

**ENCLOSURE 1**

**Edwin I. Hatch Nuclear Plant**

**Annual Radioactive Effluent Release Report for 2002**

**SOUTHERN COMPANY**  
**E. I. HATCH NUCLEAR PLANT**  
**UNITS NO. 1 & 2**  
**ANNUAL REPORT**  
**PLANT RADIOACTIVE EFFLUENT RELEASES**  
**JANUARY 1, 2002 THROUGH DECEMBER 31, 2002**

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## **1.0 Liquid Effluents**

### **1.1 Regulatory Requirements**

#### **1.1.1 Concentration Limits**

The concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS shall be limited to ten times the concentrations specified in 10 CFR Part 20, Appendix B, Table 2, Column 2, for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 1E-04 microcuries/ml total activity.

#### **1.1.2 Dose Limits**

The dose or dose commitment, to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released from each unit to UNRESTRICTED AREAS, shall be limited:

- a. During any calendar quarter, to less than or equal to 1.5 mrem to the whole body and to less than or equal to 5 mrem to any organ, and
- b. During any calendar year, to less than or equal to 3 mrem to the whole body and to less than or equal to 10 mrem to any organ.

### **1.2 Effluent Concentration Limit**

ECL values used in determining allowable liquid radwaste release rates and concentrations, for principal gamma emitters, I-131, tritium, Sr-89, Sr-90 and Fe-55, are taken from 10 CFR Part 20, Appendix B, Table 2, Column 2. A tolerance factor of up to 10 is utilized to allow flexibility in establishing practical monitor set points which can accommodate effluent releases at concentrations higher than the ECL values stated in 10 CFR 20, Appendix B, Table 2, Column 2.

For dissolved or entrained noble gases in liquid radwaste, the ECL is 1E-04 uCi/ml total activity.

For gross alpha in liquid radwaste, the ECL is 2E-09 uCi/ml.

Furthermore, for all the above radionuclides, or categories of radioactivity, the overall ECL fraction is determined in accordance with 10 CFR Part 20, Appendix B.

The method utilizing the ECL fraction to determine release rates and liquid radwaste effluent radiation monitor set points is described in Subsection 1.3 of this report.

### **1.3 Measurements and Approximations of Total Radioactivity**

Prior to the release of any tank containing liquid radwaste, following the required recirculations, samples are collected and analyzed in accordance with the Edwin I. Hatch Nuclear Plant Offsite Dose Calculation Manual (ODCM) Table 2-3. A sample from each tank planned for release is analyzed for principal gamma emitters, I-131, and dissolved and entrained noble gases, by gamma spectroscopy. Monthly and quarterly composites are prepared for analysis by extracting aliquots from each sample taken from the tanks released. Liquid radwaste sample analyses are performed as described in Section 1.3.1.

#### **1.3.1 Total Radioactivity Determination**

<b>MEASUREMENT</b>	<b>FREQUENCY</b>	<b>METHOD</b>
1. Gamma Isotopic	Each Batch	Gamma Spectroscopy with computerized data reduction.
2. Dissolved or entrained noble gas	Each Batch	Gamma Spectroscopy with computerized data reduction.
3. Tritium	Monthly Composite	Distillation and liquid scintillation counting
4. Gross Alpha	Monthly Composite	Gas flow proportional counting
5. Sr-89 & Sr-90	Quarterly Composite	Chemical separation and gas flow proportional or scintillation counting
6. Fe-55	Quarterly Composite	Chemical separation and liquid scintillation counting

Gamma isotopic measurements are performed in-house using germanium detectors with a resolution of 2.0 keV or lower. The detectors are shielded by four inches of lead. A liquid radwaste sample is typically counted for 2000 seconds and a peak search of the resulting gamma ray spectrum is performed. Energy and net count data for all significant peaks are determined and a quantitative reduction or MDC calculation is performed to ensure that the MDC's are met for the nuclides specified in the ODCM Chapter 10 (i.e., Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141 and Ce-144). The quantitative calculations, corrections for counting time, decay time, sample volume, sample geometry, detector efficiency, baseline counts, branching ratio and MDC calculations, are made based on the counts at the location in the spectrum where the peak for that radionuclide would be located, if present. Typically achieved liquid effluent sample analyses minimum detectable concentrations are reported in Table 1-4.

Tritium, Gross Alpha, Sr-89, Sr-90 and Fe-55 are, in some cases, analyzed offsite.

The radionuclide concentrations determined by gamma spectroscopic analysis of samples taken from tanks planned for release, in addition to the most current sample analysis results available for tritium, gross alpha, Sr-89, Sr-90 and Fe-55, are used along with the corresponding ECL values to determine the ECL fraction for these tanks. This ECL fraction is then used, with the appropriate safety factors, tolerance factors, and the expected dilution stream flow to calculate maximum permissible release rate and a liquid effluent monitor setpoint. The monitor setpoint is calculated to assure that the limits of the ODCM are not exceeded.

A monitor reading in excess of the calculated setpoint will result in an automatic termination of the liquid radwaste discharge. Liquid effluent discharge is also automatically terminated if the dilution stream flow rate falls below the minimum assured dilution flow rate used in the setpoint calculations and established as a setpoint on the dilution stream flow monitor.

Radionuclide concentrations, safety factors, dilution stream flow rate, and the liquid effluent radiation monitor calibration factor, are entered into the computer and a pre-release printout is generated. If the release is not permissible, appropriate warnings will be displayed on the computer screen. If the release is permissible, it is approved by the Chemistry Foreman on duty. The pertinent information is transferred manually from the prerelease printout to a one-page release permit, which is forwarded to Radwaste Operations. When the release is completed, the release permit is returned from Radwaste Operations to Chemistry with the actual release data provided. These data are input into the computer and a post-release printout is generated. The post release printout contains the actual release rates, the actual release concentrations and quantities, the actual dilution flow, and the calculated doses to a Member of the Public.

### **1.3.2 Total Error Estimation**

The maximum error associated with volume and flow measurements, based upon plant calibration practice, is estimated to be + or - 10%. The average error associated with counting is estimated to be less than + or - 15%.

### **1.4 Liquid Effluent Release Data**

Regulatory Guide 1.21, Tables 2A and 2B are found in this report as Table 1-1A, for Unit 1, Table 1-1B, for Unit 2 and Table 1-1C, for the site; and Table 1-2A, for Unit 1, 1-2B, for Unit 2, and Table 1-2C, for the site. Typical liquid minimum detectable concentrations (MDC's) used for analyses are found in Table 1-4.

The evaluation for the release of Unit 1 RHR Service Water from 1996: Release of Contaminated Water can be found in Appendix A of this report.

The values for the four categories of Tables 1-1A, and 1-1B, and 1-1C, are calculated and the Tables completed as follows:

1. Fission and activation products - The total release values (not including tritium, gases, and alpha) are comprised of the sum of the measured individual radionuclide activities. This sum is for each batch released to the river for the respective quarter.
2. Tritium - The measured tritium concentrations in the monthly composite samples are used to calculate the total release and average diluted concentration during each period.
3. Dissolved and entrained gases - Concentrations of dissolved and entrained gases in liquid effluents are measured by germanium spectroscopy using a one liter sample from each liquid radwaste batch. The measured concentrations are used to calculate the total release and the average diluted concentration during the period. Radioisotopes of iodine in any form are also determined during the isotopic analysis for each batch; therefore, a separate analysis for possible gaseous forms is not performed because it would not provide additional information.
4. Gross alpha radioactivity - The measured gross alpha concentrations in the monthly composite samples are used to calculate the total release of alpha radioactivity.

### **1.5 Radiological Impact Due to Liquid Releases**

Doses to a Member of the Public due to radioactivity in liquid effluent were calculated in accordance with the Offsite Dose Calculation Manual. Results are presented in Table 1-3A for Unit 1, and 1-3B for Unit 2, for all four quarters.

### **1.6 Liquid Effluents - Batch Releases**

Batch Release information for Units 1 and 2 is summarized in the following tables:

Unit 1 Liquid Batch Releases: Table 1-5A

Unit 2 Liquid Batch Releases: Table 1-5B

### **1.7 Liquid Effluents - Abnormal Releases**

There were no abnormal liquid releases for this reporting period.

TABLE 1-1A  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Summation of All Releases  
 Unit: 1  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
<hr/>				
A. FISSION & ACTIVATION PRODUCTS				
<hr/>				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	8.71E-03	1.54E-02	4.70E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	6.44E-08	3.03E-08	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<hr/>				
B. TRITIUM				
<hr/>				
1. TOTAL RELEASE	CURIES	9.28E-01	3.20E+00	3.70E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	6.86E-06	6.30E-06	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<hr/>				
C. DISSOLVED AND ENTRAINED GASES				
<hr/>				
1. TOTAL RELEASE	CURIES	1.71E-06	6.73E-06	1.00E+02
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.26E-11	1.33E-11	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<hr/>				
D. GROSS ALPHA RADIOACTIVITY				
<hr/>				
1. TOTAL RELEASE	CURIES	2.70E-07	0.00E+00	1.20E+02
<hr/>				
E. WASTE VOL RELEASED(PRE-DILUTION)	LITERS	5.69E+05	1.97E+06	1.00E+01
F. VOLUME OF DILUTION WATER USED	LITERS	1.35E+08	5.07E+08	1.60E+02
<hr/>				

\*      Applicable limits are expressed in terms of dose.    See Tables 1-3A and 1-3B of this report.

TABLE 1-1A  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Summation of All Releases  
 Unit: 1  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	9.99E-03	7.61E-03	4.70E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.44E-08	1.29E-08	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	4.91E+00	6.98E+00	3.70E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	7.08E-06	1.18E-05	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. DISSOLVED AND ENTRAINED GASES				
-----				
1. TOTAL RELEASE	CURIES	2.48E-05	2.27E-05	1.00E+02
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	3.58E-11	3.86E-11	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
D. GROSS ALPHA RADIOACTIVITY				
-----				
1. TOTAL RELEASE	CURIES	2.18E-08	7.63E-07	1.20E+02
-----				
E. WASTE VOL RELEASED(PRE-DILUTION)	LITERS	2.88E+06	2.78E+06	1.00E+01
-----				
F. VOLUME OF DILUTION WATER USED	LITERS	6.93E+08	5.89E+08	1.60E+02
-----				

\* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.

TABLE 1-1B  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Summation of All Releases  
 Unit: 2  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
<hr/>				
A. FISSION & ACTIVATION PRODUCTS				
<hr/>				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	2.18E-03	2.83E-03	4.70E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	2.23E-08	2.75E-08	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<hr/>				
B. TRITIUM				
<hr/>				
1. TOTAL RELEASE	CURIES	7.08E-01	2.01E+00	3.70E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	7.26E-06	1.95E-05	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<hr/>				
C. DISSOLVED AND ENTRAINED GASES				
<hr/>				
1. TOTAL RELEASE	CURIES	1.18E-05	3.41E-05	1.00E+02
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.21E-10	3.31E-10	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<hr/>				
D. GROSS ALPHA RADIOACTIVITY				
<hr/>				
1. TOTAL RELEASE	CURIES	0.00E+00	5.30E-08	1.20E+02
<hr/>				
E. WASTE VOL RELEASED(PRE-DILUTION)	LITERS	4.73E+05	5.55E+05	1.00E+01
F. VOLUME OF DILUTION WATER USED	LITERS	9.76E+07	1.03E+08	1.60E+02
<hr/>				

\* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.



TABLE 1-1B  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Summation of All Releases  
 Unit: 2  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	2.00E-03	5.12E-04	4.70E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	9.58E-09	4.50E-09	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	4.28E+00	2.49E+00	3.70E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	2.05E-05	2.19E-05	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. DISSOLVED AND ENTRAINED GASES</b>				
1. TOTAL RELEASE	CURIES	3.10E-05	1.72E-06	1.00E+02
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.48E-10	1.51E-11	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>D. GROSS ALPHA RADIOACTIVITY</b>				
1. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00	1.20E+02
E. WASTE VOL RELEASED(PRE-DILUTION)	LITERS	1.14E+06	6.12E+05	1.00E+01
F. VOLUME OF DILUTION WATER USED	LITERS	2.09E+08	1.14E+08	1.60E+02

\* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.

TABLE 1-1C  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Summation of All Releases  
 Unit: Site  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	1.09E-02	1.82E-02	4.70E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	4.67E-08	2.99E-08	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	1.64E+00	5.21E+00	3.70E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	7.03E-06	8.54E-06	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. DISSOLVED AND ENTRAINED GASES				
-----				
1. TOTAL RELEASE	CURIES	1.35E-05	4.09E-05	1.00E+02
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	5.80E-11	6.70E-11	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
D. GROSS ALPHA RADIOACTIVITY				
-----				
1. TOTAL RELEASE	CURIES	2.70E-07	5.30E-08	1.20E+02
-----				
E. WASTE VOL RELEASED (PRE-DILUTION)	LITERS	1.04E+06	2.52E+06	1.00E+01
F. VOLUME OF DILUTION WATER USED	LITERS	2.33E+08	6.10E+08	1.60E+02
-----				

\*      Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.

TABLE 1-1C  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Summation of All Releases  
 Unit: Site  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	1.20E-02	8.13E-03	4.70E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.33E-08	1.16E-08	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	9.19E+00	9.47E+00	3.70E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.02E-05	1.35E-05	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. DISSOLVED AND ENTRAINED GASES</b>				
1. TOTAL RELEASE	CURIES	5.59E-05	2.44E-05	1.00E+02
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	6.19E-11	3.48E-11	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>D. GROSS ALPHA RADIOACTIVITY</b>				
1. TOTAL RELEASE	CURIES	2.18E-08	7.63E-07	1.20E+02
<b>E. WASTE VOL RELEASED(PRE-DILUTION)</b>	LITERS	4.02E+06	3.39E+06	1.00E+01
<b>F. VOLUME OF DILUTION WATER USED</b>	LITERS	9.02E+08	7.03E+08	1.60E+02

\* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.

