2004

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

R. E. GINNA NUCLEAR POWER PLANT

DOCKET NO. 50-244

TABLE OF CONTENTS

LIST OF TABLES

1.0 INTRODUCTION

This Annual Radioactive Effluent Release Report is for the R.E. Ginna Nuclear Power Plant and is submitted in accordance with the requirements of Technical Specification Section 5.6.3. The report covers the period from January 1, 2004 through December 31, 2004.

This report includes a summary of the quantities of radioactive gaseous and liquid effluents and solid waste released from the plant presented in the format outlined in Appendix B of Regulatory Guide 1.21, Revision 1, June 1974.

All gaseous and liquid effluents discharged during this reporting period were in compliance with the limits of the R.E. Ginna Technical Specifications as defined in the Offsite Dose Calculation Manual (ODCM).

2.0 SUPPLEMENTAL INFORMATION

2.1 Regulatory Limits

The ODCM limits applicable to the release of radioactive material in liquid and gaseous effluents are:

2.1.1 Fission and Activation Gases

The instantaneous dose rate, as calculated in the ODCM, due to noble gases released in gaseous effluents from the site shall be limited to a release rate which would yield $\leq$ 500 mrem/yr to the total body and $\leq$ 3000 mrem/yr to the skin if allowed to continue for a full year.

The air dose, as calculated in the ODCM, due to noble gases released in gaseous effluents from the site shall be limited to the following:

(I) During any calendar quarter to $\leq$ 5 mrad for gamma radiation and to $\leq$ 10 mrad for beta radiation.

(ii) During any calendar year to $\leq$ 10 mrad for gamma radiation and to $\leq$ 20 mrad for beta radiation.

2.1.2 Radioiodine, Tritium and Particulates

The instantaneous dose rate, as calculated in the ODCM, due to radioactive materials released in gaseous effluents from the site as radioiodines, radioactive materials in particulate form, and radionuclides other than noble gases with half-lives greater than 8 days shall be limited to a release rate which would yield $\leq$ 1500 mrem/yr to any organ if allowed to continue for a full year.

The dose to an individual, as calculated in the ODCM, from radioiodine, radioactive materials in particulate form and radionuclides other than noble gases with half-lives greater than eight days released with gaseous effluents from the site shall be limited to the following:

(i) During any calendar quarter to $\leq$ 7.5 mrem to any organ.

(ii) During any calendar year to $\leq$ 15 mrem to any organ.

2.1.3 Liquid Effluents

The release of radioactive liquid effluents shall be such that the concentration in the circulating water discharge does not exceed the limits specified in accordance with Appendix B, Table II, Column 2 and notes thereto of 10CFR20. For dissolved or entrained noble gases the total activity due to dissolved or entrained noble gases shall not exceed 2E-04 μCi/ml.

The dose or dose commitment to an individual as calculated in the ODCM from radioactive materials in liquid effluents released to unrestricted areas shall be limited:

(i) During any calendar quarter to $\leq$ 1.5 mrem to the total body and to $\leq$ 5 mrem to any organ, and

(ii) During any calendar year to $\leq$ 3 mrem to the total body and to $\leq$ 10 mrem to any organ.

2.2 Maximum Permissible Concentrations (MPC)

2.2.1 For gaseous effluents, maximum permissible concentrations are not directly used in release rate calculations since the applicable limits are stated in terms of dose rate at the unrestricted area boundary, in accordance with Technical Specification 5.5.4.g.

2.2.2 For liquid effluents, ten times the effluent concentration values specified in 10CFR20, Appendix B, Table II, column 2, are used to calculate release rates and permissible concentrations at the unrestricted area boundary as permitted by Technical Specification 5.5.4.b. A value of 2E-04 μCi/ml is used as the MPC for dissolved and entrained noble gases in liquid effluents.

2.3 Release Rate Limits Based on Average Nuclide Energy

The release rate limits for fission and activation gases from the R.E. Ginna Nuclear Power Plant are not based on the average energy of the radionuclide mixture in gaseous effluents; therefore, this value is not applicable. However, the 2004 average beta/gamma energy of the radionuclide mixture in fission and activation gases released from Ginna is available for review upon request.

