump failure. Particulate and iodine values were less than LLD for those analytes. There were no unusual plant evolutions occurring during that timeframe that would have increased particulate or iodine concentrations. This issue was entered into the Corrective Action Program as IR 1359736.

On 5/24/12, the CWBD compositor was found to not be working. The compositor was promptly repaired and compensatory grab sampling was instituted. This issue was entered into the Corrective Action Program as IR 1370433.

On 6/3/12, the 14 day time clock associated with OPR02J operability expired. Releases from waste gas release tanks ceased after the expiration of the time clock. Decontamination of the OPR02J was required to return the instrument to operable status. This issue was entered into the Corrective Action Program as IR 1373813.

On 6/27/12, a chemistry technician identified that the height of the iodine cartridges used in the Station Vent Stack 1/2PR29J process radiation monitors were greater than those used in the 1/2PR28J process radiation monitors. The calibrated geometry used for the 1/2PR28J had been used interchangeably for both iodine cartridges for many years. A calibration source was created for the taller iodine cartridge for comparison to the historically used geometry. An 11.6% average disparity across the energy range of interest was identified between the two geometries. A calibration geometry was created for the taller iodine cartridge and is currently being utilized.

BRAIDWOOD NUCLEAR POWER STATION
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The 1/2PR29J process radiation monitors serve as the back-up to the 1/2PR28J process radiation monitors. Iodine results from 1/2PR29J instruments are infrequently used for ODCM dose calculations. In 2012, the 1PR29J sample data was used for ODCM dose calculations for four weeks during the year. Each of those weeks' iodine concentrations were less than the lower level of detection. 2PR29J sample data was used for a period of two weeks during the year. I-131 was identified on one of the samples corresponding to an effluent concentration of $8.225\text{E-}14$ uCi/cc. Increasing the effluent concentration to $9.179\text{E-}14$ uCi/cc would have increased the dose to the thyroid of the maximally exposed individual by $2.00\text{E-}06$ mrem. This issue was entered into the Corrective Action Program as IR 1404278.

On 7/10/12, the weekly ODCM Exelon Pond compositor did not have the needed two liters of sample to perform the required analysis. The Exelon Pond pump was shutdown on 7/3/12. The last sample obtained from the Exelon pond pump compositor was on 7/2/12. The Exelon pond pump ran for approximately one day before being shut down for which there was insufficient sample to meet the procedurally required two liter minimum sample required for analysis. Water from the Exelon Pond had been trending less than 200 pCi/L tritium for the entirety of 2012 as monitored for RGPP. Additionally, remediated Exelon Pond water was composited downstream as part of Circulating Water Blowdown. This issue was entered into the Corrective Action Program as IR 1387611.

On 9/17/12, the Waste Water Treatment compositor was found to be off. Upon investigation it was determined that the ground fault circuit interrupter (GFCI) had tripped. The GFCI was reset and the sampling program resumed. It is unknown when the sampler stopped compositing, however, there was adequate sample in the polyethylene jug for analysis. This issue was entered into the Corrective Action Program as IR 1414098.

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
UNIT 1 AND 2 (Docket Numbers 50-456 and 50-457)

APPENDIX C

Unit Specific Annual Effluent Summaries

LIQUID RELEASE AND DOSE SUMMARY REPORT
 ----- (PERIOD BASIS - BY UNIT) -----

Release ID.....: 1 All Liquid Release Types
 Period Start Date.....: 01/01/2012 00:00
 Period End Date.....: 01/01/2013 00:00
 Period Duration (mins): 5.270E+05
 Unit.....: 1

=== MULTIPLE RELEASE POINT MESSAGE =====
 Undiluted and Diluted Flowrate(s) and Concentration(s) cannot be combined.

=== RELEASE DATA =====
 Total Release Duration (minutes)..... 1.848E+06
 Total Undiluted Volume Released (gallons)..... NA
 Average Undiluted Flowrate (gpm)..... NA

Total Dilution Volume (gallons)..... NA
 Average Dilution Flowrate (gpm)..... NA

=== NUCLIDE DATA =====

Nuclide uCi

CO-57	8.58E+00
NB-97	5.99E+01
SN-113	5.30E+00
SB-124	2.45E+02
SB-125	8.67E+03
TE-123M	1.91E+02
CR-51	5.18E+05
MN-54	1.31E+02
FE-59	2.98E+02
CO-58	4.37E+03
CO-60	3.17E+03
ZR-95	7.31E+01
NB-95	1.67E+02
AG-110M	8.02E+01
TE-125M	5.49E+03
TE-129M	3.53E+01
TE-132	1.07E+01
I-132	7.80E+00
W-187	4.58E+00

Gamma 5.41E+05

XE-133M 8.34E+00

D&EG 8.34E+00

H-3 1.29E+09

NI-63 1.09E+03

SR-91 4.69E+00

LIQUID RELEASE AND DOSE SUMMARY REPORT
----- (PERIOD BASIS - BY UNIT) -----

Release ID.....: 1 All Liquid Release Types
Period Start Date.....: 01/01/2012 00:00
Period End Date.....: 01/01/2013 00:00
Period Duration (mins): 5.270E+05

=== NUCLIDE DATA =====

Nuclide	uCi
-----	-----
Beta	1.29E+09
-----	-----
Total	1.29E+09

LIQUID RELEASE AND DOSE SUMMARY REPORT
 ----- (PERIOD BASIS - BY UNIT) -----

Release ID.....: 1 All Liquid Release Types
 Period Start Date.....: 01/01/2012 00:00
 Period End Date.....: 01/01/2013 00:00
 Period Duration (mins): 5.270E+05
 Unit.....: 1
 Receptor.....: 0 Liquid Receptor

=== PERIOD DOSE BY AGEGROUP, PATHWAY, ORGAN (mrem) ===

Age/Path	Bone	Liver	Thyroid	Kidney	Lung	GI-Lli	Skin	TB
APWtr	2.16E-05	1.48E-02	1.48E-02	1.48E-02	1.48E-02	1.49E-02	0.00E+00	1.48E-02
AFWFSp	1.28E-03	6.39E-03	6.25E-03	7.68E-03	6.16E-03	1.94E-02	0.00E+00	6.31E-03
TPWtr	2.06E-05	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.05E-02	0.00E+00	1.04E-02
TFWFSp	1.35E-03	4.99E-03	4.83E-03	4.77E-03	4.74E-03	1.42E-02	0.00E+00	4.89E-03
CPWtr	6.26E-05	2.00E-02	2.00E-02	2.00E-02	2.00E-02	2.01E-02	0.00E+00	2.00E-02
CFWFSp	1.75E-03	4.16E-03	4.06E-03	3.95E-03	3.92E-03	7.29E-03	0.00E+00	4.12E-03
IPWtr	5.13E-05	1.96E-02	1.96E-02	1.96E-02	1.96E-02	1.97E-02	0.00E+00	1.96E-02

=== PERIOD DOSE BY AGEGROUP, ORGAN (mrem) ===

Agegroup	Bone	Liver	Thyroid	Kidney	Lung	GI-Lli	Skin	TB
ADULT	1.30E-03	2.12E-02	2.10E-02	2.25E-02	2.09E-02	3.43E-02	0.00E+00	2.11E-02
TEEN	1.37E-03	1.54E-02	1.53E-02	1.52E-02	1.52E-02	2.46E-02	0.00E+00	1.53E-02
CHILD	1.82E-03	2.42E-02	2.41E-02	2.40E-02	2.39E-02	2.73E-02	0.00E+00	2.41E-02
INFANT	5.13E-05	1.96E-02	1.96E-02	1.96E-02	1.96E-02	1.97E-02	0.00E+00	1.96E-02

LIQUID RELEASE AND DOSE SUMMARY REPORT
----- (PERIOD BASIS - BY UNIT) -----

Release ID.....: 1 All Liquid Release Types
 Period Start Date.....: 01/01/2012 00:00
 Period End Date.....: 01/01/2013 00:00
 Period Duration (mins): 5.270E+05
 Unit.....: 1
 Receptor.....: 0 Liquid Receptor

=== MAXIMUM PERIOD DOSE TO LIMIT (Any Organ) ===

Dose Period	Age Group	Organ	Dose (mrem)	Limit Period	Admin Limit	Admin % of Limit	T.Spec Limit	T.Spec % of Limit
Strt->End	ADULT	GILLI	3.43E-02	31-day	1.50E-01	2.28E+01	2.00E-01	1.71E+01
Qrtr->End	ADULT	GILLI	3.43E-02	Quarter	3.75E+00	9.14E-01	5.00E+00	6.85E-01
Year->End	ADULT	GILLI	3.43E-02	Annual	7.50E+00	4.57E-01	1.00E+01	3.43E-01