TABLE 1-2A\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents

Unit: 1  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

NUCLIDE	UNIT	CONTINUOUS MODE**		BATCH MODE	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
H-3	CURIES	0.00E+00	0.00E+00	9.28E-01	3.20E+00

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	2.25E-04	1.68E-04
CO-58	CURIES	0.00E+00	0.00E+00	1.63E-04	1.68E-04
CO-60	CURIES	0.00E+00	0.00E+00	1.83E-03	3.27E-03
CR-51	CURIES	0.00E+00	0.00E+00	6.53E-04	6.00E-04
CS-134	CURIES	0.00E+00	0.00E+00	1.62E-06	5.58E-06
CS-137	CURIES	0.00E+00	0.00E+00	1.24E-03	1.35E-03
FE-55	CURIES	0.00E+00	0.00E+00	1.51E-03	2.88E-03
FE-59	CURIES	0.00E+00	0.00E+00	1.48E-05	5.15E-05
HF-181	CURIES	0.00E+00	0.00E+00	0.00E+00	1.02E-05
I-131	CURIES	0.00E+00	0.00E+00	3.45E-05	2.07E-05
MN-54	CURIES	0.00E+00	0.00E+00	9.63E-04	1.91E-03
NA-24	CURIES	0.00E+00	0.00E+00	2.41E-05	1.09E-04
NB-97	CURIES	0.00E+00	0.00E+00	9.22E-06	4.03E-04
SR-89	CURIES	0.00E+00	0.00E+00	3.07E-06	0.00E+00
ZN-65	CURIES	0.00E+00	0.00E+00	2.04E-03	4.43E-03
ZN-69M	CURIES	0.00E+00	0.00E+00	6.94E-06	0.00E+00
TOTALS	CURIES	0.00E+00	0.00E+00	8.71E-03	1.54E-02

DISSOLVED AND ENTRAINED GASES

XE-133	CURIES	0.00E+00	0.00E+00	1.71E-06	0.00E+00
XE-135	CURIES	0.00E+00	0.00E+00	0.00E+00	6.73E-06
TOTALS	CURIES	0.00E+00	0.00E+00	1.71E-06	6.73E-06

G-ALPHA	CURIES	0.00E+00	0.00E+00	2.70E-07	0.00E+00
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\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

\*\* There are no continuous mode radioactive liquid release pathways at Plant Hatch.

TABLE 1-2A\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents

Unit: 1  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

NUCLIDE	UNIT	CONTINUOUS MODE**		BATCH MODE	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
H-3	CURIES	0.00E+00	0.00E+00	4.91E+00	6.98E+00

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	2.84E-05	5.83E-06
AS-76	CURIES	0.00E+00	0.00E+00	0.00E+00	4.90E-05
CE-141	CURIES	0.00E+00	0.00E+00	4.99E-06	0.00E+00
CO-58	CURIES	0.00E+00	0.00E+00	3.05E-05	7.99E-05
CO-60	CURIES	0.00E+00	0.00E+00	3.65E-03	2.66E-03
CR-51	CURIES	0.00E+00	0.00E+00	3.12E-05	0.00E+00
CS-137	CURIES	0.00E+00	0.00E+00	7.72E-04	6.09E-04
CS-138	CURIES	0.00E+00	0.00E+00	1.95E-05	0.00E+00
FE-55	CURIES	0.00E+00	0.00E+00	1.52E-03	2.00E-03
MN-54	CURIES	0.00E+00	0.00E+00	1.12E-03	9.57E-04
NA-24	CURIES	0.00E+00	0.00E+00	1.14E-04	1.17E-04
NB-97	CURIES	0.00E+00	0.00E+00	3.77E-04	3.07E-05
SR-89	CURIES	0.00E+00	0.00E+00	9.76E-07	0.00E+00
SR-92	CURIES	0.00E+00	0.00E+00	1.08E-05	1.49E-06
ZN-65	CURIES	0.00E+00	0.00E+00	2.30E-03	1.09E-03
ZN-69M	CURIES	0.00E+00	0.00E+00	0.00E+00	5.44E-06
TOTALS	CURIES	0.00E+00	0.00E+00	9.99E-03	7.61E-03

DISSOLVED AND ENTRAINED GASES

XE-133	CURIES	0.00E+00	0.00E+00	1.20E-05	3.59E-06
XE-135	CURIES	0.00E+00	0.00E+00	1.29E-05	1.91E-05
TOTALS	CURIES	0.00E+00	0.00E+00	2.48E-05	2.27E-05

G-ALPHA	CURIES	0.00E+00	0.00E+00	2.18E-08	7.63E-07
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\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

\*\* There are no continuous mode radioactive liquid release pathways at Plant Hatch.

TABLE 1-2B\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents

Unit: 2  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

NUCLIDE	UNIT	CONTINUOUS MODE**		BATCH MODE	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
H-3	CURIES	0.00E+00	0.00E+00	7.08E-01	2.01E+00

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	3.44E-06	1.02E-05
AS-76	CURIES	0.00E+00	0.00E+00	0.00E+00	2.62E-06
CE-141	CURIES	0.00E+00	0.00E+00	0.00E+00	1.22E-05
CO-58	CURIES	0.00E+00	0.00E+00	1.69E-05	3.23E-06
CO-60	CURIES	0.00E+00	0.00E+00	1.85E-04	6.84E-05
CR-51	CURIES	0.00E+00	0.00E+00	8.55E-06	1.23E-05
CS-137	CURIES	0.00E+00	0.00E+00	6.78E-05	1.02E-04
CS-138	CURIES	0.00E+00	0.00E+00	2.62E-05	0.00E+00
FE-55	CURIES	0.00E+00	0.00E+00	7.94E-04	2.33E-03
I-131	CURIES	0.00E+00	0.00E+00	2.08E-06	2.55E-06
MN-54	CURIES	0.00E+00	0.00E+00	2.58E-04	4.32E-05
NA-24	CURIES	0.00E+00	0.00E+00	2.62E-05	9.96E-05
SR-89	CURIES	0.00E+00	0.00E+00	1.52E-05	1.39E-05
SR-90	CURIES	0.00E+00	0.00E+00	5.68E-14	1.68E-07
SR-91	CURIES	0.00E+00	0.00E+00	4.47E-06	0.00E+00
TC-99M	CURIES	0.00E+00	0.00E+00	1.13E-06	1.57E-05
Y-91M	CURIES	0.00E+00	0.00E+00	4.75E-05	0.00E+00
ZN-65	CURIES	0.00E+00	0.00E+00	7.19E-04	1.15E-04
ZN-69M	CURIES	0.00E+00	0.00E+00	1.55E-06	0.00E+00
TOTALS	CURIES	0.00E+00	0.00E+00	2.18E-03	2.83E-03

DISSOLVED AND ENTRAINED GASES

XE-133	CURIES	0.00E+00	0.00E+00	6.34E-06	9.14E-06
XE-135	CURIES	0.00E+00	0.00E+00	5.47E-06	2.50E-05
TOTALS	CURIES	0.00E+00	0.00E+00	1.18E-05	3.41E-05
G-ALPHA	CURIES	0.00E+00	0.00E+00	0.00E+00	5.30E-08

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

\*\* There are no continuous mode radioactive liquid release pathways at Plant Hatch.

TABLE 1-2B\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents

Unit: 2  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

NUCLIDE	UNIT	CONTINUOUS MODE**		BATCH MODE	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
H-3	CURIES	0.00E+00	0.00E+00	4.28E+00	2.49E+00

FISSION & ACTIVATION PRODUCTS

AS-76	CURIES	0.00E+00	0.00E+00	0.00E+00	5.02E-06
CE-141	CURIES	0.00E+00	0.00E+00	3.54E-05	6.98E-06
CO-58	CURIES	0.00E+00	0.00E+00	9.25E-06	0.00E+00
CO-60	CURIES	0.00E+00	0.00E+00	2.35E-04	3.32E-05
CS-134	CURIES	0.00E+00	0.00E+00	0.00E+00	1.49E-06
CS-137	CURIES	0.00E+00	0.00E+00	1.40E-04	1.12E-04
FE-55	CURIES	0.00E+00	0.00E+00	3.22E-04	2.47E-04
I-131	CURIES	0.00E+00	0.00E+00	8.53E-06	1.19E-06
I-133	CURIES	0.00E+00	0.00E+00	2.16E-06	1.46E-06
LA-140	CURIES	0.00E+00	0.00E+00	8.06E-06	0.00E+00
MN-54	CURIES	0.00E+00	0.00E+00	2.65E-04	2.33E-05
NA-24	CURIES	0.00E+00	0.00E+00	4.14E-04	2.24E-05
NB-97	CURIES	0.00E+00	0.00E+00	4.69E-05	0.00E+00
SR-89	CURIES	0.00E+00	0.00E+00	2.25E-05	3.81E-05
SR-90	CURIES	0.00E+00	0.00E+00	6.51E-08	0.00E+00
TC-99M	CURIES	0.00E+00	0.00E+00	4.88E-07	0.00E+00
ZN-65	CURIES	0.00E+00	0.00E+00	4.94E-04	2.09E-05
TOTALS	CURIES	0.00E+00	0.00E+00	2.00E-03	5.12E-04

DISSOLVED AND ENTRAINED GASES

XE-133	CURIES	0.00E+00	0.00E+00	2.08E-05	1.42E-06
XE-135	CURIES	0.00E+00	0.00E+00	1.02E-05	2.98E-07
TOTALS	CURIES	0.00E+00	0.00E+00	3.10E-05	1.72E-06

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

\*\* There are no continuous mode radioactive liquid release pathways at Plant Hatch.

TABLE 1-2C\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents  
 Unit: Site  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

NUCLIDE	UNIT	CONTINUOUS MODE**		BATCH MODE	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
H-3	CURIES	0.00E+00	0.00E+00	1.64E+00	5.21E+00

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	2.29E-04	1.78E-04
AS-76	CURIES	0.00E+00	0.00E+00	0.00E+00	2.62E-06
CE-141	CURIES	0.00E+00	0.00E+00	0.00E+00	1.22E-05
CO-58	CURIES	0.00E+00	0.00E+00	1.80E-04	1.71E-04
CO-60	CURIES	0.00E+00	0.00E+00	2.01E-03	3.34E-03
CR-51	CURIES	0.00E+00	0.00E+00	6.62E-04	6.13E-04
CS-134	CURIES	0.00E+00	0.00E+00	1.62E-06	5.58E-06
CS-137	CURIES	0.00E+00	0.00E+00	1.30E-03	1.45E-03
CS-138	CURIES	0.00E+00	0.00E+00	2.62E-05	0.00E+00
FE-55	CURIES	0.00E+00	0.00E+00	2.30E-03	5.21E-03
FE-59	CURIES	0.00E+00	0.00E+00	1.48E-05	5.15E-05
HF-181	CURIES	0.00E+00	0.00E+00	0.00E+00	1.02E-05
I-131	CURIES	0.00E+00	0.00E+00	3.66E-05	2.33E-05
MN-54	CURIES	0.00E+00	0.00E+00	1.22E-03	1.95E-03
NA-24	CURIES	0.00E+00	0.00E+00	5.03E-05	2.09E-04
NB-97	CURIES	0.00E+00	0.00E+00	9.22E-06	4.03E-04
SR-89	CURIES	0.00E+00	0.00E+00	1.82E-05	1.39E-05
SR-90	CURIES	0.00E+00	0.00E+00	5.68E-14	1.68E-07
SR-91	CURIES	0.00E+00	0.00E+00	4.47E-06	0.00E+00
TC-99M	CURIES	0.00E+00	0.00E+00	1.13E-06	1.57E-05
Y-91M	CURIES	0.00E+00	0.00E+00	4.75E-05	0.00E+00
ZN-65	CURIES	0.00E+00	0.00E+00	2.76E-03	4.55E-03
ZN-69M	CURIES	0.00E+00	0.00E+00	8.48E-06	0.00E+00
TOTALS	CURIES	0.00E+00	0.00E+00	1.09E-02	1.82E-02

DISSOLVED AND ENTRAINED GASES

XE-133	CURIES	0.00E+00	0.00E+00	8.05E-06	9.14E-06
XE-135	CURIES	0.00E+00	0.00E+00	5.47E-06	3.17E-05
TOTALS	CURIES	0.00E+00	0.00E+00	1.35E-05	4.09E-05



TABLE 1-2C\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents  
 Unit: Site  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

		CONTINUOUS	MODE**	BATCH	MODE
NUCLIDE	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
G-ALPHA	CURIES	0.00E+00	0.00E+00	2.70E-07	5.30E-08

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

\*\* There are no continuous mode radioactive liquid release pathways at Plant Hatch.

TABLE 1-2C\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents

Unit: Site  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

NUCLIDE	UNIT	CONTINUOUS MODE**		BATCH MODE	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
H-3	CURIES	0.00E+00	0.00E+00	9.19E+00	9.47E+00

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	2.84E-05	5.83E-06
AS-76	CURIES	0.00E+00	0.00E+00	0.00E+00	5.40E-05
CE-141	CURIES	0.00E+00	0.00E+00	4.04E-05	6.98E-06
CO-58	CURIES	0.00E+00	0.00E+00	3.98E-05	7.99E-05
CO-60	CURIES	0.00E+00	0.00E+00	3.89E-03	2.70E-03
CR-51	CURIES	0.00E+00	0.00E+00	3.12E-05	0.00E+00
CS-134	CURIES	0.00E+00	0.00E+00	0.00E+00	1.49E-06
CS-137	CURIES	0.00E+00	0.00E+00	9.12E-04	7.21E-04
CS-138	CURIES	0.00E+00	0.00E+00	1.95E-05	0.00E+00
FE-55	CURIES	0.00E+00	0.00E+00	1.84E-03	2.25E-03
I-131	CURIES	0.00E+00	0.00E+00	8.53E-06	1.19E-06
I-133	CURIES	0.00E+00	0.00E+00	2.16E-06	1.46E-06
LA-140	CURIES	0.00E+00	0.00E+00	8.06E-06	0.00E+00
MN-54	CURIES	0.00E+00	0.00E+00	1.39E-03	9.80E-04
NA-24	CURIES	0.00E+00	0.00E+00	5.28E-04	1.39E-04
NB-97	CURIES	0.00E+00	0.00E+00	4.24E-04	3.07E-05
SR-89	CURIES	0.00E+00	0.00E+00	2.35E-05	3.81E-05
SR-90	CURIES	0.00E+00	0.00E+00	6.51E-08	0.00E+00
SR-92	CURIES	0.00E+00	0.00E+00	1.08E-05	1.49E-06
TC-99M	CURIES	0.00E+00	0.00E+00	4.88E-07	0.00E+00
ZN-65	CURIES	0.00E+00	0.00E+00	2.80E-03	1.11E-03
ZN-69M	CURIES	0.00E+00	0.00E+00	0.00E+00	5.44E-06
TOTALS	CURIES	0.00E+00	0.00E+00	1.20E-02	8.13E-03

DISSOLVED AND ENTRAINED GASES

XE-133	CURIES	0.00E+00	0.00E+00	3.28E-05	5.01E-06
XE-135	CURIES	0.00E+00	0.00E+00	2.31E-05	1.94E-05
TOTALS	CURIES	0.00E+00	0.00E+00	5.59E-05	2.44E-05

TABLE 1-2C\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents  
 Unit: Site  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

NUCLIDE	UNIT	CONTINUOUS MODE**		BATCH MODE	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
G-ALPHA	CURIES	0.00E+00	0.00E+00	2.18E-08	7.63E-07

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

\*\* There are no continuous mode radioactive liquid release pathways at Plant Hatch.