2.4 Measurements and Approximations of Total Radioactivity

Gamma spectroscopy was the primary analysis method used to determine the radionuclide composition and concentration of gaseous and liquid effluents. Composite samples were analyzed for Sr-89, Sr-90 and Fe-55 by a contract laboratory. Tritium and alpha analysis were performed using liquid scintillation and gas flow proportional counting respectively.

The total radioactivity in effluent releases was determined from the measured concentration of each radionuclide present and the total volume of effluents released.

2.5 Batch Releases

2.5.1 Liquid

1. Number of batch releases:	7.1 E+01
2. Total time period for batch releases:	2.38 E+04 min
3. Maximum time period for a batch release:	9.03 E+03 min
4. Average time period for batch releases:	3.35 E+02 min
5. Minimum time period for a batch release:	1.50 E+01 min
6. Average blowdown (LPM) during periods of effluent release into the discharge canal.	2.14 E+02 LPM

2.5.2 Gaseous

1. Number of batch releases:	3.5 E+01
2. Total time period for batch releases:	5.32 E+05 min
3. Maximum time period for a batch release:	4.46 E+04 min
4. Average time period for batch releases:	1.52 E+04 min
5. Minimum time period for a batch release:	6.00 E+01 min

2.6 Abnormal Releases

There were no abnormal or unplanned releases in 2004. Several examples of ventilation system deficiencies that could result in small quantities of air exiting controlled areas by pathways other than monitored vent exhaust were documented by the corrective action process. Sampling did not result in any measured radioactivity. Gaseous release permit methodology is conservative against small deviations in flow direction, if activity were present.

3.0 SUMMARY OF GASEOUS RADIOACTIVE EFFLUENTS

The quantities of radioactive material released in gaseous effluents are summarized in tables 1A and 1B. Plant vent and Containment Vent releases are modeled as mixed mode and Air Ejector is modeled as ground level release.

4.0 SUMMARY OF LIQUID RADIOACTIVE EFFLUENTS

The quantities of radioactive material released in liquid effluents are summarized in tables 2A and 2B.

5.0 SOLID WASTE

The quantities of radioactive material released in shipments of solid waste transported from the site during the reporting period are summarized in Table 3. Principal nuclides were determined by gamma spectroscopy and non-gamma emitters were calculated from scaling factors determined by an independent laboratory from representative samples of that waste type. The majority of Dry Active Waste is processed utilizing an off-site processor who reduces the volume and then sends the waste for burial.

6.0 LOWER LIMIT OF DETECTION

Required Lower Limit of Detection, (LLD), as defined in the ODCM, was not met on the following occasion of a liquid batch releases in 2004.

"A" Monitor Tank release #2004052, 3/30/04:
Cs-137, 6.61E-7
Cs-134, 5.30E-7
Fe-59, 5.26E-7
Zn-65, 6.03E-7

7.0 RADIOLOGICAL IMPACT

An assessment of doses to the maximally exposed individual from gaseous and liquid effluents was performed for locations representing the maximum calculated dose in occupied sectors. Meteorological sectors from WNW through ENE are entirely over Lake Ontario. In all cases, doses were well below Technical Specification limits as defined in the ODCM. Doses were assessed based upon historical meteorological conditions considering the noble gas exposure, inhalation, ground plane exposure, and ingestion pathways. The ingestion pathways considered were the fruit, vegetable, fish, drinking water, goat's milk, cow's milk and meat pathways. The results of this assessment are presented in Tables 4A and 4B.
Since the events of September 11, 2001, Ginna Security has been augmented by full-time presence of the New York State Police and the New York National Guard. These personnel have posts within the site boundary. For this reason, the exposure and uptake pathways for 2004 are calculated using maximum meteorological dispersion and deposition parameters at on-site posts, as well as at the site boundary.

7.1 Total Dose

40CFR190 limits the total dose to members of the public due to radiation and radioactivity from uranium fuel cycle sources to:

<25 mrem total body or any organ and;
<75 mrem thyroid for a calendar year.