Critical Pathway.....: 1 Fresh Water Fish - Sport (FFSP)
 Major Contributors.....: 0.0 % or greater to total

Nuclide Percentage

H-3	6.10E+01
CR-51	1.30E+01
MN-54	1.35E-01
FE-59	1.89E-01
CO-58	6.30E-01
CO-60	1.21E+00
NI-63	3.85E-02
SR-91	7.44E-04
ZR-95	2.26E-03
NB-95	1.92E+01
AG-110M	3.97E-03
TE-125M	4.32E+00
TE-129M	1.50E-01
TE-132	6.04E-02
I-132	2.49E-06
W-187	2.83E-02

=== MAXIMUM PERIOD DOSE TO LIMIT (Tot Body) ===

Dose Period	Age Group	Organ	Dose (mrem)	Limit Period	Admin Limit	Admin % of Limit	T.Spec Limit	T.Spec % of Limit
Strt->End	CHILD	TBODY	2.41E-02	31-day	4.50E-02	5.36E+01	6.00E-02	4.02E+01
Qrtr->End	CHILD	TBODY	2.41E-02	Quarter	1.13E+00	2.15E+00	1.50E+00	1.61E+00
Year->End	CHILD	TBODY	2.41E-02	Annual	2.25E+00	1.07E+00	3.00E+00	8.04E-01

Critical Pathway.....: 0 Potable Water (PWtr)
 Major Contributors.....: 0.0 % or greater to total

Nuclide Percentage

H-3	9.90E+01
CR-51	8.16E-02

LIQUID RELEASE AND DOSE SUMMARY REPORT
----- (PERIOD BASIS - BY UNIT) -----

Release ID.....: 1 All Liquid Release Types
Period Start Date.....: 01/01/2012 00:00
Period End Date.....: 01/01/2013 00:00
Period Duration (mins): 5.270E+05

Major Contributors.....: 0.0 % or greater to total

Nuclide	Percentage
-----	-----
MN-54	1.29E-02
FE-59	3.54E-02
CO-58	1.12E-01
CO-60	2.30E-01
NI-63	1.79E-01
SR-91	1.26E-05
ZR-95	1.12E-06
NB-95	2.67E-03
AG-110M	1.38E-05
TE-125M	2.88E-01
TE-129M	9.20E-03
TE-132	1.99E-03
I-132	8.83E-06
W-187	5.35E-05

LIQUID RELEASE AND DOSE SUMMARY REPORT
 ----- (PERIOD BASIS - BY UNIT) -----

Release ID.....: 1 All Liquid Release Types
 Period Start Date.....: 01/01/2012 00:00
 Period End Date.....: 01/01/2013 00:00
 Period Duration (mins): 5.270E+05
 Unit.....: 2

=== MULTIPLE RELEASE POINT MESSAGE =====
 Undiluted and Diluted Flowrate(s) and Concentration(s) cannot be combined.

=== RELEASE DATA =====
 Total Release Duration (minutes)..... 1.848E+06
 Total Undiluted Volume Released (gallons)..... NA
 Average Undiluted Flowrate (gpm)..... NA

 Total Dilution Volume (gallons)..... NA
 Average Dilution Flowrate (gpm)..... NA

=== NUCLIDE DATA =====

Nuclide	uCi
CO-57	8.58E+00
NB-97	5.99E+01
SN-113	5.30E+00
SB-124	2.45E+02
SB-125	8.67E+03
TE-123M	1.91E+02
CR-51	5.18E+05
MN-54	1.31E+02
FE-59	2.98E+02
CO-58	4.37E+03
CO-60	3.17E+03
ZR-95	7.31E+01
NB-95	1.67E+02
AG-110M	8.02E+01
TE-125M	5.49E+03
TE-129M	3.53E+01
TE-132	1.07E+01
I-132	7.80E+00
W-187	4.58E+00
Gamma	5.41E+05
XE-133M	8.34E+00
D&EG	8.34E+00
H-3	1.29E+09
NI-63	1.09E+03
SR-91	4.69E+00

LIQUID RELEASE AND DOSE SUMMARY REPORT
----- (PERIOD BASIS - BY UNIT) -----

Release ID.....: 1 All Liquid Release Types
Period Start Date.....: 01/01/2012 00:00
Period End Date.....: 01/01/2013 00:00
Period Duration (mins): 5.270E+05

=== NUCLIDE DATA =====

Nuclide	uCi
-----	-----
Beta	1.29E+09
-----	-----
Total	1.29E+09

LIQUID RELEASE AND DOSE SUMMARY REPORT
 ----- (PERIOD BASIS - BY UNIT) -----

Release ID.....: 1 All Liquid Release Types
 Period Start Date.....: 01/01/2012 00:00
 Period End Date.....: 01/01/2013 00:00
 Period Duration (mins): 5.270E+05
 Unit.....: 2
 Receptor.....: 0 Liquid Receptor

=== PERIOD DOSE BY AGEGROUP, PATHWAY, ORGAN (mrem) ===

Age/Path	Bone	Liver	Thyroid	Kidney	Lung	GI-Lli	Skin	TB
APWtr	2.16E-05	1.48E-02	1.48E-02	1.48E-02	1.48E-02	1.49E-02	0.00E+00	1.48E-02
AFWFSp	1.28E-03	6.39E-03	6.25E-03	7.68E-03	6.16E-03	1.94E-02	0.00E+00	6.31E-03
TPWtr	2.06E-05	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.05E-02	0.00E+00	1.04E-02
TFWFSp	1.35E-03	4.99E-03	4.83E-03	4.77E-03	4.74E-03	1.42E-02	0.00E+00	4.89E-03
CPWtr	6.26E-05	2.00E-02	2.00E-02	2.00E-02	2.00E-02	2.01E-02	0.00E+00	2.00E-02
CFWFSp	1.75E-03	4.16E-03	4.06E-03	3.95E-03	3.92E-03	7.29E-03	0.00E+00	4.12E-03
IPWtr	5.13E-05	1.96E-02	1.96E-02	1.96E-02	1.96E-02	1.97E-02	0.00E+00	1.96E-02

=== PERIOD DOSE BY AGEGROUP, ORGAN (mrem) ===

Agegroup	Bone	Liver	Thyroid	Kidney	Lung	GI-Lli	Skin	TB
ADULT	1.30E-03	2.12E-02	2.10E-02	2.25E-02	2.09E-02	3.43E-02	0.00E+00	2.11E-02
TEEN	1.37E-03	1.54E-02	1.53E-02	1.52E-02	1.52E-02	2.46E-02	0.00E+00	1.53E-02
CHILD	1.82E-03	2.42E-02	2.41E-02	2.40E-02	2.39E-02	2.73E-02	0.00E+00	2.41E-02
INFANT	5.13E-05	1.96E-02	1.96E-02	1.96E-02	1.96E-02	1.97E-02	0.00E+00	1.96E-02

LIQUID RELEASE AND DOSE SUMMARY REPORT
----- (PERIOD BASIS - BY UNIT) -----

Release ID.....: 1 All Liquid Release Types
 Period Start Date.....: 01/01/2012 00:00
 Period End Date.....: 01/01/2013 00:00
 Period Duration (mins): 5.270E+05
 Unit.....: 2
 Receptor.....: 0 Liquid Receptor

=== MAXIMUM PERIOD DOSE TO LIMIT (Any Organ) ===

Dose Period	Age Group	Organ	Dose (mrem)	Limit Period	Admin Limit	Admin % of Limit	T.Spec Limit	T.Spec % of Limit
Strt->End	ADULT	GILLI	3.43E-02	31-day	1.50E-01	2.28E+01	2.00E-01	1.71E+01
Qrtr->End	ADULT	GILLI	3.43E-02	Quarter	3.75E+00	9.14E-01	5.00E+00	6.85E-01
Year->End	ADULT	GILLI	3.43E-02	Annual	7.50E+00	4.57E-01	1.00E+01	3.43E-01

Critical Pathway.....: 1 Fresh Water Fish - Sport (FFSP)
 Major Contributors.....: 0.0 % or greater to total

Nuclide	Percentage
H-3	6.10E+01
CR-51	1.30E+01
MN-54	1.35E-01
FE-59	1.89E-01
CO-58	6.30E-01
CO-60	1.21E+00
NI-63	3.85E-02
SR-91	7.44E-04
ZR-95	2.26E-03
NB-95	1.92E+01
AG-110M	3.97E-03
TE-125M	4.32E+00
TE-129M	1.50E-01
TE-132	6.04E-02
I-132	2.49E-06
W-187	2.83E-02

