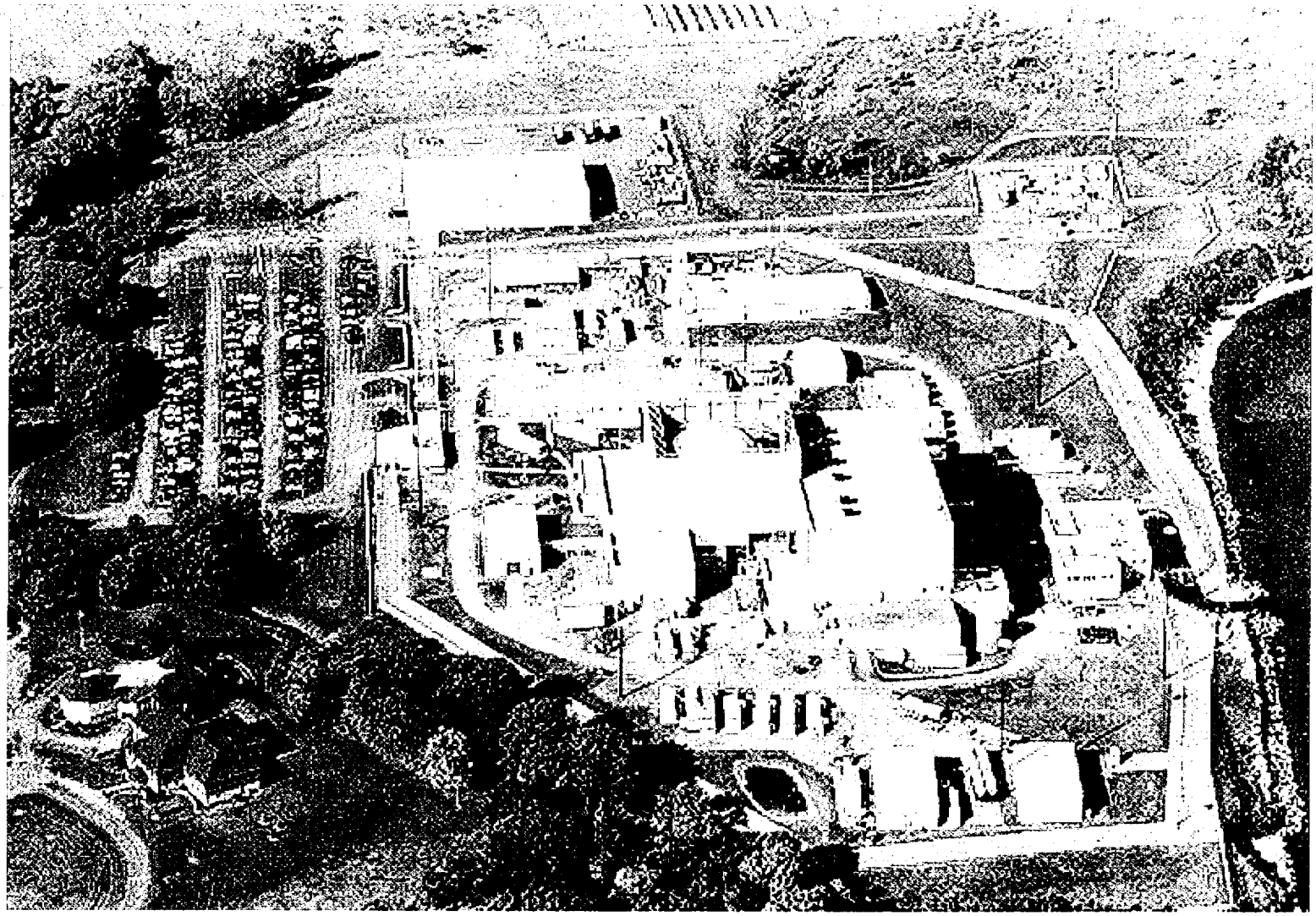
2001
Annual Radiological Environmental Operating Report



R.E. Ginna Nuclear Plant
Rochester Gas and Electric

Docket No. 50-244

2001

ANNUAL RADIOLOGICAL ENVIRONMENTAL

OPERATING REPORT

R.E. Ginna Nuclear Station

Rochester Gas & Electric Corporation

Docket No. 50-244

TABLE OF CONTENTS

LIST OF TABLES/FIGURES

LIST OF TABLES/FIGURES (continued)

LIST OF MAPS

RADIOLOGICAL ENVIRONMENTAL SURVEY
January 1 - December 31, 2001

1.0 SUMMARY

The Annual Radiological Environmental Operating Report is published in accordance with Section 5.0 of the Offsite Dose Calculation Manual, (ODCM). This report describes the Radiological Environmental Monitoring Program, (REMP), and its implementation as required by the ODCM.

The REMP is implemented to measure radioactivity in the aquatic and terrestrial pathways. The aquatic pathways include Lake Ontario fish, Lake Ontario water, and Deer Creek water. Measurement results of the samples representing these pathways contained only natural background radiation or low concentrations of Cs-137 resulting from past atmospheric nuclear weapons testing.
Terrestrial pathways monitored included airborne particulate and radioiodine, milk, food products, and direct radiation. Analysis of terrestrial pathways demonstrated no detectable increase in radiation levels as a result of plant operation. The 2001 results were consistent with data for the past five years and exhibited no adverse trends.

The analytical results from the 2001 Radiological Environmental Monitoring Program demonstrate that the operation of the R. E. Ginna Nuclear Power Plant had no measurable radiological impact on the environment. The results also demonstrate that operation of the plant did not result in a measurable radiation dose to the general population above natural background levels.

During 2001, 1185 samples were collected for analysis by gross beta counting and/or gamma spectroscopy. These included 936 air samples, 60 water samples, 16 fish samples, 18 vegetation samples, 57 milk samples, and 156 thermoluminescent dosimeter measurements. During 2001 there was one deviation from the sampling schedule for TLD's, 6 deviations for air samples, and 2 deviations for water samples. The minimum number of samples required in ODCM Table 5-1 were collected for all pathways.

Samples were collected by Ginna Station chemistry personnel and analyzed by the J. A. Fitzpatrick Nuclear Power Plant Environmental Laboratory.
A summary of the data collected indicating the results of all data for indicator and control locations is given in Table 1-1.

Table 1-1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

PATHWAY SAMPLED UNIT OF MEASUREMENT	TYPE AND TOTAL NUMBER OF ANALYSES	LLD	INDICATOR LOCATIONS MEAN (1) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS MEAN (1) RANGE
				NAME, DISTANCE AND DIRECTION	MEAN (1) RANGE	
AIR: Particulate(pCi/M^3)	Gross Beta 624	0.003	0.017 (468/468) 0.006-0.043	Onsite Location # 5 185 160M	0.019 (52/52) 0.07 - 0.034	0.017 (156/156) 0.004 - 0.034
(pCi/M^3) Iodine(pCi/M^3)	Gamma Scan 48	(2)	< LLD	N/A	N/A	< LLD
	Gamma Scan 260	0.006- 0.054	< LLD	N/A	N/A	< LLD
DIRECT RADIATION: TLD (mrem/quarter)	Gamma 156	5.0	12.5 (120/120) 9.6 – 20.3	Onsite Location #7 257 220M	18.7 (4/4) 17.7 – 20.3	11.0 (36/36) 9.4 – 12.8
WATER: Drinking (pCi/Liter)	Gross Beta 12	0.2	2.51 (12/12) 0.86 – 3.29	OWD 70 1200M	2.51 0.86 – 3.29	N/A
	Gamma Scan 12	(2)	Ra-226 94 (12/12) 56 – 176	OWD 70 1200M	Ra-226 94 (12/12) 56 – 176	N/A
	Tritium 12	(2)	<LLD	N/A	N/A	N/A
	Iodine 12	0.56*	< LLD	N/A	N/A	N/A
Surface (pCi/Liter)	Gross Beta 48	0.2	2.51 (12/12) 0.98 - 3.64	Deer Creek 105 260M	3.90 (12/12) 1.36 – 5.64	2.17 (12/12) 1.44 – 3.43
	Gamma Scan 48	(2)	Ra-226 99 (12/12) 63 – 145	Circ-out 15 130M	Ra-226 99 (12/12) 63 - 145	Ra-226 77 (12/12) 36 – 105
	Tritium 48	(2)	<LLD	N/A	N/A	N/A
	Iodine 48	0.75*	< LLD	N/A	N/A	< LLD
MILK: (pCi/Liter)	Iodine 58	0.54*	< LLD	N/A	N/A	< LLD
	Gamma Scan 58	(2)	< LLD	N/A	N/A	< LLD
FISH: (pCi/Kg)	Gamma Scan 17	(2)	Ra-226 745 (6/8) 550 - 996	Indicator Fish 015 130M	Ra-226 745 (6/8) 550 - 996	Ra-226 487 (4/6) 324 – 835
VEGETATION: (pCi/Kg)	Gamma Scan 8	(2)	Ra-226 265 (5/5) 94 - 506	Indicator Vegetation	Ra-226 265 (5/5) 94 - 506	Ra-226 135 (3/4) 65 - 204

(1) Mean and range based on detectable measurements only. Fraction of detectable measurements at specified locations in parentheses.

(2) Table of LLD values attached for gamma scan measurements.

(3) Single sample

* Average LLD

2.0 PROGRAM DESCRIPTION

2.1 Program Objectives

The objectives of the Radiological Environmental Monitoring Program are:

- Measure and evaluate the effects of plant operation on the environment.
- Monitor background radiation levels in the environs of the Ginna site.
- Demonstrate compliance with the environmental conditions and requirements of applicable state and federal regulations, including the ODCM and 40 CFR 190.
- Provide information by which the general public can evaluate environmental aspects of the operation of Ginna Nuclear Power Station.

2.2 Program Requirements

In order to achieve the objectives listed in section 2.1, a sampling and analysis program is implemented each year according to table 5-1 of the ODCM. Following are the requirements from the ODCM:

Monitoring Program

The radiological environmental monitoring program shall be conducted as specified in Table 5-1 at the locations given in the ODCM.

If the radiological environmental monitoring program is not conducted as specified in Table 5-1, prepare and submit to the Commission, in the Annual Radiological Environmental Operating Report, a description of the reasons for these deviations and the plans for preventing a recurrence. Deviations are permitted from the required sampling schedule if specimens are unobtainable due to hazardous conditions, seasonal availability, or to malfunction of automatic sampling equipment. If the latter, efforts shall be made to complete corrective action prior to the end of the next sampling period.

If milk or fresh leafy vegetable samples are unavailable for more than one sample period from one or more of the sampling locations indicated by the ODCM, a discussion shall be included in the Annual Radiological Environmental Operating Report which identifies the cause of the unavailability of samples and identifies locations for obtaining replacement samples. If a milk or leafy vegetable sample location becomes unavailable, the locations from which samples were unavailable may then be deleted from the ODCM, provided that comparable locations are added to the environmental monitoring program.

Land Use Census

A land use census shall be conducted and shall identify the location of the nearest milk producing animal and the nearest residence in each of the 16 meteorological sectors within a distance of five miles.

An onsite garden located in either the meteorological sector having the highest historical D/Q, or in a location with a higher D/Q than the location of the maximally exposed individual, may be used for broad leaf vegetation sampling in lieu of a garden census. Otherwise the land use census shall also identify the location of the nearest garden of greater than 500 square feet in each of the 16 meteorological sectors within a distance of five miles. D/Q shall be determined in accordance with methods described in the ODCM.

Interlaboratory Comparison Program

Analyses shall be performed on applicable radioactive environmental samples supplied as part of an interlaboratory comparison program which has been approved by NRC, if such a program exists.

Specification

The radiological environmental monitoring samples shall be collected pursuant to Table 5-1. Acceptable locations are shown in the ODCM. Samples shall be analyzed pursuant to the requirements of Tables 5-1 and 5-3.

A land use census shall be conducted annually between June 1 and October 1.

A summary of the results obtained as part of the required Interlaboratory Comparison Program shall be included in the Annual Radiological Environmental Operating Report.

Deviations from the Sampling Schedule

Deviations from the sampling schedule are allowed when samples are unavailable due to hazardous conditions, seasonal variations or malfunction of automatic sampling equipment.

Table 2-1 Page 1 of 2
Offsite Dose Calculation Manual Table 5-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF SAMPLES & SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
1. AIRBORNE			
a. Radioiodine	5 indicator 1 control	Continuous operation of sampler with sample collection at least once per 10 days	Radioiodine canister. Analyze within 7 days of collection for Iodine-131.
b. Particulate	9 indicator 3 control	Same as above	Particulate sampler. Analyze for gross beta radioactivity ≥ 24 hours following filter change. Perform gamma isotopic analysis on each sample for which gross beta activity is > 10 times the mean of offsite samples. Perform gamma isotopic analysis on composite (by location) sample at least once per 92 days.
2. DIRECT RADIATION	30 indicator 9 control (11 placed greater than 5 miles from plant site.)	TLDs at least quarterly	Gamma dose quarterly.
3. WATERBORNE			
a. Surface	1 control (Russell Station) 1 indicator (Condenser Water Discharge)	Composite* sample collected over a period of ≤ 31 days.	Gross beta and gamma isotopic analysis of each composite sample. Tritium analysis of one composite sample at least once per 92 days.
b. Drinking	1 indicator (Ontario Water District Intake)	Same as above	Same as above.
c. Shoreline Sediment	1 Control (Russell Station) 1 Indicator (Ontario Water District)	Semi-annnually	Gamma isotopic analysis of each sample

* Composite sample to be collected by collecting an aliquot at intervals not exceeding 2 hours.

Offsite Dose Calculation Manual Table 5-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF SAMPLES & SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
4. INGESTION			
a. Milk	1 control 3 indicator (June thru October)	At least once per 15 days	Gamma isotopic and I-131 analysis of each sample.
	1 control 1 indicator (November thru May)	At least once per 31 days	Gamma isotopic and I-131 analysis of each sample.
			Gamma isotopic analysis on edible portions of each sample.
b. Fish	4 control 4 indicator (Off shore at Ginna)	Twice during fishing season including at least four species.	Gamma isotopic analysis on edible portion of sample.
c. Food Products	1 control 2 indicator (On site)	Annual at time of harvest. Sample from two of the following: 1. apples 2. cherries 3. Other crops grown on site by contract farmer	Gamma isotopic analysis on edible portion of sample.
	1 control 1 indicator (On site garden or nearest offsite garden within 5 miles in the highest D/Q meterological sector)	At time of harvest. One sample of: 1. broad leaf vegetation* 2. other vegetable *leaves from 3 different plant species composited	

Table 2-2 Page 1 of 2

The maximum LLD values as defined by ODCM Table 5-3

Analysis	Water (pCi/Liter)	Airborne Particulate or Gas (pCi/m^3)	Fish (pCi/kg, wet)	Milk (pCi/Liter)	Food Particulate (pCi/kg, wet)
Gross Beta	4(a)	1×10^{-2}			
H-3	2000 (1000)(a)				
Mn-54	15		130		
Fe-59	30		260		
Co-58 Co-60	15		130		
Zn-65	30		260		
Zr-Nb-95	15[b]				
I-131	1	7×10^{-2}		1	60
Cs-134 Cs-137	15(10)(a), 18	1×10^{-2}	130	15	60
Ba-La-140	15(b)			15(b)	

a. LLD for drinking water

b. Total for parent and daughter

LLD TABLE NOTATION

The LLD is the smallest concentration of radioactive material in a sample that will yield a net count (above system background) that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal. The LLD is defined as an apriori (before the fact) limit representing the capability of a measurement system and not as an aposteriori (after the fact) limit for a particular measurement, the minimum detectable activity (MDA).

For a particular measurement system (which may include radiochemical separation):

$$LLD = \frac{4.66\ Sb}{E\ V\ 2.22\ Y \exp(-\lambda \Delta t)}$$

where:

LLD is the lower limit of detection as defined above (as pCi per unit mass or volume)

4.66 establishes 95% confidence interval about LLD

Sb is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (in counts per minute)

E is the counting efficiency (as counts per disintegration)

V is the sample size (in units of mass or volume)

2.22 is the number of disintegrations per minute per picocurie

Y is the fractional radiochemical yield (when applicable)

λ is the decay constant for the particular radionuclide

Δt is the elapsed time between sample collection, (or end of sample collection period), and time of counting

Table 2-3

DIRECTION AND DISTANCE TO SAMPLE POINTS

All directions given in degrees and all distances given in meters

Air Sample Stations	Direction	Distance
#2 I	87	320
#3 I	110	420
#4 I	140	250
#5 I	185	160
#6 I	232	225
#7 I	257	220
#8 C	258	19200
#9 I	235	11400
#10 C	185	13100
#11 I	123	11500
#12 C	93	25100
#13 I	194	690

Water Sample Locations	Direction	Distance
Russell Station C	270	25600
Ontario Water District I	70	2200
Circ Water Intake S	0	420
Circ Water Discharge I	15	130
Deer Creek S	105	260

Milk Sample Locations	Direction	Distance
Farm A I	113	9500
Farm B I	242	5450
Farm C I	156	4950
Farm D C	132	21000

Fish Samples	
Indicator Samples	Lake Ontario Discharge Plume
Background Samples	Russell Station

Produce Samples	
Indicator Samples	Grown on property surrounding Plant
Background Samples	Purchased from farms > 10 miles

I = Indicator Samples

C = Control Samples

S = Supplemental Samples

TLD Locations	Direction	Distance
#2	87	320
#3	110	420
#4	140	250
#5	185	160
#6	232	225
#7	257	220
#8	258	19200
#9	235	11400
#10	185	13100
#11	123	11500
#12	93	25100
#13	292	230
#14	292	770
#15	272	850
#16	242	900
#17	208	500
#18	193	650
#19	177	400
#20	165	680
#21	145	600
#22	128	810
#23	107	680
#24	90	630
#25	247	14350
#26	223	14800
#27	202	14700
#28	145	17700
#29	104	13800
#30	103	20500
#31	263	7280
#32	246	6850
#33	220	7950
#34	205	6850
#35	193	7600
#36	174	5650
#37	158	6000
#38	137	7070
#39	115	6630
#40	87	6630

3.0 DATA SUMMARY

3.1 Analytical Results

The values listed on the following tables include the uncertainties stated as +/- 1 standard deviation.

Definitions

Curie (Ci):	The quantity of any radionuclide in which the number of disintegrations per second is 37 billion.
Picocurie (pCi):	One millionth of a millionth of a curie or 0.037 disintegrations per second
Cubic meter (M^3)	Approximately 35.3 cubic feet
Liter (L):	Approximately 1.06 quarts
Kilogram (Kg):	Approximately 2.205 pounds

Lower Limit of Detection

The U.S. Nuclear Regulatory Commission has requested that reported values be compared to the Lower Limit of Detection (LLD) for each piece of equipment. The LLD for the equipment is established by the measurement of a blank sample. These values are before correction for decay. Decay correction is applied from the end of the sampling period to the counting time, not from the midpoint of the sampling period. An explanation of the calculation of the LLD is included with Table 2-2, (page 8).