Using the maximum exposure and uptake pathways, the maximum liquid pathways, and the direct radiation measurements onsite in the vicinity of the National Guard outpost, yield the following dose summaries to the hypothetical maximally exposed individual member of the public on-site.

5.2 mrem total body (5.2 mrem direct radiation plus 3.27E-3 mrem all other pathways).
5.24E-3 mrem thyroid (maximum organ dose).

Using the maximum exposure and uptake pathways, the maximum liquid pathways, and the maximum direct radiation measurements at the site boundary, yields the following dose summaries to the hypothetical maximally exposed individual member of the public off-site. This dose conservatively bounds any real member of the public.

8.0 mrem total body (8.0 mrem direct radiation plus 3.88E-3 mrem all other pathways).
5.30E-3 mrem thyroid, maximum organ dose.

8.0 METEOROLOGICAL DATA

The annual summary of hourly meteorological data collected during 2004 is not included with this report, but can be made available at the R. E. Ginna Nuclear Station.

9.0 LAND USE CENSUS CHANGES

There were no changes in critical receptor location for dose calculations during the reporting period. There were no large changes in land use within 5 miles of the plant. Additional new homes are being built at an increasing rate compared to past years.

10.0 CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL

The ODCM was revised January 21, 2004, to correct transcriptional errors, clarify instructions, provide consistency in surveillance frequencies, and include explanatory notes. No major changes were made to requirements or to methodology used in calculation of offsite dose. See attached ODCM, Revision 19.

11.0 CHANGES TO THE PROCESS CONTROL PROGRAM

There were no changes to the Process Control Program during the reporting period.

12.0 MAJOR CHANGES TO RADWASTE TREATMENT SYSTEMS

There were no major changes to the Radwaste Treatment Systems during the reporting period.

13.0 INOPERABLE MONITORS

- RM-15A, Out of service for sample cooler leak, 2/23/04 – 3/9/04
- RM-15A, Out of service due to sample cooler failure, 7/8/04 – 7/15/04.
- RM-15A, Out of service due to Channel 7 low fail, 8/8/04 – 8/11/04.
- RM-10B, Out of Service due to low skid flow, 1/1/0/04 -1/20/04

R. E. Ginna Nuclear Power Plant

Table 1A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES
January - June : 2004

A. Fission & activation gases	Unit	Quarter 1st	Quarter 2nd	Est. Total Error, %
1. Total release	Ci	7.49E+00	6.99E+00	1.50E+01
2. Average release rate for period	uCi/sec	9.91E-01	9.24E-01	
3. Percent of technical specification limit	%	1.57E-04	1.47E-04	
B. Iodines				
1. Total iodine-131	Ci	2.68E-05	2.68E-05	1.50E+01
2. Average release rate for period	uCi/sec	3.54E-06	3.54E-06	
3. Percent of technical specification limit	%	7.70E-03	7.70E-03	
C. Particulates				
1. Particulates with half-lives > 8days	Ci			
2. Average release rate for period	uCi/sec			
3. Percent of technical specification limit	%			
4. Gross alpha radioactivity	Ci			
D. Tritium				
1. Total release	Ci	1.86E+01	1.80E+01	9.20E+00
2. Average release rate for period	uCi/sec	1.47E+00	1.46E+00	
3. Percent of technical specification limit	%	1.72E-04	1.71E-04	

Note: Isotope for which no value is given were not identified in applicable releases.