=== MAXIMUM PERIOD DOSE TO LIMIT (Tot Body) ===

Dose Period	Age Group	Organ	Dose (mrem)	Limit Period	Admin Limit	Admin % of Limit	T.Spec Limit	T.Spec % of Limit
Strt->End	CHILD	TBODY	2.41E-02	31-day	4.50E-02	5.36E+01	6.00E-02	4.02E+01
Qrtr->End	CHILD	TBODY	2.41E-02	Quarter	1.13E+00	2.15E+00	1.50E+00	1.61E+00
Year->End	CHILD	TBODY	2.41E-02	Annual	2.25E+00	1.07E+00	3.00E+00	8.04E-01

Critical Pathway.....: 0 Potable Water (PWtr)
 Major Contributors.....: 0.0 % or greater to total

Nuclide	Percentage
H-3	9.90E+01
CR-51	8.16E-02

LIQUID RELEASE AND DOSE SUMMARY REPORT
----- (PERIOD BASIS - BY UNIT) -----

Release ID.....: 1 All Liquid Release Types
Period Start Date.....: 01/01/2012 00:00
Period End Date.....: 01/01/2013 00:00
Period Duration (mins): 5.270E+05

Major Contributors.....: 0.0 % or greater to total

Nuclide	Percentage
-----	-----
MN-54	1.29E-02
FE-59	3.54E-02
CO-58	1.12E-01
CO-60	2.30E-01
NI-63	1.79E-01
SR-91	1.26E-05
ZR-95	1.12E-06
NB-95	2.67E-03
AG-110M	1.38E-05
TE-125M	2.88E-01
TE-129M	9.20E-03
TE-132	1.99E-03
I-132	8.83E-06
W-187	5.35E-05

GASEOUS RELEASE AND DOSE SUMMARY REPORT - BY UNIT
(Composite Critical Receptor - Limited Analysis)

Release ID.....: 1 All Gas Release Types
 Period Start Date.....: 01/01/2012 00:00
 Period End Date.....: 01/01/2013 00:00
 Period Duration (min): 5.270E+05
 Coefficient Type.....: Historical
 Unit.....: 1

=== RELEASE DATA ===
 Total Release Duration (minutes)..... 5.746E+05
 Total Release Volume (cf)..... 5.212E+10
 Average Release Flowrate (cfm)..... 9.070E+04

Average Period Flowrate (cfm)..... 9.889E+04

=== NUCLIDE DATA ===

Nuclide	uCi	Average uCi/cc	ECrcent Ratio	EC
AR-41	1.38E+03	9.34E-13	9.34E-05	1.00E-08
KR-85M	3.30E+02	2.24E-13	2.24E-06	1.00E-07
KR-85	0.00E+00	0.00E+00	0.00E+00	7.00E-07
KR-87	2.05E+02	1.39E-13	6.94E-06	2.00E-08
XE-133M	2.63E+03	1.78E-12	2.97E-06	6.00E-07
KR-83M	0.00E+00	0.00E+00	0.00E+00	5.00E-05
KR-88	0.00E+00	0.00E+00	0.00E+00	9.00E-09
XE-131M	0.00E+00	0.00E+00	0.00E+00	2.00E-06
XE-135	2.41E+04	1.63E-11	2.33E-04	7.00E-08
XE-133	3.79E+05	2.57E-10	5.14E-04	5.00E-07
F&AG	4.08E+05	2.76E-10	8.53E-04	
I-131	5.56E+01	3.77E-14	1.88E-04	2.00E-10
I-132	3.86E+02	2.62E-13	1.31E-05	2.00E-08
I-133	7.24E+00	4.90E-15	4.90E-06	1.00E-09
I-135	0.00E+00	0.00E+00	0.00E+00	6.00E-09
Iodine	4.49E+02	3.04E-13	2.06E-04	
BR-82	0.00E+00	0.00E+00	0.00E+00	5.00E-09
C-14	4.14E+06	2.81E-09	9.35E-01	3.00E-09
Other	4.14E+06	2.81E-09	9.35E-01	
H-3	1.84E+08	1.24E-07	1.24E+00	1.00E-07
H-3	1.84E+08	1.24E-07	1.24E+00	
TC-99M	3.65E+00	2.48E-15	1.24E-08	2.00E-07

GASEOUS RELEASE AND DOSE SUMMARY REPORT - BY UNIT
(Composite Critical Receptor - Limited Analysis)

Release ID.....: 1 All Gas Release Types
Period Start Date.....: 01/01/2012 00:00
Period End Date.....: 01/01/2013 00:00
Period Duration (min): 5.270E+05
Coefficient Type.....: Historical
Unit.....: 1

=== NUCLIDE DATA =====

Nuclide	uCi	Average uCi/cc	ECrcent Ratio	EC
P<8	3.65E+00	2.48E-15	1.24E-08	
CO-60	1.17E+01	7.94E-15	1.59E-04	5.00E-11
P>=8	1.17E+01	7.94E-15	1.59E-04	
Total	1.88E+08	1.27E-07	2.18E+00	

GASEOUS RELEASE AND DOSE SUMMARY REPORT - BY UNIT
(Composite Critical Receptor - Limited Analysis)

Release ID.....: 1 All Gas Release Types
 Period Start Date.....: 01/01/2012 00:00
 Period End Date.....: 01/01/2013 00:00
 Period Duration (min): 5.270E+05
 Coefficient Type.....: Historical
 Unit.....: 1
 Receptor.....: 5 Composite Crit. Receptor - IP
 Distance (meters).....: 0.0
 Compass Point.....: 0.0

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=== PERIOD DOSE BY AGEGROUP, PATHWAY, ORGAN (mrem) ===
Age/Path Bone      Liver      Thyroid      Kidney      Lung      GI-Lli      Skin      TB
-----
AGPD      1.50E-04 1.50E-04 1.50E-04 1.50E-04 1.50E-04 1.50E-04 0.00E+00 1.50E-04
AINHL     2.77E-03 5.37E-03 5.40E-03 5.37E-03 5.38E-03 5.37E-03 0.00E+00 5.37E-03
AVEG      1.37E-01 3.60E-02 3.71E-02 3.60E-02 3.60E-02 3.60E-02 0.00E+00 3.60E-02
AGMILK     4.11E-03 6.84E-03 1.16E-02 6.85E-03 6.82E-03 6.83E-03 0.00E+00 6.83E-03
ACMEAT     5.07E-02 1.14E-02 1.15E-02 1.14E-02 1.14E-02 1.14E-02 0.00E+00 1.14E-02
ACMILK     5.53E-02 1.40E-02 1.80E-02 1.40E-02 1.40E-02 1.40E-02 0.00E+00 1.40E-02
TGPD      1.50E-04 1.50E-04 1.50E-04 1.50E-04 1.50E-04 1.50E-04 0.00E+00 1.50E-04
TINHL     3.96E-03 5.64E-03 5.67E-03 5.64E-03 5.64E-03 5.64E-03 0.00E+00 5.64E-03
TVEG      2.21E-01 5.43E-02 5.52E-02 5.43E-02 5.43E-02 5.43E-02 0.00E+00 5.43E-02
TGMILK     7.42E-03 9.31E-03 1.69E-02 9.33E-03 9.28E-03 9.29E-03 0.00E+00 9.30E-03
TCMEAT     4.28E-02 9.31E-03 9.42E-03 9.31E-03 9.31E-03 9.31E-03 0.00E+00 9.31E-03
TCMILK     1.02E-01 2.43E-02 3.06E-02 2.43E-02 2.42E-02 2.43E-02 0.00E+00 2.43E-02
CGPD      1.50E-04 1.50E-04 1.50E-04 1.50E-04 1.50E-04 1.50E-04 0.00E+00 1.50E-04
CINHL     5.47E-03 5.35E-03 5.39E-03 5.35E-03 5.35E-03 5.35E-03 0.00E+00 5.35E-03
CVEG      5.33E-01 1.22E-01 1.24E-01 1.22E-01 1.22E-01 1.22E-01 0.00E+00 1.22E-01
CGMILK     2.38E-01 6.25E-02 7.76E-02 6.26E-02 6.25E-02 6.25E-02 0.00E+00 6.25E-02
CCMEAT     8.06E-02 1.71E-02 1.72E-02 1.71E-02 1.71E-02 1.71E-02 0.00E+00 1.71E-02
CCMILK     2.51E-01 5.62E-02 6.88E-02 5.63E-02 5.62E-02 5.62E-02 0.00E+00 5.62E-02
IGPD      1.50E-04 1.50E-04 1.50E-04 1.50E-04 1.50E-04 1.50E-04 0.00E+00 1.50E-04
IINHL     4.04E-03 3.30E-03 3.33E-03 3.30E-03 3.30E-03 3.30E-03 0.00E+00 3.30E-03
IGMILK     4.92E-01 1.24E-01 1.60E-01 1.24E-01 1.24E-01 1.24E-01 0.00E+00 1.24E-01
ICMILK     4.92E-01 1.14E-01 1.45E-01 1.14E-01 1.14E-01 1.14E-01 0.00E+00 1.14E-01
  