3.2 Air Samples

Radioactive particles in air are collected by drawing approximately one SCFM through a two inch diameter particulate filter. The volume of air sampled is measured by a dry gas meter and corrected for the pressure drop across the filter. The filters are changed weekly and allowed to decay for three days prior to counting to eliminate most of the natural radioactivity such as the short half-life progeny products of radon and thoron. The decay period is used to give a more sensitive measurement of long-lived man-made radioactivity.

A ring of 6 sampling stations is located on the plant site from 150 to 420 meters from the reactor centerline near the point of the maximum annual average ground level concentration, 1 more is located on-site at 690 meters, and 2 others offsite at approximately 7 miles. In addition, there are 3 sampling stations located approximately 7 to 17 miles from the site that serve as control stations.

Based on weekly comparisons, there was no statistical difference between the Control and Indicator radioactive particulate concentrations. The averages for the control samples were 0.018 pCi/m^3, and the averages for the indicators were 0.019 pCi/m^3 for the period of January to December, 2001. Maximum weekly concentrations for each station were less than 0.043 pCi/m^3. These values represent a worst-case evaluation of the four environmental air sample gas meters which failed as-found testing on 6/27/01. The failed as-found flows varied between 106% and 127%, and included 3 indicator stations and 1 control station. See section 7.0.
The major airborne species released from the plant are noble gases, tritium and radioiodines. Most of this activity is released in a gaseous form, however, some radioiodine is released as airborne particulate and some of the particulate activity is due to short lived noble gas decay products.

Tables 3-1A, 3-1B are a list of gross beta analysis values for the on-site sample stations. Tables 3-2A, 3-2B are a list of gross beta analysis values for the off-site sampler stations.

The particulate filters from each sampling location were saved and a 13 week composite was made. A gamma isotopic analysis was performed for each sampling location and corrected for decay. The results of these analyses are listed in Tables 3-4 A to D.

Radioiodine cartridges are placed at six locations. These cartridges are changed and analyzed each week. No positive analytical results were found on any sample. A list of values for these cartridges is given in Table 3-5.

A trend plot of the 2001 Onsite vs. Offsite air filter data is included, Table 3-3. Additionally, a trend plot of the annual averages measured since 1968, Table 3-6, is included to show the variation of data during the years that the R.E. Ginna Nuclear Power Plant has been operational. The peak activities measured correspond to the years when atmospheric tests of nuclear weapons were being conducted.

Table 3-1 A
On-Site Air Particulate Samplers
Gross Beta Results in pCi/m3

Collection Date	Sta. #2 (I)	Sta. #3 (I)	Sta. #4 (I)	Sta. #5 (I)	Sta. #6 (I)	Sta. #7 (I)	Sta #13A (I)	Average
8-Jan	0.018 ± 0.005	0.018 ± 0.004	0.022 ± 0.007(a)	0.034 ± 0.007(a)	0.020 ± 0.004	0.019 ± 0.003	0.020 ± 0.004	0.022
16-Jan	0.021 ± 0.005	0.021 ± 0.003	0.021 ± 0.003	0.021 ± 0.003	0.020 ± 0.003	0.020 ± 0.003	0.025 ± 0.004	0.021
22-Jan	0.016 ± 0.005	0.021 ± 0.004	0.020 ± 0.004	0.022 ± 0.004	0.019 ± 0.003	0.020 ± 0.003	0.026 ± 0.005	0.021
29-Jan	0.021 ± 0.005	0.019 ± 0.003	0.021 ± 0.004	0.029 ± 0.004	0.021 ± 0.003	0.018 ± 0.003	0.026 ± 0.004	0.022
5-Feb	0.023 ± 0.005	0.020 ± 0.003	0.019 ± 0.004	0.025 ± 0.004	0.020 ± 0.003	0.018 ± 0.003	0.022 ± 0.004	0.021
12-Feb	0.020 ± 0.005	0.022 ± 0.004	0.022 ± 0.004	0.025 ± 0.004	0.009 ± 0.003	0.021 ± 0.003	0.024 ± 0.004	0.021
20-Feb	0.020 ± 0.005	0.024 ± 0.003	0.021 ± 0.003	0.026 ± 0.003	0.028 ± 0.004	0.023 ± 0.003	0.028 ± 0.004	0.024
26-Feb	0.017 ± 0.005	0.016 ± 0.003	0.018 ± 0.004	0.022 ± 0.004	0.016 ± 0.003	0.015 ± 0.003	0.021 ± 0.004	0.018
5-Mar	0.021 ± 0.005	0.018 ± 0.003	0.019 ± 0.004	0.023 ± 0.004	0.021 ± 0.003	0.018 ± 0.003	0.022 ± 0.004	0.020
12-Mar	0.011 ± 0.004	0.015 ± 0.003	0.014 ± 0.003	0.018 ± 0.003	0.013 ± 0.003	0.013 ± 0.003	0.016 ± 0.004	0.014
19-Mar	0.014 ± 0.005	0.015 ± 0.003	0.013 ± 0.003	0.017 ± 0.003	0.017 ± 0.003	0.016 ± 0.003	0.018 ± 0.004	0.016
26-Mar	0.008 ± 0.004	0.011 ± 0.003	0.010 ± 0.003	0.013 ± 0.003	0.012 ± 0.003	0.011 ± 0.002	0.013 ± 0.003	0.011
2-Apr	0.009 ± 0.004	0.013 ± 0.003	0.011 ± 0.003	0.012 ± 0.003	0.014 ± 0.003	0.011 ± 0.003	0.016 ± 0.004	0.012
9-Apr	0.016 ± 0.005	0.016 ± 0.003	0.017 ± 0.003	0.017 ± 0.003	0.017 ± 0.003	0.014 ± 0.003	0.018 ± 0.004	0.017
16-Apr	0.009 ± 0.004	0.010 ± 0.003	0.010 ± 0.003	0.013 ± 0.003	0.007 ± 0.005(a)	0.008 ± 0.002	0.008 ± 0.003	0.009
23-Apr	0.019 ± 0.005	0.019 ± 0.003	0.020 ± 0.004	0.028 ± 0.004	0.023 ± 0.004	0.020 ± 0.003	0.021 ± 0.004	0.021
30-Apr	0.018 ± 0.005	0.020 ± 0.003	0.023 ± 0.004	0.026 ± 0.004	0.027 ± 0.004	0.022 ± 0.003	0.028 ± 0.005	0.023
7-May	0.019 ± 0.005	0.025 ± 0.004	0.024 ± 0.004	0.033 ± 0.004	0.025 ± 0.004	0.020 ± 0.003	0.025 ± 0.004	0.024
14-May	0.012 ± 0.004	0.016 ± 0.003	0.018 ± 0.003	0.021 ± 0.003	0.016 ± 0.003	0.016 ± 0.003	0.023 ± 0.004	0.017
21-May	0.010 ± 0.004	0.011 ± 0.003	0.011 ± 0.003	0.013 ± 0.003	0.013 ± 0.003	0.010 ± 0.002	0.013 ± 0.004	0.012
29-May	0.007 ± 0.003	0.006 ± 0.002	0.006 ± 0.002	0.008 ± 0.002	0.008 ± 0.002	0.007 ± 0.002	0.008 ± 0.003	0.007
4-Jun	0.012 ± 0.008(a)	0.009 ± 0.003	0.008 ± 0.003	0.009 ± 0.003	0.010 ± 0.003	0.008 ± 0.003	0.011 ± 0.004	0.009
11-Jun	0.010 ± 0.004	0.012 ± 0.003	0.012 ± 0.003	0.012 ± 0.003	0.015 ± 0.003	0.012 ± 0.003	0.020 ± 0.004	0.013
18-Jun	0.014 ± 0.004	0.016 ± 0.003	0.015 ± 0.003	0.015 ± 0.003	0.017 ± 0.003	0.017 ± 0.003	0.016 ± 0.004	0.016
25-Jun	0.009 ± 0.004	0.012 ± 0.003	0.012 ± 0.003	0.013 ± 0.003	0.018 ± 0.003	0.013 ± 0.003	0.012 ± 0.003	0.013
2-Jul	0.017 ± 0.005	0.019 ± 0.003	0.018 ± 0.003	0.018 ± 0.004	0.026 ± 0.004	0.019 ± 0.003	0.018 ± 0.004	0.019
Maximum	0.023 ± 0.005	0.025 ± 0.004	0.024 ± 0.004	0.034 ± 0.007	0.028 ± 0.004	0.023 ± 0.003	0.028 ± 0.004	
Average	0.015	0.016	0.016	0.020	0.017	0.016	0.019	
Minimum	0.007 ± 0.003	0.006 ± 0.002	0.006 ± 0.002	0.008 ± 0.002	0.007 ± 0.002	0.007 ± 0.002	0.008 ± 0.003	

(a) Sample collected for <84 hours in sample period.

I= Indicator
C= Control

Table 3-1 B
On-Site Air Particulate Samplers
Gross Beta Results in pCi/m3

Collection Date	Sta. #2 (I)	Sta. #3 (I)	Sta. #4 (I)	Sta. #5 (I)	Sta. #6 (I)	Sta. #7 (I)	Sta. #13A (I)	Average
9-Jul	0.010 ± 0.004	0.012 ± 0.003	0.015 ± 0.003	0.011 ± 0.003	0.016 ± 0.003	0.012 ± 0.003	0.017 ± 0.004	0.013
16-Jul	0.007 ± 0.004	0.009 ± 0.003	0.008 ± 0.002	0.007 ± 0.003	0.012 ± 0.003	0.010 ± 0.002	0.011 ± 0.003	0.009
23-Jul	0.016 ± 0.003	0.015 ± 0.003	0.015 ± 0.003	0.016 ± 0.003	0.018 ± 0.004	0.016 ± 0.003	0.016 ± 0.004	0.016
30-Jul	0.015 ± 0.003	0.013 ± 0.003	0.017 ± 0.003	0.014 ± 0.003	0.017 ± 0.003	0.017 ± 0.003	0.016 ± 0.004	0.015
6-Aug	0.022 ± 0.003	0.022 ± 0.003	0.020 ± 0.003	0.019 ± 0.004	0.022 ± 0.003	0.021 ± 0.004	0.024 ± 0.004	0.021
13-Aug	0.024 ± 0.003	0.026 ± 0.004	0.024 ± 0.003	0.024 ± 0.004	0.021 ± 0.003	0.023 ± 0.004	0.022 ± 0.004	0.023
20-Aug	0.015 ± 0.003	0.013 ± 0.003	0.016 ± 0.003	0.015 ± 0.003	0.016 ± 0.003	0.016 ± 0.003	0.017 ± 0.004	0.015
27-Aug	0.016 ± 0.003	0.017 ± 0.003	0.017 ± 0.003	0.015 ± 0.003	0.015 ± 0.003	0.015 ± 0.003	0.017 ± 0.004	0.016
4-Sep	0.018 ± 0.003	0.019 ± 0.003	0.025 ± 0.012(a)	0.015 ± 0.003	0.018 ± 0.003	0.018 ± 0.003	0.016 ± 0.003	0.018
10-Sep	0.022 ± 0.004	0.021 ± 0.004	0.022 ± 0.004	0.020 ± 0.004	0.020 ± 0.004	0.023 ± 0.004	0.024 ± 0.005	0.022
17-Sep	0.016 ± 0.003	0.013 ± 0.003	0.016 ± 0.003	0.013 ± 0.003	0.016 ± 0.003	0.015 ± 0.003	0.018 ± 0.004	0.016
24-Sep	0.020 ± 0.003	0.022 ± 0.003	0.025 ± 0.004	0.023 ± 0.004	0.024 ± 0.004	0.021 ± 0.004	0.020 ± 0.004	0.022
1-Oct	0.009 ± 0.003	0.008 ± 0.002	0.008 ± 0.002	0.008 ± 0.003	0.010 ± 0.003	0.007 ± 0.003	0.008 ± 0.003	0.008
9-Oct	0.018 ± 0.003	0.021 ± 0.003	0.021 ± 0.003	0.019 ± 0.003	0.019 ± 0.003	0.021 ± 0.003	0.017 ± 0.004	0.019
15-Oct	0.018 ± 0.004	0.016 ± 0.003	0.016 ± 0.003	0.020 ± 0.004	0.019 ± 0.004	0.018 ± 0.004	0.021 ± 0.005	0.018
23-Oct	0.017 ± 0.003	0.018 ± 0.003	0.018 ± 0.003	0.017 ± 0.003	0.016 ± 0.003	0.016 ± 0.003	0.016 ± 0.004	0.017
29-Oct	0.010 ± 0.003	0.012 ± 0.003	0.011 ± 0.003	0.011 ± 0.003	0.011 ± 0.003	0.011 ± 0.003	0.010 ± 0.004	0.011
5-Nov	0.018 ± 0.003	0.019 ± 0.003	0.020 ± 0.003	0.018 ± 0.004	0.019 ± 0.003	0.023 ± 0.004	0.021 ± 0.004	0.020
12-Nov	0.013 ± 0.003	0.014 ± 0.003	0.016 ± 0.003	0.012 ± 0.003	0.016 ± 0.003	0.017 ± 0.003	0.019 ± 0.004	0.015
19-Nov	0.038 ± 0.005	0.036 ± 0.004	0.043 ± 0.005	0.033 ± 0.005	0.035 ± 0.004	0.035 ± 0.004	0.038 ± 0.005	0.037
26-Nov	0.015 ± 0.004	0.021 ± 0.003	0.022 ± 0.003	0.022 ± 0.004	0.018 ± 0.004	0.020 ± 0.004	0.021 ± 0.004	0.020
3-Dec	0.011 ± 0.013(a)	0.014 ± 0.003	0.016 ± 0.003	0.016 ± 0.003	0.016 ± 0.003	0.011 ± 0.003	0.013 ± 0.004	0.014
10-Dec	0.023 ± 0.004	0.034 ± 0.004	0.029 ± 0.004	0.025 ± 0.004	0.030 ± 0.004	0.033 ± 0.004	0.033 ± 0.005	0.030
17-Dec	0.019 ± 0.003	0.024 ± 0.004	0.025 ± 0.004	0.021 ± 0.004	0.022 ± 0.004	0.025 ± 0.004	0.022 ± 0.005	0.023
26-Dec	0.018 ± 0.003	0.021 ± 0.003	0.020 ± 0.003	0.020 ± 0.003	0.020 ± 0.003	0.018 ± 0.003	0.023 ± 0.004	0.020
2-Jan	0.016 ± 0.003	0.019 ± 0.003	0.018 ± 0.003	0.016 ± 0.003	0.017 ± 0.003	0.016 ± 0.003	0.019 ± 0.004	0.017
Maximum	0.038 ± 0.005	0.036 ± 0.004	0.043 ± 0.005	0.033 ± 0.005	0.035 ± 0.004	0.035 ± 0.004	0.038 ± 0.005	
Average	0.017	0.018	0.019	0.017	0.019	0.018	0.019	
Minimum	0.007 ± 0.004	0.008 ± 0.002	0.008 ± 0.002	0.007 ± 0.003	0.010 ± 0.003	0.007 ± 0.003	0.008 ± 0.003	

(a) Sample collected for <84 hours in sample period.

I= Indicator
C= Control

Table 3-2 A
Off-Site Air Particulate Samplers
Gross Beta Results in pCi/m3

Collection Date	Sta. #8 (C)	Sta.#9 (I)	Sta. #10 (C)	Sta. #11 (I)	Sta.#12 (C)	Average
8-Jan	0.018 ± 0.003	0.018 ± 0.004	0.021 ± 0.004	0.020 ± 0.003	0.022 ± 0.004	0.019
16-Jan	0.017 ± 0.003	0.015 ± 0.003	0.022 ± 0.003	0.017 ± 0.003	0.024 ± 0.004	0.019
22-Jan	0.022 ± 0.004	0.016 ± 0.004	0.022 ± 0.004	0.018 ± 0.003	0.022 ± 0.004	0.020
29-Jan	0.015 ± 0.003	0.018 ± 0.004	0.029 ± 0.004	0.017 ± 0.003	0.026 ± 0.004	0.021
5-Feb	0.018 ± 0.003	0.015 ± 0.004	0.020 ± 0.003	0.016 ± 0.003	0.022 ± 0.004	0.018
12-Feb	0.019 ± 0.003	0.018 ± 0.004	0.019 ± 0.003	0.018 ± 0.003	0.026 ± 0.004	0.020
20-Feb	0.020 ± 0.003	0.018 ± 0.004	0.021 ± 0.003	0.020 ± 0.003	0.022 ± 0.004	0.020
26-Feb	0.013 ± 0.003	0.016 ± 0.004	0.013 ± 0.003	0.014 ± 0.003	0.018 ± 0.004	0.015
5-Mar	0.017 ± 0.003	0.016 ± 0.004	0.017 ± 0.003	0.016 ± 0.003	0.026 ± 0.004	0.018
12-Mar	0.010 ± 0.002	0.011 ± 0.003	0.013 ± 0.003	0.011 ± 0.002	0.016 ± 0.004	0.012
19-Mar	0.014 ± 0.003	0.014 ± 0.004	0.018 ± 0.003	0.013 ± 0.003	0.018 ± 0.004	0.015
26-Mar	0.013 ± 0.003	0.011 ± 0.004	0.012 ± 0.002	0.011 ± 0.002	0.017 ± 0.004	0.013
2-Apr	0.011 ± 0.003	0.011 ± 0.004	0.010 ± 0.002	0.013 ± 0.003	0.014 ± 0.004	0.012
9-Apr	0.015 ± 0.003	0.011 ± 0.004	0.014 ± 0.003	0.014 ± 0.003	0.018 ± 0.004	0.015
16-Apr	0.009 ± 0.002	0.008 ± 0.003	0.010 ± 0.002	0.007 ± 0.002	0.011 ± 0.004	0.009
23-Apr	0.020 ± 0.003	0.017 ± 0.004	0.018 ± 0.003	0.015 ± 0.003	0.022 ± 0.004	0.019
30-Apr	0.021 ± 0.003	0.023 ± 0.004	0.021 ± 0.003	0.022 ± 0.003	0.026 ± 0.005	0.022
7-May	0.027 ± 0.004	0.023 ± 0.004	0.021 ± 0.003	0.023 ± 0.003	0.033 ± 0.005	0.025
14-May	0.016 ± 0.004	0.016 ± 0.004	0.018 ± 0.003	0.018 ± 0.003	0.021 ± 0.004	0.018
21-May	0.013 ± 0.003	0.011 ± 0.003	0.012 ± 0.002	0.012 ± 0.003	0.018 ± 0.004	0.013
29-May	0.005 ± 0.002	0.009 ± 0.003	0.009 ± 0.002	0.008 ± 0.002	0.008 ± 0.003	0.008
4-Jun	0.008 ± 0.003	0.008 ± 0.003	0.007 ± 0.002	0.008 ± 0.003	0.012 ± 0.004	0.009
11-Jun	0.014 ± 0.003	0.013 ± 0.003	0.013 ± 0.002	0.012 ± 0.003	0.014 ± 0.004	0.013
18-Jun	0.015 ± 0.003	0.017 ± 0.004	0.016 ± 0.003	0.017 ± 0.003	0.018 ± 0.003	0.017
25-Jun	0.018 ± 0.003	0.016 ± 0.003	0.011 ± 0.002	0.014 ± 0.003	0.011 ± 0.002	0.014
2-Jul	0.021 ± 0.003	0.021 ± 0.004	0.019 ± 0.003	0.019 ± 0.003	0.016 ± 0.003	0.019
Maximum	0.027 ± 0.004	0.023 ± 0.004	0.029 ± 0.004	0.023 ± 0.003	0.033 ± 0.005	
Average	0.016	0.015	0.016	0.015	0.019	
Minimum	0.005 ± 0.002	0.008 ± 0.003	0.007 ± 0.002	0.007 ± 0.002	0.008 ± 0.003	