R. E. Ginna Nuclear Power Plant

Table 1A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES
July - December 2004

A. Fission & activation gases	Unit	Quarter 3rd	Quarter 4th	Est. Total Error, %
1. Total release	Ci	7.07E+00	7.08E+00	1.50E+01
2. Average release rate for period	uCi/sec	9.27E-01	9.27E+00	
3. Percent of technical specification limit	%	1.47E-04	1.47E-04	
B. Iodines				
1. Total iodine-131	Ci	2.71E-05	2.71E-05	1.50E+01
2. Average release rate for period	uCi/sec	3.54E-06	3.54E-06	
3. Percent of technical specification limit	%	7.70E-03	7.70E-03	
C. Particulates				
1. Particulates with half-lives > 8days	Ci			
2. Average release rate for period	uCi/sec			
3. Percent of technical specification limit	%			
4. Gross alpha radioactivity	Ci			
D. Tritium				
1. Total release	Ci	1.31E+01	7.92E+00	9.20E+00
2. Average release rate for period	uCi/sec	1.71E+00	1.04E+00	
3. Percent of technical specification limit	%	2.02E-04	1.21E-04	

Note: Isotope for which no value is given were not identified in applicable releases.

Table 1B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
GASEOUS EFFLUENTS - CONTINUOUS AND BATCH RELEASES 2004

		Continuous Mode		Batch Mode	
Nuclides released	Unit	Quarter	Quarter	Quarter	Quarter
		1st	2nd	1st	2nd
1. Fission gases					
argon-41	Ci			4.58E-02	5.06E-02
krypton-85	Ci			1.19E-01	
krypton-85m	Ci				
krypton-87	Ci				
krypton-88	Ci				
xenon-131m	Ci				
xenon-133	Ci	4.55E+00	4.56E+00	4.80E-01	1.03E-01
xenon-133m	Ci			3.36E-03	3.30E-04
xenon-135	Ci	2.28E+00	2.27E+00	7.92E-03	1.82E-03
xenon-135m	Ci				
xenon-138	Ci				
others (specify)	Ci				
	Ci				
	Ci				
	Ci				
Total for period	Ci				
2. Iodines					
iodine-131	Ci	1.25E-05	1.25E-05		
iodine-132	Ci				
iodine-133	Ci	1.42E-05	1.42E-05		
Total for period	Ci				
3. Particulates					
strontium-89	Ci				
strontium-90	Ci				
cesium-134	Ci				
cesium-137	Ci				
niobium-95	Ci				
cobalt-58	Ci				
cobalt-60	Ci				
Total for period	Ci				
unidentified	Ci				

Note: Isotope for which no value is given were not identified in applicable releases.

R. E. Ginna Nuclear Power Plant

Table 1B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
GASEOUS EFFLUENTS - CONTINUOUS AND BATCH RELEASES 2004

		Continuous Mode		Batch Mode	
Nuclides released	Unit	Quarter	Quarter	Quarter	Quarter
		3rd	4th	3rd	4th
1. Fission gases					
argon-41	Ci			5.17E-02	5.65E-02
krypton-85	Ci				
krypton-85m	Ci				
krypton-87	Ci				
krypton-88	Ci				
xenon-131m	Ci				
xenon-133	Ci	4.60E+00	4.61E+00	1.08E-01	1.14E-01
xenon-133m	Ci				
xenon-135	Ci	2.31E+00	2.30E+00	4.07E-03	2.42E-03
xenon-135m	Ci				
xenon-138	Ci				
others (specify)	Ci				
	Ci				
	Ci				
	Ci				
Total for period	Ci				
2. Iodines					
iodine-131	Ci	1.27E-05	1.27E-05		
iodine-133	Ci				
iodine-135	Ci	1.44E-05	1.44E-05		
Total for period	Ci				
3. Particulates					
chromium-51	Ci				
manganese-54	Ci				
zirconium-95	Ci				
silver-110m	Ci				
niobium-95	Ci				
cobalt-58	Ci				
cobalt-60	Ci				
Total for period	Ci				
unidentified	Ci				

Note: Isotope for which no value is given were not identified in applicable releases.