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=== PERIOD DOSE BY AGEGROUP, ORGAN (mrem) ===
Agegroup Bone      Liver      Thyroid      Kidney      Lung      GI-Lli      Skin      TB
-----
ADULT     2.50E-01 7.38E-02 8.39E-02 7.38E-02 7.37E-02 7.38E-02 0.00E+00 7.38E-02
TEEN      3.77E-01 1.03E-01 1.18E-01 1.03E-01 1.03E-01 1.03E-01 0.00E+00 1.03E-01
CHILD     1.11E+00 2.64E-01 2.93E-01 2.64E-01 2.64E-01 2.64E-01 0.00E+00 2.64E-01
INFANT    9.89E-01 2.42E-01 3.09E-01 2.42E-01 2.41E-01 2.41E-01 0.00E+00 2.41E-01
  
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GASEOUS RELEASE AND DOSE SUMMARY REPORT - BY UNIT
(Composite Critical Receptor - Limited Analysis)

Release ID.....: 1 All Gas Release Types
 Period Start Date.....: 01/01/2012 00:00
 Period End Date.....: 01/01/2013 00:00
 Period Duration (min): 5.270E+05
 Coefficient Type.....: Historical
 Unit.....: 1
 Receptor.....: 5 Composite Crit. Receptor - IP
 Distance (meters).....: 0.0
 Compass Point.....: 0.0

=== MAXIMUM PERIOD DOSE TO LIMIT (Any Organ) ===

Dose Period	Age Group	Organ	Dose (mrem)	Limit Period	Admin Limit	Admin % of Limit	T.Spec Limit	T.Spec % of Limit
Strt->End	CHILD	BONE	1.11E+00	31-day	2.25E-01	4.93E+02	3.00E-01	3.70E+02
Qrtr->End	CHILD	BONE	1.11E+00	Quarter	5.63E+00	1.97E+01	7.50E+00	1.48E+01
Year->End	CHILD	BONE	1.11E+00	Annual	1.13E+01	9.86E+00	1.50E+01	7.39E+00

Critical Pathway.....: 2 Vegetation (VEG)
 Major Contributors.....: 0.0 % or greater to total

Nuclide	Percentage
H-3	0.00E+00
C-14	1.00E+02
CO-60	1.35E-02
TC-99M	3.16E-08
I-131	7.96E-03
I-132	2.53E-05
I-133	1.53E-05
I-135	0.00E+00

=== MAXIMUM PERIOD DOSE TO LIMIT (Tot Body) ===

Dose Period	Age Group	Organ	Dose (mrem)	Limit Period	Admin Limit	Admin % of Limit	T.Spec Limit	T.Spec % of Limit
Strt->End	CHILD	TBODY	2.64E-01	31-day	1.50E-01	1.76E+02	2.00E-01	1.32E+02
Qrtr->End	CHILD	TBODY	2.64E-01	Quarter	5.25E+00	5.02E+00	7.50E+00	3.51E+00
Year->End	CHILD	TBODY	2.64E-01	Annual	1.05E+01	2.51E+00	1.50E+01	1.76E+00

Critical Pathway.....: 2 Vegetation (VEG)
 Major Contributors.....: 0.0 % or greater to total

Nuclide	Percentage
H-3	1.48E+01
C-14	8.50E+01
CO-60	6.03E-02
TC-99M	1.33E-07
I-131	1.92E-02
I-132	1.05E-04
I-133	3.19E-05

GASEOUS RELEASE AND DOSE SUMMARY REPORT - BY UNIT
(Composite Critical Receptor - Limited Analysis)

Release ID.....: 1 All Gas Release Types
Period Start Date.....: 01/01/2012 00:00
Period End Date.....: 01/01/2013 00:00
Period Duration (min): 5.270E+05
Coefficient Type.....: Historical
Unit.....: 1

Major Contributors.....: 0.0 % or greater to total

Nuclide	Percentage
-----	-----
I-135	0.00E+00

GASEOUS RELEASE AND DOSE SUMMARY REPORT - BY UNIT
(Composite Critical Receptor - Limited Analysis)

Release ID.....: 1 All Gas Release Types
Period Start Date.....: 01/01/2012 00:00
Period End Date.....: 01/01/2013 00:00
Period Duration (min): 5.270E+05
Coefficient Type.....: Historical
Unit.....: 1
Receptor.....: 4 Composite Crit. Receptor - NG
Distance (meters).....: 0.0
Compass Point.....: 0.0

=== MAXIMUM PERIOD NG DOSE TO LIMIT (Gamma) ===

Dose Period	Dose Type	Dose (mrad)	Limit Period	Admin Limit	Admin % of Limit	T.Spec Limit	T.Spec % of Limit
Strt->End	Gamma	4.41E-06	31-day	1.50E-01	2.94E-03	2.00E-01	2.21E-03
Qrtr->End	Gamma	4.41E-06	Quarter	3.75E+00	1.18E-04	5.00E+00	8.82E-05
Year->End	Gamma	4.41E-06	Annual	7.50E+00	5.88E-05	1.00E+01	4.41E-05

Major Contributors.....: 0.0 % or greater to total

Nuclide Percentage

AR-41	6.56E+00
KR-85M	2.08E-01
KR-85	0.00E+00
KR-87	6.47E-01
XE-133M	4.41E-01
KR-83M	0.00E+00
KR-88	0.00E+00
XE-131M	0.00E+00
XE-135	2.37E+01
XE-133	6.85E+01

=== MAXIMUM PERIOD NG DOSE TO LIMIT (Beta) ===

Dose Period	Dose Type	Dose (mrad)	Limit Period	Admin Limit	Admin % of Limit	T.Spec Limit	T.Spec % of Limit
Strt->End	Beta	1.72E-05	31-day	3.00E-01	5.75E-03	4.00E-01	4.31E-03
Qrtr->End	Beta	1.72E-05	Quarter	7.50E+00	2.30E-04	1.00E+01	1.72E-04
Year->End	Beta	1.72E-05	Annual	1.50E+01	1.15E-04	2.00E+01	8.62E-05

Major Contributors.....: 0.0 % or greater to total

Nuclide Percentage

AR-41	9.65E-01
KR-85M	1.39E-01
KR-85	0.00E+00
KR-87	4.51E-01
XE-133M	8.32E-01
KR-83M	0.00E+00
KR-88	0.00E+00
XE-131M	0.00E+00
XE-135	1.26E+01

GASEOUS RELEASE AND DOSE SUMMARY REPORT - BY UNIT
(Composite Critical Receptor - Limited Analysis)

Release ID.....: 1 All Gas Release Types
Period Start Date.....: 01/01/2012 00:00
Period End Date.....: 01/01/2013 00:00
Period Duration (min): 5.270E+05
Coefficient Type.....: Historical
Unit.....: 1

Major Contributors.....: 0.0 % or greater to total

Nuclide	Percentage
-----	-----
XE-133	8.50E+01

GASEOUS RELEASE AND DOSE SUMMARY REPORT - BY UNIT
(Composite Critical Receptor - Limited Analysis)

Release ID.....: 1 All Gas Release Types
Period Start Date.....: 01/01/2012 00:00
Period End Date.....: 01/01/2013 00:00
Period Duration (min): 5.270E+05
Coefficient Type.....: Historical
Unit.....: 2

=== RELEASE DATA ===
Total Release Duration (minutes)..... 5.632E+05
Total Release Volume (cf)..... 7.473E+10
Average Release Flowrate (cfm)..... 1.327E+05