TABLE 1-3A  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO LIQUID RELEASES  
 Unit: 1

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Cumulative Doses per Quarter

Organ	Tech Spec Limit	Units	Quarter 1	% of Tech Spec Limit	Quarter 2	% of Tech Spec Limit
Bone	5.0	mrem	4.63E-03	9.27E-02	4.46E-03	8.92E-02
Liver	5.0	mrem	6.79E-03	1.36E-01	6.95E-03	1.39E-01
TBody	1.5	mrem	4.39E-03	2.92E-01	4.41E-03	2.94E-01
Thyroid	5.0	mrem	1.85E-04	3.69E-03	1.19E-04	2.37E-03
Kidney	5.0	mrem	2.51E-03	5.01E-02	2.74E-03	5.48E-02
Lung	5.0	mrem	6.91E-04	1.38E-02	6.52E-04	1.30E-02
GILLI	5.0	mrem	1.90E-03	3.80E-02	2.66E-03	5.32E-02

Cumulative Doses per Year

Organ	Tech Spec Limit	Units	Year to Ending Date	% of Tech Spec Limit
Bone	10.0	mrem	9.10E-03	9.10E-02
Liver	10.0	mrem	1.37E-02	1.37E-01
TBody	3.0	mrem	8.80E-03	2.93E-01
Thyroid	10.0	mrem	3.03E-04	3.03E-03
Kidney	10.0	mrem	5.25E-03	5.25E-02
Lung	10.0	mrem	1.34E-03	1.34E-02
GILLI	10.0	mrem	4.56E-03	4.56E-02

TABLE 1-3A  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO LIQUID RELEASES  
 Unit: 1

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Cumulative Doses per Quarter

Organ	Tech Spec Limit	Units	Quarter 3	% of Tech Spec Limit	Quarter 4	% of Tech Spec Limit
Bone	5.0	mrem	2.54E-03	5.08E-02	2.10E-03	4.20E-02
Liver	5.0	mrem	4.01E-03	8.02E-02	3.22E-03	6.44E-02
TBody	1.5	mrem	2.62E-03	1.75E-01	2.15E-03	1.43E-01
Thyroid	5.0	mrem	3.11E-05	6.23E-04	4.91E-05	9.81E-04
Kidney	5.0	mrem	1.57E-03	3.14E-02	1.22E-03	2.44E-02
Lung	5.0	mrem	3.91E-04	7.82E-03	3.56E-04	7.12E-03
GILLI	5.0	mrem	2.33E-03	4.67E-02	1.72E-03	3.44E-02

Cumulative Doses per Year

Organ	Tech Spec Limit	Units	Year to Ending Date	% of Tech Spec Limit
Bone	10.0	mrem	1.37E-02	1.37E-01
Liver	10.0	mrem	2.10E-02	2.10E-01
TBody	3.0	mrem	1.36E-02	4.52E-01
Thyroid	10.0	mrem	3.83E-04	3.83E-03
Kidney	10.0	mrem	8.04E-03	8.04E-02
Lung	10.0	mrem	2.09E-03	2.09E-02
GILLI	10.0	mrem	8.62E-03	8.62E-02

TABLE 1-3B  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO LIQUID RELEASES  
 Unit: 2

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Cumulative Doses per Quarter

Organ	Tech Spec Limit	Units	Quarter 1	% of Tech Spec Limit	Quarter 2	% of Tech Spec Limit
Bone	5.0	mrem	3.48E-04	6.96E-03	4.00E-04	8.01E-03
Liver	5.0	mrem	6.45E-04	1.29E-02	5.87E-04	1.17E-02
TBody	1.5	mrem	3.75E-04	2.50E-02	3.83E-04	2.55E-02
Thyroid	5.0	mrem	2.00E-05	4.00E-04	3.29E-05	6.57E-04
Kidney	5.0	mrem	3.08E-04	6.15E-03	2.22E-04	4.45E-03
Lung	5.0	mrem	4.60E-05	9.21E-04	7.57E-05	1.51E-03
GILLI	5.0	mrem	3.23E-04	6.47E-03	1.18E-04	2.36E-03

Cumulative Doses per Year

Organ	Tech Spec Limit	Units	Year to Ending Date	% of Tech Spec Limit
Bone	10.0	mrem	7.48E-04	7.48E-03
Liver	10.0	mrem	1.23E-03	1.23E-02
TBody	3.0	mrem	7.57E-04	2.52E-02
Thyroid	10.0	mrem	5.29E-05	5.29E-04
Kidney	10.0	mrem	5.30E-04	5.30E-03
Lung	10.0	mrem	1.22E-04	1.22E-03
GILLI	10.0	mrem	4.41E-04	4.41E-03

TABLE 1-3B  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO LIQUID RELEASES  
 Unit: 2

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Cumulative Doses per Quarter

Organ	Tech Spec Limit	Units	Quarter 3	% of Tech Spec Limit	Quarter 4	% of Tech Spec Limit
Bone	5.0	mrem	5.92E-04	1.18E-02	4.62E-04	9.24E-03
Liver	5.0	mrem	9.61E-04	1.92E-02	6.57E-04	1.31E-02
TBody	1.5	mrem	6.12E-04	4.08E-02	4.38E-04	2.92E-02
Thyroid	5.0	mrem	9.45E-05	1.89E-03	2.77E-05	5.54E-04
Kidney	5.0	mrem	4.08E-04	8.17E-03	2.37E-04	4.74E-03
Lung	5.0	mrem	1.18E-04	2.36E-03	8.97E-05	1.79E-03
GILLI	5.0	mrem	3.34E-04	6.68E-03	5.86E-05	1.17E-03

Cumulative Doses per Year

Organ	Tech Spec Limit	Units	Year to Ending Date	% of Tech Spec Limit
Bone	10.0	mrem	1.80E-03	1.80E-02
Liver	10.0	mrem	2.85E-03	2.85E-02
TBody	3.0	mrem	1.81E-03	6.02E-02
Thyroid	10.0	mrem	1.75E-04	1.75E-03
Kidney	10.0	mrem	1.18E-03	1.18E-02
Lung	10.0	mrem	3.30E-04	3.30E-03
GILLI	10.0	mrem	8.34E-04	8.34E-03

**Table 1-4**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**MINIMUM DETECTABLE CONCENTRATIONS - LIQUID SAMPLE ANALYSES**  
**STARTING: 1-Jan-2002** **ENDING: 31-Dec-2002**

The values in this table represent a priori Minimum Detectable Concentrations (MDC) that are typically achieved in laboratory analyses of liquid radwaste samples.

<b>RADIONUCLIDE</b>	<b>MDC</b>	<b>UNITS</b>
Mn-54	1.97E-08	uCi/ml
Fe-59	3.94E-08	uCi/ml
Co-58	1.59E-08	uCi/ml
Co-60	1.72E-08	uCi/ml
Zn-65	2.92E-08	uCi/ml
Mo-99	1.20E-07	uCi/ml
Cs-134	1.75E-08	uCi/ml
Cs-137	1.62E-08	uCi/ml
Ce-141	1.92E-08	uCi/ml
Ce-144	8.83E-08	uCi/ml
I-131	1.43E-08	uCi/ml
Xe-135	1.03E-08	uCi/ml
Fe-55	2.34E-08	uCi/ml
Sr-89	1.44E-08	uCi/ml
Sr-90	8.50E-09	uCi/ml
H-3	6.00E-07	uCi/ml



**Table 1-5A**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**LIQUID EFFLUENTS - BATCH RELEASE SUMMARY**  
**UNIT 1**

**STARTING: 1-Jan-2002**

**ENDING: 30-Jun-2002**

NUMBER OF RELEASES	:	77	
TOTAL TIME FOR ALL RELEASES	:	10279.00	MINUTES
MAXIMUM TIME FOR A RELEASE	:	177.00	MINUTES
AVERAGE TIME FOR A RELEASE	:	133.49	MINUTES
MINIMUM TIME FOR A RELEASE	:	7.00	MINUTES
AVERAGE STREAM FLOW DURING PERIODS OF RELEASE OF LIQUID EFFLUENT INTO A FLOWING STREAM	:	5116	CFS

**Table 1-5A**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**LIQUID EFFLUENTS - BATCH RELEASE SUMMARY**  
**UNIT 1**

**STARTING: 1-Jul-2002**

**ENDING: 31-Dec-2002**

NUMBER OF RELEASES	:	155	
TOTAL TIME FOR ALL RELEASES	:	21695.00	MINUTES
MAXIMUM TIME FOR A RELEASE	:	230.00	MINUTES
AVERAGE TIME FOR A RELEASE	:	139.97	MINUTES
MINIMUM TIME FOR A RELEASE	:	78.00	MINUTES
AVERAGE STREAM FLOW DURING PERIODS OF RELEASE OF LIQUID EFFLUENT INTO A FLOWING STREAM	:	5116	CFS

**Table 1-5B**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**LIQUID EFFLUENTS - BATCH RELEASE SUMMARY**  
**UNIT 2**

**STARTING: 1-Jan-2002**

**ENDING: 30-Jun-2002**

NUMBER OF RELEASES	:	38	
TOTAL TIME FOR ALL RELEASES	:	3955.00	MINUTES
MAXIMUM TIME FOR A RELEASE	:	126.00	MINUTES
AVERAGE TIME FOR A RELEASE	:	104.08	MINUTES
MINIMUM TIME FOR A RELEASE	:	82.00	MINUTES
AVERAGE STREAM FLOW DURING PERIODS OF RELEASE OF LIQUID EFFLUENT INTO A FLOWING STREAM	:	5116	CFS

**Table 1-5B**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**LIQUID EFFLUENTS - BATCH RELEASE SUMMARY**  
**UNIT 2**

**STARTING: 1-Jul-2002**

**ENDING: 31-Dec-2002**

NUMBER OF RELEASES	:	62	
TOTAL TIME FOR ALL RELEASES	:	6577.00	MINUTES
MAXIMUM TIME FOR A RELEASE	:	155.00	MINUTES
AVERAGE TIME FOR A RELEASE	:	106.08	MINUTES
MINIMUM TIME FOR A RELEASE	:	81.00	MINUTES
AVERAGE STREAM FLOW DURING PERIODS OF RELEASE OF LIQUID EFFLUENT INTO A FLOWING STREAM	:	5116	CFS

**Table 1-6A**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**LIQUID EFFLUENTS - ABNORMAL RELEASE SUMMARY**  
**UNIT 1**

**STARTING: 1-Jan-2002**

**ENDING: 30-Jun-2002**

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0	MINUTES
AVERAGE TIME FOR A RELEASE	:	0	MINUTES
MINIMUM TIME FOR A RELEASE	:	0	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

There were no abnormal liquid releases for this reporting period.

**Table 1-6A**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**LIQUID EFFLUENTS - ABNORMAL RELEASE SUMMARY**  
**UNIT 1**

**STARTING: 1-Jul-2002**

**ENDING: 31-Dec-2002**

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0	MINUTES
AVERAGE TIME FOR A RELEASE	:	0	MINUTES
MINIMUM TIME FOR A RELEASE	:	0	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

There were no abnormal liquid releases for this reporting period.

**Table 1-6B**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**LIQUID EFFLUENTS - ABNORMAL RELEASE SUMMARY**  
**UNIT 2**

**STARTING: 1-Jan-2002**

**ENDING: 30-Jun-2002**

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0	MINUTES
AVERAGE TIME FOR A RELEASE	:	0	MINUTES
MINIMUM TIME FOR A RELEASE	:	0	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

There were no abnormal liquid releases for this reporting period.

**Table 1-6B**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**LIQUID EFFLUENTS - ABNORMAL RELEASE SUMMARY**  
**UNIT 2**

**STARTING: 1-Jul-2002**

**ENDING: 31-Dec-2002**

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0	MINUTES
AVERAGE TIME FOR A RELEASE	:	0	MINUTES
MINIMUM TIME FOR A RELEASE	:	0	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

There were no abnormal liquid releases for this reporting period.

## **2.0 Gaseous Effluents**

### **2.1 Regulatory Requirements**

The ODCM Specifications presented in this section are for Unit 1 and Unit 2.

#### **2.1.1 Dose Rate Limits**

The dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the SITE BOUNDARY shall be limited to the following:

- a. For noble gases: Less than or equal to 500 mrem/yr. to the whole body and less than or equal to 3000 mrem/yr. to the skin and,
- b. For Iodine-131, Iodine-133, tritium and for all radionuclides in particulate form with half lives greater than 8 days: Less than or equal to 1500 mrem/yr. to any organ.

#### **2.1.2 Air Doses Due To Noble Gases in Gaseous Effluents**

The air dose due to noble gases released in gaseous effluents, from each unit, to areas at and beyond the SITE BOUNDARY, shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation, and
- b. During any calendar year: Less than or equal to 10 mrad for gamma radiation and less than or equal to 20 mrad for beta radiation.

#### **2.1.3 Doses To A Member of the Public**

The dose to a MEMBER OF THE PUBLIC from Iodine-131, Iodine-133, tritium and all radionuclides in particulate form with half-lives greater than 8 days, in gaseous effluents released from each unit, to areas at and beyond the SITE BOUNDARY, shall be limited to the following.