R. E. Ginna Nuclear Power Plant

Table 2A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES
January - June 2004

A. Fission and activation products	Unit	Quarter 1st	Quarter 2nd	Est.Total Error, %
1. Total release (not including tritium, gases, alpha)	Ci	2.83E-06	8.51E-06	9.90E+00
2. Average diluted concentration during period	uCi/ml	7.27E-15	1.73E-14	
3. Percent of applicable limit	%	5.68E-07	1.35E-06	
B. Tritium				
1. Total release	Ci	1.37E+01	4.57E+01	9.20E+00
2. Average diluted concentration during period	uCi/ml	3.53E-08	9.27E-08	
3. Percent of applicable limit	%	3.53E-04	9.27E-04	
C. Dissolved and entrained gases				
1. Total release	Ci			
2. Average diluted concentration during period	uCi/ml			
3. Percent of applicable limit	%			
D. Gross alpha radioactivity				
1. Total release	Ci			
E. Vol. of waste released (prior to dilution)	Liters	8.21E+07	8.29E+07	
F. Vol. of dilution water used during period	Liters	3.90E+11	4.92E+11	

Note: Isotope for which no value is given were not identified in applicable releases.

R. E. Ginna Nuclear Power Plant

Table 2A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES
July - December 2004

A. Fission and activation products	Unit	Quarter 3rd	Quarter 4th	Est.Total Error, %
1. Total release (not including tritium, gases, alpha)	Ci	2.18E-04	4.51E-05	9.90E+00
2. Average diluted concentration during period	uCi/ml	4.24E-13	9.14E-14	
3. Percent of applicable limit	%	3.31E-05	7.14E-06	
B. Tritium				
1. Total release	Ci	7.18E+01	1.97E+02	9.20E+00
2. Average diluted concentration during period	uCi/ml	1.39E-07	3.98E-07	
3. Percent of applicable limit	%	1.39E-03	3.98E-03	
C. Dissolved and entrained gases				
1. Total release	Ci		5.01E-06	9.90E+00
2. Average diluted concentration during period	uCi/ml		1.01E-14	
3. Percent of applicable limit	%		5.05E-09	
D. Gross alpha radioactivity				
1. Total release	Ci			
E. Vol. of waste released (prior ro dilution)	Liters	8.78E+07	8.48E+07	
F. Vol. of dilution water used during period	Liters	5.15E+11	4.96E+11	

Note: Isotope for which no value is given were not identified in applicable releases.

Table 3
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
January 1, 2004 - December 31, 2004

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL - (Not irradiated fuel)

1. Type of waste	Unit	12 month period	Est. total Error %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m^3 Ci	3.396 189	7
b. Dry compressible waste, contaminated equip, etc.	m^3 Ci	467.76 0.0733	7
c. Irradiated components, control rods, etc.	m^3 Ci	0.011 0.168	7
d. Other:	m^3 Ci	36.193 7.56	7

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

a.			b.			d.		
Co-58	%	39.15	Co-58	%	27.5	Fe-55	%	77.38
Ni-63	%	37.99	Cr-51	%	18.65	Co-60	%	14.95
Fe-55	%	10.11	Fe-55	%	14.49	Pu-241	%	3.36
Co-60	%	7.67	Nb-95	%	11.37	Co-58	%	1.49
Mn-54	%	1.64	Zr-95	%	8.67	Ni-63	%	0.86
Sb-125	%	1.24	Ni-63	%	8.4	Mn-54	%	0.51
Cs-137	%	0.66	Co-60	%	6.31	Ce-144	%	0.26
Ce-144	%	0.54	Ag110m	%	1.56	Zn-65	%	0.14
Co-57	%	0.47	Sb-125	%	0.66	Ru-106	%	0.23
Ag110m	%	0.35	Cs-137	%	0.53	Cs-137	%	0.14
Total		99.82	Total		98.14	Total		99.32

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
8	Sole Use Truck	Duratek, SC
3	Sole Use Truck	RACE, TN
1	Sole Use Truck	Barnwell, SC
1	Sole Use Truck	Studsvik, TN
1	Sole Use Truck	Envirocare, UT