Average Period Flowrate (cfm)..... 1.418E+05

=== NUCLIDE DATA ===

Nuclide	uCi	Average uCi/cc	ECrcent Ratio	EC
AR-41	1.38E+03	6.51E-13	6.51E-05	1.00E-08
KR-85M	3.30E+02	1.56E-13	1.56E-06	1.00E-07
KR-85	0.00E+00	0.00E+00	0.00E+00	7.00E-07
KR-87	2.05E+02	9.69E-14	4.84E-06	2.00E-08
XE-133M	2.63E+03	1.24E-12	2.07E-06	6.00E-07
KR-83M	0.00E+00	0.00E+00	0.00E+00	5.00E-05
KR-88	0.00E+00	0.00E+00	0.00E+00	9.00E-09
XE-131M	0.00E+00	0.00E+00	0.00E+00	2.00E-06
XE-135	2.41E+04	1.14E-11	1.63E-04	7.00E-08
XE-133	3.79E+05	1.79E-10	3.58E-04	5.00E-07
F&AG	4.08E+05	1.93E-10	5.95E-04	
I-131	3.19E+01	1.51E-14	7.53E-05	2.00E-10
I-132	8.84E+02	4.18E-13	2.09E-05	2.00E-08
I-133	1.16E+02	5.50E-14	5.50E-05	1.00E-09
Iodine	1.03E+03	4.88E-13	1.51E-04	
C-14	4.17E+06	1.97E-09	6.57E-01	3.00E-09
Other	4.17E+06	1.97E-09	6.57E-01	
H-3	3.87E+08	1.83E-07	1.83E+00	1.00E-07
H-3	3.87E+08	1.83E-07	1.83E+00	
AG-108M	0.00E+00	0.00E+00	0.00E+00	3.00E-11
CO-60	8.86E+01	4.19E-14	8.38E-04	5.00E-11

GASEOUS RELEASE AND DOSE SUMMARY REPORT - BY UNIT
(Composite Critical Receptor - Limited Analysis)

Release ID.....: 1 All Gas Release Types
Period Start Date....: 01/01/2012 00:00
Period End Date.....: 01/01/2013 00:00
Period Duration (min): 5.270E+05
Coefficient Type.....: Historical
Unit.....: 2

=== NUCLIDE DATA ===

Nuclide	uCi	Average uCi/cc	ECrcent Ratio	EC
P>=8	8.86E+01	4.19E-14	8.38E-04	
Total	3.92E+08	1.85E-07	2.49E+00	

GASEOUS RELEASE AND DOSE SUMMARY REPORT - BY UNIT
(Composite Critical Receptor - Limited Analysis)

Release ID.....: 1 All Gas Release Types
 Period Start Date.....: 01/01/2012 00:00
 Period End Date.....: 01/01/2013 00:00
 Period Duration (min): 5.270E+05
 Coefficient Type.....: Historical
 Unit.....: 2
 Receptor.....: 5 Composite Crit. Receptor - IP
 Distance (meters).....: 0.0
 Compass Point.....: 0.0

=== PERIOD DOSE BY AGEGROUP, PATHWAY, ORGAN (mrem) ===

Age/Path	Bone	Liver	Thyroid	Kidney	Lung	GI-Lli	Skin	TB
AGPD	1.13E-03	1.13E-03	1.13E-03	1.13E-03	1.13E-03	1.13E-03	0.00E+00	1.13E-03
AINHL	2.79E-03	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	0.00E+00	1.08E-02
AVEG	1.38E-01	4.59E-02	4.65E-02	4.58E-02	4.58E-02	4.60E-02	0.00E+00	4.59E-02
AGMILK	4.13E-03	1.35E-02	1.63E-02	1.35E-02	1.35E-02	1.35E-02	0.00E+00	1.35E-02
ACMEAT	5.11E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	0.00E+00	1.29E-02
ACMILK	5.57E-02	1.74E-02	1.97E-02	1.74E-02	1.73E-02	1.74E-02	0.00E+00	1.74E-02
TGPD	1.13E-03	1.13E-03	1.13E-03	1.13E-03	1.13E-03	1.13E-03	0.00E+00	1.13E-03
TINHL	3.99E-03	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	0.00E+00	1.11E-02
TVEG	2.23E-01	6.57E-02	6.62E-02	6.57E-02	6.57E-02	6.58E-02	0.00E+00	6.57E-02
TGMILK	7.47E-03	1.80E-02	2.24E-02	1.80E-02	1.80E-02	1.80E-02	0.00E+00	1.80E-02
TCMEAT	4.31E-02	1.02E-02	1.03E-02	1.02E-02	1.02E-02	1.02E-02	0.00E+00	1.02E-02
TCMILK	1.03E-01	2.87E-02	3.24E-02	2.87E-02	2.86E-02	2.87E-02	0.00E+00	2.86E-02
CGPD	1.13E-03	1.13E-03	1.13E-03	1.13E-03	1.13E-03	1.13E-03	0.00E+00	1.13E-03
CINHL	5.51E-03	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	0.00E+00	1.02E-02
CVEG	5.37E-01	1.40E-01	1.41E-01	1.40E-01	1.40E-01	1.40E-01	0.00E+00	1.40E-01
CGMILK	2.39E-01	7.66E-02	8.55E-02	7.66E-02	7.66E-02	7.66E-02	0.00E+00	7.66E-02
CCMEAT	8.12E-02	1.82E-02	1.83E-02	1.82E-02	1.82E-02	1.82E-02	0.00E+00	1.82E-02
CCMILK	2.53E-01	6.33E-02	7.07E-02	6.33E-02	6.33E-02	6.33E-02	0.00E+00	6.33E-02
IGPD	1.13E-03	1.13E-03	1.13E-03	1.13E-03	1.13E-03	1.13E-03	0.00E+00	1.13E-03
IINHL	4.07E-03	6.06E-03	6.10E-03	6.06E-03	6.08E-03	6.06E-03	0.00E+00	6.06E-03
IGMILK	4.96E-01	1.45E-01	1.67E-01	1.45E-01	1.45E-01	1.45E-01	0.00E+00	1.45E-01
ICMILK	4.96E-01	1.25E-01	1.43E-01	1.25E-01	1.25E-01	1.25E-01	0.00E+00	1.25E-01

=== PERIOD DOSE BY AGEGROUP, ORGAN (mrem) ===

Agegroup	Bone	Liver	Thyroid	Kidney	Lung	GI-Lli	Skin	TB
ADULT	2.53E-01	1.01E-01	1.07E-01	1.01E-01	1.01E-01	1.02E-01	0.00E+00	1.01E-01
TEEN	3.81E-01	1.35E-01	1.44E-01	1.35E-01	1.35E-01	1.35E-01	0.00E+00	1.35E-01
CHILD	1.12E+00	3.10E-01	3.27E-01	3.10E-01	3.10E-01	3.10E-01	0.00E+00	3.10E-01
INFANT	9.97E-01	2.78E-01	3.17E-01	2.78E-01	2.78E-01	2.78E-01	0.00E+00	2.78E-01

GASEOUS RELEASE AND DOSE SUMMARY REPORT - BY UNIT
(Composite Critical Receptor - Limited Analysis)

Release ID.....: 1 All Gas Release Types
 Period Start Date....: 01/01/2012 00:00
 Period End Date.....: 01/01/2013 00:00
 Period Duration (min): 5.270E+05
 Coefficient Type.....: Historical
 Unit.....: 2
 Receptor.....: 5 Composite Crit. Receptor - IP
 Distance (meters)....: 0.0
 Compass Point.....: 0.0

=== MAXIMUM PERIOD DOSE TO LIMIT (Any Organ) ===

Dose Period	Age Group	Organ	Dose (mrem)	Limit Period	Admin Limit	Admin % of Limit	T.Spec Limit	T.Spec % of Limit
Strt->End	CHILD	BONE	1.12E+00	31-day	2.25E-01	4.97E+02	3.00E-01	3.73E+02
Qrtr->End	CHILD	BONE	1.12E+00	Quarter	5.63E+00	1.99E+01	7.50E+00	1.49E+01
Year->End	CHILD	BONE	1.12E+00	Annual	1.13E+01	9.94E+00	1.50E+01	7.45E+00

Critical Pathway.....: 2 Vegetation (VEG)
 Major Contributors.....: 0.0 % or greater to total

Nuclide	Percentage
H-3	0.00E+00
C-14	1.00E+02
CO-60	1.01E-01
I-131	4.52E-03
I-132	5.74E-05
I-133	2.44E-04

=== MAXIMUM PERIOD DOSE TO LIMIT (Tot Body) ===

Dose Period	Age Group	Organ	Dose (mrem)	Limit Period	Admin Limit	Admin % of Limit	T.Spec Limit	T.Spec % of Limit
Strt->End	CHILD	TBODY	3.10E-01	31-day	1.50E-01	2.06E+02	2.00E-01	1.55E+02
Qrtr->End	CHILD	TBODY	3.10E-01	Quarter	5.25E+00	5.90E+00	7.50E+00	4.13E+00
Year->End	CHILD	TBODY	3.10E-01	Annual	1.05E+01	2.95E+00	1.50E+01	2.06E+00

Critical Pathway.....: 2 Vegetation (VEG)
 Major Contributors.....: 0.0 % or greater to total