- a. During any calendar quarter: Less than or equal to 7.5 mrem to any organ.
- b. During any calendar year: Less than or equal to 15 mrem to any organ.

## **2.2 Measurements and Approximations of Total Radioactivity**

Waste gas release at Plant Hatch is confined to four paths: main stack (also called the offgas vent), Unit 1 reactor building vent; Unit 2 reactor building vent, and the recombiner building vent. Each of these four paths is continuously monitored for gaseous radioactivity.

### **2.2.1 Sample Collection and Analysis**

Each of the four gaseous effluent paths is equipped with an integrating-type sample collection device for collecting particulates and iodines. Unless required more frequently under certain circumstances, samples are collected as follows:

1. Noble gas samples are collected by grab sampling monthly.
2. Tritium samples are collected by grab sampling monthly.
3. Radioiodine samples are collected by pulling the sample stream through a charcoal cartridge over a 7-day period.
4. Particulates are collected by pulling the sample stream through a particulate filter over a 7-day period.
5. The 7-day particulate filters above are analyzed for gross alpha activity.
6. Quarterly composite samples are prepared from the particulate filters collected over the previous quarter and the samples are analyzed for Sr-89 and Sr-90.

Sample analyses results and release flow rates from the four release points form the basis for calculating released quantities of radionuclide-specific radioactivity, the dose rates associated with gaseous releases, and the cumulative doses for the current quarter and year. This task is normally performed with computer assistance.

The noble gas grab sample analysis results are used along with maximum expected release flow rates from each of the four vents to calculate monitor setpoints for the gaseous effluent monitors serving the four release points. Calculation of monitor setpoints is described in the ODCM. Typically achieved minimum detectable concentrations for gaseous effluents sample and analyses are reported in Table 2-6.

For each release period, released radioactivity, dose rates, and cumulative doses are calculated. Cumulative dose results are tabulated along with the percent of the ODCM limit for each release, for the current quarter and year.

## **2.2.2 Total Quantities of Radioactivity, Dose Rates, and Cumulative Doses**

The methods for determining release quantities of radioactivity, dose rates, and cumulative doses follow:

### **2.2.2.1 Fission and Activation Gases**

The released radioactivity is determined using sample analyses results collected as described above and the average release flow rates over the period represented by the collected sample.

Dose rates due to noble gases, radioiodines, tritium, and particulates are calculated (with computer assistance). The calculated dose rates are compared to the dose rate limits specified in ODCM 3.1.2 for noble gases, radioiodine, tritium, and particulates. Dose rate calculation methodology is presented in the ODCM.

Beta and gamma air doses due to noble gases are calculated for the location in the unrestricted area with the potential for the highest exposure due to gaseous releases. Air doses are calculated for each release period and cumulative totals are kept for each unit for the calendar quarter and year. Cumulative air doses are compared to the dose limits specified in ODCM 3.1.3. The current percent of the ODCM limits are shown on the printout for each release period. Air dose calculation methodology is presented in the ODCM.

### **2.2.2.2 Radioiodine, Tritium and Particulate Releases**

Released quantities of radioiodines are determined using the weekly samples and release flow rates for the four release points. Radioiodine concentrations are determined by gamma spectroscopy.

Release quantities of particulates are determined using the weekly (filter) samples and release flow rates for the four release points. Gamma spectroscopy is used to quantify concentrations of principal gamma emitters.

After each quarter, the particulate filters from each vent are combined, fused, and a strontium separation is performed. Since sample flows and vent flows are almost constant over each quarterly period the filters from each vent can be dissolved together. Decay corrections are performed back to the middle of the quarterly collection period. If Sr-89 or Sr-90 is not detected, MDC's are calculated. Strontium concentrations are input into the composite file of the computer and used for release dose rate and dose calculations for a Member of the Public.

Tritium samples are obtained monthly from each vent by passing the sample stream through a cold trap. The grams of water vapor/cubic foot is measured upstream of the cold trap in order to alleviate the difficulties in determining water vapor collection efficiencies. The tritium samples are analyzed by an independent laboratory and the results are furnished in uCi/ml of water. The tritium concentration in water is converted to the tritium concentration in air and this value is input into the composite file of the computer and used in release, dose rate, and individual dose calculations.

Dose rates due to radioiodine, tritium and particulates are calculated for a hypothetical child exposed to the inhalation pathway at the location in the unrestricted area where the potential dose rate is expected to be the highest. Dose rates are calculated, for each release point for each release period, and the dose rates from each release point are compared to the dose rate limits as described in ODCM 3.1.2. Doses due to radioiodine, tritium and particulates are calculated for the controlling receptor, which is described in the ODCM. Doses to a Member of the Public are calculated for each release period, and cumulative totals are kept for each unit, for the current calendar quarter and year. Cumulative doses are compared to the dose limits specified in ODCM 3.1.4. The current percent of ODCM limits are shown on the printout for each release period.

### ***2.2.2.3 Gross Alpha Release***

The gross alpha release is computed each month by counting the particulate filters, for each week for gross alpha activity in a proportional counter. The four or five weeks' numbers are then recorded on a data sheet and the activity is summed at the end of the month. The summed activity is then divided by the total monthly volume to determine the concentration. This concentration is input into the composite file of the computer and used for release calculations.

### ***2.2.3 Total Error Estimation***

The total or maximum error associated with the effluent measurement will include the cumulative errors resulting from the total process of sampling and measurement. Due to the difficulty with assigning error terms for each parameter affecting the final measurement, detailed statistical evaluation of error is not suggested. The objective is to obtain an overall estimate of the error associated with measurements of radioactive materials released in liquid and gaseous effluents and solid waste.

Estimated errors are associated with counting equipment calibration, counting statistics, vent-flow rates, vent sample flow rates, non steady release rates, chemical yield factors and sample losses for such items as charcoal cartridges.



Fission and activation total release was calculated from sample analysis results and release point flow rates.

Statistical error	60%
Counting equipment calibration	10%
Vent flow rates	10%
Non-steady release rates	20%
TOTAL ERROR	100%

I-131 releases were calculated from each weekly sample.

Statistical error	60%
Counting equipment calibration	10%
Vent flow rates	10%
Vent sample flow rates	10%
Non-steady release rates	10%
Losses from charcoal cartridges	10%
TOTAL ERROR	110%

Particulates with half lives greater than 8 days releases were calculated from sample analysis results and release point flow rates.

Statistical error	60%
Counting equipment calibration	10%
Vent flow rates	10%
Vent sample flow rates	10%
Non-steady release rates	10%
TOTAL ERROR	100%

Total tritium releases were calculated from sample analysis results and release point flow rates.

Water vapor in sample stream determination	20%
Vent flow rates	10%
Counting calibration and statistics	10%
Non-steady release rates	50%
TOTAL ERROR	90%

Gross Alpha radioactivity was calculated from sample analysis results and release point flow rates.

Statistical error	60%
Counting equipment calibration	10%
Vent flow rates	10%
Vent sample flow rates	10%
Non-steady release rates	10%
TOTAL ERROR	100%

### **2.3 Gaseous Effluent Release Data**

Regulatory Guide 1.21 Tables 1A, 1B, and 1C are found in this report as Tables 2-1A, 2-1B, 2-1C, 2-2A, 2-2B, 2-2C, 2-3A, 2-3B, 2-3C. Data is presented on a quarterly basis as required by Regulatory Guide 1.21 for all quarters.

To complete table 2-1A, 2-1B, and 2-1C, total release for each of the four categories (fission and activation gases, iodines, particulates, and tritium) was divided by the number of seconds in the quarter to obtain a release rate in uCi/second for each category for each quarter. However, the percent of the ODCM limits are not applicable because we have no curie limits for gaseous releases. Applicable limits are expressed in terms of dose. Noble gases are limited as specified in ODCM 3.1.2. The other three categories (tritium, radioiodines, and particulates) are limited as a group as specified in ODCM 3.1.2.

Dose rates due to noble gas releases, and due to radioiodine, tritium, and particulates were calculated as part of the pre-release and post-release permits on individual permits. No limits were exceeded for this reporting period.

Gross alpha radioactivity is reported in Table 2-1A, 2-1B, and 2-1C, as curies released in each quarter.

Limits for cumulative beta and gamma air doses due to noble gases are specified in ODCM 3.1.3. Cumulative air doses are presented in Table 2-4A and 2-4B, along with percent of ODCM limits.

Limits for cumulative doses to a Member of the Public due to radioiodine, tritium and particulates, are specified in ODCM 3.1.4. Cumulative doses to a Member of the Public doses are presented in Table 2-5A, and 2-5B, along with percent of ODCM limits.

## **2.4 Radiological Impact Due to Gaseous Releases**

Dose rates due to noble gas release were calculated for the site in accordance with ODCM 3.1.2. Dose rates due to radioiodine, tritium, and particulates in gaseous releases were calculated in accordance with ODCM 3.1.2.

These dose rates were calculated as part of the pre-release and post release on individual release permits. No limits were exceeded for this reporting period.

Cumulative air doses due to noble gas releases were calculated for each unit in accordance with ODCM 3.1.3. These results are presented in Tables 2-4A and 2-4B.

Cumulative doses to a Member of the Public due to radioiodine, tritium and particulates in gaseous releases were calculated for each unit in accordance with ODCM 3.1.4. These results are presented in Tables 2-5A and 2-5B.

Dose rates and doses were calculated using the methodology presented in the ODCM.

## **2.5 Gaseous Effluents - Batch Releases**

There are no gaseous batch releases from Plant Hatch.

## **2.6 Gaseous Effluents - Abnormal Releases**

There were no unplanned or uncontrolled gaseous releases during this reporting period.

TABLE 2-1A  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Summation of All Releases  
 Unit: 1  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE	CURIES	9.86E+00	1.69E+00	1.00E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.27E+00	2.15E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. RADIOIODINES</b>				
1. TOTAL IODINE-131	CURIES	2.63E-04	6.33E-05	1.10E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	3.38E-05	8.05E-06	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. PARTICULATES</b>				
1. PARTICULATES (HALF-LIVES > 8 DAYS)	CURIES	1.13E-04	2.09E-05	1.00E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.45E-05	2.65E-06	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
4. GROSS ALPHA RADIOACTIVITY	CURIES	0.00E+00	0.00E+00	
<b>D. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	2.00E+00	3.62E+00	9.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.57E-01	4.61E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

TABLE 2-1A  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Summation of All Releases  
 Unit: 1  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE	CURIES	3.07E+00	2.96E+00	1.00E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	3.86E-01	3.72E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. RADIOIODINES</b>				
1. TOTAL IODINE-131	CURIES	5.95E-05	1.10E-04	1.10E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	7.49E-06	1.39E-05	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. PARTICULATES</b>				
1. PARTICULATES (HALF-LIVES > 8 DAYS)	CURIES	1.58E-05	2.43E-05	1.00E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.99E-06	3.05E-06	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
4. GROSS ALPHA RADIOACTIVITY	CURIES	0.00E+00	0.00E+00	
<b>D. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	4.01E+00	4.31E+00	9.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	5.04E-01	5.42E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

TABLE 2-1B  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Summation of All Releases  
 Unit: 2  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE	CURIES	9.31E+00	1.73E+00	1.00E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.20E+00	2.20E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. RADIOIODINES</b>				
1. TOTAL IODINE-131	CURIES	2.83E-04	7.47E-05	1.10E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	3.64E-05	9.50E-06	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. PARTICULATES</b>				
1. PARTICULATES (HALF-LIVES > 8 DAYS)	CURIES	5.50E-05	2.44E-05	1.00E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	7.07E-06	3.10E-06	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
4. GROSS ALPHA RADIOACTIVITY	CURIES	0.00E+00	0.00E+00	
<b>D. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	3.27E+00	3.73E+00	9.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	4.20E-01	4.75E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

TABLE 2-1B  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Summation of All Releases  
 Unit: 2  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE	CURIES	3.02E+00	2.96E+00	1.00E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	3.79E-01	3.72E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. RADIOIODINES</b>				
1. TOTAL IODINE-131	CURIES	6.09E-05	1.13E-04	1.10E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	7.66E-06	1.42E-05	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. PARTICULATES</b>				
1. PARTICULATES (HALF-LIVES > 8 DAYS)	CURIES	1.74E-05	1.90E-05	1.00E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.19E-06	2.40E-06	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
4. GROSS ALPHA RADIOACTIVITY	CURIES	0.00E+00	0.00E+00	
<b>D. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	4.85E+00	4.69E+00	9.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	6.10E-01	5.90E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

TABLE 2-1C  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Summation of All Releases  
 Unit: Site  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE	CURIES	1.92E+01	3.42E+00	1.00E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.47E+00	4.35E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. RADIOIODINES</b>				
1. TOTAL IODINE-131	CURIES	5.46E-04	1.38E-04	1.10E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	7.02E-05	1.75E-05	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. PARTICULATES</b>				
1. PARTICULATES (HALF-LIVES > 8 DAYS)	CURIES	1.68E-04	4.53E-05	1.00E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.16E-05	5.76E-06	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
4. GROSS ALPHA RADIOACTIVITY	CURIES	0.00E+00	0.00E+00	
<b>D. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	5.27E+00	7.36E+00	9.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	6.78E-01	9.36E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.