I= Indicator
C= Control

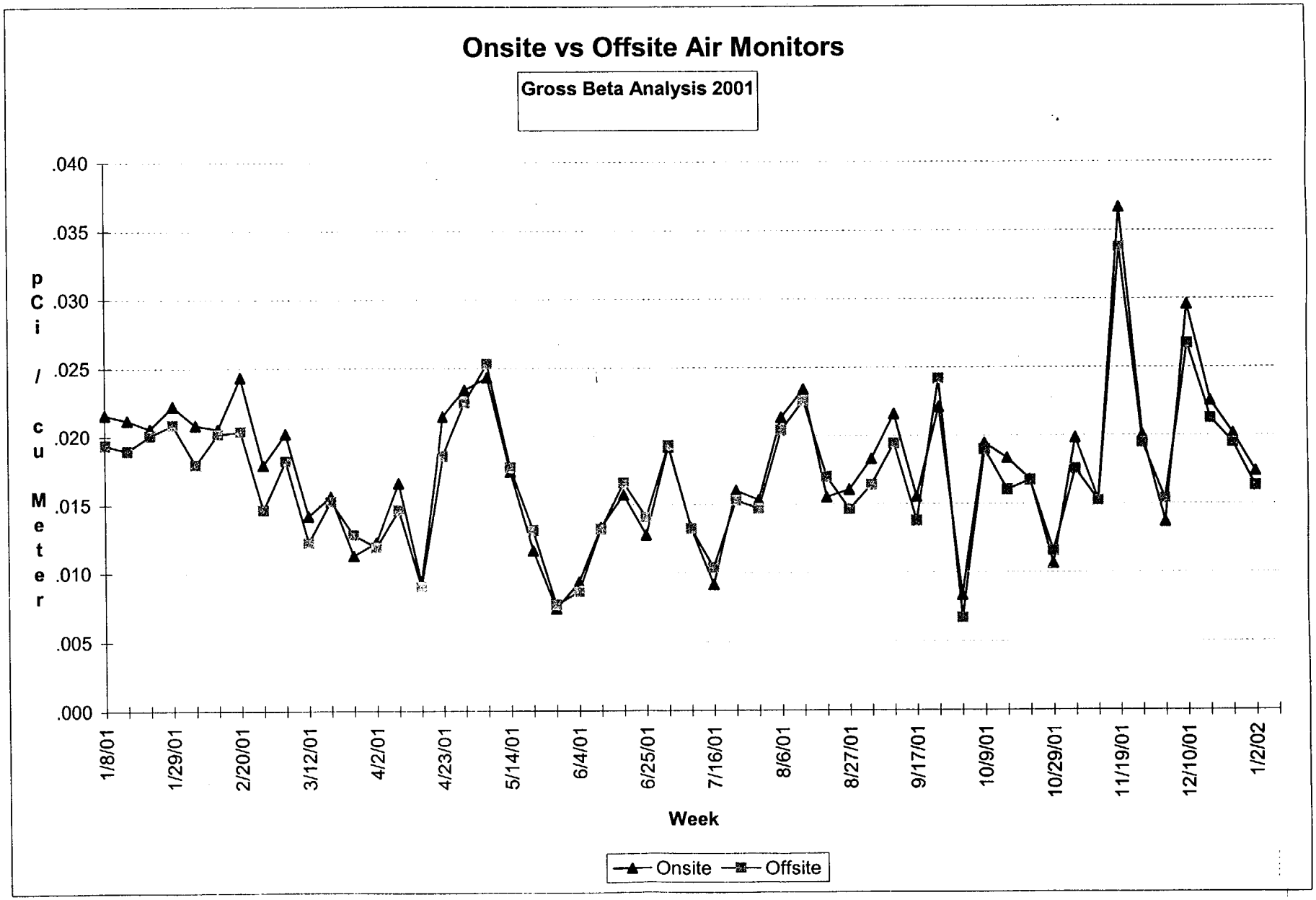
Table 3-2 B
Off-Site Air Particulate Samplers
Gross Beta Results in pCi/m3

Collection Date	Sta. #8 (C)	Sta. #9 (I)	Sta. #10 (C)	Sta. #11 (I)	Sta. #12 (C)	Average
9-Jul	0.015 ± 0.003	0.012 ± 0.003	0.013 ± 0.003	0.014 ± 0.003	0.011 ± 0.002	0.013
16-Jul	0.010 ± 0.003	0.012 ± 0.003	0.011 ± 0.002	0.009 ± 0.002	0.010 ± 0.002	0.010
23-Jul	0.016 ± 0.003	0.015 ± 0.003	0.014 ± 0.003	0.018 ± 0.003	0.013 ± 0.002	0.015
30-Jul	0.015 ± 0.003	0.015 ± 0.003	0.016 ± 0.003	0.015 ± 0.003	0.013 ± 0.002	0.015
6-Aug	0.022 ± 0.003	0.021 ± 0.004	0.020 ± 0.003	0.021 ± 0.003	0.017 ± 0.003	0.020
13-Aug	0.024 ± 0.003	0.022 ± 0.004	0.023 ± 0.003	0.024 ± 0.003	0.019 ± 0.003	0.023
20-Aug	0.018 ± 0.003	0.019 ± 0.004	0.013 ± 0.004	0.017 ± 0.003	(b)	0.017
27-Aug	0.017 ± 0.003	0.016 ± 0.004	0.012 ± 0.004	0.018 ± 0.003	0.011 ± 0.002	0.015
4-Sep	0.016 ± 0.002	0.015 ± 0.003	0.016 ± 0.004	0.018 ± 0.003	0.017 ± 0.002	0.016
10-Sep	0.021 ± 0.004	0.018 ± 0.004	0.020 ± 0.006	0.019 ± 0.004	0.019 ± 0.003	0.019
17-Sep	0.015 ± 0.003	0.013 ± 0.003	0.014 ± 0.004	0.014 ± 0.003	0.013 ± 0.003	0.014
24-Sep	0.022 ± 0.003	0.031 ± 0.005	0.022 ± 0.005	0.025 ± 0.004	0.021 ± 0.003	0.024
1-Oct	0.006 ± 0.002	0.009 ± 0.003	0.004 ± 0.004	0.007 ± 0.002	0.008 ± 0.002	0.007
9-Oct	0.018 ± 0.003	0.019 ± 0.004	0.019 ± 0.004	0.020 ± 0.003	0.018 ± 0.003	0.019
15-Oct	0.017 ± 0.003	0.019 ± 0.004	0.015 ± 0.005	0.016 ± 0.004	0.013 ± 0.003	0.016
23-Oct	0.015 ± 0.003	0.018 ± 0.004	0.017 ± 0.004	0.019 ± 0.003	0.014 ± 0.003	0.017
29-Oct	0.012 ± 0.003	0.010 ± 0.003	0.012 ± 0.005	0.013 ± 0.003	0.011 ± 0.003	0.012
5-Nov	0.017 ± 0.003	0.018 ± 0.004	0.015 ± 0.004	0.020 ± 0.003	0.018 ± 0.003	0.018
12-Nov	0.017 ± 0.003	0.013 ± 0.003	0.015 ± 0.004	0.015 ± 0.003	0.016 ± 0.003	0.015
19-Nov	0.034 ± 0.004	0.034 ± 0.005	0.030 ± 0.006	0.041 ± 0.004	0.030 ± 0.004	0.034
26-Nov	0.019 ± 0.003	0.020 ± 0.004	0.019 ± 0.005	0.019 ± 0.003	0.019 ± 0.003	0.019
3-Dec	0.014 ± 0.003	0.016 ± 0.003	0.016 ± 0.004	0.018 ± 0.003	0.013 ± 0.003	0.015
10-Dec	0.028 ± 0.004	0.024 ± 0.004	0.026 ± 0.005	0.030 ± 0.004	0.026 ± 0.003	0.027
17-Dec	0.021 ± 0.003	0.020 ± 0.004	0.020 ± 0.005	0.026 ± 0.004	0.019 ± 0.003	0.021
26-Dec	0.020 ± 0.003	0.020 ± 0.003	0.019 ± 0.004	0.019 ± 0.003	0.019 ± 0.003	0.019
2-Jan	0.016 ± 0.003	0.017 ± 0.004	0.017 ± 0.005	0.014 ± 0.003	0.017 ± 0.003	0.016
Maximum	0.034 ± 0.004	0.034 ± 0.005	0.030 ± 0.006	0.041 ± 0.004	0.030 ± 0.004	
Average	0.018	0.018	0.017	0.019	0.016	
Minimum	0.006 ± 0.002	0.009 ± 0.003	0.004 ± 0.004	0.007 ± 0.002	0.008 ± 0.002	

(b) data rejected, statistical outlier

I= Indicator
C= Control

Rochester Gas and Electric
Figure 3-3



Rochester Gas and Electric

Table 3-4A
13 Week Composite
Gamma Isotopic Analysis
Result in pCi/m3
First Qtr

Station	7Be	40K	54Mn	59Fe	58Co	60Co	65Zn	95Zr	95Nb	103Ru	106Ru	134Cs	137Cs	140Ba	141Ce	144Ce
#2	0.092±0.017	<.009	<.003	<.013	<.004	<.001	<.009	<.006	<.005	<.006	<.015	<.002	<.001	<.028	<.005	<.007
#3	0.078±0.013	<.018	<.001	<.005	<.003	<.002	<.005	<.003	<.001	<.003	<.020	<.002	<.002	<.024	<.004	<.007
#4	0.090±0.013	0.041±0.010	<.001	<.007	<.002	<.001	<.006	<.004	<.004	<.003	<.018	<.002	<.002	<.023	<.005	<.008
#5	0.081±0.012	<.024	<.002	<.005	<.002	<.001	<.004	<.003	<.001	<.003	<.012	<.002	<.001	<.018	<.003	<.005
#6	0.060±0.010	<.014	<.001	<.016	<.002	<.001	<.004	<.004	<.003	<.001	<.020	<.002	<.001	<.005	<.003	<.006
#7	0.080±0.011	<.013	<.001	<.004	<.002	<.002	<.002	<.004	<.002	<.002	<.013	<.001	<.001	<.013	<.002	<.003
#8	0.078±0.012	<.016	<.002	<.006	<.003	<.002	<.004	<.003	<.004	<.003	<.016	<.001	<.001	<.017	<.004	<.006
#9	0.080±0.014	0.046±0.01	<.002	<.009	<.004	<.002	<.006	<.006	<.004	<.004	<.021	<.003	<.002	<.026	<.006	<.009
#10	0.093±0.011	<.005	<.001	<.006	<.002	<.002	<.003	<.004	<.001	<.003	<.011	<.001	<.001	<.005	<.003	<.005
#11	0.084±0.010	<.004	<.001	<.005	<.001	<.002	<.001	<.003	<.002	<.002	<.010	<.002	<.001	<.005	<.002	<.004
#12	0.120±0.015	<.018	<.002	<.005	<.002	<.003	<.004	<.003	<.003	<.002	<.013	<.002	<.001	<.007	<.003	<.005
#13	0.120±0.016	<.007	<.002	<.008	<.002	<.003	<.005	<.005	<.005	<.004	<.018	<.002	<.001	<.034	<.005	<.008

Rochester Gas and Electric

Table 3-4B
13 Week Composite
Gamma Isotopic Analysis
Result in pCi/m3
Second Qtr

Station	7Be	40K	54Mn	59Fe	58Co	60Co	65Zn	95Zr	95Nb	103Ru	106Ru	134Cs	137Cs	140Ba	141Ce	144Ce
#2	0.101±0.016	<.025	<.003	<.003	<.004	<.003	<.005	<.005	<.004	<.004	<.021	<.002	<.003	<.024	<.005	<.006
#3	0.111±0.013	<.005	<.001	<.004	<.002	<.001	<.005	<.003	<.004	<.002	<.011	<.001	<.001	<.005	<.002	<.005
#4	0.104±0.014	<.026	<.002	<.006	<.003	<.002	<.005	<.004	<.003	<.003	<.015	<.002	<.002	<.016	<.004	<.006
#5	0.122±0.013	<.005	<.001	<.005	<.001	<.002	<.004	<.004	<.004	<.002	<.012	<.002	<.001	<.005	<.002	<.005
#6	0.118±0.014	<.015	<.001	<.007	<.003	<.002	<.005	<.004	<.003	<.003	<.017	<.001	<.001	<.014	<.003	<.006
#7	0.104±0.011	<.016	<.001	<.001	<.001	<.001	<.004	<.003	<.002	<.002	<.009	<.001	<.001	<.014	<.002	<.003
#8	0.088±0.012	0.044±0.011	<.002	<.007	<.003	<.003	<.005	<.005	<.003	<.003	<.015	<.002	<.001	<.005	<.004	<.006
#9	0.104±0.014	0.045±0.010	<.002	<.008	<.003	<.003	<.005	<.005	<.004	<.004	<.021	<.002	<.002	<.017	<.005	<.009
#10	0.126±0.012	<.004	<.001	<.005	<.001	<.001	<.003	<.003	<.003	<.002	<.012	<.002	<.001	<.014	<.002	<.003
#11	0.121±0.013	<.005	<.001	<.006	<.003	<.001	<.002	<.004	<.003	<.002	<.014	<.001	<.001	<.004	<.002	<.005
#12	0.151±0.017	<.006	<.001	<.010	<.002	<.003	<.006	<.004	<.004	<.002	<.022	<.001	<.001	<.006	<.003	<.006
#13	0.125±0.015	0.062±0.012	<.001	<.007	<.004	<.002	<.005	<.006	<.005	<.004	<.024	<.003	<.002	<.022	<.005	<.009

Table 3-4C
13 Week Composite
Gamma Isotopic Analysis
Result in pCi/m3
Third Qtr

Station	7Be	40K	54Mn	59Fe	58Co	60Co	65Zn	95Zr	95Nb	103Ru	106Ru	134Cs	137Cs	140Ba	141Ce	144Ce
#2	0.128±0.014	<.023	<.001	<.003	<.002	<.001	<.001	<.004	<.003	<.002	<.016	<.001	<.001	<.021	<.002	<.006
#3	0.093±0.012	<.023	<.002	<.006	<.002	<.001	<.004	<.003	<.003	<.002	<.002	<.002	<.001	<.006	<.003	<.004
#4	0.096±0.012	<.014	<.001	<.009	<.002	<.000	<.003	<.004	<.004	<.003	<.016	<.001	<.001	<.015	<.003	<.005
#5	0.099±0.014	<.006	<.002	<.011	<.002	<.003	<.007	<.005	<.003	<.004	<.014	<.002	<.002	<.031	<.005	<.008
#6	0.107±0.014	0.038±0.008	<.002	<.002	<.003	<.002	<.004	<.005	<.004	<.003	<.019	<.002	<.002	<.017	<.004	<.009
#7	0.096±0.011	0.018±0.005	<.001	<.008	<.002	<.001	<.003	<.003	<.003	<.003	<.011	<.001	<.001	<.005	<.003	<.004
#8	0.097±0.011	0.029±0.006	<.001	<.005	<.002	<.001	<.003	<.003	<.003	<.003	<.013	<.001	<.001	<.017	<.002	<.003
#9	0.101±0.012	0.042±0.008	<.002	<.008	<.002	<.001	<.003	<.004	<.003	<.003	<.015	<.002	<.001	<.004	<.004	<.007
#10	0.093±0.011	<.004	<.002	<.002	<.002	<.001	<.001	<.004	<.004	<.002	<.012	<.001	<.001	<.025	<.003	<.004
#11	0.119±0.011	<.011	<.001	<.005	<.001	<.001	<.002	<.002	<.002	<.001	<.009	<.001	<.001	<.016	<.002	<.003
#12	0.095±0.009	0.031±0.006	<.001	<.007	<.002	<.001	<.002	<.003	<.002	<.002	<.010	<.001	<.001	<.011	<.003	<.004
#13	0.097±0.012	0.051±0.008	<.002	<.009	<.003	<.002	<.004	<.005	<.003	<.003	<.017	<.002	<.001	<.017	<.004	<.007

Rochester Gas and Electric

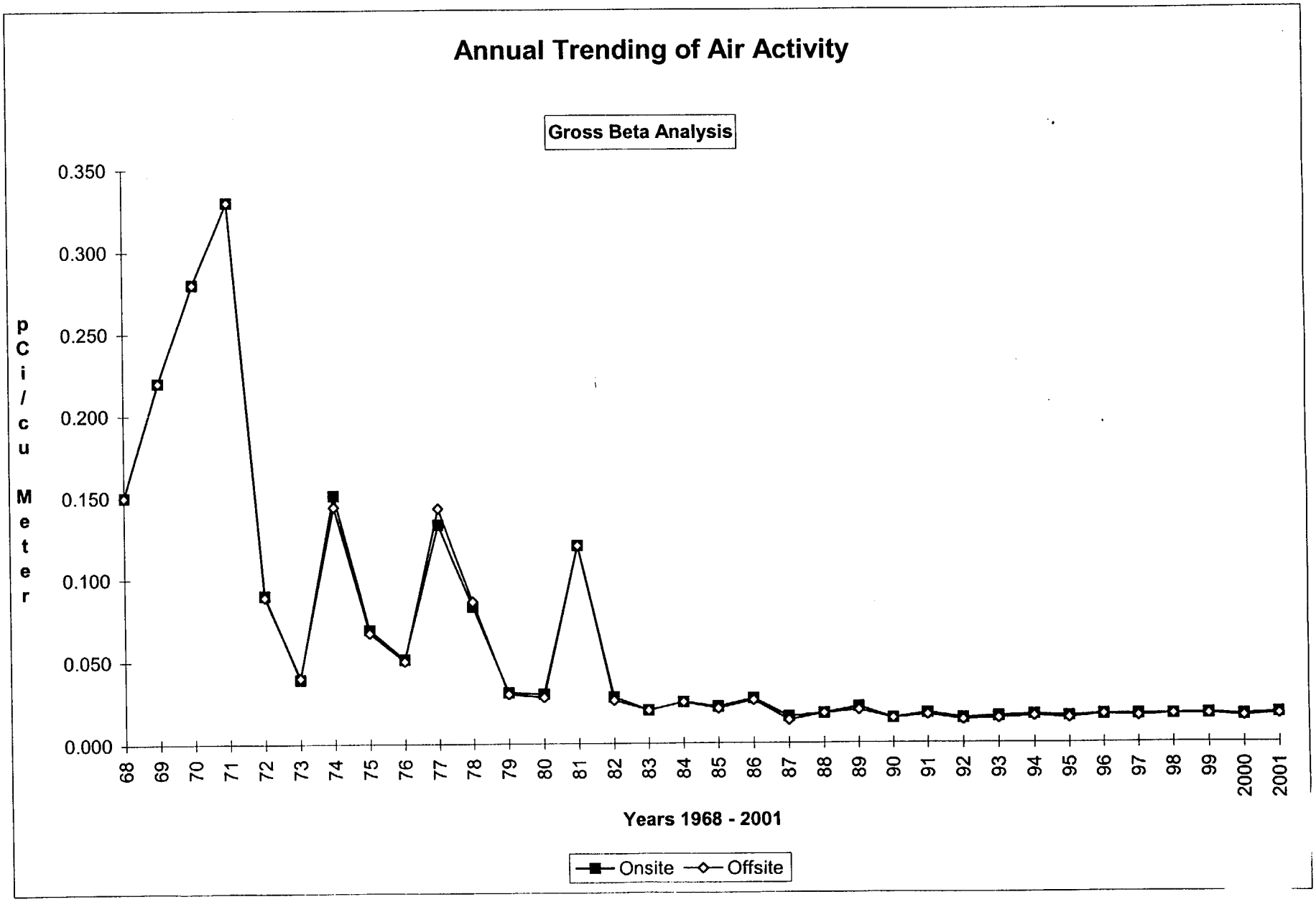
12 Week Composite
13 Week Composite
Gamma Isotopic Analysis
Result in pCi/m3
Fourth Qtr