Nuclide	Percentage
H-3	2.66E+01
C-14	7.30E+01
CO-60	3.88E-01
I-131	9.37E-03
I-132	2.05E-04
I-133	4.36E-04

GASEOUS RELEASE AND DOSE SUMMARY REPORT - BY UNIT
(Composite Critical Receptor - Limited Analysis)

Release ID.....: 1 All Gas Release Types
 Period Start Date.....: 01/01/2012 00:00
 Period End Date.....: 01/01/2013 00:00
 Period Duration (min): 5.270E+05
 Coefficient Type.....: Historical
 Unit.....: 2
 Receptor.....: 4 Composite Crit. Receptor - NG
 Distance (meters).....: 0.0
 Compass Point.....: 0.0

=== MAXIMUM PERIOD NG DOSE TO LIMIT (Gamma) ===

Dose Period	Dose Type	Dose (mrad)	Limit Period	Admin Limit	Admin % of Limit	T.Spec Limit	T.Spec % of Limit
Strt->End	Gamma	4.41E-06	31-day	1.50E-01	2.94E-03	2.00E-01	2.21E-03
Qrtr->End	Gamma	4.41E-06	Quarter	3.75E+00	1.18E-04	5.00E+00	8.82E-05
Year->End	Gamma	4.41E-06	Annual	7.50E+00	5.88E-05	1.00E+01	4.41E-05
Major Contributors.....: 0.0 % or greater to total							
Nuclide	Percentage						
AR-41	6.56E+00						
KR-85M	2.08E-01						
KR-85	0.00E+00						
KR-87	6.47E-01						
XE-133M	4.41E-01						
KR-83M	0.00E+00						
KR-88	0.00E+00						
XE-131M	0.00E+00						
XE-135	2.37E+01						
XE-133	6.85E+01						

=== MAXIMUM PERIOD NG DOSE TO LIMIT (Beta) ===

Dose Period	Dose Type	Dose (mrad)	Limit Period	Admin Limit	Admin % of Limit	T.Spec Limit	T.Spec % of Limit
Strt->End	Beta	1.72E-05	31-day	3.00E-01	5.75E-03	4.00E-01	4.31E-03
Qrtr->End	Beta	1.72E-05	Quarter	7.50E+00	2.30E-04	1.00E+01	1.72E-04
Year->End	Beta	1.72E-05	Annual	1.50E+01	1.15E-04	2.00E+01	8.62E-05
Major Contributors.....: 0.0 % or greater to total							
Nuclide	Percentage						
AR-41	9.65E-01						
KR-85M	1.39E-01						
KR-85	0.00E+00						
KR-87	4.51E-01						
XE-133M	8.32E-01						
KR-83M	0.00E+00						
KR-88	0.00E+00						
XE-131M	0.00E+00						
XE-135	1.26E+01						

GASEOUS RELEASE AND DOSE SUMMARY REPORT - BY UNIT
(Composite Critical Receptor - Limited Analysis)

Release ID.....: 1 All Gas Release Types
Period Start Date....: 01/01/2012 00:00
Period End Date.....: 01/01/2013 00:00
Period Duration (min): 5.270E+05
Coefficient Type.....: Historical
Unit.....: 2

Major Contributors.....: 0.0 % or greater to total

Nuclide	Percentage
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XE-133	8.50E+01

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2011
UNIT 1 AND 2 (Docket Numbers 50-456 and 50-457)

ATTACHMENT 1

ERRATA CORRECTIONS FROM 2011 REPORT

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
UNIT 1 AND 2 (Docket Numbers 50-456 and 50-457)

Errata for Previous Annual Radioactive Effluent Release Reports

Improvements in nuclear power plant effluent management practices have resulted in a decrease in radiological effluent concentrations and a change in the distribution of gaseous radionuclides released to the environment. In Pressurized Water Reactors (PWRs), such as Braidwood, Carbon-14 (C-14) is produced in the reactor and released with gaseous effluents through the plant vent stacks unmitigated by the effluent treatment process. At many plants, C-14 may not have been a dose significant radionuclide, however, as effluent activities have been reduced over the years, C-14's calculated relative abundance has increased. Regulatory Guide 1.21 Revision 2 indicates that the C-14 discharge can be estimated by sample measurements or by use of a normalized C-14 source term and scaling factors based on power generation. The NRC has provided direction to all U.S. nuclear stations that C-14 must be reported in the ARERR. Braidwood's C-14 release (4.45 curies per unit) was conservatively estimated based on Electric Power Research Institute (EPRI) Technical Report 1021106 and added to gaseous effluents as a continuous release through the plant vent stacks. As a result, the organ dose to the maximum exposed individual increased substantially, but the resultant annual dose remains below 1 mrem per year against an annual regulatory limit of 15 mrem per year organ dose. The C-14 release and dose data can be viewed in the included tables.

C-14 is primarily released as a gas in the form of carbon dioxide. The gaseous effluent tracking software that is utilized by Braidwood had been set up to characterize C-14 as a particulate in 2011. While the software correctly calculated dose for the C-14 emissions, the fraction of particulates released by the station grew significantly. This method of accounting for C-14 in the "particulate" category proved troublesome as Braidwood Station appeared to be an industry outlier for the quantity of particulates released in 2011. Most stations were placing C-14 in the "other" category. A request was made to resubmit the relevant 2011 C-14 effluent data to place the determined activities in the "other" category. The dose associated with the emissions does not require revision as the software calculated it correctly. The Errata is being submitted to allow effective effluent comparisons across the industry. IR 1465929 was entered into the Corrective Action Program to document the issue.

The following changes are the 2011 errata submission:

2011 1st quarter

U-1 particulates (>8 day half life) = 0 Ci

U-2 particulates (>8 day half life) = 1.61E-06 Ci

2011 2nd quarter

U-1 particulates (>8 day half life) = 0 Ci

U-2 particulates (>8 day half life) = 1.96E-09 Ci

2011 3rd quarter

U-1 particulates (>8 day half life) = 3.50E-06 Ci

U-2 particulates (>8 day half life) = 0 Ci

2011 4th quarter

U-1 particulates (>8 day half life) = 0 Ci

U-2 particulates (>8 day half life) = 0 Ci

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
UNIT 1 AND 2 (Docket Numbers 50-456 and 50-457)

ATTACHMENT 2

Process Control Program for Radioactive Wastes

PROCESS CONTROL PROGRAM FOR RADIOACTIVE WASTES

1. PURPOSE

- 1.1. The purpose of the Process Control Program (PCP) is to:
 - 1.1.1. Establish the process and boundary conditions for the preparation of specific procedures for processing, sampling, analysis, packaging, storage, and shipment of solid radwaste in accordance with local, state, and federal requirements. (CM-1)
 - 1.1.2. Establish parameters which will provide reasonable assurance that all Low Level Radioactive Wastes (LLRW), processed by the in-plant waste process systems on-site OR by on-site vendor supplied waste processing systems, meet the acceptance criteria to a Licensed Burial Facility, as required by 10CFR Part 20, 10CFR Part 61, 10CFR Part 71, 49CFR Parts 171-172, "Technical Position on Waste Form (Revision 1)" [1/81], "Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification" [5/83], and the Station Technical Specifications, as applicable.
 - 1.1.3. Provide reasonable assurance that waste placed in "on-site storage" meets the requirements as addressed within the Safety Analysis Reports for the low level radwaste storage facilities for dry and/or processed wet waste.

2. TERMS AND DEFINITIONS

- 2.1. Process Control Program (PCP): The program which contains the current formulas, sampling, analysis, tests, and determinations to be made to ensure that processing and packaging of solid radioactive waste based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure the waste meets the stabilization criteria specified in 10CFR Parts 20, 61 and 71, state regulations, and burial site requirements.
- 2.2. Solidification: Liquid waste processed to either an unstable or stable form per 10CFR61 requirements. Waste solidified does not have to meet the 300-year free standing monolith criteria. Approved formulas, samples and tests do not have to meet NRC approval for wastes solidified in a container meeting stability criteria (e.g. High Integrity Container).
- 2.3. Stabilization: Liquid waste processed to a "stable state" per 10CFR61 Requirements. Established formulas, samples, and tests shall be approved by the NRC in order to meet solidification "stabilization" criteria. This processing method is currently not available, because the NRC recognizes that waste packed in a High Integrity Container meets the 300-year stabilization criteria. In the event that this processing method becomes an acceptable method, then the NRC shall approve the stabilization formulas, samples, tests, etc.