TABLE 2-1C  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Summation of All Releases  
 Unit: Site  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE	CURIES	6.08E+00	5.92E+00	1.00E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	7.65E-01	7.44E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. RADIOIODINES</b>				
1. TOTAL IODINE-131	CURIES	1.20E-04	2.23E-04	1.10E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.52E-05	2.81E-05	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. PARTICULATES</b>				
1. PARTICULATES (HALF-LIVES>8 DAYS)	CURIES	3.32E-05	4.33E-05	1.00E+02
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	4.18E-06	5.45E-06	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
4. GROSS ALPHA RADIOACTIVITY	CURIES	0.00E+00	0.00E+00	
<b>D. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	8.86E+00	9.00E+00	9.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.11E+00	1.13E+00	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

TABLE 2-2A\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Elevated Level Releases  
 Unit: 1  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE**	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
<b>FISSION GASES</b>					
XE-137	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
XE-138	CURIES	3.53E+00	8.44E-01	0.00E+00	0.00E+00
XE-135M	CURIES	1.93E+00	7.92E-01	0.00E+00	0.00E+00
AR-41	CURIES	4.95E-01	0.00E+00	0.00E+00	0.00E+00
KR-85M	CURIES	1.53E+00	0.00E+00	0.00E+00	0.00E+00
XE-135	CURIES	4.08E-01	5.39E-02	0.00E+00	0.00E+00
XE-133	CURIES	1.96E+00	0.00E+00	0.00E+00	0.00E+00
<b>TOTAL FOR PERIOD</b>	<b>CURIES</b>	<b>9.86E+00</b>	<b>1.69E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>
<b>IODINES</b>					
I-133	CURIES	4.02E-04	2.11E-04	0.00E+00	0.00E+00
I-131	CURIES	2.24E-04	5.82E-05	0.00E+00	0.00E+00
<b>TOTAL FOR PERIOD</b>	<b>CURIES</b>	<b>6.26E-04</b>	<b>2.70E-04</b>	<b>0.00E+00</b>	<b>0.00E+00</b>
<b>PARTICULATES</b>					
I-131	CURIES	7.93E-07	0.00E+00	0.00E+00	0.00E+00
BA-140	CURIES	1.27E-05	1.03E-05	0.00E+00	0.00E+00
CR-51	CURIES	2.76E-07	6.29E-07	0.00E+00	0.00E+00
SR-89	CURIES	1.31E-05	7.93E-06	0.00E+00	0.00E+00
ZN-65	CURIES	4.71E-07	8.96E-08	0.00E+00	0.00E+00
MN-54	CURIES	2.56E-07	1.31E-07	0.00E+00	0.00E+00
CO-60	CURIES	1.96E-07	2.12E-07	0.00E+00	0.00E+00
SR-90	CURIES	1.45E-07	1.79E-07	0.00E+00	0.00E+00
CS-137	CURIES	0.00E+00	6.63E-08	0.00E+00	0.00E+00
<b>TOTAL FOR PERIOD</b>	<b>CURIES</b>	<b>2.79E-05</b>	<b>1.96E-05</b>	<b>0.00E+00</b>	<b>0.00E+00</b>
<b>H-3</b>	<b>CURIES</b>	<b>5.35E-01</b>	<b>9.64E-01</b>	<b>0.00E+00</b>	<b>0.00E+00</b>

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

\*\* There are no batch mode radioactive gaseous release pathways at Plant Hatch.

TABLE 2-2A\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Elevated Level Releases

Unit: 1  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE**	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
<b>FISSION GASES</b>					
XE-138	CURIES	1.72E+00	1.73E+00	0.00E+00	0.00E+00
XE-135M	CURIES	1.70E-01	3.27E-01	0.00E+00	0.00E+00
AR-41	CURIES	0.00E+00	1.16E-01	0.00E+00	0.00E+00
KR-85M	CURIES	0.00E+00	6.72E-02	0.00E+00	0.00E+00
XE-135	CURIES	3.13E-01	1.73E-01	0.00E+00	0.00E+00
XE-133	CURIES	8.17E-01	5.46E-01	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	3.02E+00	2.96E+00	0.00E+00	0.00E+00
<b>IODINES</b>					
I-133	CURIES	2.57E-04	2.76E-04	0.00E+00	0.00E+00
I-131	CURIES	5.95E-05	1.06E-04	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	3.16E-04	3.82E-04	0.00E+00	0.00E+00
<b>PARTICULATES</b>					
I-131	CURIES	0.00E+00	1.59E-07	0.00E+00	0.00E+00
BA-140	CURIES	6.02E-06	4.97E-06	0.00E+00	0.00E+00
SR-89	CURIES	9.19E-06	1.11E-05	0.00E+00	0.00E+00
MN-54	CURIES	7.88E-08	1.27E-07	0.00E+00	0.00E+00
SR-90	CURIES	1.24E-07	1.33E-07	0.00E+00	0.00E+00
CS-137	CURIES	0.00E+00	1.22E-07	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.54E-05	1.66E-05	0.00E+00	0.00E+00
H-3	CURIES	1.69E+00	1.69E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

\*\* There are no batch mode radioactive gaseous release pathways at Plant Hatch.

TABLE 2-2B\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Mixed-Mode Level Releases  
 Unit: 2  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

		CONTINUOUS MODE	BATCH MODE**		
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

\*\* There are no batch mode radioactive gaseous release pathways at Plant Hatch.

TABLE 2-2B\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Mixed-Mode Level Releases  
 Unit: 2  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

		CONTINUOUS MODE	BATCH MODE**		
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

\*\* There are no batch mode radioactive gaseous release pathways at Plant Hatch.

TABLE 2-2C\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Elevated Level Releases  
 Unit: Site  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

		CONTINUOUS MODE		BATCH MODE**	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
<b>FISSION GASES</b>					
XE-137	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
XE-138	CURIES	7.06E+00	1.69E+00	0.00E+00	0.00E+00
XE-135M	CURIES	3.51E+00	1.58E+00	0.00E+00	0.00E+00
AR-41	CURIES	9.89E-01	0.00E+00	0.00E+00	0.00E+00
KR-85M	CURIES	3.07E+00	3.71E-02	0.00E+00	0.00E+00
XE-135	CURIES	8.16E-01	1.08E-01	0.00E+00	0.00E+00
XE-133	CURIES	3.72E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.92E+01	3.42E+00	0.00E+00	0.00E+00
<b>IODINES</b>					
I-133	CURIES	8.55E-04	4.53E-04	0.00E+00	0.00E+00
I-131	CURIES	4.77E-04	1.22E-04	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.33E-03	5.75E-04	0.00E+00	0.00E+00
<b>PARTICULATES</b>					
I-131	CURIES	1.56E-06	0.00E+00	0.00E+00	0.00E+00
BA-140	CURIES	2.64E-05	2.07E-05	0.00E+00	0.00E+00
CR-51	CURIES	9.41E-07	1.26E-06	0.00E+00	0.00E+00
SR-89	CURIES	2.66E-05	1.91E-05	0.00E+00	0.00E+00
ZN-65	CURIES	6.29E-07	1.79E-07	0.00E+00	0.00E+00
MN-54	CURIES	6.37E-07	2.62E-07	0.00E+00	0.00E+00
CO-60	CURIES	5.13E-07	4.25E-07	0.00E+00	0.00E+00
SR-90	CURIES	2.90E-07	3.58E-07	0.00E+00	0.00E+00
CS-137	CURIES	0.00E+00	1.91E-07	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	5.75E-05	4.24E-05	0.00E+00	0.00E+00
H-3	CURIES	1.09E+00	2.12E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

\*\* There are no batch mode radioactive gaseous release pathways at Plant Hatch.

TABLE 2-2C\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Elevated Level Releases  
 Unit: Site  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

		CONTINUOUS MODE		BATCH MODE**	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
<b>FISSION GASES</b>					
XE-138	CURIES	3.43E+00	3.46E+00	0.00E+00	0.00E+00
XE-135M	CURIES	3.40E-01	6.54E-01	0.00E+00	0.00E+00
AR-41	CURIES	0.00E+00	2.32E-01	0.00E+00	0.00E+00
KR-85M	CURIES	0.00E+00	1.34E-01	0.00E+00	0.00E+00
XE-135	CURIES	6.26E-01	3.47E-01	0.00E+00	0.00E+00
XE-133	CURIES	1.63E+00	1.09E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	6.03E+00	5.92E+00	0.00E+00	0.00E+00
<b>IODINES</b>					
I-133	CURIES	5.13E-04	5.52E-04	0.00E+00	0.00E+00
I-131	CURIES	1.19E-04	2.12E-04	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	6.32E-04	7.65E-04	0.00E+00	0.00E+00
<b>PARTICULATES</b>					
I-131	CURIES	0.00E+00	3.19E-07	0.00E+00	0.00E+00
BA-140	CURIES	1.20E-05	9.93E-06	0.00E+00	0.00E+00
SR-89	CURIES	1.84E-05	2.21E-05	0.00E+00	0.00E+00
MN-54	CURIES	1.58E-07	2.54E-07	0.00E+00	0.00E+00
SR-90	CURIES	2.47E-07	2.66E-07	0.00E+00	0.00E+00
CS-137	CURIES	0.00E+00	2.44E-07	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	3.08E-05	3.31E-05	0.00E+00	0.00E+00
H-3	CURIES	3.37E+00	3.37E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

\*\* There are no batch mode radioactive gaseous release pathways at Plant Hatch.

TABLE 2-3A\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Ground Level Releases  
 Unit: 1  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE**	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
IODINES					
I-133	CURIES	7.83E-05	0.00E+00	0.00E+00	0.00E+00
I-131	CURIES	3.53E-05	5.09E-06	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.14E-04	5.09E-06	0.00E+00	0.00E+00
PARTICULATES					
I-131	CURIES	2.24E-06	0.00E+00	0.00E+00	0.00E+00
CR-51	CURIES	4.12E-05	7.09E-09	0.00E+00	0.00E+00
SR-89	CURIES	3.09E-06	1.28E-06	0.00E+00	0.00E+00
MN-54	CURIES	2.46E-05	0.00E+00	0.00E+00	0.00E+00
CO-60	CURIES	1.40E-05	0.00E+00	0.00E+00	0.00E+00
SR-90	CURIES	1.42E-14	7.10E-11	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	8.52E-05	1.29E-06	0.00E+00	0.00E+00
H-3	CURIES	1.47E+00	2.66E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

\*\* There are no batch mode radioactive gaseous release pathways at Plant Hatch.



TABLE 2-3A\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Ground Level Releases  
 Unit: 1  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

		CONTINUOUS MODE		BATCH MODE**	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
XE-133	CURIES	4.95E-02	0.00E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	4.95E-02	0.00E+00	0.00E+00	0.00E+00
IODINES					
I-131	CURIES	7.78E-09	4.26E-06	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	7.78E-09	4.26E-06	0.00E+00	0.00E+00
PARTICULATES					
CE-141	CURIES	0.00E+00	7.30E-10	0.00E+00	0.00E+00
SR-89	CURIES	2.73E-07	1.52E-09	0.00E+00	0.00E+00
MN-54	CURIES	2.90E-09	2.75E-06	0.00E+00	0.00E+00
CO-60	CURIES	2.83E-09	4.24E-06	0.00E+00	0.00E+00
SR-90	CURIES	1.30E-07	6.89E-07	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	4.09E-07	7.68E-06	0.00E+00	0.00E+00
H-3	CURIES	2.32E+00	2.62E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

\*\* There are no batch mode radioactive gaseous release pathways at Plant Hatch.

TABLE 2-3B\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Ground Level Releases  
 Unit: 2  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

		CONTINUOUS MODE		BATCH MODE**	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
IODINES					
I-133	CURIES	4.68E-05	0.00E+00	0.00E+00	0.00E+00
I-131	CURIES	2.94E-05	1.13E-05	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	7.62E-05	1.13E-05	0.00E+00	0.00E+00
PARTICULATES					
CR-51	CURIES	8.74E-06	0.00E+00	0.00E+00	0.00E+00
HF-181	CURIES	4.09E-06	0.00E+00	0.00E+00	0.00E+00
SR-89	CURIES	3.64E-06	1.56E-06	0.00E+00	0.00E+00
MN-54	CURIES	6.92E-06	0.00E+00	0.00E+00	0.00E+00
CO-60	CURIES	2.01E-06	0.00E+00	0.00E+00	0.00E+00
SR-90	CURIES	1.04E-14	6.88E-15	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	2.54E-05	1.56E-06	0.00E+00	0.00E+00
H-3	CURIES	2.71E+00	2.58E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

\*\* There are no batch mode radioactive gaseous release pathways at Plant Hatch.

TABLE 2-3B\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Ground Level Releases  
 Unit: 2  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE**	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
IODINES					
I-133	CURIES	0.00E+00	1.70E-05	0.00E+00	0.00E+00
I-131	CURIES	1.41E-06	6.49E-06	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.41E-06	2.35E-05	0.00E+00	0.00E+00
PARTICULATES					
SR-89	CURIES	1.92E-06	2.48E-06	0.00E+00	0.00E+00
SR-90	CURIES	4.79E-08	0.00E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.97E-06	2.48E-06	0.00E+00	0.00E+00
H-3	CURIES	3.16E+00	3.00E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

\*\* There are no batch mode radioactive gaseous release pathways at Plant Hatch.

TABLE 2-3C\*  
 E. I. HATCH NUCLEAR PLANT  
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Ground Level Releases  
 Unit: Site  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE**	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
IODINES					
I-133	CURIES	1.25E-04	0.00E+00	0.00E+00	0.00E+00
I-131	CURIES	6.47E-05	1.64E-05	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.90E-04	1.64E-05	0.00E+00	0.00E+00
PARTICULATES					
I-131	CURIES	2.24E-06	0.00E+00	0.00E+00	0.00E+00
CR-51	CURIES	5.00E-05	7.09E-09	0.00E+00	0.00E+00
HF-181	CURIES	4.09E-06	0.00E+00	0.00E+00	0.00E+00
SR-89	CURIES	6.73E-06	2.84E-06	0.00E+00	0.00E+00
MN-54	CURIES	3.15E-05	0.00E+00	0.00E+00	0.00E+00
CO-60	CURIES	1.61E-05	0.00E+00	0.00E+00	0.00E+00
SR-90	CURIES	2.46E-14	7.11E-11	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.11E-04	2.85E-06	0.00E+00	0.00E+00
H-3	CURIES	4.17E+00	5.24E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

\*\* There are no batch mode radioactive gaseous release pathways at Plant Hatch.

TABLE 2-3C\*  
E. I. HATCH NUCLEAR PLANT

RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
Gaseous Effluents-Ground Level Releases  
Unit: Site  
Starting : 1-Jul-2002      Ending : 31-Dec-2002

		CONTINUOUS MODE		BATCH MODE**	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
<b>FISSION GASES</b>					
XE-133	CURIES	4.95E-02	0.00E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	4.95E-02	0.00E+00	0.00E+00	0.00E+00
<b>IODINES</b>					
I-133	CURIES	0.00E+00	1.70E-05	0.00E+00	0.00E+00
I-131	CURIES	1.42E-06	1.08E-05	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.42E-06	2.77E-05	0.00E+00	0.00E+00
<b>PARTICULATES</b>					
CE-141	CURIES	0.00E+00	7.30E-10	0.00E+00	0.00E+00
SR-89	CURIES	2.20E-06	2.48E-06	0.00E+00	0.00E+00
MN-54	CURIES	2.90E-09	2.75E-06	0.00E+00	0.00E+00
CO-60	CURIES	2.83E-09	4.24E-06	0.00E+00	0.00E+00
SR-90	CURIES	1.78E-07	6.89E-07	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	2.38E-06	1.02E-05	0.00E+00	0.00E+00
H-3	CURIES	5.48E+00	5.62E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

\*\* There are no batch mode radioactive gaseous release pathways at Plant Hatch.