Station	7Be	40K	54Mn	59Fe	58Co	60Co	65Zn	95Zr	95Nb	103Ru	106Ru	134Cs	137Cs	140Ba	141Ce	144Ce
#2	0.086±0.013	<.006	<.002	<.008	<.002	<.002	<.003	<.005	<.004	<.003	<.018	<.002	<.001	<.017	<.004	<.007
#3	0.089±0.011	0.049±0.009	<.001	<.008	<.002	<.002	<.003	<.004	<.002	<.003	<.016	<.002	<.001	<.018	<.004	<.005
#4	0.097±0.011	<.005	<.001	<.006	<.002	<.001	<.002	<.003	<.003	<.002	<.008	<.002	<.001	<.005	<.003	<.006
#5	0.072±0.011	<.021	<.002	<.010	<.003	<.002	<.004	<.003	<.004	<.003	<.012	<.001	<.001	<.023	<.004	<.007
#6	0.083±0.012	<.020	<.002	<.013	<.002	<.001	<.001	<.004	<.003	<.002	<.016	<.001	<.001	<.017	<.003	<.006
#7	0.070±0.011	0.041±0.009	<.001	<.011	<.003	<.002	<.005	<.006	<.004	<.004	<.020	<.002	<.013	<.013	<.005	<.007
#8	0.070±0.010	<.013	<.002	<.006	<.002	<.001	<.004	<.003	<.003	<.003	<.012	<.002	<.001	<.013	<.002	<.005
#9	0.077±0.013	<.017	<.002	<.003	<.003	<.001	<.001	<.004	<.003	<.004	<.020	<.002	<.001	<.021	<.004	<.004
#10	0.060±0.021	<.041	<.004	<.023	<.007	<.006	<.011	<.012	<.009	<.007	<.041	<.005	<.003	<.010	<.009	<.016
#11	0.084±0.011	<.005	<.001	<.007	<.001	<.001	<.004	<.004	<.003	<.002	<.012	<.002	<.001	<.025	<.003	<.006
#12	0.079±0.001	0.031±0.007	<.001	<.006	<.003	<.001	<.004	<.003	<.003	<.003	<.014	<.002	<.001	<.010	<.003	<.005
#13	0.086±0.015	<.022	<.002	<.004	<.003	<.002	<.005	<.005	<.005	<.004	<.026	<.003	<.002	<.026	<.004	<.007

Table 3-5
Charcoal Cartridges Gamma Analysis for Iodine
Results in pCi/m3

Collection Date	Sta. #2	Sta. #4	Sta. #7	Sta. #8	Sta. #9	Sta. #11
8-Jan	<.015	<.037	<.017	<.009	<.020	<.010
16-Jan	<.021	<.017	<.016	<.012	<.018	<.011
22-Jan	<.019	<.016	<.012	<.014	<.020	<.011
29-Jan	<.027	<.017	<.013	<.010	<.032	<.015
5-Feb	<.021	<.013	<.009	<.014	<.015	<.010
12-Feb	<.026	<.023	<.011	<.017	<.017	<.013
20-Feb	<.022	<.016	<.013	<.015	<.016	<.010
26-Feb	<.020	<.020	<.011	<.013	<.029	<.014
5-Mar	<.020	<.018	<.013	<.015	<.019	<.013
12-Mar	<.022	<.013	<.015	<.016	<.020	<.015
19-Mar	<.031	<.014	<.012	<.017	<.024	<.009
26-Mar	<.029	<.018	<.020	<.014	<.025	<.013
2-Apr	<.038	<.020	<.013	<.019	<.017	<.013
9-Apr	<.032	<.023	<.023	<.019	<.026	<.013
16-Apr	<.030	<.015	<.014	<.017	<.019	<.008
23-Apr	<.044	<.027	<.035	<.030	<.037	<.021
30-Apr	<.028	<.028	<.020	<.019	<.054	<.016
7-May	<.042	<.043	<.026	<.034	<.043	<.032
14-May	<.035	<.035	<.029	<.042	<.028	<.025
21-May	<.041	<.022	<.017	<.028	<.037	<.032
29-May	<.018	<.013	<.012	<.012	<.016	<.011
4-Jun	<.061	<.023	<.028	<.020	<.042	<.024
11-Jun	<.044	<.033	<.023	<.027	<.036	<.017
18-Jun	<.028	<.026	<.024	<.025	<.023	<.021
25-Jun	<.054	<.022	<.024	<.030	<.031	<.020
2-Jul	<.042	<.016	<.020	<.014	<.039	<.024
9-Jul	<.053	<.021	<.028	<.021	<.029	<.027
16-Jul	<.051	<.034	<.029	<.026	<.031	<.024
23-Jul	<.026	<.020	<.026	<.021	<.040	<.014
30-Jul	<.030	<.028	<.033	<.016	<.034	<.028
6-Aug	<.020	<.025	<.019	<.015	<.026	<.023
13-Aug	<.028	<.022	<.017	<.021	<.027	<.022
20-Aug	<.006	<.023	<.006	<.014	<.023	<.019
27-Aug	<.030	<.014	<.017	<.029	<.006	<.021
4-Sep	<.015	<.063	<.027	<.024	<.023	<.028
10-Sep	<.026	<.023	<.031	<.020	<.021	<.028
17-Sep	<.017	<.027	<.046	<.023	<.027	<.021
24-Sep	<.024	<.029	<.027	<.020	<.031	<.020
1-Oct	<.027	<.038	<.022	<.016	<.028	<.039
9-Oct	<.023	<.024	<.016	<.025	<.034	<.019
15-Oct	<.033	<.030	<.034	<.027	<.008	<.037
23-Oct	<.024	<.043	<.023	<.013	<.006	<.022
29-Oct	<.041	<.032	<.032	<.034	<.030	<.025
5-Nov	<.034	<.025	<.030	<.021	<.032	<.028
12-Nov	<.027	<.017	<.022	<.028	<.032	<.035
19-Nov	<.024	<.023	<.020	<.017	<.028	<.023
26-Nov	<.033	<.036	<.025	<.021	<.024	<.022
3-Dec	<.062	<.023	<.028	<.022	<.032	<.015
10-Dec	<.021	<.023	<.027	<.021	<.037	<.032
17-Dec	<.021	<.020	<.025	<.024	<.032	<.021
26-Dec	<.015	<.018	<.021	<.017	<.017	<.019
2-Jan	<.036	<.031	<.049	<.024	<.025	<.040

Rochester Gas and Electric
Figure 3-6



Peaks are indicative of atmospheric nuclear weapon detonations

3.3 Water Samples

Water samples are collected on a schedule specified in the ODCM, from locations surrounding the plant to assess if there is any measurable influence upon or contamination of drinking or irrigation water from liquid effluent releases, or deposition from gaseous effluent releases.

Samples are collected weekly from Lake Ontario, upstream (Russell Station) and downstream (Ontario Water District Plant - OWD), composited monthly, and analyzed for gross beta activity, Table 3-8. There was no statistically significant difference between the upstream and downstream sample concentrations. The 2001 averages were 2.17 pCi/liter and 2.51 pCi/liter for the upstream and downstream samples respectively. Gamma isotopic analysis of the monthly composite samples showed no significant difference in activity between the upstream and downstream samples.

A graphical comparison of upstream vs downstream gross beta analysis results is given in Table 3-7A. Peaks up to 10 pCi/liter can occur when the lake is stirred up by wind and the weekly sample includes large quantities of suspended silt. A trend plot, Table 3-7 B, showing the annual average activity measured during the years since 1968 is included to show the data during the years the R.E. Ginna Nuclear Power Plant has been in operation. The peaks correspond to the years when atmospheric testing of nuclear weapons occurred.

Weekly samples are taken from the plant circulating water intake (Circ In) and discharge canal (Circ Out), and composited monthly. The 2001 averages were 2.25 pCi/liter and 2.51 pCi/liter for the intake and discharge canal respectively. These are essentially the same as the upstream and downstream values as they fall within the $\pm$ 2 sigma error band and range of the measurement.

Results for all water beta analyses are listed in Table 3-8 .

Samples of the creek which crosses the site are collected and analyzed monthly. Deer Creek gross beta values are typically higher than other surface water samples due to Radon progeny in the soils from which the creek recharges and over which the creek flows.

Isotopic Analysis

Gamma isotopic analysis is performed on each monthly sample and on each monthly composite of weekly samples. These are listed in Tables 3-9 to 3-14 and are separated by source of sample. No anomalous results were noted.

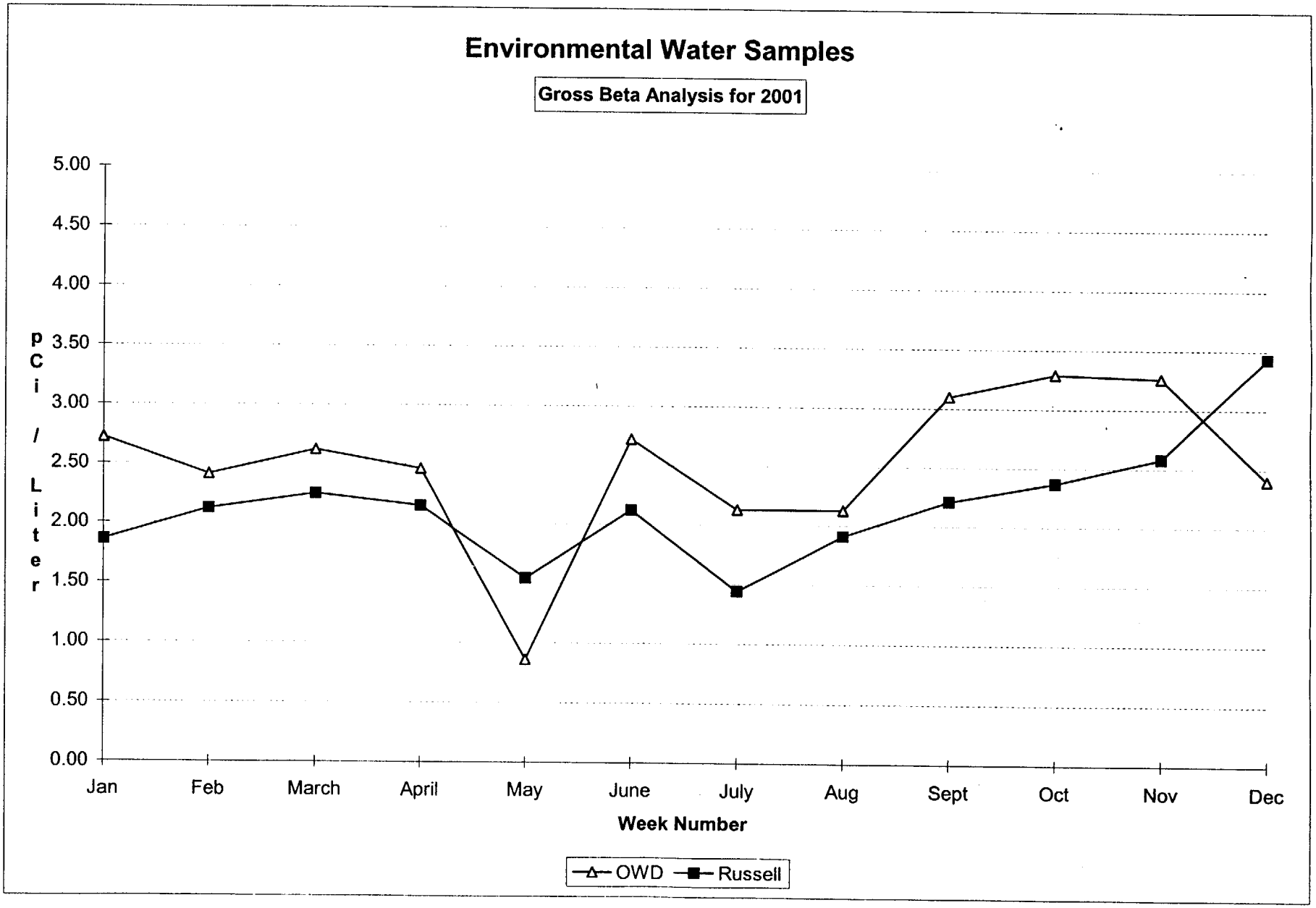
Tritium Analysis

Tritium analysis was performed on all water samples on a monthly basis. Composites are made from the weekly samples and a portion distilled to remove interferences for analysis by beta scintillation. Tritium data is given in Table 3-15.

Radioiodine analysis

All monthly composite water samples are analyzed for Iodine-131. The analysis allows the determination of Iodine-131 activity of <1pCi/liter. Radioiodine data is given in Table 3-16. Any positive counts and the 1 sigma error are reported. During 2001, no sample results indicated I-131 activity in excess of the LLD for the analysis. One control sample, September composite from Russell failed to meet the required LLD of 1.0 pCi/liter. Actual calculated LLD was 1.49 pCi/liter.

Rochester Gas and Electric
Figure 3-7A



Rochester Gas and Electric
Figure 3-7B

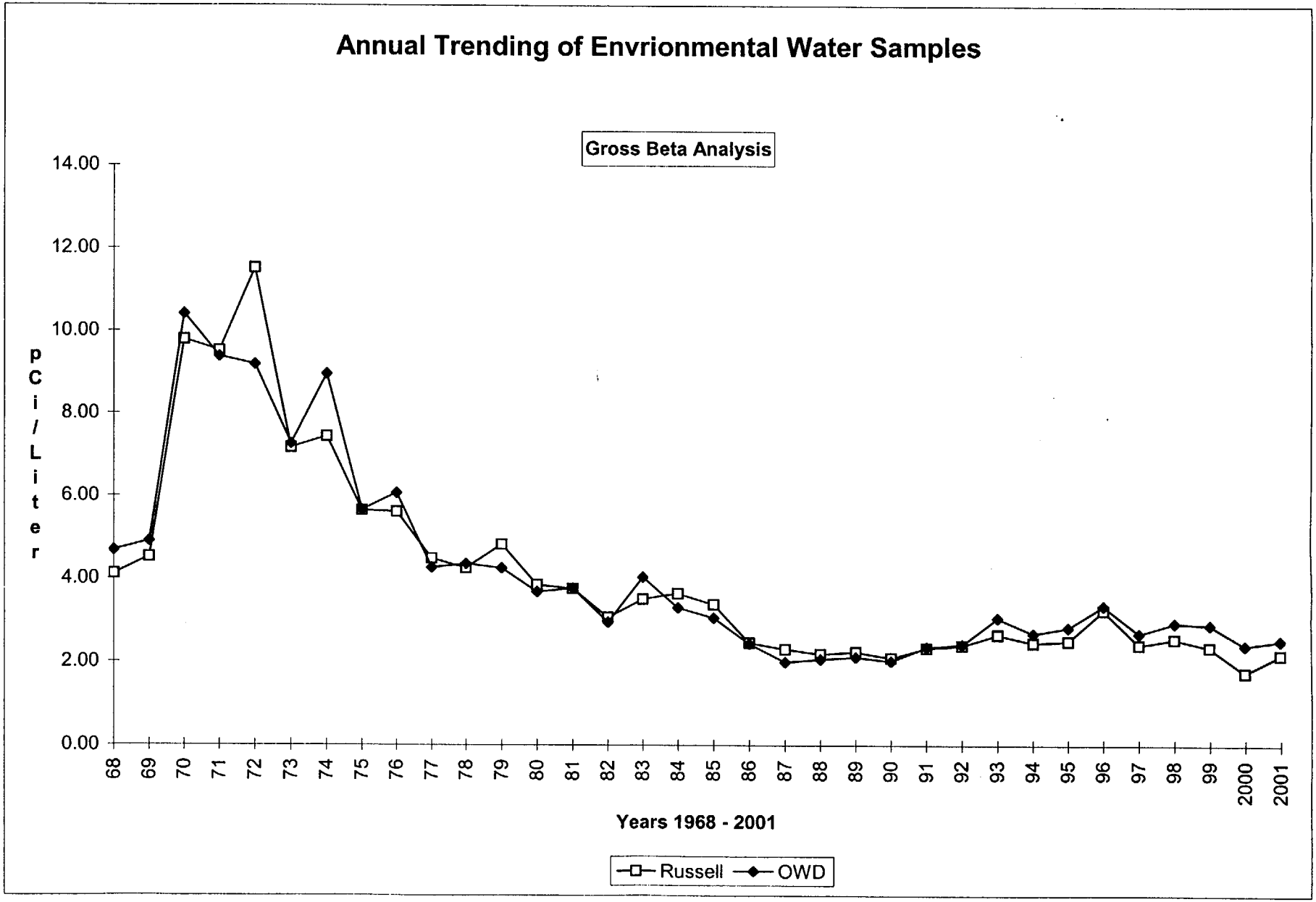


Table 3-8
Environmental Water Samples Gross Beta Analysis
Results in pCi / l

Month	Russell	O.W.D.	Circ In	Circ Out	Deer Creek
January	1.86 ± 0.44	2.72 ± 0.48	1.84 ± 0.44	2.52 ± 0.46	2.85 ± 0.60
February	2.12 ± 0.50	2.41 ± 0.50	1.55 ± 0.45	2.57 ± 0.48	3.45 ± 0.57
March	2.25 ± 0.49	2.62 ± 0.50	2.68 ± 0.50	3.64 ± 0.53	3.79 ± 0.60
April	2.15 ± 0.47	2.46 ± 0.47	2.30 ± 0.47	2.82 ± 0.49	3.12 ± 0.48
May	1.54 ± 0.48	0.86 ± 0.45	1.96 ± 0.49	0.98 ± 0.46	3.82 ± 0.56
June	2.12 ± 0.44	2.72 ± 0.47	2.24 ± 0.45	2.34 ± 0.45	5.14 ± 0.60
July	1.44 ± 0.43	2.13 ± 0.44	1.15 ± 0.34	2.61 ± 0.47	5.64 ± 0.65
August	1.91 ± 0.53	2.13 ± 0.53	1.82 ± 0.53	2.14 ± 0.53	4.64 ± 0.66
September	2.21 ± 0.47	3.10 ± 0.45	2.16 ± 0.40	3.17 ± 0.45	3.93 ± 0.53
October	2.37 ± 0.44	3.29 ± 0.51	2.63 ± 0.47	3.33 ± 0.51	4.10 ± 0.70
November	2.58 ± 0.55	3.26 ± 0.56	3.12 ± 0.56	2.59 ± 0.55	1.36 ± 1.02
December	3.43 ± 0.93	2.40 ± 0.89	3.52 ± 0.90	1.45 ± 0.89	4.95 ± 1.22
Maximum	3.43 ± 0.93	3.29 ± 0.51	3.52 ± 0.90	3.64 ± 0.53	5.64 ± 0.65
Average	2.17	2.51	2.25	2.51	3.90
Minimum	1.44 ± 0.43	0.86 ± 0.45	1.15 ± 0.34	0.98 ± 0.46	1.36 ± 1.02