- 2.4. **Solidification Media:** An approved media (e.g. Bamwell - vinyl ester styrene, cement, bitumen) when waste containing nuclides with greater than 5-year half lives is solidified in a container with activity greater than 1 micro curie/cc. Waste solidified in a HIC is approved by the commission meeting the 10CFR81 stabilization criteria, including 1% free standing liquids by volume when the waste is packaged to a "stable" form and $\leq 0.5\%$ when waste is packaged to an "unstable" form. The formulas, sampling, analysis, and test do not require NRC approval, because the HIC meets the stability criteria.
- 2.4.1. Solidification to an unstable or stable state is performed by vendors, when applicable. Liquid waste solidified to meet stabilization criteria (10CFR81 and D1-81 Branch Technical Requirements) shall have documentation available that demonstrates that the process is approved by the NRC or disposal facility.
- 2.5. **Dewatering:** The process of removing fluids from liquid waste streams to produce a waste form that meets the requirements of 10CFR Part 81 and applicable burial site criteria, $\leq 0.5\%$ by volume when the waste is packaged to an "unstable" state, or $\leq 1\%$ by volume when the waste is packaged to a "stable" form.
- 2.6. **High Integrity Container (HIC):** A disposable container that is approved to the Requirements of 10CFR81. The use of HIC's is an alternative to solidification or encapsulation in a steel container to meet burial stability. HIC's are used to package dewatered liquid wastes, (e.g. filter cartridges, filter media, resin, sludges, etc), or dry active waste.
- 2.7. **Encapsulation:** The process of placing a component (e.g. cartridge filters or mechanical components) into a special purpose disposable container and then completely surrounding the waste material with an approved stabilization media, such as cement.
- 2.8. **Liquid Waste Processing Systems:** In-plant or vendor supplied processing systems consisting of equipment utilized for evaporation, filtration, demineralization, dewatering, compression dewatering, solidification, or reverse osmosis (RO) for the treatment of liquid wastes (such as Floor Drains, Chemical Drains and Equipment Drain inputs).
- 2.9. **Incineration, RVR, and/or Glass Vitrification of Liquid or Solid:** Dry or wet waste processed via incineration and/or thermal processing where the volume is reduced by thermal means meets 10CFR81 requirements.
- 2.10. **Compaction:** When dry wastes such as paper, wood, plastic, cardboard, incinerator ash, and etc. are volume reduced through the use of a compactor.
- 2.11. **Waste Streams:** Consist of but are not limited to
- Filter media (powdered, bead resin and fiber),
 - Filter cartridges,
 - Pre-coat body feed material,
 - Contaminated charcoal,

- Fuel pool activated hardware,
- Oil Dry absorbent material added to a container to absorb liquids
- Fuel Pool Crud
- Sump and tank sludges,
- High activity filter cartridges,
- Concentrated liquids,
- Contaminated waste oil,
- Dried sewage or wastewater plant waste,
- Dry Active Waste (DAW): Waste such as filters, air filters, low activity cartridge filters, paper, wood, glass, plastic, cardboard, hoses, cloth, and metals, etc. which have become contaminated as a consequence of normal operating, housekeeping and maintenance activities.
- Other radioactive waste generated from cleanup of inadvertent contamination.

3. RESPONSIBILITIES

- 3.1. Implementation of this Process Control Program (PCP) is described in procedures at each station and is the responsibility of the each site to implement.

4. MAIN BODY

4.1. Process Control Program Requirements

- 4.1.1. A change to this PCP (Radioactive Waste Treatment Systems) may be made provided that the change is reported as part of the annual radioactive effluent release report, Regulatory Guide 1.21, and is approved by the Plant Operations Review Committee (PORC).
- 4.1.2. Changes become effective upon acceptance per station requirements.
- 4.1.3. A solidification media, approved by the burial site, may be **REQUIRED** when liquid radwaste is solidified to a stable/unstable state.
- 4.1.4. **When processing liquid radwaste to meet solidification stability using a vendor supplied solidification system:**
1. If the vendor has its own Quality Assurance (QA) Program, then the vendor shall **ADHERE** to its own QA Program and shall have **SUBMITTED** its process system topical report to the NRC or agreement state.
 2. If the vendor does **not HAVE** its own Quality Assurance Program, then the vendor shall **ADHERE** to an approved Quality Assurance Topical Report standard belonging to the Station or to another approved vendor.

- 4.1.5. The vendor processing system(s) is/are controlled per the following:
1. A commercial vendor supplied processing system(s) may be **USED** for the processing of LLRW streams.
 2. Vendors that process liquid LLRW at the sites shall **MEET** applicable Quality Assurance Topical Report and Augmented Quality Requirements.
- 4.1.6. Vendor processing system(s) operated at the site shall be **OPERATED** and **CONTROLLED** in accordance with vendor approved procedures or station procedures based upon vendor approved documents.
- 4.1.7. All waste streams processed for burial or long term on-site storage shall **MEET** the waste classification and characteristics specified in 10CFR Part 61.55, Part 61.56, the 5-83 Branch Technical Position for waste classification, and the applicable burial site acceptance criteria (for any burial site operating at the time the waste was processed).
- 4.1.8. An Exelon Nuclear plant may store waste at another Exelon Nuclear plant, provided formal NRC approval has been **RECEIVED** for the transfer of waste.
- 4.2. General Waste Processing Requirements
- NOTE: On-site resin processing involves tank mixing and settling, transferring to the station or vendor processing system via resin water slurry or vacuuming into approved waste containers, and, when applicable, dewatering for burial.
- 4.2.1. Vendor resin beds may be **USED** for decontamination of plant systems, such as, SFP (Spent Fuel Pool), RWCU (reactor water cleanup), and SDC (Shut Down Cooling). These resins are then **PROCESSED** via the station or vendor processing system.
- 4.2.2. Various drains and sump discharges will be **COLLECTED** in tanks or suitable containers for processing treatment. Water from these tanks may be **SENT** through a filter, demineralizer, concentrator or vendor supplied processing systems.
- 4.2.3. Process waste (e.g. filter media, sludges, resin, etc) will be periodically **DISCHARGED** to the station or vendor processing system for onsite waste treatment or **PACKAGED** in containers for shipment to offsite vendor for volume reduction processing.
- 4.2.4. Process water (e.g. chemical, floor drain, equipment drain, etc.) may be **SENT** to either the site waste processing systems or vendor waste processing systems for further filtration, demineralization for plant re-use, or discharge.
- 4.2.5. All dewatering and solidification/stabilization will be **PERFORMED** by either utility site personnel or by on-site vendors or will be **PACKAGED** and **SHIPPED** to an off-site vendor low-level radwaste processing facility.

- 4.2.6. Dry Active Waste (DAW) will be **HANDLED** and **PROCESSED** per the following:
1. DAW will be **COLLECTED** and **SURVEYED** and may be **SORTED** for compactable and non-compactable wastes.
 2. DAW may be packaged in containers to facilitate on-site pre-compaction and/or off-site vendor contract requirements.
 3. DAW items may be **SURVEYED** for release onsite or offsite when applicable.
 4. Contaminated filter cartridges will be **PLACED** into a HIC or will be **ENCAPSULATED** in an in-situ liner for disposal or **SHIPPED** to an offsite waste processor in drums, boxes or steel liners per the vendor site criteria for processing and disposal.
- 4.2.7. Filtering devices using pre-coat media may be **USED** for the removal of suspended solids from liquid waste streams. The pre-coat material or cartridges from these devices may be routinely **REMOVED** from the filter vessel and discharged to a Filter Sludge Tank or Liner/HIC. Periodically, the filter sludge may be **DISCHARGED** to the vendor processing system for waste treatment onsite or **PACKAGED** in containers for shipment to offsite vendor for volume reduction processing.
- 4.2.8. Activated hardware stored in the Spent Fuel Pools will be **PROCESSED** periodically using remote handling equipment and may then be **PUT** into a container for shipment or storage in the pool or loading the processed activated hardware into the Dry Cask storage system.
- 4.2.9. High Integrity Containers (HIC):
1. For disposal at Barnwell, vendors supplying HIC's to the station shall **PROVIDE** a copy of the HIC Certificate of Compliance, which details specific limitations on use of the HIC.
 2. For disposal at Clive, vendors supplying HIC's to the station shall **PROVIDE** a copy of the HIC Certificate of Conformance, which details specific limitations on use of the HIC.
 3. Vendors supplying HIC's to the station shall **PROVIDE** a handling procedure which establishes guidelines for the utilization of the HIC. These guidelines serve to protect the integrity of the HIC and ensure the HIC is handled in accordance with the requirements of the Certificate of Compliance or Certificate of Conformance.
- 4.2.10. Lubricants and oils contaminated as a consequence of normal operating and maintenance activities may be **PROCESSED** on-site (by incineration, for oils meeting 10CFR20.2004 and applicable state requirements, or by an approved vendor process) or **SHIPPED** offsite (for incineration or other acceptable processing method).
- 4.2.11. Former in-plant systems GE or Stock Drum Transfer Cart and Drum Storage Areas may be **USED** for higher dose DAW storage at Clinton, Dresden, Quad Cities, Braidwood and Byron.