TABLE 2-4A  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 AIR DOSES DUE TO GASEOUS RELEASES

Unit: 1

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Cumulative Doses per Quarter

Type of Radiation	Tech Spec Limit	Units	Quarter 1	% of Tech Spec Limit	Quarter 2	% of Tech Spec Limit
Gamma	5.0	mrad	1.07E-04	2.14E-03	2.40E-05	4.79E-04
Beta	10.0	mrad	3.37E-05	3.37E-04	6.14E-06	6.14E-05

Cumulative Doses per Year

Type of Radiation	Tech Spec Limit	Units	Year to Ending Date	% of Tech Spec Limit
Gamma	10.0	mrad	1.31E-04	1.31E-03
Beta	20.0	mrad	3.98E-05	1.99E-04

TABLE 2-4A  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 AIR DOSES DUE TO GASEOUS RELEASES

Unit: 1

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Cumulative Doses per Quarter

Type of Radiation	Tech Spec Limit	Units	Quarter 3	% of Tech Spec Limit	Quarter 4	% of Tech Spec Limit
Gamma	5.0	mrads	4.28E-05	8.57E-04	4.20E-05	8.40E-04
Beta	10.0	mrads	2.67E-05	2.67E-04	1.29E-05	1.29E-04

Cumulative Doses per Year

Type of Radiation	Tech Spec Limit	Units	Year to Ending Date	% of Tech Spec Limit
Gamma	10.0	mrads	2.16E-04	2.16E-03
Beta	20.0	mrads	7.94E-05	3.97E-04

TABLE 2-4B  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 AIR DOSES DUE TO GASEOUS RELEASES

Unit: 2

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Cumulative Doses per Quarter

Type of Radiation	Tech Spec Limit	Units	Quarter 1	% of Tech Spec Limit	Quarter 2	% of Tech Spec Limit
Gamma	5.0	mrads	1.04E-04	2.08E-03	2.41E-05	4.81E-04
Beta	10.0	mrads	3.31E-05	3.31E-04	6.24E-06	6.24E-05

Cumulative Doses per Year

Type of Radiation	Tech Spec Limit	Units	Year to Ending Date	% of Tech Spec Limit
Gamma	10.0	mrads	1.28E-04	1.28E-03
Beta	20.0	mrads	3.93E-05	1.96E-04



TABLE 2-4B  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 AIR DOSES DUE TO GASEOUS RELEASES

Unit: 2

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Cumulative Doses per Quarter

Type of Radiation	Tech Spec Limit	Units	Quarter 3	% of Tech Spec Limit	Quarter 4	% of Tech Spec Limit
Gamma	5.0	mrads	3.82E-05	7.64E-04	4.20E-05	8.40E-04
Beta	10.0	mrads	1.29E-05	1.29E-04	1.29E-05	1.29E-04

Cumulative Doses per Year

Type of Radiation	Tech Spec Limit	Units	Year to Ending Date	% of Tech Spec Limit
Gamma	10.0	mrads	2.08E-04	2.08E-03
Beta	20.0	mrads	6.51E-05	3.26E-04

TABLE 2-5A  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO RADIOIODINES, TRITIUM,  
 AND PARTICULATES IN GASEOUS RELEASES

Unit: 1

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Cumulative Doses per Quarter

Organ	Tech Spec Limit	Unit	Quarter 1	% of Tech Spec Limit	Quarter 2	% of Tech Spec Limit
Bone	7.5	mrem	1.58E-04	2.10E-03	3.73E-05	4.98E-04
Liver	7.5	mrem	8.69E-04	1.16E-02	1.39E-03	1.85E-02
TBody	7.5	mrem	8.70E-04	1.16E-02	1.39E-03	1.86E-02
Thyroid	7.5	mrem	1.92E-03	2.56E-02	1.59E-03	2.13E-02
Kidney	7.5	mrem	8.66E-04	1.16E-02	1.39E-03	1.85E-02
Lung	7.5	mrem	8.74E-04	1.17E-02	1.39E-03	1.85E-02
GILLI	7.5	mrem	8.74E-04	1.17E-02	1.39E-03	1.85E-02

Cumulative Doses per Year

Organ	Tech Spec Limit	Units	Year to Ending Date	% of Tech Spec Limit
Bone	15.0	mrem	1.95E-04	1.30E-03
Liver	15.0	mrem	2.26E-03	1.51E-02
TBody	15.0	mrem	2.26E-03	1.51E-02
Thyroid	15.0	mrem	3.52E-03	2.34E-02
Kidney	15.0	mrem	2.26E-03	1.50E-02
Lung	15.0	mrem	2.26E-03	1.51E-02
GILLI	15.0	mrem	2.26E-03	1.51E-02

TABLE 2-5A  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO RADIOIODINES, TRITIUM,  
 AND PARTICULATES IN GASEOUS RELEASES

Unit: 1

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Cumulative Doses per Quarter

Organ	Tech Spec Limit	Unit	Quarter 3	% of Tech Spec Limit	Quarter 4	% of Tech Spec Limit
Bone	7.5	mrem	9.15E-05	1.22E-03	3.38E-04	4.50E-03
Liver	7.5	mrem	1.22E-03	1.63E-02	1.40E-03	1.87E-02
TBody	7.5	mrem	1.24E-03	1.65E-02	1.48E-03	1.97E-02
Thyroid	7.5	mrem	1.36E-03	1.81E-02	1.70E-03	2.27E-02
Kidney	7.5	mrem	1.22E-03	1.63E-02	1.40E-03	1.87E-02
Lung	7.5	mrem	1.22E-03	1.63E-02	1.41E-03	1.88E-02
GILLI	7.5	mrem	1.22E-03	1.63E-02	1.41E-03	1.88E-02

Cumulative Doses per Year

Organ	Tech Spec Limit	Units	Year to Ending Date	% of Tech Spec Limit
Bone	15.0	mrem	6.24E-04	4.16E-03
Liver	15.0	mrem	4.88E-03	3.25E-02
TBody	15.0	mrem	4.98E-03	3.32E-02
Thyroid	15.0	mrem	6.57E-03	4.38E-02
Kidney	15.0	mrem	4.88E-03	3.25E-02
Lung	15.0	mrem	4.89E-03	3.26E-02
GILLI	15.0	mrem	4.90E-03	3.26E-02

TABLE 2-5B  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO RADIOIODINES, TRITIUM,  
 AND PARTICULATES IN GASEOUS RELEASES

Unit: 2

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Cumulative Doses per Quarter

Organ	Tech Spec Limit	Unit	Quarter 1	% of Tech Spec Limit	Quarter 2	% of Tech Spec Limit
Bone	7.5	mrem	8.44E-05	1.13E-03	4.36E-05	5.82E-04
Liver	7.5	mrem	1.43E-03	1.90E-02	1.35E-03	1.80E-02
TBody	7.5	mrem	1.43E-03	1.90E-02	1.35E-03	1.80E-02
Thyroid	7.5	mrem	2.44E-03	3.25E-02	1.66E-03	2.21E-02
Kidney	7.5	mrem	1.43E-03	1.90E-02	1.35E-03	1.80E-02
Lung	7.5	mrem	1.43E-03	1.90E-02	1.35E-03	1.80E-02
GILLI	7.5	mrem	1.43E-03	1.90E-02	1.35E-03	1.80E-02

Cumulative Doses per Year

Organ	Tech Spec Limit	Units	Year to Ending Date	% of Tech Spec Limit
Bone	15.0	mrem	1.28E-04	8.54E-04
Liver	15.0	mrem	2.77E-03	1.85E-02
TBody	15.0	mrem	2.78E-03	1.85E-02
Thyroid	15.0	mrem	4.10E-03	2.73E-02
Kidney	15.0	mrem	2.78E-03	1.85E-02
Lung	15.0	mrem	2.77E-03	1.85E-02
GILLI	15.0	mrem	2.78E-03	1.85E-02

TABLE 2-5B  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO RADIOIODINES, TRITIUM,  
 AND PARTICULATES IN GASEOUS RELEASES

Unit: 2

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Cumulative Doses per Quarter

Organ	Tech Spec Limit	Unit	Quarter 3	% of Tech Spec Limit	Quarter 4	% of Tech Spec Limit
Bone	7.5	mrem	7.59E-05	1.01E-03	4.68E-05	6.24E-04
Liver	7.5	mrem	1.65E-03	2.21E-02	1.57E-03	2.10E-02
TBody	7.5	mrem	1.67E-03	2.22E-02	1.57E-03	2.10E-02
Thyroid	7.5	mrem	1.81E-03	2.41E-02	1.91E-03	2.55E-02
Kidney	7.5	mrem	1.65E-03	2.21E-02	1.57E-03	2.10E-02
Lung	7.5	mrem	1.65E-03	2.21E-02	1.57E-03	2.09E-02
GILLI	7.5	mrem	1.66E-03	2.21E-02	1.57E-03	2.10E-02

Cumulative Doses per Year

Organ	Tech Spec Limit	Units	Year to Ending Date	% of Tech Spec Limit
Bone	15.0	mrem	2.51E-04	1.67E-03
Liver	15.0	mrem	6.00E-03	4.00E-02
TBody	15.0	mrem	6.02E-03	4.01E-02
Thyroid	15.0	mrem	7.82E-03	5.21E-02
Kidney	15.0	mrem	6.00E-03	4.00E-02
Lung	15.0	mrem	6.00E-03	4.00E-02
GILLI	15.0	mrem	6.00E-03	4.00E-02



**Table 2-7A**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**GASEOUS EFFLUENTS - BATCH RELEASE SUMMARY**  
**UNIT 1**

**STARTING: 1-Jan-2002**

**ENDING: 30-Jun-2002**

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NUMBER OF BATCH RELEASES	:	0	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	0	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	0	MINUTES
AVERAGE TIME FOR BATCH RELEASES	:	0	MINUTES
MINIMUM TIME FOR A BATCH RELEASE	:	0	MINUTES

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There were no batch gaseous releases for this reporting period.

**Table 2-7A**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**GASEOUS EFFLUENTS - BATCH RELEASE SUMMARY**  
**UNIT 1**

**STARTING: 1-Jul-2002**

**ENDING: 31-Dec-2002**

---

NUMBER OF BATCH RELEASES	:	0	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	0	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	0	MINUTES
AVERAGE TIME FOR BATCH RELEASES	:	0	MINUTES
MINIMUM TIME FOR A BATCH RELEASE	:	0	MINUTES

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There were no batch gaseous releases for this reporting period.

**Table 2-7B**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**GASEOUS EFFLUENTS - BATCH RELEASE SUMMARY**  
**UNIT 2**

**STARTING: 1-Jan-2002**

**ENDING: 30-Jun-2002**

NUMBER OF BATCH RELEASES	:	0	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	0	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	0	MINUTES
AVERAGE TIME FOR BATCH RELEASES	:	0	MINUTES
MINIMUM TIME FOR A BATCH RELEASE	:	0	MINUTES

There were no batch gaseous releases for this reporting period.

**Table 2-7B**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**GASEOUS EFFLUENTS - BATCH RELEASE SUMMARY**  
**UNIT 2**

**STARTING: 1-Jul-2002**

**ENDING: 31-Dec-2002**

NUMBER OF BATCH RELEASES	:	0	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	0	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	0	MINUTES
AVERAGE TIME FOR BATCH RELEASES	:	0	MINUTES
MINIMUM TIME FOR A BATCH RELEASE	:	0	MINUTES

There were no batch gaseous releases for this reporting period.



**Table 2-8A**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**GASEOUS EFFLUENTS - ABNORMAL RELEASE SUMMARY**  
**UNIT 1**  
**STARTING: 1-Jan-2002**                      **ENDING: 30-Jun-2002**

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0	MINUTES
AVERAGE TIME FOR A RELEASE	:	0	MINUTES
MINIMUM TIME FOR A RELEASE	:	0	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

There were no abnormal gaseous releases for this reporting period.

**Table 2-8A**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**GASEOUS EFFLUENTS - ABNORMAL RELEASE SUMMARY**  
**UNIT 1**  
**STARTING: 1-Jul-2002**                      **ENDING: 31-Dec-2002**

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0	MINUTES
AVERAGE TIME FOR A RELEASE	:	0	MINUTES
MINIMUM TIME FOR A RELEASE	:	0	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

There were no abnormal gaseous releases for this reporting period.

**Table 2-8B**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**GASEOUS EFFLUENTS - ABNORMAL RELEASE SUMMARY**  
**UNIT 2**  
**STARTING: 1-Jan-2002**                      **ENDING: 30-Jun-2002**

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0	MINUTES
AVERAGE TIME FOR A RELEASE	:	0	MINUTES
MINIMUM TIME FOR A RELEASE	:	0	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

There were no abnormal gaseous releases for this reporting period.

**Table 2-8B**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**GASEOUS EFFLUENTS - ABNORMAL RELEASE SUMMARY**  
**UNIT 2**  
**STARTING: 1-Jul-2002**                      **ENDING: 31-Dec-2002**

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0	MINUTES
AVERAGE TIME FOR A RELEASE	:	0	MINUTES
MINIMUM TIME FOR A RELEASE	:	0	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

There were no abnormal gaseous releases for this reporting period.

### **3.0 Solid Waste**

#### **3.1 Regulatory Requirements**

The Process Control Program (PCP) and the ODCM requirements presented in this section are for Unit 1 and Unit 2 and are stated in part.

##### **3.1.1 Solid Radioactive Waste System**

PCP Section A.3.1 Solid Radioactive Waste System control states:

The solid radwaste system shall be used in accordance with the PROCESS CONTROL PROGRAM to provide for the SOLIDIFICATION of wet solid wastes and for the SOLIDIFICATION and packaging of other radioactive wastes, as required, to ensure that they meet requirements of 10 CFR Parts 20 and 71, prior to shipment of radioactive wastes from the site.