Table 3-9
Russell Station Water Gamma Isotopic Analyses
Results in pCi/Liter

Month	7Be	51Cr	54Mn	59Fe	58Co	60Co	65Zn	95Zr	95Nb	103Ru	106Ru	134Cs	137Cs	140Ba	141Ce	144Ce	226Ra
Jan	<29	<38	<3	<8	<3	<3	<7	<5	<4	<4	<26	<3	<3	<12	<7	<19	<57
Feb	<23	<26	<2	<5	<3	<3	<5	<5	<3	<3	<23	<2	<2	<6	<5	<15	36±14
March	<39	<55	<4	<10	<5	<5	<9	<8	<6	<6	<44	<2	<4	<11	<11	<35	<95
April	<42	<41	<4	<10	<5	<4	<10	<9	<5	<6	<48	<4	<4	<10	<9	<29	77±31
May	<25	<28	<2	<6	<3	<3	<5	<5	<3	<3	<23	<2	<2	<8	<5	<16	61±18
June	<31	<32	<3	<8	<3	<4	<6	<6	<4	<4	<28	<3	<3	<9	<6	<19	96±23
July	<20	<28	<2	<5	<2	<2	<5	<5	<3	<3	<21	<2	<2	<9	<5	<14	95±19
Aug	<21	<29	<2	<9	<2	<2	<4	<5	<3	<2	<21	<2	<2	<11	<5	<14	48±15
Sept	<37	<47	<3	<11	<4	<3	<4	<7	<5	<5	<33	<2	<3	<14	<10	<28	105±37
Oct	<24	<29	<2	<8	<3	<2	<5	<5	<3	<4	<24	<1	<2	<9	<6	<16	63±13
Nov	<25	<30	<2	<8	<3	<2	<3	<5	<4	<3	<25	<1	<2	<7	<7	<20	100±21
Dec	<17	<22	<1	<5	<2	<2	<2	<3	<2	<2	<18	<1	<2	<5	<5	<14	87±16

Table 3-10
Ontario Water District Water Gamma Isotopic Analyses
Results in pCi/Liter

Month	7Be	51Cr	54Mn	59Fe	58Co	60Co	65Zn	95Zr	95Nb	103Ru	106Ru	134Cs	137Cs	140Ba	141Ce	144Ce	226Ra
Jan	<27	<33	<2	<7	<3	<3	<6	<5	<4	<3	<29	<3	<3	<7	<3	<19	102±23
Feb	<37	<48	<4	<9	<5	<5	<10	<8	<6	<5	<43	<2	<4	<11	<9	<31	100±36
March	<45	<47	<4	<9	<5	<4	<10	<8	<6	<6	<45	<4	<4	<14	<6	<30	176±35
April	<40	<44	<4	<10	<5	<5	<11	<8	<6	<6	<51	<4	<4	<12	<8	<28	<83
May	<30	<34	<3	<7	<3	<3	<6	<6	<4	<4	<31	<3	<3	<8	<6	<20	64±23
June	<43	<47	<4	<9	<5	<4	<11	<8	<5	<6	<47	<4	<5	<10	<8	<28	82±38
July	<37	<43	<3	<11	<5	<4	<8	<8	<5	<6	<48	<4	<4	<10	<8	<28	56±32
Aug	<42	<53	<4	<18	<5	<4	<10	<9	<7	<7	<45	<3	<4	<13	<10	<30	<100
Sept	<39	<39	<3	<10	<3	<3	<8	<7	<5	<5	<34	<2	<3	<10	<7	<27	92±32
Oct	<31	<46	<4	<11	<4	<4	<9	<7	<5	<5	<35	<4	<4	<9	<7	<26	70±27
Nov	<30	<40	<3	<11	<3	<3	<8	<6	<4	<4	<29	<3	<3	<11	<8	<23	102±25
Dec	<22	<28	<2	<8	<3	<2	<5	<4	<3	<3	<25	<1	<2	<7	<4	<15	97±20

Table 3-11
Circ-In Water Gamma Isotopic Analyses
Results in pCi/Liter

Month	7Be	51Cr	54Mn	59Fe	58Co	60Co	65Zn	95Zr	95Nb	103Ru	106Ru	134Cs	137Cs	140Ba	141Ce	144Ce	226Ra
Jan	<21	<29	<2	<5	<3	<2	<5	<4	<3	<3	<25	<1	<2	<6	<6	<18	58±23
Feb	<23	<29	<2	<5	<3	<2	<6	<5	<3	<3	<23	<2	<2	<5	<4	<19	116±21
March	<38	<43	<4	<11	<4	<4	<9	<8	<5	<6	<37	<4	<4	<13	<8	<23	<79
April	<25	<30	<3	<7	<3	<3	<6	<6	<4	<4	<27	<3	<2	<7	<6	<18	144±23
May	<37	<45	<4	<11	<4	<4	<9	<7	<5	<6	<39	<4	<4	<7	<8	<26	84±29
June	<46	<56	<4	<11	<6	<5	<13	<9	<6	<7	<46	<5	<5	<14	<10	<32	66±41
July	<35	<43	<4	<10	<5	<4	<8	<7	<5	<5	<33	<2	<4	<10	<7	<21	67±30
Aug	<43	<56	<4	<15	<5	<5	<8	<10	<7	<7	<43	<4	<5	<14	<10	<31	95±34
Sept	<36	<5	<4	<14	<4	<4	<10	<8	<5	<5	<36	<2	<4	<9	<9	<25	42±26
Oct	<32	<38	<3	<10	<3	<3	<4	<6	<4	<4	<36	<2	<3	<6	<8	<28	91±27
Nov	<24	<34	<3	<9	<3	<3	<6	<5	<4	<4	<29	<3	<3	<7	<6	<18	136±22
Dec	<17	<24	<2	<6	<2	<2	<4	<4	<3	<3	<20	<2	<2	<7	<3	<13	103±16

Table 3-12
Circ. Outlet Water Gamma Isotopic Analyses
Results in pCi/Liter

Month	7Be	51Cr	54Mn	59Fe	58Co	60Co	65Zn	95Zr	95Nb	103Ru	106Ru	134Cs	137Cs	140Ba	141Ce	144Ce	226Ra
Jan	<22	<28	<2	<5	<3	<2	<3	<4	<3	<3	<23	<1	<2	<5	<6	<19	96±22
Feb	<42	<39	<4	<11	<4	<4	<10	<8	<4	<6	<37	<4	<4	<11	<8	<25	<73
March	<35	<46	<4	<12	<5	<4	<10	<9	<7	<5	<40	<3	<4	<14	<9	<30	<96
April	<37	<41	<4	<8	<4	<4	<9	<7	<5	<5	<42	<2	<3	<8	<8	<27	80±31
May	<25	<32	<3	<7	<3	<3	<5	<6	<4	<4	<30	<2	<2	<8	<6	<17	145±22
June	<35	<42	<3	<8	<4	<3	<4	<7	<5	<5	<39	<2	<3	<9	<8	<27	97±29
July	<43	<47	<4	<10	<5	<5	<12	<8	<5	<6	<44	<3	<4	<11	<10	<30	79±33
Aug	<43	<57	<4	<13	<5	<4	<9	<7	<5	<6	<41	<3	<4	<11	<10	<31	<92
Sept	<36	<39	<3	<13	<4	<3	<8	<8	<5	<5	<39	<3	<3	<9	<5	<23	120±31
Oct	<43	<48	<4	<15	<5	<4	<10	<9	<6	<5	<41	<3	<4	<13	<10	<31	101±35
Nov	<33	<45	<3	<10	<4	<3	<8	<7	<5	<4	<35	<2	<3	<14	<8	<21	113±21
Dec	<19	<25	<2	<6	<2	<2	<4	<4	<3	<3	<21	<2	<2	<7	<5	<16	63±18

Table 3-13
Deer Creek Water Gamma Isotopic Analyses
Results in pCi/Liter

Month	7Be	51Cr	54Mn	59Fe	58Co	60Co	65Zn	95Zr	95Nb	103Ru	106Ru	134Cs	137Cs	140Ba	141Ce	144Ce	226Ra
Jan	<28	<29	<4	<9	<4	<5	<6	<7	<4	<4	<42	<3	<5	<6	<6	<27	113±33
Feb	<19	<18	<2	<4	<2	<2	<5	<4	<2	<2	<20	<2	<3	<3	<33	<15	51±18
March	<33	<32	<4	<9	<4	<4	<9	<7	<4	<4	<37	<4	<4	<6	<6	<26	62±30
April	<37	<37	<4	<8	<5	<5	<11	<9	<5	<6	<48	<3	<6	<7	<7	<30	<113
May	<77	<73	<9	<18	<10	<10	<21	<12	<8	<9	<90	<8	<8	<13	<13	<54	<19
June	<51	<59	<6	<11	<5	<5	<15	<10	<6	<7	<49	<5	<5	<11	<8	<38	136±39
July	<38	<37	<5	<10	<4	<5	<10	<9	<5	<5	<40	<5	<4	<7	<7	<30	<96
Aug	<40	<41	<5	<14	<4	<5	<13	<10	<6	<5	<44	<3	<5	<7	<7	<25	<97
Sept	<52	<50	<6	<18	<6	<5	<19	<10	<7	<6	<66	<6	<7	<10	<10	<38	<142
Oct	<54	<48	<6	<14	<5	<7	<13	<10	<6	<7	<53	<5	<6	<7	<9	<39	<131
Nov	<43	<50	<6	<17	<6	<6	<14	<9	<6	<6	<60	<6	<5	<8	<6	<36	72±42
Dec	<39	<47	<7	<13	<5	<6	<16	<11	<6	<6	<49	<5	<5	<7	<10	<37	105±46

Table 3-14
Environmental Water Samples Tritium Analysis
Results in pCi/L

Month of	Russell	O.W.D.	Circ In	Circ Out	Deer Creek
January	<267	<268	<268	<267	<275
February	<271	<273	<277	<275	<294
March	<273	<268	<271	<270	<276
April	<282	<286	<285	<284	<296
May	<291	<287	<291	<291	<308
June	<273	<278	<277	<278	<287
July	<241	<240	<239	<240	<252
August	<258	<260	<260	<259	<271
September	<260	<256	<253	<254	<267
October	<265	<267	<270	<272	<276
November	<251	<254	<255	<250	<262
December	<256	<259	<258	<258	<258

Table 3-15
Iodine in Water
Results in pCi/L

Month of	Russell	O.W.D.	Circ. In	Circ. Out	Deer Creek
January	<.88	<.39	<.45	<.44	<.46
February	<.64	<.60	<.54	<.43	<.41
March	<.81	<.60	<.47	<.47	<.56
April	<.96	<.55	<.74	<.63	<.73
May	<.65	<.58	<.58	<.71	<.97
June	<.99	<.84	<.75	<.63	<.77
July	<.96	<.63	<.58	<.62	<.70
August	<.99	<.40	<.47	<.57	<.74
September	<1.2 (a)	<.57	<.50	<.42	<.58
October	<.98	<.63	<.49	<.60	<.54
November	<.72	<.43	<.50	<.97	<.45
December	<.44	<.48	<.57	<.53	<.54

3.4 Milk Samples

There are three indicator dairy herds located three to five miles from the plant. Milk samples are collected monthly during November through May from one of the three and biweekly during June through October from each. A control farm sample is taken for each monthly sample and once during each biweekly period. The milk is analyzed for Iodine-131 and also analyzed by gamma spectroscopy for major fission products.

All positive counts and the ±1 sigma error are reported. During 2001, no samples indicated I-131 activity that exceeded the LLD for the analysis.
Table 3-17 is a listing of all samples collected during 2001 with analytical results.

Rochester Gas and Electric

Table 3-16

Milk

Results in pCi/Liter

Farm	Date	I-131	Cs-134	Cs-137	Ba-140	K-40
FARM C	1/9/01	<.45	<5	<5	<7	1540±68
FARM D	1/9/01	<.42	<5	<6	<6	1540±66
FARM B	2/13/01	<.41	<5	<6	<6	1530±68
FARM D	2/13/01	<.51	<4	<4	<4	1440±58
FARM A	3/13/01	<.36	<3	<4	<4	1700±52
FARM D	3/13/01	<.50	<7	<7	<9	1760±76
FARM C	4/10/01	<.49	<5	<5	<5	1450±67
FARM D	4/10/01	<.33	<6	<7	<9	1640±98
FARM B	5/15/01	<.51	<7	<6	<10	1380±82
FARM D	5/15/01	<.67	<9	<8	<8	1470±97
FARM A	6/12/01	<.47	<7	<6	<7	3050±121
FARM B	6/12/01	<.59	<6	<8	<11	1480±95
FARM C	6/12/01	<.53	<12	<10	<12	1510±101
FARM D	6/12/01	<.70	<4	<6	<6	1900±78
FARM A	6/26/01	<.52	<8	<7	<8	1360±77
FARM B	6/26/01	<.51	<9	<8	<11	1700±90
FARM C	6/26/01	<.58	<6	<6	<9	1380±80
FARM D	6/26/01	<.72	<10	<8	<12	1800±93
FARM A	7/10/01	<.47	<6	<5	<7	1430±71
FARM B	7/10/01	<.56	<8	<7	<7	1550±82
FARM C	7/10/01	<.79	<7	<6	<6	1420±76
FARM D	7/10/01	<.67	<9	<9	<8	1870±94
FARM A	7/24/01	<.47	<5	<5	<7	1450±71
FARM B	7/24/01	<.64	<6	<7	<8	1690±88
FARM C	7/24/01	<.61	<6	<7	<8	1460±79
FARM D	7/24/01	<.55	<9	<8	<6	1800±92
FARM A	8/7/01	<.57	<5	<6	<6	1560±74
FARM B	8/7/01	<.56	<7	<8	<9	1560±84
FARM C	8/7/01	<.70	<7	<6	<8	1380±77
FARM D	8/7/01	<.66	<7	<6	<7	1600±81
FARM A	9/5/01	<.39	<6	<6	<6	1420±70
FARM B	9/5/01	<.45	<7	<7	<7	1680±84
FARM C	9/5/01	<.45	<6	<6	<6	1530±59
FARM D	9/5/01	<.53	<5	<6	<7	1310±68
FARM A	9/18/01	<.42	<6	<5	<7	1460±71
FARM B	9/18/01	<.49	<8	<6	<8	1530±82
FARM C	9/18/01	<.59	<9	<6	<9	1500±83
FARM D	9/18/01	<.55	<7	<7	<12	1460±79
FARM A	10/2/01	<.53	<5	<5	<5	1410±63
FARM B	10/2/01	<.69	<6	<6	<5	1550±66
FARM C	10/2/01	<.58	<3	<4	<4	1450±46
FARM D	10/2/01	<.73	<3	<4	<5	1490±48
FARM A	10/16/01	<.40	<6	<6	<6	1360±69
FARM B	10/16/01	<.47	<6	<6	<9	1570±79
FARM C	10/16/01	<.55	<7	<7	<12	1730±87
FARM D	10/16/01	<.60	<3	<6	<6	1710±62
FARM A	10/30/01	<.51	<7	<6	<6	1400±77
FARM B	10/30/01	<.51	<6	<6	<7	1410±75
FARM C	10/30/01	<.57	<7	<6	<8	1320±77
FARM D	10/30/01	<.64	<3	<6	<5	1780±63
FARM A	10/16/01	<.40	<6	<6	<6	1360±69
FARM B	10/16/01	<.47	<6	<6	<9	1570±79
FARM C	10/16/01	<.55	<7	<7	<12	1730±87
FARM D	10/16/01	<.60	<3	<6	<6	1710±62
FARM B	11/13/01	<.39	<4	<6	<9	1470±71
FARM D	11/12/01	<.54	<4	<5	<8	1280±75
FARM A	12/11/01	<.44	<3	<5	<6	2430±49

3.5 Fish Samples

Indicator fish are caught in the vicinity of the Discharge Canal and analyzed for radioactivity from liquid effluent releases from the plant. The fish are filleted to represent that portion which would normally be eaten. Additional fish are caught more than 15 miles away to be used as control samples and are prepared in the same manner.

Four different species of fish are analyzed during each half-year from the indicator and background locations if they are available. There was no statistically significant difference in the activity of the fish caught between the indicator and control locations.

Fish are caught by R. G. & E. biologists and analyzed by gamma spectroscopy after being held for periods of less than one week to keep the LLD value for the shorter half-life isotopes realistic. Detection limits could also be affected by small mass samples, (< 2000 grams), in some species.
Gamma isotopic concentrations (pCi/kilogram wet) are listed in Tables 3-17A, 3-17B.

Samples of shoreline sediment are taken upstream (Russell Station) and downstream (OWD) of Ginna Station.
Results of the gamma isotopic analysis are included in Table 3-18.