- 4.2.13 Certain waste, including flowable solids from holding pond, oily waste separator, cooling tower basin and emergency spray pond, may be disposed of onsite under the provisions of a 10CFR20.2002 permit. Specific requirements associated with the disposal shall be incorporated into station implementing procedures. (CM-2)
- 4.3. Burial Site Requirements
- 4.3.1. Waste sent directly to burial shall **COMPLY** with the applicable parts of 49CFR171-172, 10CFR61, 10CFR71, and the acceptance criteria for the applicable burial site.
- 4.4. Shipping and Inspection Requirements
- 4.4.1. All shipping/storage containers shall be **INSPECTED**, as required by station procedures, for compliance with applicable requirements (Department of Transportation (DOT), Nuclear Regulatory Commission (NRC), station, on-site storage, and/or burial site requirements) prior to use.
- 4.4.2. Containers of solidified liquid waste shall be **INSPECTED** for solidification quality and/or dewatering requirements per the burial site, offsite vendor acceptance, or station acceptance criteria, as applicable.
- 4.4.3. Shipments sent to an off site processor shall be **INSPECTED** to ensure that the applicable processor's waste acceptance criteria are being met.
- 4.4.4. Shipments sent for off site storage shall **MEET** the storage site's waste acceptance criteria.
- 4.5. Inspection and Corrective Action
- 4.5.1. Inspection results that indicate non-compliance with applicable NRC, State, vendor, or site requirements shall be **IDENTIFIED** and **TRACKED** through the Corrective Action Program.
- 4.5.2. Administrative controls for preventing unsatisfactory waste forms from being released for shipment are described in applicable station procedures. If the provisions of the Process Control Program are not satisfied, then **SUSPEND** shipments of defectively packaged radioactive waste from the site. (CM-1)
- 4.5.3. If freestanding water or solidification not meeting program requirements is observed, then samples of the particular series of batches shall be **TAKEN** to determine the cause. Additional samples shall be **TAKEN**, as warranted, to ensure that no freestanding water is present and solidification requirements are maintained.
- 4.6. Procedure and Process Reviews
- 4.6.1. The Exelon Nuclear Process Control Program and subsequent changes (other than editorial/minor changes) shall be **REVIEWED** and **APPROVED** in accordance with the station procedures, plant-specific Technical Specifications (Tech Spec), Technical Requirements Manual (T&RM), Operation Requirements Manual (ORM), as applicable, for the respective station and LS-AA-100. Changes to the Licensees Controlled Documents, UFSAR, ORM, or TRM are controlled by the provisions of 10CFR 50.59.

- 4.6.2. Any changes to the PCP shall be reviewed to determine if reportability is required in the Annual Radiological Effluent Release Report (ARERR). The Radwaste Specialist shall ensure correct information is SUBMITTED to the ODCM program owner prior to submittal of the ARERR.
- 4.6.3. Station processes, applicable site-specific cask manual procedures, or other vendor waste processing/operating procedures shall be approved per RM-AA-102-1008. Procedures related to waste manifests, shipment inspections, and container activity determinations are CONTROLLED by Radiation Protection Standard Procedures (RP-AA-600 Series).
1. Site waste processing IS CONTROLLED by site operating procedures.
 2. Liquid processed by vendor equipment shall be PERFORMED in accordance with vendor procedures.

4.7. Waste Types, Point of Generation, and Processing Method

Methods of processing and individual vendors may CHANGE due to changing financial and regulatory options. The table below is a representative sample. It is not intended be all encompassing.

WASTE STREAM	POINTS OF GENERATION	AVAILABLE WASTE PROCESSING METHODS
Bead Resin	Systems - Fuel Pool, Condensate, Reactor Water Cleanup, Blowdown, Equipment Drain, Chemical and Volume Control Systems, Floor Drain, Maximum Recycle, Blowdown, Boric Acid Recycling System, Vendor Supplied Processing Systems, and Portable Demin System	Dewatering, solidification to an unstable/stable state Thermal Processing Free Release to a Land Fill
Powdered Resin	Systems - (Condensate System, Floor Drain/Equipment Drain filtration, Fuel Pool)	Dewatering, solidification to an unstable/stable state Thermal Processing
Concentrated Waste	Waste generated from Site Evaporators resulting typically from the Floor Drain and Equipment Drain Systems	Solidification to an unstable/stable state Thermal Processing
Sludge	Sedimentation resulting from various sumps, condensers, tanks, cooling tower, emergency spray pond, holding pond, and oily waste separators	Dewatering, solidification to an unstable/stable state Thermal Processing Evaporation on-site or at an offsite processor On-site disposal per 10CFR20.2002 permit

WASTE STREAM	POINTS OF GENERATION	AVAILABLE WASTE PROCESSING METHODS
Filter cartridges	Systems - Floor/Equipment Drains, Fuel Pool; cartridge filters are typically generated from clean up activities within the fuel pool, torus, etc	Dewatering, solidification to an unstable/stable state Processed by a vendor for volume reduction
Dry Active Waste	Paper, wood, plastic, rubber, glass, metal, and etc, resulting from daily plant activities	Decon/Sorting for Free Release Compaction/Super-compaction Thermal Processing by incineration or glass vitrification Sorting for Free Release Metal melting to an Ingot
Contaminated Oil	Oil contaminated with radioactive materials from any in-plant system	Solidification unstable state Thermal Processing by incineration Free Release for recycling
Drying Bed Sludge	Sewage Treatment and Waste Water Treatment Facilities	Free release to a landfill or burial
Metals	See DAW	See DAW
Irradiated Hardware	Fuel Pool, Reactor Components	Volume Reduction for packaging efficiencies

5. DOCUMENTATION

5.1.1. Records of reviews performed shall be retained for the duration of the unit operating license. This documentation shall contain:

1. Sufficient information to support the change together with the appropriate analyses or evaluations justifying the change, and
2. A determination which documents that the change will maintain the overall conformance of waste products to Federal (10CFR61 and the Branch Technical Position), State, or other applicable requirements, including applicable burial site criteria.

6. REFERENCES

6.1. Technical Specifications:

6.1.1. The details contained in Current Tech Specs (CTS) or Improved Technical Specifications (ITS), as applicable, in regard to the Process Control Program (PCP), are to be relocated to the Licensee Controlled Documents. Some facilities have elected to relocate these details into the Operational Requirements Manual (ORM). Relocation of the description of the PCP from the CTS or ITS does not affect the safe operation of the facility. Therefore, the relocation details are not required to be in the CTS or the ITS to provide adequate protection of the public health and safety.

6.2. Writers' References:

- 6.2.1. Code of Federal Regulations: 10 CFR Part 20, Part 61, Part 71, 49 CFR Parts 171-172
- 6.2.2. Low Level Waste Licensing Branch Technical Position on Radioactive Waste Classification, May 1983
- 6.2.3. Technical Position on Waste Form (Revision 1), January 1991
- 6.2.4. Branch Technical Position on Concentration Averaging and Encapsulation, January 1995
- 6.2.5. Regulatory Guide 1.21, Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants
- 6.2.6. I.E. Circular 50.18, 10CFR 50.59 Safety Evaluation for Changes to Radioactive Waste Treatment Systems

6.3. Users' References:

- 6.3.1. Quality Assurance Program (QATR)
- 6.3.2. LS-AA-106, Plant Operations Review Committee
- 6.3.3. RM-AA-102-1006, Processing Vendor Documents
- 6.3.4. RP-AA-600 Series, Radioactive Material/Waste Shipments
- 6.3.5. CY-AA-170-2000, Annual Radioactive Effluent Release Report

6.4. Station Commitments:

- 6.4.1. Peach Bottom
CM-1, T03819, Letter from G.A. Hunger, Jr., dated Sept. 29 1994, transmitting TSCR 93-16 (Improved Technical Specifications).
- 6.4.2. Limerick
CM-2, T03896, 10CFR20.2002 permit granted to Limerick via letter dated July 10, 1996.

7. ATTACHMENTS - None

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2012
UNIT 1 AND 2 (Docket Numbers 50-456 and 50-457)

ATTACHMENT 3

OFFSITE DOSE CALCULATION MANUAL (ODCM)

See included CD