##### **3.1.2 Reporting Requirements**

Technical Specification 5.6.3 requires in part:

The Radioactive Effluent Release Report covering the operation of the unit shall be submitted in accordance with 10 CFR 50.36a. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be consistent with the objectives outlined in the ODCM and the Process Control Program and in conformance with 10 CFR 50.36a and 10 CFR 50, Appendix I, Section IV.B.1.

PCP Section A.4.1 states in part:

The Radioactive Effluent Release Report, submitted in accordance with Technical Specification 5.6.3, shall include a summary of the quantities of solid radwaste released from the units as outlined in Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," Revision 1, June 1974, with data summarized on a 6 month basis following the format of Appendix B thereof.

For each type of solid radwaste shipped offsite during the report period, the report shall include the following information:

- a. Container volume.
- b. Total curie quantity (specify whether determined by measurement or estimate).
- c. Principal radionuclides (specify whether determined by measurement or estimate).
- d. Type of waste (such as spent resin, compacted dry waste, evaporator bottoms).
- e. Type of container (such as LSA, type A, type B, large quantity).
- f. Solidification agent (such as cement).

Major changes to the solid radioactive waste treatment system shall be reported to the Nuclear Regulatory Commission in the Radioactive Effluent Release Report for the period in which the evaluation was reviewed and accepted by the PRB.

### **3.2 Solid Waste Data**

Regulatory Guide 1.21, Table 3 is found in this report as Table 3-1.

**TABLE 3-1**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**SOLID WASTE AND IRRADIATED FUEL SHIPMENTS**  
**UNIT 1 AND 2**

**STARTING: 1-Jan-2002**

**ENDING: 30-Jun-2002**

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

1. Type of waste	UNIT	6 month period	Est. Total ERROR %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m <sup>3</sup>	1.22E+01	
	Ci	1.53E+03	1.00 E 01
b. Dry compressible waste, contaminated equip. etc.	m <sup>3</sup>	6.31E+01	
	Ci	6.25E+01	2.00 E 01
c. Irradiated components, control rods,	m <sup>3</sup>		
	Ci		
d. Control Rod Drive Filters	m <sup>3</sup>		
	Ci		
e. Other (describe) Equip. etc.	m <sup>3</sup>		
	Ci		

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

ISOTOPE	PERCENT	CURIES
a. Fe-55	66.2	1.01E+03
Co-60	10.5	1.61E+02
Zn-65	9.5	1.50E+02
Mn-54	9.3	1.42E+02
Other	4.2	6.40E+01
b. Fe-55	64.1	4.00E+01
Co-60	12.4	7.76E+00
Mn-54	13.8	8.62E+00
Cr-51	4.63	2.89E+00
Other	5.09	3.18E+00
c.		
d.		
e.		

**3. Solid Waste Disposition**

Number of Shipments

4

Mode of Transportation

Tractor and Trailer

Destination

Barnwell/Envirocare

**B. IRRADIATED FUEL SHIPMENTS (Disposition)**

Number of Shipments

0

Mode of Transportation

N/A

Destination

N/A

**TABLE 3-1**  
**E. I. HATCH NUCLEAR PLANT**  
**RADIOACTIVE EFFLUENT RELEASE REPORT - 2002**  
**SOLID WASTE AND IRRADIATED FUEL SHIPMENTS**  
**UNIT 1 AND 2**

**STARTING: 1-Jul-2002**

**ENDING: 31-Dec-2002**

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

1. Type of waste	UNIT	6 month period	Est. Total ERROR %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m <sup>3</sup>	1.07E+01	
	Ci	7.70E+01	1.00 E 01
b. Dry compressible waste, contaminated equip. etc.	m <sup>3</sup>	2.86E+01	
	Ci	3.43E+00	2.00 E 01
c. Irradiated components, control rods,	m <sup>3</sup>		
	Ci		
d. Control Rod Drive Filters	m <sup>3</sup>		
	Ci		
e. Other (describe) Equip. etc.	m <sup>3</sup>		
	Ci		

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

ISOTOPE	PERCENT	CURIES
a. Fe-55	11.8	9.09E+00
Co-60	23.6	1.82E+01
Zn-65	44.9	3.46E+01
Mn-54	11.9	9.16E+00
Other	7.7	5.90E+00
b. Fe-55	64.1	2.20E+00
Co-60	12.4	4.30E-01
Mn-54	13.8	4.70E-01
Cr-51	4.63	1.60E-01
Other	5.09	1.70E-01
c.		
d.		
e.		

**3. Solid Waste Disposition**

Number of Shipments

All waste was sent to processors

Mode of Transportation

N/A

Destination

N/A

**B. IRRADIATED FUEL SHIPMENTS (Disposition)**

Number of Shipments

0

Mode of Transportation

N/A

Destination

N/A

**TABLE 3-1  
E. I. HATCH NUCLEAR PLANT  
RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS  
UNIT 1 AND 2**

**STARTING: 1-Jan-2002**

**ENDING: 30-Jun-2002**

TYPE OF WASTE	CURIE QUANTITY/ DETERMINED	PRINCIPAL NUCLIDES/ DETERMINATION	BURIAL CONTAINER DESCRIPTION	NUMBER OF CONTAINERS SHIPPED	VOLUME OF EACH CONTAINER CUBIC FEET (FT 3)	TYPE SHIPMENT/ CONTAINER	SOLIDIFICATION AGENT
Dewatered Resins	1530	Zn-65,Fe-55,Co-60 Mn-54	High Integrity Container	3.6 *See Note	120.3	14-210 DOT 7A TYPE A CASK / 8-120(B) CASK/ 14-210**STC CASK	N/A
Dry Active Waste	62.5	Fe-55,Co-60,Mn-54 Cr-51	B-25 Boxes/High Integrity Container	24 *See Note	96/132.4/ 202.1	**STC (B-25)/DOT 7A TYPE A CASK	N/A

\* Note: The actual size and number of the containers may vary due to the use of different burial containers by waste processors.

\*\* STC-Strong Tight Container

**TABLE 3-1  
E.I.HATCH NUCLEAR PLANT  
RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS  
UNIT 1 AND 2**

**STARTING: 1-JUL-2002**

**ENDING:31-DEC-2002**

TYPE OF WASTE	CURIE QUANTITY/ DETERMINED	PRINCIPAL NUCLIDES/ DETERMINATION	BURIAL CONTAINER DESCRIPTION	NUMBER OF CONTAINERS SHIPPED	VOLUME OF EACH CONTAINER CUBIC FEET (FT 3)	TYPE SHIPMENT/ CONTAINER	SOLIDIFICATION AGENT
Dewatered Resins	77	Zn-65,Fe-55,Co-60 Mn-54	High Integrity Container	3.2 *See Note	120.3	14-210 DOT 7A TYPE A CASK/ 14-210**STC CASK	N/A
Dry Active Waste	3.43	Fe-55,Co-60,Mn-54 Cr-51	B-25 Boxes/High Integrity Container	11 *See Note	96	**STC (B-25)	N/A

\* Note: The actual size and number of the containers may vary due to the use of different burial containers by waste processors.All resin waste for the second half of 2002 was shipped to Studsvik for processing prior to burial.

\*\* STC-Strong Tight Container

#### **4.0 Doses to Members of the Public Inside the Site Boundary**

##### **4.1 Regulatory Requirements**

ODCM 7.2.2.3 states in part that the Radioactive Effluent Release Report shall also include an assessment of the radiation doses from radioactive liquid and gaseous effluents to MEMBERS OF THE PUBLIC due to their activities inside the SITE BOUNDARY during the report period; this assessment must be performed in accordance with the ODCM.

##### **4.2 Demonstration of Compliance**

The locations of concern within the site boundary are the Roadside Park, the Camping Area, the Recreation Area, and the Visitors Center. Listed in Table 4-1 are: The distance and direction from a point midway between the center of Unit 1 and the Unit 2 reactors, the dispersion and deposition factors for any releases from the Main Stack (elevated) and from the reactor building (ground level); and the estimated maximum occupancy factor for an individual and the assumed age group of this individual.

The source term is not listed in Table 4-1 . The source term is listed in Tables 2-2A and 2-2B, for the elevated releases. Similarly the source term is listed in Tables 2-3A and 2-3B for the ground level releases.

The maximum doses in units of mrem accumulated by an individual MEMBER OF THE PUBLIC due to their activities inside the site boundary during the reporting period are presented in Table 4-1.



TABLE 4-1  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSE TO A MEMBER OF THE PUBLIC  
 DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
 Unit: Site

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Page: 1

Location Name	ROADSIDE PARK	
Distance (kilometers)	1.18E+00	
Sector	WNW	
Occupancy Factor	2.28E-04	(2.00E+00 hr/yr)
Age Group	CHILD	

Ground Level Releases:

Noble Gas X/Q (sec/m3)	7.83E-06
Particulate X/Q (sec/m3)	7.00E-06
Particulate D/Q (m-2)	2.01E-08

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

Elevated Releases:

Noble Gas X/Q (sec/m3)	2.42E-08
Particulate X/Q (sec/m3)	2.37E-08
Particulate D/Q (m-2)	1.29E-09

	Units	Quarter 1	Quarter 2	Quarters 1 and 2	Year to Ending Date
Bone	mrem	1.06E-07	1.12E-08	1.17E-07	1.17E-07
Liver	mrem	3.50E-07	3.12E-07	6.63E-07	6.63E-07
TBody	mrem	3.50E-07	3.12E-07	6.62E-07	6.62E-07
Thyroid	mrem	4.30E-07	3.26E-07	7.56E-07	7.56E-07
Kidney	mrem	3.51E-07	3.12E-07	6.63E-07	6.63E-07
Lung	mrem	3.59E-07	3.12E-07	6.72E-07	6.72E-07
GI-LLI	mrem	3.50E-07	3.12E-07	6.62E-07	6.62E-07

TABLE 4-1  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSE TO A MEMBER OF THE PUBLIC  
 DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
 Unit: Site

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Page: 2

Location Name	CAMPING AREA
Distance (kilometers)	1.27E+00
Sector	WNW
Occupancy Factor	5.48E-03 (4.80E+01 hr/yr)
Age Group	CHILD

Ground Level Releases:

Noble Gas X/Q (sec/m3)	7.03E-06
Particulate X/Q (sec/m3)	6.27E-06
Particulate D/Q (m-2)	1.80E-08

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

Elevated Releases:

Noble Gas X/Q (sec/m3)	2.38E-08
Particulate X/Q (sec/m3)	2.33E-08
Particulate D/Q (m-2)	1.21E-09

	Units	Quarter 1	Quarter 2	Quarters 1 and 2	Year to Ending Date
Bone	mrem	2.32E-06	2.51E-07	2.57E-06	2.57E-06
Liver	mrem	7.58E-06	6.73E-06	1.43E-05	1.43E-05
TBody	mrem	7.58E-06	6.73E-06	1.43E-05	1.43E-05
Thyroid	mrem	9.31E-06	7.02E-06	1.63E-05	1.63E-05
Kidney	mrem	7.59E-06	6.73E-06	1.43E-05	1.43E-05
Lung	mrem	7.77E-06	6.74E-06	1.45E-05	1.45E-05
GI-LLI	mrem	7.58E-06	6.73E-06	1.43E-05	1.43E-05

TABLE 4-1  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSE TO A MEMBER OF THE PUBLIC  
 DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY

Unit: Site

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Page: 3

Location Name	RECREATION AREA	
Distance (kilometers)	1.03E+00	
Sector	SSE	
Occupancy Factor	2.37E-02	(2.08E+02 hr/yr)
Age Group	CHILD	

Ground Level Releases:	
Noble Gas X/Q (sec/m3)	6.42E-06
Particulate X/Q (sec/m3)	5.73E-06
Particulate D/Q (m-2)	2.36E-08

Mixed Mode Releases:	
Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

Elevated Releases:	
Noble Gas X/Q (sec/m3)	3.30E-08
Particulate X/Q (sec/m3)	3.21E-08
Particulate D/Q (m-2)	1.56E-09

	Units	Quarter 1	Quarter 2	Quarters 1 and 2	Year to Ending Date
Bone	mrem	1.14E-05	1.01E-06	1.24E-05	1.24E-05
Liver	mrem	3.22E-05	2.66E-05	5.88E-05	5.88E-05
TBody	mrem	3.22E-05	2.66E-05	5.88E-05	5.88E-05
Thyroid	mrem	3.91E-05	2.78E-05	6.69E-05	6.69E-05
Kidney	mrem	3.22E-05	2.67E-05	5.88E-05	5.88E-05
Lung	mrem	3.29E-05	2.67E-05	5.96E-05	5.96E-05
GI-LLI	mrem	3.22E-05	2.66E-05	5.88E-05	5.88E-05

TABLE 4-1  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSE TO A MEMBER OF THE PUBLIC  
 DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Page: 4

Location Name VISITORS CENTER  
 Distance (kilometers) 6.94E-01  
 Sector WSW  
 Occupancy Factor 4.57E-04 (4.00E+00 hr/yr)  
 Age Group CHILD

Ground Level Releases:  
 Noble Gas X/Q (sec/m3) 1.87E-05  
 Particulate X/Q (sec/m3) 1.72E-05  
 Particulate D/Q (m-2) 5.47E-08

Mixed Mode Releases:  
 Noble Gas X/Q (sec/m3) N/A  
 Particulate X/Q (sec/m3) N/A  
 Particulate D/Q (m-2) N/A

Elevated Releases:  
 Noble Gas X/Q (sec/m3) 5.00E-08  
 Particulate X/Q (sec/m3) 4.97E-08  
 Particulate D/Q (m-2) 2.26E-09

	Units	Quarter 1	Quarter 2	Quarters 1 and 2	Year to Ending Date
Bone	mrem	4.87E-07	4.06E-08	5.28E-07	5.28E-07
Liver	mrem	1.69E-06	1.52E-06	3.21E-06	3.21E-06
TBody	mrem	1.69E-06	1.52E-06	3.21E-06	3.21E-06
Thyroid	mrem	2.08E-06	1.59E-06	3.67E-06	3.67E-06
Kidney	mrem	1.69E-06	1.52E-06	3.21E-06	3.21E-06
Lung	mrem	1.73E-06	1.52E-06	3.26E-06	3.26E-06
GI-LLI	mrem	1.69E-06	1.52E-06	3.21E-06	3.21E-06