Table 3-17A
Fish Samples Gamma Isotopic Analysis
Results in pCi/kgm Wet

Description	40K	51Cr	54Mn	59Fe	58Co	60Co	65Zn	95Zr	95Nb
Indicator Fish									
First Half 2001									
Brown Trout	5090±317	<270	<35	<61	<36	<27	<77	<46	<37
Rainbow Trout	6510±374	<312	<36	<99	<37	<49	<103	<71	<40
Freshwater Drum	6700±348	<400	<42	<101	<42	<39	<72	<73	<47
Smallmouth Bass	4260±267	<266	<29	<72	<30	<37	<83	<48	<36
Second Half 2001									
Walleye	5490±318	<257	<27	<90	<27	<29	<66	<58	<31
White Sucker	4960±293	<242	<31	<101	<29	<36	<72	<48	<33
Yellow Perch	6010±291	<325	<33	<110	<36	<29	<78	<59	<37
Freshwater Drum	4220±298	<243	<31	<87	<42	<38	<63	<58	<36
Background Fish									
First Half 2001									
Lake Trout	3730±194	<176	<23	<42	<21	<24	<56	<42	<22
White Sucker	5890±26	<237	<26	<64	<27	<34	<71	<47	<30
Freshwater Drum	3830±25	<255	<24	<72	<25	<29	<60	<49	<32
Smallmouth Bass	3720±258	<213	<25	<69	<34	<28	<70	<50	<31
Second Half 2001									
Brown Trout	4350±350	<237	<34	<108	<37	<46	<106	<72	<44
Carp	4170±336	<303	<36	<90	<33	<39	<87	<47	<47
Chinook Salmon	4640±343	<307	<36	<109	<33	<44	<79	<55	<46
Rainbow Trout	4340±348	<298	<25	<118	<40	<44	<77	<56	<40

Table 3-17B
Fish Samples Gamma Isotopic Analysis
Results in pCi/kgm Wet

Description	103 Ru	Ru 106	131I	134Cs	137Cs	140Ba	141Ce	144Ce	226Ra
Indicator Fish									
First Half 2001									
Brown Trout	<31	<293	<48	<30	<32	<56	<39	<151	733±204
Rainbow Trout	<36	<418	<59	<37	<39	<68	<50	<201	<692
Freshwater Drum	<49	<458	<64	<27	<42	<52	<68	<255	996±312
Smallmouth Bass	<29	<333	<65	<28	<28	<76	<36	<140	<520
Second Half 2001									
Walleye	<32	<318	<58	<24	<24	<61	<39	<121	945±195
White Sucker	<29	<326	<58	<26	<26	<52	<38	<134	550±193
Yellow Perch	<40	<361	<69	<22	<31	<56	<50	<200	669±266
Freshwater Drum	<36	<333	<52	<29	55±11	<45	<37	<141	578±188
Background Fish									
First Half 2001									
Lake Trout	<22	<228	<40	<23	<21	<31	<26	<109	386±144
White Sucker	<25	<272	<48	<28	<27	<43	<36	<138	405±154
Freshwater Drum	<30	<260	<96	<26	<27	<94	<41	<134	32±17*
Smallmouth Bass	<30	<266	<46	<30	<27	<49	<35	<118	<39
Second Half 2001									
Brown Trout	<37	<398	<65	<38	<36	<70	<47	<174	324±194
Carp	<41	<422	<78	<34	<35	<82	<57	<191	<727
Chinook Salmon	<37	<369	<80	<36	<26	<63	<47	<168	<530
Rainbow Trout	<39	<368	<68	<27	<38	<64	<45	<163	835±226

* statistical outlier from historical data

Table 3-18
Lake Samples Gamma Isotopic Analysis
Results in pCi/kgm Wet

Description	40K	Cr 51	54Mn	59Fe	58Co	60Co	65Zn	95Zr	95Nb
OWD SHORE.	16500±504	<317	<35	<90	<38	<43	<59	<67	<49
SHORELINE SED.	11600±460	<367	<39	<117	<42	<39	<63	<75	<52

Description	103Ru	106Ru	131I	134Cs	137Cs	140Ba	141Ce	144Ce	226Ra
OWD SHORE.	<37	<332	<87	<38	<34	<68	<57	<195	1000±286
SHORELINE SED.	<46	<327	<205	<42	<41	<143	<68	<195	877±253

3.6 Vegetation Samples

Crops are grown on the plant property in a location with a higher D/Q than the location of the maximally exposed individual and samples of the produce are collected at harvest time for analysis. Control samples are purchased from farms greater than ten miles from the plant. (Gro-Moore Farm Market in Henrietta, New York). There was no indication in the samples of any measurable activity other than naturally occurring K-40 and Ra-226.

Gamma isotopic data is given in Table 3-19.

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Table 3-19
Vegetation Samples Gamma Isotopic Analysis
Results in pCi/kgm Wet

Description	40K	Cr 51	54Mn	59Fe	58Co	60Co	65Zn	95Zr	95Nb
Indicator Vegetation									
Lettuce	6420±243	<111	<18	<44	<17	<19	<41	<34	<19
Cherry	1630±46	<29	<4	<9	<4	<5	<10	<7	<4
Tomato	4840±124	<67	<9	<26	<10	<8	<23	<16	<10
Corn	2590±125	<79	<11	<33	<11	<13	<28	<18	<12
Apples	1800±79	<68	<9	<25	<9	<11	<20	<15	<8
Background Vegetation									
Cherry	1960±56	<37	<4	<12	<5	<6	<11	<8	<5
Lettuce	2450±136	<88	<13	<30	<14	<14	<33	<22	<12
Tomato	2270±104	<70	<9	<29	<10	<12	<24	<20	<11
Corn	3060±123	<78	<10	<30	<11	<11	<25	<18	<10

	103 Ru	Ru 106	131I	134Cs	137Cs	140Ba	141Ce	144Ce	226Ra
Indicator Vegetation									
Lettuce	<17	<184	<15	<19	<15	<19	<19	<73	276±99
Cherry	<4	<40	<5	<4	<4	<6	<5	<20	94±30
Tomato	<9	<100	<10	<9	<8	<11	<11	<47	506±65
Corn	<11	<117	<19	<12	<11	<16	<13	<48	141±62
Apples	<9	<93	<9	<7	<9	<10	<14	<51	307±69
Background Vegetation									
Cherry	<4	<45	<6	<5	<5	<7	<5	<21	65±29
Lettuce	<13	<117	<18	<14	<12	<17	<15	<54	136±84
Tomato	<8	<93	<14	<9	<9	<13	<13	<50	<166
Corn	<9	<98	<15	<9	<9	<11	<12	<50	204±58

3.7 External Penetrating Radiation

Thermoluminescent dosimeters, (TLD's), with a sensitivity of 5 millirem/quarter are placed as part of the environmental monitoring program. Thirty-nine TLD badges are currently placed in four rings around the plant. These rings range from less than 1000 feet to 15 miles and have been dispersed to give indications in each of the nine land based sectors around the plant should an excessive release occur from the plant. Badges are changed and read after approximately 3 months exposure.

TLD locations #7 and #13 are influenced by close proximity to radioactive equipment storage areas and will normally read slightly higher than other locations. For the year of 2001, on-site exposure ranged between 10.4 –20.3 mrem/quarter, with an average exposure of 13.1 mrem/quarter and off-site ranged between 9.6 – 14.7 mrem/quarter with an average exposure of 11.4 mrem/quarter.

40 CFR 190 requires that the annual dose equivalent not exceed 25 millirems to the whole body of any member of the public. Using the annual average of control TLD stations as background and the TLD station in the vicinity of the National Guard outpost as the maximum dose to members of the public, leads to 4.8 millirem direct radiation dose to the maximally exposed member of the public.
Table 3-21 gives TLD readings for each quarter.

A trend chart with a comparison of data for each location for the years of 2000 and 2001 is included, Table 3-21. The data plotted is the average quarterly dose measured. TLD location #7 is elevated due to its proximity to radioactive equipment storage areas

Table 3-20
External Penetrating Radiation
Thermoluminescent Dosimetry 2001
Units mrem/91 Day Quarter

	Location	Type	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
#2 - #7 plus #13 are	2	I	11.6 ± 2.9	12.1 ± 3.1	12.9 ± 3.3	12.4 ± 3.1
on-site near the line	3	I	12.0 ± 3.0	12.7 ± 3.2	14.5 ± 3.7	13.4 ± 3.4
of the highest annual	4	I	12.8 ± 3.2	12.0 ± 3.0	14.1 ± 3.5	13.2 ± 3.3
average ground level	5	I	13.6 ± 3.4	12.6 ± 3.2	15.1 ± 3.8	13.1 ± 3.3
concentration.	6	I	13.1 ± 3.3	10.4 ± 2.6	11.3 ± 2.9	11.1 ± 2.8
	7	I	18.1 ± 4.6	17.7 ± 4.5	20.3 ± 5.1	18.8 ± 4.7
#8 - #12 are offsite at	8	C	11.3 ± 2.8	11.3 ± 2.9	12.8 ± 3.2	11.9 ± 3.0
a distance of 8 to 15 miles.	9	I	10.7 ± 2.7	10.5 ± 2.6	11.8 ± 3.0	11.2 ± 2.8
	10	C	10.4 ± 2.6	11.1 ± 2.8	11.5 ± 2.9	11.0 ± 2.8
	11	I	10.9 ± 2.7	10.7 ± 2.7	11.8 ± 3.0	11.5 ± 2.9
	12	C	9.7 ± 2.4	9.6 ± 2.4	10.6 ± 2.7	10.6 ± 2.7
	13	I	12.6 ± 3.2	13.4 ± 3.4	15.4 ± 3.9	14.8 ± 3.7
#14 - #16 are located	14	I	11.6 ± 2.9	11.4 ± 2.9	13.6 ± 3.4	11.9 ± 3.0
along a line 3000 ft. west	15	I	11.9 ± 3.0	13.1 ± 3.3	14.7 ± 3.7	13.8 ± 3.5
of the plant.	16	I	12.1 ± 3.0	12.0 ± 3.0	14.3 ± 3.6	13.1 ± 3.3
#17 - #21 are located	17	I	11.3 ± 2.8	11.4 ± 2.9	13.0 ± 3.3	12.0 ± 3.0
along Lake Road.	18	I	12.4 ± 3.1	12.7 ± 3.2	14.6 ± 3.7	14.1 ± 3.5
	19	I	10.9 ± 2.8	12.0 ± 3.0	13.4 ± 3.4	12.5 ± 3.1
	20	I	11.7 ± 2.9	12.2 ± 3.1	13.1 ± 3.3	12.8 ± 3.2
	21	I	12.5 ± 3.2	12.3 ± 3.1	14.6 ± 3.7	13.3 ± 3.3
#22 - #24 are located	22	I	11.2 ± 2.8	11.2 ± 2.8	12.3 ± 3.1	11.7 ± 2.9
along the east site	23	I	11.4 ± 2.9	12.3 ± 3.1	14.4 ± 3.6	13.6 ± 3.4
boundary line.	24	I	12.0 ± 3.0	12.0 ± 3.0	13.8 ± 3.5	13.0 ± 3.3
#25 - #30 are offsite	25	C	10.5 ± 2.7	10.6 ± 2.7	11.2 ± 2.8	11.0 ± 2.8
at a distance of 8	26	C	10.4 ± 2.6	10.3 ± 2.6	10.9 ± 2.8	11.5 ± 2.9
to 15 miles.	27	C	10.6 ± 2.7	11.4 ± 2.9	12.7 ± 3.2	11.9 ± 3.0
	28	C	11.0 ± 2.8	11.7 ± 2.9	12.6 ± 3.2	12.6 ± 3.2
	29	C	10.4 ± 2.6	11.1 ± 2.8	11.8 ± 3.0	11.7 ± 2.9
	30	C	10.3 ± 2.6	9.4 ± 2.4	10.2 ± 2.6	10.1 ± 2.6
#31 - #40 are located	31	I	12.2 ± 3.1	12.3 ± 3.1	14.4 ± 3.6	12.9 ± 3.3
in an arc at a distance	32	I	10.4 ± 2.6	11.0 ± 2.8	11.6 ± 2.9	11.1 ± 2.8
of 4 - 5 miles.	33	I	9.6 ± 2.4	10.7 ± 2.7	11.5 ± 2.9	11.1 ± 2.8
	34	I	11.6 ± 2.9	12.6 ± 3.2	13.7 ± 3.4	13.3 ± 3.3
	35	I	11.4 ± 2.9	12.2 ± 3.1	14.2 ± 3.6	12.9 ± 3.3
	36	I	10.3 ± 2.6	11.0 ± 2.8	12.5 ± 3.1	11.5 ± 2.9
	37	I	10.2 ± 2.6	10.2 ± 2.6	11.1 ± 2.8	10.9 ± 2.8
	38	I	11.4 ± 2.9	11.9 ± 3.0	13.2 ± 3.3	12.7 ± 3.2
	39	I	10.8 ± 2.7	11.9 ± 3.0	12.8 ± 3.2	12.3 ± 3.1
	40	I	9.8 ± 2.5	10.0 ± 2.5	11.2 ± 2.8	10.8 ± 2.7

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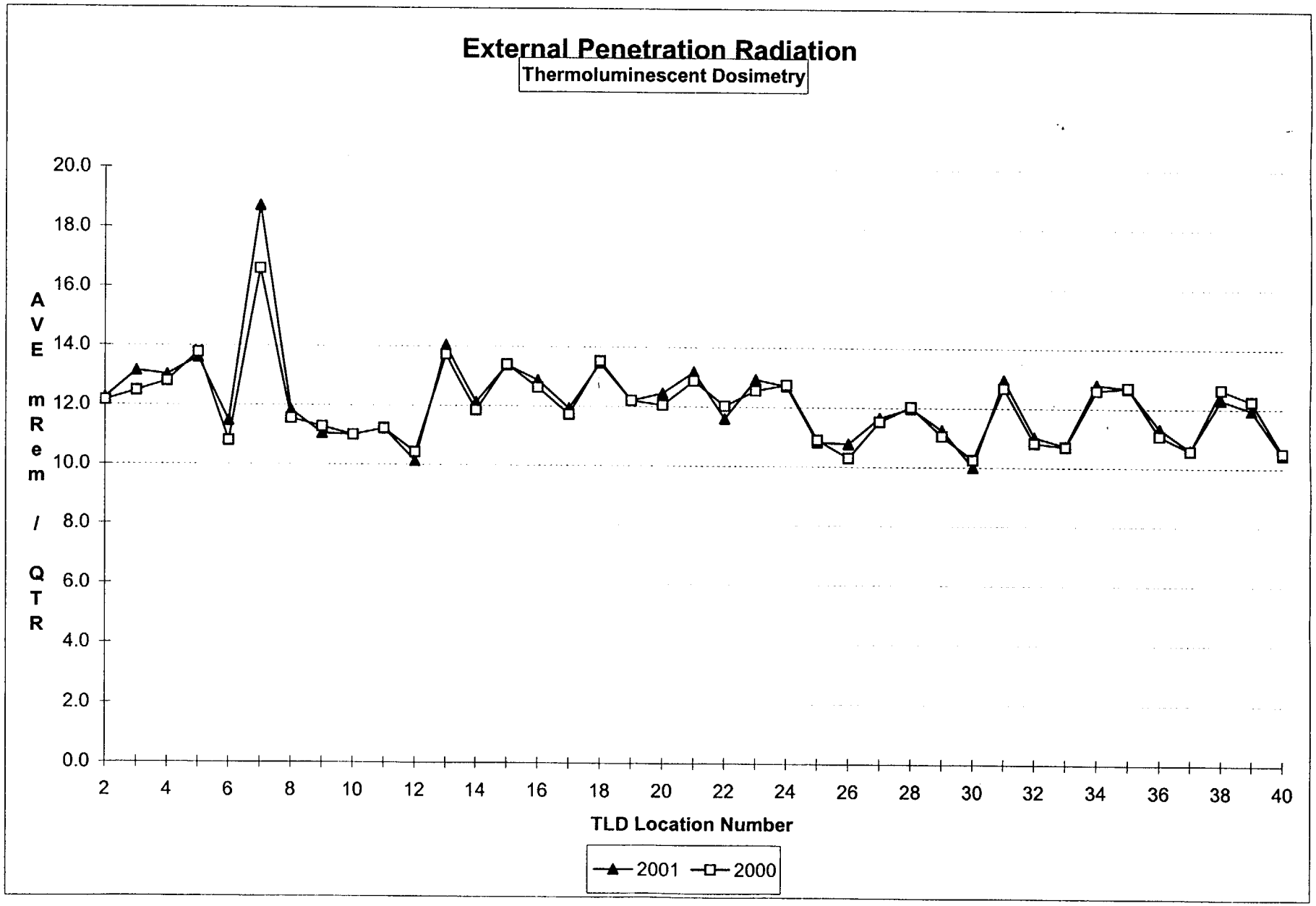
Figure 3-21



4.0 LAND USE CENSUS

A land use census is performed each year to determine any major changes in the use of the land within 5 miles of the plant. There were no major changes in 2001. The land use remains mainly agricultural in nature. There were several new private home developments. The three dairy operations nearest to the plant continued in operation with 40 to 70 milk cows. There are no goats raised for human consumption of milk or meat within the five mile radius. Beef cattle are still raised on 3 farms within 5 miles of the plant as in past years.

An on-site garden is used for broad leaf vegetation and on-site crops are collected for indicator samples when available.

A copy of the Land Use Census that was completed in September 2001 is attached. Detailed land use census data is available on file at Ginna Station.

5.0 EXTERNAL INFLUENCES

During 2001, there were no external influences such as atmospheric weapons testing or accidents at other nuclear facilities which had an impact on the data reported.

Attachment I

Land Use Census

Sector	Distance to Nearest Residence	Distance to Nearest Garden	Distance to Milk Producing Animals
E	1260 meter	N/A	N/A
ESE	1050 meter	N/A	N/A
SE	610 meter	N/A	8270 meter
SSE	660 meter	N/A	5230 meter
S	1560 meter	N/A	N/A
SSW	760 meter	N/A	N/A
SW	660 meter	N/A	4680 meter
WSW	1350 meter	N/A	N/A
W	1160 meter	N/A	N/A

Changes from previous year:

None

Milk animal locations:

No new milk producing animals identified in 2001 Land Use Census

UFSAR change request: Y_____ N___X_____

Land Use Census Completed by: _____ Date: 9/15/01

Reviewed by: _____ Date: 5/11/02

6.0 QUALITY ASSURANCE

6.1 INTERLABORATORY BLIND SAMPLE COMPARISON

A Laboratory's participation in an interlaboratory comparison program provides a means for verifying the measurement accuracy of radioactive material in environmental sample media with another laboratory. The ODCM requires participation in an interlaboratory comparison program that is approved by the NRC, if such a program exists. Until 1996 the United States Environmental Protection Agency (EPA), Office of Research and Development, National Exposure Research Laboratory, Las Vegas, Nevada, was the NRC approved program. Since the NRC has not approved a replacement for the EPA's program, Ginna Station has engaged the services of Analytics, Inc., Atlanta, Georgia for quality control blind spiked environmental sample media for interlaboratory comparison. Ginna Station submits blind spiked to our contract laboratory, James A. Fitzpatrick Environmental Laboratory (JAFEL), for analysis with field samples. JAFEL engages the services of Analytics and Environmental Measurements Laboratory (EML) for environmental sample media as blind sample spikes that are in addition to those submitted by Ginna Station. JAFEL reports their comparison results to Ginna Station.