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
None	N/A	N/A

R. E. Ginna Nuclear Power Plant

Table 4A Radiation Dose to Maximum Individual Receptor First Quarter 2004 (Units In rem)						
	All	All	Adult	Teen	Child	Infant
	Noble Gas	Noble Gas	Thyroid	Thyroid	Thyroid	Thyroid
	Air Gamma	Air Beta				
N	1.77E-08	2.97E-08				
NNE	1.50E-08	2.52E-08				
NE	1.73E-08	2.91E-08				
ENE	2.24E-08	3.76E-08				
E	3.99E-08	6.70E-08	3.37E-07	3.41E-07	4.86E-07	1.75E-07
ESE	5.08E-08	8.52E-08	4.80E-07	4.80E-07	6.78E-07	1.93E-07
SE	3.07E-08	5.16E-08	2.77E-07	2.82E-07	4.05E-07	1.68E-07
SSE	1.27E-08	2.13E-08	1.02E-07	1.10E-07	1.69E-07	1.46E-07
S	2.22E-08	3.73E-08	1.53E-07	1.61E-07	2.38E-07	1.53E-07
SSW	2.21E-08	3.71E-08	1.79E-07	1.86E-07	2.73E-07	1.56E-07
SW	2.22E-08	3.73E-08	1.99E-07	2.05E-07	3.00E-07	1.58E-07
WSW	2.36E-08	3.97E-08	1.57E-07	1.66E-07	2.43E-07	1.53E-07
W	1.50E-08	2.52E-08	7.89E-08	8.81E-08	1.38E-07	1.43E-07
WNW	1.27E-09	2.13E-09				
NW	4.16E-09	6.98E-09				
NNW	1.30E-08	2.18E-08				
MAX.	5.08E-08	8.52E-08	4.80E-07	4.80E-07	6.78E-07	1.93E-07

R. E. Ginna Nuclear Power Plant

Table 4A Radiation Dose to Maximum Individual Receptor Second Quarter 2004 (Units In rem)						
	All	All	Adult	Teen	Child	Infant
	Noble Gas	Noble Gas	Thyroid	Thyroid	Thyroid	Thyroid
	Air Gamma	Air Beta				
N	1.74E-08	2.85E-08				
NNE	1.48E-08	2.43E-08				
NE	1.70E-08	2.79E-08				
ENE	2.20E-08	3.61E-08				
E	3.93E-08	6.45E-08	3.33E-07	3.41E-07	4.34E-07	2.03E-07
ESE	5.00E-08	8.21E-08	4.74E-07	4.81E-07	6.02E-07	2.30E-07
SE	3.03E-08	4.97E-08	2.75E-07	2.82E-07	3.63E-07	1.90E-07
SSE	1.25E-08	2.05E-08	1.01E-07	1.10E-07	1.55E-07	1.53E-07
S	2.18E-08	3.58E-08	1.52E-07	1.61E-07	2.16E-07	1.64E-07
SSW	2.18E-08	3.58E-08	1.78E-07	1.86E-07	2.47E-07	1.70E-07
SW	2.18E-08	3.58E-08	1.97E-07	2.05E-07	2.70E-07	1.74E-07
WSW	2.33E-08	3.82E-08	1.56E-07	1.66E-07	2.22E-07	1.68E-07
W	1.48E-08	2.43E-08	7.83E-08	8.81E-08	1.28E-07	1.48E-07
WNW	1.25E-09	2.05E-09				
NW	4.10E-09	6.72E-09				
NNW	1.28E-08	2.11E-08				
MAX.	5.00E-08	8.21E-08	4.74E-07	4.81E-07	6.02E-07	2.30E-07