An assessment of the blind spiked sample media for accuracy was performed, using the acceptance test generally referred to as the "NRC" method. This method is contained in NRC Procedure DVP-04.01 and was taken from the Criteria of Comparing Analytical Results (USNRC) and Bevington, P.R., Data Reduction and Error Analysis for the Physical Sciences, McGraw-Hill, New York, (1969). The Laboratory's accuracy is evaluation by comparison to a reference as follows:

$$\text{Error Resolution} = \frac{\text{Reference Value}}{\text{Reference Uncertainty}}$$

$$\text{Comparison Ratio} = \frac{\text{Laboratory Analysis}}{\text{Reference Value}}$$

The reference value and uncertainty are Analytics values. Using Table 6.1A, the interval for the RATIO OF AGREEMENT is determined by the appropriate row under the ERROR RESOLUTION column. The RATIO OF AGREEMENT provides criteria for evaluating the comparison ratio as to being in agreement or disagreement. When the comparison ratio is found to be in agreement with the reference value a Laboratory's analysis does not have a statistically significant analysis error, either systematic or programmatic. If the comparison ratio is found to be in disagreement with the reference value the Laboratory's analysis has a statistically significant analysis error, which may be either systematic or programmatic.

Table 6.1A

ERROR RESOLUTION	RATIO OF AGREEMENT
<3	0.4 to 2.5
3.1 to 7.5	0.5 to 2.0
7.6 to 15.5	0.6 to 1.66
15.6 to 50.5	0.75 to 1.33
50.6 to 200	0.8 to 1.25
<200	0.85 to 1.18

A 5% reference uncertainty was applied to the reference value. According to ANSI N42.23-1996, 5% is the maximum acceptable bias for a reference laboratory that prepares blind spiked samples. The ERROR RESOLUTION for all the Analytics' spiked samples was determined to fall between 15.6 and 50.5 which correlates to RATIO OF AGREEMENT OF 0.75 to 1.33. Comparison ratios are displayed in Figures 6.1A, 6.1B, 6.1C and 6.1D along with a lower control limit (LCL) of 0.75 and an upper control limit (UCL) of 1.33.

6.2 ANALYTICS SAMPLE NON-CONFORMITIES

For 2001, two nuclides fell outside of the LCL and UCL, Cr-51 (Figures 6.1A, QC-2, 6.1C, QC-2 and 6.1D, QC-1) and Zn-65 (Figure 6.1D, QC-1). JAFEL was unable to identify systematic error or programmatic deficiency for either isotope.

Cr-51 Non-conformities

A spiked mixed gamma in soil sample was received from Analytics, Inc. and was analyzed in accordance with standard laboratory procedures. The sample contained a total of nine radionuclides for analysis. Nine of the nine radionuclides present were quantified. Seven of the nine radionuclides were quantified within the acceptable range. The results for Cr-51 and Zn-65 were determined to be outside the QA Acceptance Criteria.

An evaluation of the Cr-51 result was performed. The spectrum and peak search results were examined with no abnormalities identified. Cr-51 decays by electron capture with a 27.7 day half-life and a gamma ray energy of 320 Kev with a yield of 9.8%. No secondary gamma energies are produced in the Cr-51 decay scheme. This low gamma energy yield and short half-life will result in very low net counts for samples containing environmental levels of Cr-51. The average net count rate of the six analyses was less than one count per minute. The counting error for the six analyses was high and ranged from 26% to 62%. The sample matrix of soil has a relatively high density, which would have a high self-absorption factor for the low energy gamma associated with Cr-51.

The combination of the following; low sample activity and resulting very small net count rate, short half-life, low gamma energy, small gamma yield and high sample density, resulted in an inaccurate sample result. The wide range of the associated counting errors demonstrates the low confidence level in the reported results. The poor analytical results for this sample is not routine and does not indicate a programmatic deficiency in the analysis of Cr-51 in soil samples or other environmental media. Additional non-conformities shown for Cr-51 analysis would also be due to the same factors: low sample activity, very low net count rate, short half-life, low gamma energy and small gamma yield. All these variables can result in a poorly defined spectrum peak

Confidence in the accurate analysis of Cr-51 can be easily demonstrated by other Cr-51 analytical results both in the aggregate sample results for the 2001 QA program and historical QA results. A review of historical QA data for 2000 was also performed to determine if this is a recurring systematic error or bias. In 2000, numerous QA samples were analyzed which contained Cr-51. The mean ratio for these samples relative to the Known (reference) Value is 0.93. There was one Cr-51 nonconformity in the 2000 Crosscheck Program. The current and historical data demonstrate that there is no systematic error or significant bias for the analysis of Cr-51 in environmental samples. However, JAFEL is investigating additional options for improvement to Cr-51 analysis.

Zn-65 Non-conformity

The Zn-65 result for sample E-2677-05 were also evaluated to be outside the Acceptance Criteria with a ratio of 0.73. A review of the peak search and raw spectrum shows that there was a possible interference peak with a centroid of 1120 Kev.

In soil samples, Ra-226 is a naturally occurring radionuclide, which produces a secondary peak at 1120 Kev. When the 1115 Kev (Zn-65) peak is manually defined and the interfering 1120 Kev was eliminated, the calculated result for Zn-65 is 0.358±0.078 pCi/kg, which has an acceptable reference ratio of 0.97. In most cases, the computer algorithm can differentiate the two adjacent peaks and correct for interferences from overlapping (doublet) peaks. In this particular sample spectrum, there was a low number of total counts in the 1110, to 1130 Kev area of the spectrum. The computer did not identify the counts in the 1120 Kev area as a second peak due to the low activity and subsequent poor peak shape. By not identifying the peak at 1120 Kev the software did not resolve this section of the spectrum as a double peak.

To determine if this was a programmatic or systematic error inherent to the software/analysis system, an extent of condition was performed using another spiked sample result for any similar non-conformities. In 2001, eleven spiked samples were analyzed which contained certified concentrations of Zn-65 and other radionuclides. The mean ratio for all eleven Zn-65 results was 1.02 and the ratio for the four soil samples was 0.99. Both of these mean ratio values and the eleven individual ratio values for Zn-65 are excellent indicators that the routine measurement of Zn-65 in environmental media is very accurate. These results demonstrate that there is no systematic error or bias for the analysis of Zn-65 in soil or other environmental sample media. No corrective action was implemented as a result of this non-conformity.

6.3 AUDIT OF CONTRACT LABORATORY

Ginna Station Quality Assurance personnel conducted a surveillance at JAFEL in the following six areas: Control of M&TE, Control of Records/Documents, Control/Adequacy of Sampling and Analysis, Handling, Shipping and Storage of Samples, Qualification/Training of Personnel, and Quality Programs Controls. Surveillance Report SQUA-2001-0002-AZP indicates the laboratory has functioned in an acceptable manner and was rated satisfactory with respect to all six criteria.

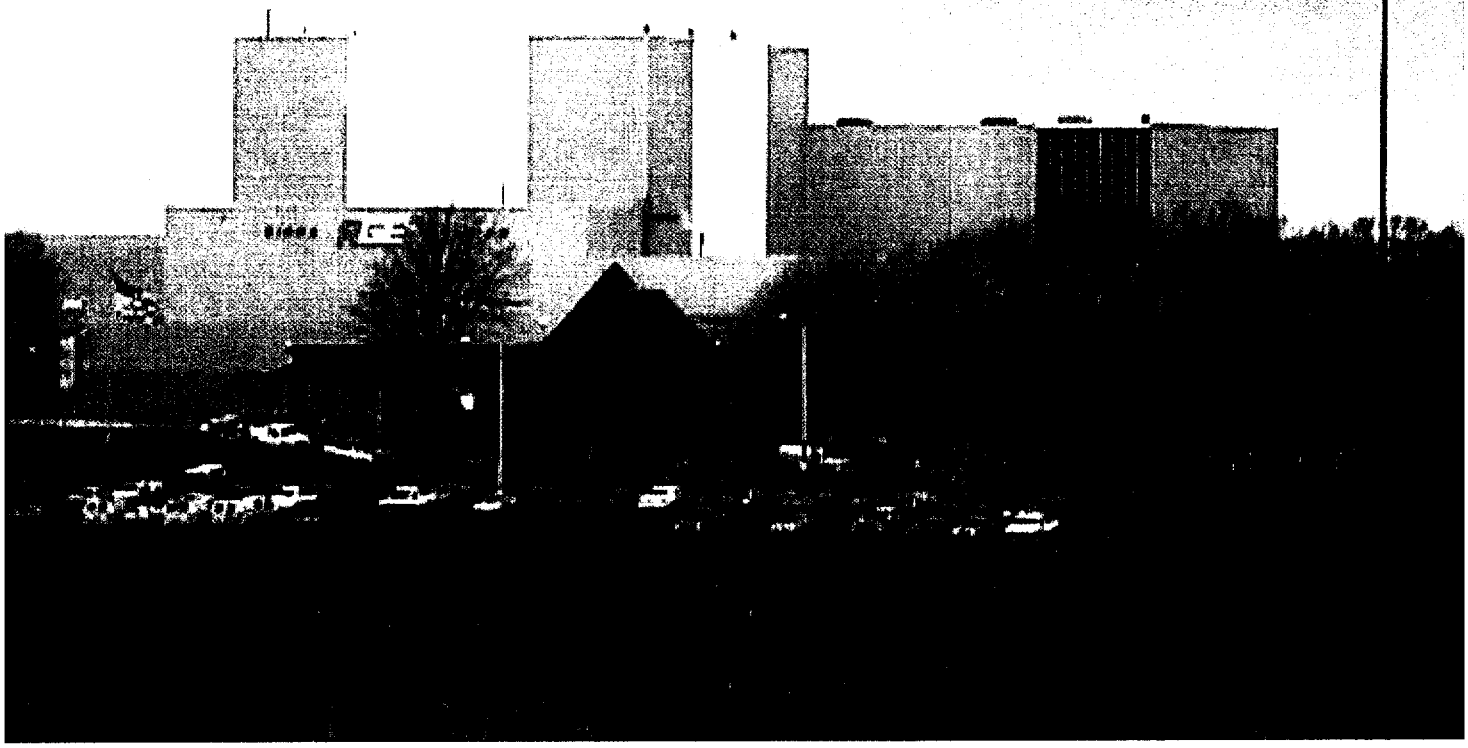
7.0 DEVIATIONS FROM SCHEDULE

Nine items reportable in the Annual Environmental Radiological Operating Report under procedure CHA-RETS-VARIATION were reported as follows:

1. Environmental Air Sample Station (ES) # 4 found off 1/8/01. Reset breaker. Sample period was 65.9 hours.
2. ES #5 found off 1/8/01. Reset breaker. Sample period was 64.9 hours.
3. ES #6 found 4/17/01 with breaker tripped. Sample period was 70.1 hours.
4. ES #2 found off 6/4/01. Reset breaker. Sample period was 69.9 hours.
5. ES #4 found off. Reset breaker. Sample period was 25.8 hours.
6. ES #2 found off. Reset breaker. Sample period was 33 hours.
7. Circ out autosampler found in standby 12/3/01. No sample collected 11/26/01 - 12/3/01.
8. Russell Station September liquid composite (control) did not meet required LLD for I-131, due to late receipt of sample.
9. On 3/2/01, TLD #6 was noted to be missing. It was replaced with a spare TLD that had been stored in the security guardhouse between TLD location #6 and the reactor plant.

In addition to these deviations, four environmental air sampler flow meters failed as found criteria at annual preventive maintenance. Although the failures appeared to have occurred during the test procedures, average air radioactivity and conclusions derived from air radioactivity applied the as found flow rate to the entire sample periods. See section 3.2

2001
Annual Effluent Operating Report



R.E. Ginna Nuclear Plant
Rochester Gas and Electric

Docket No. 50-244

2001

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

R. E. GINNA NUCLEAR PLANT

ROCHESTER GAS AND ELECTRIC

DOCKET NO. 50-244

TABLE OF CONTENTS

LIST OF TABLES

1.0 INTRODUCTION

This Annual Radioactive Effluent Release Report is for the Rochester Gas and Electric Corporation 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, 2001 through December 31, 2001.

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 2 E-4 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.

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 Station are not based on the average energy of the radionuclide mixture in gaseous effluents; therefore, this value is not applicable. However, the 2001 average beta/gamma energy of the radionuclide mixture in fission and activation gases released from Ginna Station 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:	1.56 E+02
2. Total time period for batch releases:	5.13 E+04 min
3. Maximum time period for a batch release:	6.38 E+03 min
4. Average time period for batch releases:	3.29 E+02 min
5. Minimum time period for a batch release:	1.30 E+01 min
6. Average blowdown (LPM) during periods of effluent release into the discharge canal.	None

2.5.2 Gaseous

1. Number of batch releases:	3.9 E+01
2. Total time period for batch releases:	9.53 E+04 min
3. Maximum time period for a batch release:	2.47 E+02 min
4. Average time period for batch releases:	1.48 E+02 min
5. Minimum time period for a batch release:	5.00 E+01 min

2.6 Abnormal Releases

There were no abnormal or unplanned releases in 2001.

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 five occasions of liquid batch releases in 2001.

"A" Monitor Tank release #2001012, 1/22/01.
Degradation of the liquid waste treatment demineralizer resin led to higher activity in the counted sample. Cs-137, Fe-59, and Zn-65 did not meet LLD's.
"A" monitor Tank release #2001016, 1/29/01.
Interference from Ag-110m resulted in elevated LLD for Cs-137.
"A" Monitor Tank release #2001023, 2/14/01.
Interference from Ag-110m resulted in elevated LLD for Cs-137.
"A: Monitor Tank release #2001053, 5/7/01.
Interference from Ag-110m resulted in elevated LLD for Cs-137.
"A" Monitor Tank release #2001066, 6/15/01.
Interference from Ag-110m resulted in elevated LLD for Cs-137.

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 actual meteorological conditions considering the noble gas exposure, inhalation, ground plane 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 Station 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 noble gas exposure and uptake pathways for 2001 are calculated using maximum meteorological dispersion and deposition parameters on-site rather than off-site. This change from the site boundary meteorological conditions results in slightly higher calculated doses to the maximally exposed individual member of the public than in 2000, despite better overall fuel performance.

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 gaseous effluent and liquid effluent exposure and uptake 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".

4.8 mrem total body (4.8 mrem direct radiation plus 1.4E-2 mrem all other pathways)
2.32E-2 mrem thyroid (maximum organ dose).

These doses effectively bound the maximum site boundary doses to a real member of the public.

8.0 METEOROLOGICAL DATA

The annual summary of hourly meteorological data collected during 2001 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 were built at a rate similar to past years.

10.0 CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL

The ODCM was rewritten to the guidance of NUREG-1301 and moved from an administrative procedure into Technical Specifications Supporting Documentation, effective January 22, 2001. See attached ODCM, Revision 15.
The ODCM was revised July 19, 2001, to correct transcriptional errors, clarify instructions, and include explanatory notes. No major changes were made to requirements or to methodology used in calculation of offsite dose. See attached ODCM, Revision 16.

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, Air Ejector Accident Range Gas Monitor, inoperable from 1/23/01 through 2/19/01. Cause of inoperability was electronic failures in channels 6 and 9. Corrected by repair and calibration to affected channels.
- RM-14A, Plant Vent Accident Range Gas Monitor, inoperable from 3/19/01 through 4/19/01. A Special Report was sent to the Commission on 5/2/01 describing the cause of the inoperability for greater than 30 days.
- R-31, "A" Main Steam Line Monitor, inoperable from 3/21/01 through 3/29/01 for PPCS software testing and troubleshooting.
- R-32, "B" Main Steam Line Monitor, inoperable from 3/21/01 through 3/29/01 for PPCS software testing and troubleshooting.
- RM-15A, Air Ejector Accident Range Gas Monitor, inoperable from 3/21/01 through 3/29/01 for PPCS software testing and troubleshooting.
- R-18, Liquid Waste Disposal Monitor, inoperable from 5/7/01 through 6/15/01 due to flow meter failure. Repair delayed due to back-ordered parts. There were no releases via this pathway during this period of inoperability.

- RM-15A, Air Ejector Accident Range Monitor inoperable from 7/9/01 through 7/17/01 due to primary-to-secondary leakage monitoring modification (Plant Change Request 99-008), including flow gauge replacement.
- RM-14A, Plant Vent Accident Range Gas Monitor, inoperable from 10/8/01 through 10/16/01 for calibration and repair.

14.0 CHANGES TO PREVIOUS ANNUAL EFFLUENT OPERATING REPORTS

The following are corrections to discrepancies in the Ginna Station 2000 Annual Effluent Operating Report.

- RM-15A was listed as inoperable on five occasions in 2000, although only four date periods were listed. The fifth period of inoperability for RM-15A was 4/17/00 through 5/15/00.
- R-31, "A" Main Steam Line Monitor was inoperable from 1/24/00 through 2/2/00.
- R-32, "B" Main Steam Line Monitor was inoperable from 3/24/00 through 3/31/00.
- 52 Week Running Totals for 2000 table had incorrect I-131 data for the 1999 column. See corrected table following the 52 Week Running Totals for 2001.

ROCHESTER GAS ELECTRIC CORPORATION

Table 1A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES
January - June 2001

A. Fission & activation gases	Unit	Quarter 1st	Quarter 2nd	Est. Total Error, %
1. Total release	Ci	9.91E+00	7.82E+00	1.50E+01
2. Average release rate for period	uCi/sec	1.27E+00	9.95E-01	
3. Percent of technical specification limit	%	2.02E-04	1.58E-04	
B. Iodines				
1. Total iodine-131	Ci	1.21E-05	1.22E-05	1.50E+01
2. Average release rate for period	uCi/sec	1.54E-06	1.55E-06	
3. Percent of technical specification limit	%	3.38E-03	3.41E-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	5.89E+00	7.60E+00	9.20E+00
2. Average release rate for period	uCi/sec	7.49E-01	9.67E-01	
3. Percent of technical specification limit	%	8.81E-05	1.14E-04	

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

ROCHESTER GAS ELECTRIC CORPORATION

Table 1A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES
July - December 2001

A. Fission & activation gases	Unit	Quarter 3rd	Quarter 4th	Est. Total Error, %
1. Total release	Ci	8.76E+00	8.48E+00	1.50E+01
2. Average release rate for period	uCi/sec	1.10E+00	1.07E+00	
3. Percent of technical specification limit	%	1.75E-04	1.69E-04	
B. Iodines				
1. Total iodine-131	Ci	1.24E-05	1.24E-05	1.50E+01
2. Average release rate for period	uCi/sec	1.56E-06	1.56E-06	
3. Percent of technical specification limit	%	3.43E-03	3.43E-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	1.20E+01	6.92E+00	9.20E+01
2. Average release rate for period	uCi/sec	1.51E+00	8.71E-01	
3. Percent of technical specification limit	%	1.78E-04	1.02E-04	

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

ROCHESTER GAS ELECTRIC CORPORATION

Table 1B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

GASEOUS EFFLUENTS - CONTINUOUS AND BATCH RELEASES

		Continuous Mode		Batch Mode	
Nuclides released	Unit	Quarter	Quarter	Quarter	Quarter
		1st	2nd	1st	2nd
1. Fission gases					
argon-41	Ci			3.62E-02	5.07E-02
krypton-85	Ci			6.72E-01	4.34E-02
krypton-85m	Ci			5.82E-05	2.03E-04
krypton-87	Ci				
krypton-88	Ci				
xenon-131m	Ci			4.94E-03	2.91E-03
xenon-133	Ci	5.47E+00	4.45E+00	1.18E+00	1.03E+00
xenon-133m	Ci			1.07E-02	8.14E-03
xenon-135	Ci	2.52E+00	2.22E+00	1.64E-02	1.68E-02
xenon-135m	Ci				
xenon-138	Ci				
others (specify)	Ci				
	Ci				
	Ci				
	Ci				
Total for period	Ci	7.99E+00	6.67E+00	1.92E+00	1.15E+00
2. Iodines					
iodine-131	Ci	1.21E-05	1.22E-05		
iodine-133	Ci	1.33E-05	1.37E-05		
iodine-135	Ci				
Total for period	Ci	2.54E-05	2.59E-05		
3. Particulates					
strontium-89	Ci				
strontium-90	Ci				
cesium-134	Ci				
cesium-137	Ci				
Nb-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.