R. E. Ginna Nuclear Power Plant

Table 4A Radiation Dose to Maximum Individual Receptor Third Quarter 2004 (Units In rem)						
	All	All	Adult	Teen	Child	Infant
	Noble Gas	Noble Gas	Thyroid	Thyroid	Thyroid	Thyroid
	Air Gamma	Air Beta				
N	1.76E-08	2.89E-08				
NNE	1.49E-08	2.44E-08				
NE	1.72E-08	2.82E-08				
ENE	2.22E-08	3.64E-08				
E	3.98E-08	6.53E-08	3.77E-07	3.87E-07	5.46E-07	1.85E-07
ESE	5.06E-08	8.31E-08	5.38E-07	5.47E-07	7.64E-07	2.06E-07
SE	3.06E-08	5.02E-08	3.10E-07	3.20E-07	4.53E-07	1.77E-07
SSE	1.26E-08	2.07E-08	1.13E-07	1.12E-07	1.85E-07	1.51E-07
S	2.20E-08	3.61E-08	1.70E-07	1.81E-07	2.64E-07	1.58E-07
SSW	2.20E-08	3.61E-08	2.00E-07	2.10E-07	3.04E-07	1.62E-07
SW	2.20E-08	3.61E-08	2.22E-07	2.32E-07	3.34E-07	1.65E-07
WSW	2.35E-08	3.84E-08	1.75E-07	1.87E-07	2.71E-07	1.59E-07
W	1.50E-08	2.46E-08	8.71E-08	9.76E-08	1.51E-07	1.48E-07
WNW	1.26E-09	2.07E-09				
NW	4.15E-09	6.81E-09				
NNW	1.30E-08	2.13E-09				
MAX.	5.06E-08	8.31E-08	5.38E-07	5.47E-07	7.64E-07	2.06E-07

R. E. Ginna Nuclear Power Plant

Table 4A Radiation Dose to Maximum Individual Receptor Fourth Quarter 2004 (Units In rem)						
	All	All	Adult	Teen	Child	Infant
	Noble Gas	Noble Gas	Thyroid	Thyroid	Thyroid	Thyroid
	Air Gamma	Air Beta				
N	1.77E-08	2.88E-08				
NNE	1.51E-08	2.46E-08				
NE	1.73E-08	2.82E-08				
ENE	2.24E-08	3.65E-08				
E	4.01E-08	6.54E-08	3.22E-07	2.71E-07	3.95E-07	1.63E-07
ESE	5.10E-08	8.33E-08	4.63E-07	3.84E-07	5.47E-07	1.76E-07
SE	3.09E-08	5.04E-08	2.65E-07	2.25E-07	3.31E-07	1.58E-07
SSE	1.27E-08	2.07E-08	9.73E-08	9.17E-08	1.45E-07	1.42E-07
S	2.22E-08	3.62E-08	1.46E-07	1.31E-07	2.00E-07	1.47E-07
SSW	2.23E-08	3.63E-08	1.71E-07	1.51E-07	2.27E-07	1.49E-07
SW	2.22E-08	3.62E-08	1.90E-07	1.66E-07	2.48E-07	1.51E-07
WSW	2.37E-08	3.86E-08	1.50E-07	1.34E-07	2.03E-07	1.48E-07
W	1.51E-08	2.46E-08	7.57E-08	7.46E-08	1.21E-07	1.40E-07
WNW	1.27E-09	2.07E-09				
NW	4.18E-09	6.81E-09				
NNW	1.31E-08	2.14E-08				
MAX.	5.10E-08	8.33E-08	4.63E-07	3.84E-07	5.47E-07	1.76E-07

R. E. Ginna Nuclear Power Plant

Table 4B

Radiation Dose To Maximum Individual Receptor

From Liquid Release

2004

(Units in rem)

	Adult	Teen	Child	Infant
First Quarter				
T. Body	1.08E-07	7.65E-08	1.44E-07	1.40E-07
Bone	<1.00E-10	<1.00E-10	<1.00E-10	<1.00E-10
Thyroid	1.08E-07	7.65E-08	1.44E-07	1.40E-07
Second Quarter				
T. Body	2.73E-07	1.92E-07	3.63E-07	3.53E-07
Bone	<1.00E-10	<1.00E-10	<1.00E-10	<1.00E-10
Thyroid	2.73E-07	1.92E-07	3.63E-07	3.53E-07
Third Quarter				
T. Body	4.16E-07	2.95E-07	5.55E-07	5.40E-07
Bone	2.04E-10	2.08E-10	3.60E-10	1.20E-10
Thyroid	4.16E-07	2.95E-07	5.55E-07	5.40E-07
Fourth Quarter				
T. Body	1.19E-06	8.40E-07	1.59E-06	1.54E-06
Bone	<1.00E-10	<1.00E-10	<1.00E-10	<1.00E-10
Thyroid	1.19E-06	8.40E-07	1.59E-06	1.54E-06