Table 1B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

GASEOUS EFFLUENTS - CONTINUOUS AND BATCH RELEASES

		Continuous Mode		Batch Mode	
Nuclides released	Unit	Quarter	Quarter	Quarter	Quarter
		3rd	4th	3rd	4th
1. Fission gases					
argon-41	Ci			4.83E-02	5.03E-02
krypton-85	Ci			3.48E-02	
krypton-85m	Ci			3.64E-04	5.16E-04
krypton-87	Ci				
krypton-88	Ci				
xenon-131m	Ci			5.11E-03	4.51E-03
xenon-133	Ci	4.50E+00	4.50E+00	1.87E+00	1.63E+00
xenon-133m	Ci			1.97E-02	1.61E-02
xenon-135	Ci	2.25E+00	2.25E+00	3.42E-02	3.10E-02
xenon-135m	Ci				
xenon-138	Ci				
others (specify)	Ci				
	Ci				
	Ci				
	Ci				
Total for period	Ci	6.75E+00	6.75E+00	2.01E+00	1.73E+00
2. Iodines					
iodine-131	Ci	1.24E-05	1.24E-05		
iodine-133	Ci	1.41E-05	1.41E-05		
iodine-135	Ci				
Total for period	Ci	2.65E-05	2.65E-05		
3. Particulates					
strontium-89	Ci		*		
strontium-90	Ci				
cesium-134	Ci				
cesium-137	Ci				
Nb-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.

ROCHESTER GAS ELECTRIC CORPORATION

Table 2A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES
January - June 2001

A. Fission and activation products	Unit	Quarter 1st	Quarter 2nd	Est.Total Error, %
1. Total release (not including tritium, gases, alpha)	Ci	6.61E-04	2.40E-04	9.90E+00
2. Average diluted concentration during period	uCi/ml	5.69E-12	1.45E-12	
3. Percent of applicable limit	%	5.57E-07	1.42E-07	
B. Tritium				
1. Total release	Ci	2.33E+01	2.22E+01	9.20E+00
2. Average diluted concentration during period	uCi/ml	2.01E-07	4.23E-07	
3. Percent of applicable limit	%	6.70E-03	1.41E-02	
C. Dissolved and entrained gases				
1. Total release	Ci			9.90E+00
2. Average diluted concentration during period	uCi/ml			
3. Percent of applicable limit	%			
D. Gross alpha radioactivity				
1. Total release	Ci	N/A	N/A	
E. Vol. of waste released (prior to dilution)	Liters	2.82E+07	3.02E+07	
F. Vol. of dilution water used during period	Liters	1.16E+11	1.65E+11	

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

Table 2A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES
July - December 2001

A. Fission and activation products	Unit	Quarter 3rd	Quarter 4th	Est.Total Error, %
1. Total release (not including tritium, gases, alpha)	Ci	2.12E-05	5.00E-05	9.90E+00
2. Average diluted concentration during period	uCi/ml	1.24E-13	2.97E-13	
3. Percent of applicable limit	%	1.71E-07	4.09E-07	
B. Tritium				
1. Total release	Ci	8.56E+01	7.07E+01	9.20E+00
2. Average diluted concentration during period	uCi/ml	5.01E-07	4.20E-07	
3. Percent of applicable limit	%	1.67E-02	1.40E-02	
C. Dissolved and entrained gases				
1. Total release	Ci	6.97E-05		9.20E+00
2. Average diluted concentration during period	uCi/ml	5.01E-07		
3. Percent of applicable limit	%	2.51E-01		
D. Gross alpha radioactivity				
1. Total release	Ci	N/A	N/A	
E. Vol. of waste released (prior to dilution)	Liters	3.14E+07	3.09E+07	
F. Vol. of dilution water used during period	Liters	1.71E+11	1.68E+11	

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

Table 2B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
LIQUID EFFLUENTS

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter	Quarter	Quarter	Quarter
		1st	2nd	1st	2nd
chromium-51	Ci				
manganese-54	Ci				
iron-55	Ci			2.58E-04	
iron-59	Ci				
cobalt-58	Ci			1.22E-04	4.86E-05
cobalt-60	Ci			6.42E-05	6.14E-05
zinc-65	Ci				
strontium-89	Ci				
strontium-90	Ci				
zirconium/niobium-95	Ci			1.83E-05	4.20E-06
molybdenum-99	Ci				
silver-110m	Ci			1.98E-04	1.25E-04
antimony-122	Ci				
antimony-124	Ci				
antimony-125	Ci				
iodine-131	Ci				
iodine-133	Ci				
iodine-135	Ci				
cesium-134	Ci				
cesium-136	Ci				
cesium-137	Ci				6.27E-07
barium/lanthanum-140	Ci				
cerium-141	Ci				
Te-123m	Ci				
Ru-103	Ci				
	Ci				
Total for period (above)	Ci			6.61E-04	2.40E-04
unidentified	Ci				

xenon-133	Ci				
xenon-135	Ci				

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

Table 2B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
LIQUID EFFLUENTS

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter	Quarter	Quarter	Quarter
		3rd	4th	3rd	4th
chromium-51	Ci				
manganese-54	Ci				
iron-55	Ci				
iron-59	Ci				
cobalt-58	Ci				
cobalt-60	Ci				
zinc-65	Ci				
strontium-89	Ci				
strontium-90	Ci				
zirconium/niobium-95	Ci				
molybdenum-99	Ci				
silver-110m	Ci				
antimony-122	Ci				
antimony-124	Ci				
antimony-125	Ci			2.12E-05	5.00E-05
iodine-131	Ci				
iodine-133	Ci				
iodine-135	Ci				
cesium-134	Ci				
cesium-136	Ci				
cesium-137	Ci				
barium/lanthanum-140	Ci				
cerium-141	Ci				
Ru-106	Ci				
Ru-103	Ci				
Total for period (above)	Ci			2.12E-05	5.00E-05
unidentified	Ci				
xenon-133	Ci			6.97E-05	
xenon-135	Ci				

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, 2001 - December 31, 2001

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	17.41 327.29	7.0 E+00 1.4 E+01
b. Dry compressible waste, contaminated equip, etc.	m^3 Ci	15.7 11.3	7.0 E+00 1.4 E+01
c. Irradiated components, control rods, etc.	m^3 Ci	N/A N/A	N/A N/A
d. Other:	m^3 Ci	N/A N/A	N/A N/A

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

a.			b.			d.		
Co-58	%	16.47	Co-58	%	17.02		%	
Ni-63	%	29.35	Fe-55	%	37.35		%	
Cs-134	%	11.91	Cr-51	%	3.46		%	
Cs-137	%	18.93	Co-60	%	23.9		%	
Co-60	%	10.52	Ni-63	%	11.18		%	
Fe-55	%	9.39	Mn-54	%	1.83		%	
Mn-54	%	1.34	Zr-95	%	1.29		%	
Ce-144	%	0.73	Ce-144	%	1.02		%	
	%		Nb-95	%	1.6		%	
	%		Sb-125	%	0.23		%	
	%			%			%	
Total		98.64%	Total		98.5%	Total		

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
2	Sole use truck	Oak Ridge, TN
2	Sole use truck	Barnwell, SC
1	Sole use truck	Irwin, TN
2	Sole use truck	Kingston, TN

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
None		

Table 4A

Radiation Dose to Maximum Individual Receptor

First Quarter 2001

(Units In rem)

	All	All	Adult	Teen	Child	Infant
	T. Body	Skin	THYRD	THYRD	THYRD	THYRD
N	1.82E-06	3.52E-06				
NNE	2.38E-06	4.61E-06				
NE	2.01E-06	3.91E-06				
ENE	1.48E-06	2.78E-06				
E	1.35E-06	2.62E-06	1.41E-06	1.36E-06	1.22E-06	7.20E-07
ESE	1.73E-06	3.35E-06	1.90E-06	2.09E-06	2.77E-06	3.67E-07
SE	2.85E-06	5.53E-06	2.86E-06	2.90E-06	2.58E-06	1.50E-06
SSE	3.54E-06	6.86E-06	3.60E-06	3.60E-06	3.20E-06	1.90E-06
S	3.34E-06	6.47E-06	3.93E-06	4.50E-06	6.97E-06	1.78E-06
SSW	3.13E-06	6.06E-06	3.14E-06	3.51E-06	5.43E-06	1.67E-06
SW	3.11E-06	6.02E-06	3.12E-06	3.16E-06	2.81E-06	1.66E-06
WSW	1.10E-06	2.12E-06	1.10E-06	1.10E-06	9.90E-07	5.80E-07
W	9.95E-07	1.93E-06	1.00E-06	1.00E-06	9.00E-07	5.30E-07
WNW	1.82E-07	3.54E-06				
NW	1.41E-06	2.73E-06				
NNW	1.48E-06	2.86E-06				
MAX.	3.54E-06	6.86E-06	3.93E-06	4.50E-06	6.97E-06	1.90E-06

Note: Meteorological sectors without dose entries are entirely over Lake Ontario.

Table 4A

Radiation Dose to Maximum Individual Receptor

Second Quarter 2001

(Units In rem)

	All	**All**	**Adult**	**Teen**	**Child**	**Infant**
	T. Body	Skin	THYRD	THYRD	THYRD	THYRD
N	1.68E-06	2.88E-06				
NNE	1.92E-06	3.29E-06				
NE	1.90E-06	3.25E-06				
ENE	1.57E-06	2.70E-06				
E	2.00E-06	3.42E-06	2.90E-06	2.94E-06	2.60E-06	1.50E-06
ESE	2.31E-06	3.96E-06	3.80E-06	4.16E-06	5.52E-06	7.25E-07
SE	2.41E-06	4.13E-06	3.50E-06	3.50E-06	3.14E-06	1.85E-06
SSE	2.92E-06	5.02E-06	4.25E-06	4.30E-06	3.82E-06	2.24E-06
S	2.56E-06	4.39E-06	3.72E-06	3.80E-06	3.34E-06	1.96E-06
SSW	2.64E-06	4.53E-06	3.84E-06	3.89E-06	3.45E-06	2.03E-06
SW	3.18E-06	5.46E-06	4.63E-06	4.68E-06	4.16E-06	2.44E-06
WSW	9.08E-07	1.56E-06	1.32E-06	1.34E-06	1.19E-06	6.97E-07
W	7.03E-07	1.21E-06	1.02E-06	1.04E-06	9.19E-07	5.40E-07
WNW	1.29E-06	2.21E-06				
NW	1.13E-06	1.94E-06				
NNW	1.27E-06	2.18E-06				
MAX.	3.18E-06	5.46E-06	4.63E-06	4.68E-06	5.52E-06	2.44E-06

Note: Meteorological sectors without dose entries are entirely over Lake Ontario.

Table 4A

Radiation Dose to Maximum Individual Receptor

Third Quarter 2001

(Units In rem)

	All	**All**	**Adult**	**Teen**	**Child**	**Infant**
	T. Body	Skin	THYRD	THYRD	THYRD	THYRD
N	1.13E-06	2.00E-06				
NNE	1.90E-06	3.36E-06				
NE	2.50E-06	4.43E-06				
ENE	1.46E-06	2.59E-06				
E	1.66E-06	2.94E-06	3.58E-06	3.62E-06	3.21E-06	1.87E-06
ESE	1.80E-06	3.19E-06	4.35E-06	4.77E-06	6.33E-06	8.19E-07
SE	2.38E-06	4.22E-06	5.14E-06	5.19E-06	4.60E-06	2.69E-06
SSE	2.15E-06	3.82E-06	4.65E-06	4.70E-06	4.16E-06	2.43E-06
S	1.56E-06	2.77E-06	3.37E-06	3.40E-06	3.01E-06	1.76E-06
SSW	1.75E-06	3.10E-06	3.77E-06	3.81E-06	3.38E-06	1.97E-06
SW	2.94E-06	5.22E-06	6.35E-06	6.42E-06	5.69E-06	3.32E-06
WSW	8.76E-07	1.55E-06	1.89E-06	1.91E-06	1.69E-06	9.88E-07
W	6.02E-07	1.07E-06	1.30E-06	1.31E-06	1.16E-06	6.79E-07
WNW	1.10E-06	1.95E-06				
NW	9.20E-07	1.63E-06				
NNW	1.01E-06	1.80E-06				
MAX.	2.94E-06	5.22E-06	6.35E-06	6.42E-06	6.33E-06	3.32E-06

Note: Meteorological sectors without dose entries are entirely over Lake Ontario.

Table 4A

Radiation Dose to Maximum Individual Receptor

Fourth Quarter 2001

(Units In rem)

	All	**All**	**Adult**	**Teen**	**Child**	**Infant**
	T. Body	Skin	THYRD	THYRD	THYRD	THYRD
N	2.06E-06	3.57E-06				
NNE	3.04E-06	5.29E-06				
NE	3.16E-06	5.50E-06				
ENE	1.81E-06	3.14E-06				
E	1.56E-06	2.71E-06	1.97E-06	2.00E-06	1.78E-06	1.04E-06
ESE	2.01E-06	3.49E-06	2.81E-06	3.08E-06	4.09E-06	5.39E-07
SE	2.70E-06	4.69E-06	3.42E-06	3.46E-06	3.07E-06	1.81E-06
SSE	3.38E-06	5.88E-06	4.28E-06	4.34E-06	3.85E-06	2.27E-06
S	3.19E-06	5.54E-06	4.04E-06	4.09E-06	3.63E-06	2.14E-06
SSW	2.70E-06	4.69E-06	3.41E-06	3.46E-06	3.07E-06	1.81E-06
SW	2.98E-06	5.18E-06	3.78E-06	3.82E-06	3.40E-06	2.00E-06
WSW	8.51E-07	1.48E-06	1.08E-06	1.09E-06	9.70E-07	5.71E-07
W	8.21E-07	1.43E-06	1.04E-06	1.05E-06	9.35E-07	5.50E-07
WNW	1.91E-06	3.32E-06				
NW	1.54E-06	2.67E-06				
NNW	1.49E-06	2.59E-06				
MAX.	3.38E-06	5.88E-06	4.28E-06	4.34E-06	4.09E-06	2.27E-06

Note: Meteorological sectors without dose entries are entirely over Lake Ontario.

Table 4B

Radiation Dose To Maximum Individual Receptor

From Liquid Release

2001

(Units in rem)

	Adult	Teen	Child	Infant
First Quarter				
T. Body	1.90E-07	1.34E-07	2.56E-07	2.52E-07
Bone	3.33E-09	3.48E-09	4.55E-09	1.33E-10
Thyroid	1.90E-07	1.34E-07	2.56E-07	2.52E-07
Second Quarter				
T. Body	1.28E-07	9.00E-08	1.73E-07	1.70E-07
Bone	3.18E-09	3.41E-09	4.28E-09	1.12E-11
Thyroid	1.28E-07	9.00E-08	1.72E-07	1.70E-07
Third Quarter				
T. Body	4.84E-07	3.41E-07	6.55E-07	6.40E-07
Bone	<1.0E-10	<1.0E-10	<1.0E-10	<1.0E-10
Thyroid	4.84E-07	3.41E-07	6.55E-07	6.40E-07
Fourth Quarter				
T. Body	4.06E-07	2.86E-07	5.50E-07	5.40E-07
Bone	<1.0E-10	<1.0E-10	<1.0E-10	<1.0E-10
Thyroid	4.06E-07	2.86E-07	5.50E-07	5.40E-07

ROCHESTER GAS AND ELECTRIC

[52] WEEK RUNNING TOTALS

FOR: 2001

MONTH OF	NOBLE GAS 2000 CURIES	NOBLE GAS 2001 CURIES	[52] WEEK NOBLE GAS RUNNING TOTAL Ci.	I-131 2000 uCi	I-131 2001 uCi	[52] WEEK I-131 RUNNING TOTAL uCi
	LAST YEARS TOTAL 308.33			LAST YEARS TOTAL 369.23		
JANUARY	9.62	2.95	301.65	4.50	4.17	368.89
FEBUARY	12.70	3.03	291.98	12.10	3.26	360.05
MARCH	21.60	3.95	274.33	22.80	4.17	341.42
APRIL	15.80	2.62	261.15	10.20	4.03	335.25
MAY	26.20	2.60	237.55	25.70	4.17	313.72
JUNE	23.40	2.61	216.76	14.20	4.03	303.55
JULY	66.90	3.04	152.90	8.15	4.17	299.57
AUGUST	24.30	3.05	131.65	19.50	4.17	284.24
SEPTEMBER	87.90	2.68	46.43	95.70	4.03	192.57
OCTOBER	13.80	2.76	35.39	144.00	4.20	52.77
NOVEMBER	2.54	2.92	35.77	6.44	4.06	50.39
DECEMBER	3.56	2.82	35.03	5.93	4.18	48.64
YEARLY TOTALS	308.32 CURIES	35.03 CURIES		369.22 uCi	48.64 uCi	

NOTE: The 52 week running total is not to exceed 25,000 curies for noble gases.

ROCHESTER GAS AND ELECTRIC

[52] WEEK RUNNING TOTALS

FOR: 2000

MONTH OF	NOBLE GAS 1999 CURIES	NOBLE GAS 2000 CURIES	[52] WEEK NOBLE GAS RUNNING TOTAL Ci.	I-131 1999 uCi	I-131 2000 uCi	[52] WEEK I-131 RUNNING TOTAL uCi
	LAST YEARS TOTAL 122.31			LAST YEARS TOTAL 186.51		
JANUARY	2.12	9.62	129.80	3.81	4.50	187.19
FEBUARY	1.90	12.70	140.60	3.42	12.10	195.87
MARCH	2.45	21.60	159.75	9.15	22.80	209.52
APRIL	1.63	15.80	173.92	3.75	10.20	215.97
MAY	10.50	26.20	189.62	5.57	25.70	236.10
JUNE	30.00	23.40	183.02	48.50	14.20	201.80
JULY	12.40	66.90	237.52	24.60	8.15	185.35
AUGUST	9.36	24.30	252.46	14.30	19.50	190.55
SEPTEMBER	23.90	87.80	316.36	10.50	95.70	275.75
OCTOBER	12.80	13.80	317.36	16.60	144.00	403.15
NOVEMBER	2.54	2.54	317.36	32.30	6.44	377.29
DECEMBER	12.70	3.56	308.22	14.00	5.93	369.22
YEARLY TOTALS	122.30 CURIES	308.22 CURIES		186.50 uCi	369.22 uCI	

NOTE: The 52 week running total is not to exceed 25,000 curies for noble gases.