TABLE 4-1  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSE TO A MEMBER OF THE PUBLIC  
 DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
 Unit: Site

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Page: 1

Location Name	ROADSIDE PARK	
Distance (kilometers)	1.18E+00	
Sector	WNW	
Occupancy Factor	2.28E-04	(2.00E+00 hr/yr)
Age Group	CHILD	

Ground Level Releases:

Noble Gas X/Q (sec/m3)	7.83E-06
Particulate X/Q (sec/m3)	7.00E-06
Particulate D/Q (m-2)	2.01E-08

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

Elevated Releases:

Noble Gas X/Q (sec/m3)	2.42E-08
Particulate X/Q (sec/m3)	2.37E-08
Particulate D/Q (m-2)	1.29E-09

	Units	Quarter 3	Quarter 4	Quarters 3 and 4	Year to Ending Date
Bone	mrem	1.99E-08	3.72E-08	5.71E-08	1.74E-07
Liver	mrem	3.28E-07	3.48E-07	6.76E-07	1.34E-06
TBody	mrem	3.28E-07	3.48E-07	6.76E-07	1.34E-06
Thyroid	mrem	3.30E-07	3.61E-07	6.91E-07	1.45E-06
Kidney	mrem	3.28E-07	3.48E-07	6.76E-07	1.34E-06
Lung	mrem	3.28E-07	3.51E-07	6.79E-07	1.35E-06
GI-LLI	mrem	3.28E-07	3.48E-07	6.76E-07	1.34E-06

TABLE 4-1  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSE TO A MEMBER OF THE PUBLIC  
 DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
 Unit: Site

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Page: 2

Location Name	CAMPING AREA	
Distance (kilometers)	1.27E+00	
Sector	WNW	
Occupancy Factor	5.48E-03	(4.80E+01 hr/yr)
Age Group	CHILD	

Ground Level Releases:

Noble Gas X/Q (sec/m3)	7.03E-06
Particulate X/Q (sec/m3)	6.27E-06
Particulate D/Q (m-2)	1.80E-08

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

Elevated Releases:

Noble Gas X/Q (sec/m3)	2.38E-08
Particulate X/Q (sec/m3)	2.33E-08
Particulate D/Q (m-2)	1.21E-09

	Units	Quarter 3	Quarter 4	Quarters 3 and 4	Year to Ending Date
Bone	mrem	4.42E-07	8.17E-07	1.26E-06	3.83E-06
Liver	mrem	7.07E-06	7.51E-06	1.46E-05	2.89E-05
TBody	mrem	7.07E-06	7.52E-06	1.46E-05	2.89E-05
Thyroid	mrem	7.12E-06	7.79E-06	1.49E-05	3.12E-05
Kidney	mrem	7.07E-06	7.51E-06	1.46E-05	2.89E-05
Lung	mrem	7.08E-06	7.57E-06	1.46E-05	2.92E-05
GI-LLI	mrem	7.07E-06	7.51E-06	1.46E-05	2.89E-05

TABLE 4-1  
 E. I. HATCH NUCLEAR PLANT  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSE TO A MEMBER OF THE PUBLIC  
 DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
 Unit: Site

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Page: 3

Location Name	RECREATION AREA	
Distance (kilometers)	1.03E+00	
Sector	SSE	
Occupancy Factor	2.37E-02	(2.08E+02 hr/yr)
Age Group	CHILD	

Ground Level Releases:

Noble Gas X/Q (sec/m3)	6.42E-06
Particulate X/Q (sec/m3)	5.73E-06
Particulate D/Q (m-2)	2.36E-08

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

Elevated Releases:

Noble Gas X/Q (sec/m3)	3.30E-08
Particulate X/Q (sec/m3)	3.21E-08
Particulate D/Q (m-2)	1.56E-09

	Units	Quarter 3	Quarter 4	Quarters 3 and 4	Year to Ending Date
Bone	mrem	1.78E-06	3.77E-06	5.55E-06	1.79E-05
Liver	mrem	2.80E-05	3.03E-05	5.83E-05	1.17E-04
TBody	mrem	2.80E-05	3.03E-05	5.83E-05	1.17E-04
Thyroid	mrem	2.82E-05	3.14E-05	5.96E-05	1.27E-04
Kidney	mrem	2.80E-05	3.03E-05	5.83E-05	1.17E-04
Lung	mrem	2.80E-05	3.05E-05	5.85E-05	1.18E-04
GI-LLI	mrem	2.80E-05	3.03E-05	5.83E-05	1.17E-04





## **5.0 Total Dose from Uranium Fuel Cycle (40 CFR 190)**

### **5.1 Regulatory Requirements**

*The annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC due to releases of radioactivity and to radiation from uranium fuel cycle sources shall be limited to less than or equal to 25 mrems to the whole body or to any organ, except the thyroid, which shall be limited to less than or equal to 75 mrems.*

### **5.2 Demonstration of Compliance**

No dose limits stated in ODCM Sections 2.1.3, 3.1.3, and 3.1.4 were exceeded. Therefore, compliance with 40 CFR 190 dose limits was demonstrated in accordance with the requirements of ODCM Section 5.1.3.

## **6.0 Meteorological Data**

The Radioactive Effluent Release Report, to be submitted by May 1 of each year, shall include an annual summary of hourly meteorological data collected over the previous year. This annual summary may be either in the form of an hour-by-hour listing of wind speed, wind direction, atmospheric stability, and precipitation (if measured), on magnetic tape, or, in the form of joint frequency distributions of wind speed, wind direction and atmospheric stability.

In lieu of submission with the Radioactive Effluent Release Report, the licensee has retained this summary of required meteorological data on site in a file. It will be provided to the NRC upon request.

## **7.0 Program Deviations**

### **7.1 Inoperable Liquid or Gaseous Effluent Monitoring Instrumentation**

#### **7.1.1 Regulatory Requirements**

ODCM, Chapter 7, Section 7.2.2.6.2 states that the Radioactive Effluent Release Report shall include deviations from the liquid and gaseous effluent monitoring instrumentation operability requirements included in Sections 2.1.1 and 3.1.1, respectively.

### **7.1.2 Description of Deviations**

There were no deviations from the liquid and gaseous effluent monitoring instrumentation operability requirements during this reporting period.

## **7.2 Tanks Exceeding Curie Content Limits**

### **7.2.1 Regulatory Requirements**

ODCM 7.2.2.6 states in part that the report shall include notifications if the contents within any outside temporary tank, for liquids, exceed the limit of Technical Specification 5.5.8.b.

### **7.2.2 Description of Deviations**

There were no outside temporary tanks, for liquids, that exceeded the limit of Technical Specification 5.5.8.b during this reporting period.

## **7.3 Effluent Sample Analysis Exceeding Minimum Detectable Concentration (MDC)**

### **7.3.1 Regulatory Requirements**

ODCM 7.2.2.6 states in part that deviations from MDC(s) required in Table 3-3 shall be included in the Radioactive Effluent Release Report.

### **7.3.2 Description of Deviation**

There were no deviations from MDC(s) required in Table 3-3 during this reporting period.

## **8.0 Changes to the Plant Hatch Offsite Dose Calculation Manual (ODCM)**

### **8.1 Regulatory Requirements**

Pursuant to Technical Specification 5.5.1 and ODCM Section 7.2.2.5, licensee initiated changes shall be submitted to the NRC in the form of a complete, legible copy of the entire ODCM as part of or concurrent with the Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (i.e., month and year) the change was implemented.

## **8.2 Description of Changes**

There were no changes to the ODCM in 2002.

## **9.0 Major Changes to Liquid, Gaseous, or Solid Radwaste Treatment Systems**

### **9.1 Regulatory Requirements**

The Radioactive Effluent Release Report shall include. . . . any major change to liquid, gaseous, or solid radwaste treatment systems pursuant to ODCM Chapter 7, Section 7.2.2.7.

### **9.2 Description of Major Changes**

#### **Gaseous Radwaste System**

There were no major changes to the gaseous radwaste system during this reporting period.

#### **Solid Radwaste System**

There were no major changes to the solid radwaste system during this reporting period.

#### **Liquid Radwaste System**

There were no major changes to the Liquid Radwaste Treatment System during this reporting period.

**SOUTHERN COMPANY**  
**E. I. HATCH NUCLEAR PLANT**  
**UNITS NO. 1 & 2**  
**ANNUAL REPORT**

**JANUARY 1, 2002 - DECEMBER 31, 2002**

**APPENDIX A**

## **Release of Radioactive RHR Service Water for 2002**

The following historical information is provided to create a perspective for the release of radioactivity during the year 2002 relative to the RHR Service Water System.

In 1996, the analysis of samples from the Unit 1 RHR "B" Loop service water (RHRSW) system identified several radionuclides at very low concentrations. The first indication of contamination was noted on August 8, 1996 and the second indication was noted on August 23, 1996. The total activity in the RHRSW contained within the heat exchanger, which has a volume of approximately 4000 gallons, was respectively estimated to be about 13.7  $\mu\text{Ci}$  and 25.6  $\mu\text{Ci}$ . On August 23, 1996 repairs were made to a  $\Delta p$  instrument in an effort to stop the inleakage into the service water side of the heat exchanger. To determine if the leak had been repaired, the service water loop of the heat exchanger was decontaminated by flushing and the service water in the loop was then resampled and analyzed. The circulating water flume has a blowdown line, which diverts a small portion of the total circulating water to the river via the discharge structure. This resulted in a release to an unrestricted area. Though this release was both monitored and controlled, it was not through the normally utilized liquid radwaste system but the release to the unrestricted area did in fact take the same release path to the river. The regulatory discreteness of this release is discussed in the 1996 evaluation of the release, which is documented in the 10CFR50.59 Evaluation titled "Unit 1 RHR Service Water: Release of Contaminated Water."

The requirements of the Radioactive Effluent Controls Program are spelled out in TS 5.5.4.

The Offsite Dose Calculation Manual (ODCM) implements this program and it conforms to the requirements of 10CFR50.36a for the control of radioactive effluents and for maintaining the doses as low as reasonable achievable. Compliance with TS 5.5.4 regarding liquid releases can be assured by adhering to the requirements of ODCM sections 2.1.2, 2.1.3 and 2.1.4 which respectively provide limits on the concentration of the radioactive material at the point of release to an unrestricted area, the resultant dose to a member of the public from the release, and the necessity of using the radwaste treatment system.

MWO 1-96-02845 was worked during the Unit 1 outage to repair the leaks in the U1 RHR "B" Heat Exchanger. The RHR side of the Heat Exchanger was pressurized with helium and a helium detector on the RHRSW side was used to look for the presence of leaks. Based on this it was determined that one of the outermost tubes (tube 1-1) was definitely leaking. No other tubes were identified as definite leakers; however, the eight tubes closest to tube 1-1 were identified as possible leakers.

Integrated Technologies, Inc. performed an eddy current inspection of 245 of the tubes, including all of the suspected leakers and surrounding tubes. This inspection also identified tube 1-1 as a leaker. The tube breach is located next to the top support in the outlet leg. The cause is unknown. No other leaking tubes were identified.

The conservative decision was made to plug the leaker as well as the eight surrounding tubes. After plugging the tubes a hydrostatic pressure test was conducted at 300 psi and the Heat Exchanger was inspected for signs of leakage. No leakage was noted at this time. The Heat Exchanger was deconned, closed up and placed back in service. The Chemistry Department has sampled and monitored the activity during the operation of the Heat Exchanger.

The highest concentrations of radionuclides found in the RHRSW samples for 2002 were from 7/08/02, when the total concentration released was 5.0E-8  $\mu\text{Ci/ml}$ . As shown in the following table, the highest concentrations were found in 1998, when the total concentration released was 1.69E-6  $\mu\text{Ci/ml}$ .

Radionuclide	1998 ( $\mu\text{Ci/ml}$ )	1999 ( $\mu\text{Ci/ml}$ )	2000 ( $\mu\text{Ci/ml}$ )	2001 ( $\mu\text{Ci/ml}$ )	2002 ( $\mu\text{Ci/ml}$ )
Cr-51				3.16E-7	
Mn-54	4.95E-7		2.49E-7	2.53E-7	2.78E-8
Fe-59				1.19E-7	
Co-60	1.12E-6	2.27E-8	2.82E-7	1.99E-7	1.995E-7
Zn-65	7.96E-8			2.24E-7	

Fe-59 was identified in one sample( 7/18/01). Heat exchanger testing and the analysis result indicates no new leaks to the system. The results of the samples analyzed in 2002 indicate we are monitoring residual contamination from the 1996 leaks.

ODCM section 2.1.2 requires that the concentrations of the radioactive materials released be limited to 10 times (10X) the concentrations specified in 10CFR20, Appendix B, Table 2, Column 2, with the exception for dissolved or entrained noble gases whose concentration shall be limited to 1 E-4  $\mu\text{Ci/ml}$ .

The following discussion is based on a release duration of 1 minute, a release volume of 4,000 gallons, a total dilution of only 10,000 gallons, and the radionuclide concentrations from 1997. This is a very conservative estimate, since credit for the additional dilution provided by the circulating water flume was not taken into consideration and the activity from 1997 was higher with more radionuclides. The sum of the ratios of the concentration of each radionuclide in the mixture to its effluent concentration limit (ECL) was 1.15. The sum of the ECL fractions must be less than ten (<10) to ensure that the concentration limit for the mixture is not exceeded. As can be seen, the sum is much less than ten. (10CFR20 Appendix B states that the sum of the fractions of the nuclides divided by their effluent concentration limits (ECLs) must be less than one. Further NRC guidance, Technical Specifications, and the ODCM allow the ECLs in Appendix B to be increased by a factor of 10. Mathematically this can be achieved by dividing the nuclides by the original 10CFR 20 Appendix B ECLs and insuring that the sum of the fractions is less than 10. The plant software performs the sum of the ECL fractions and comparisons this way to insure compliance with 10CRF20 limits.)

ODCM section 2.1.3 requires that the annual dose to a member of the public, in unrestricted areas, due to liquid releases from each unit be limited to 3 mrem to the total body and 10 mrem to any organ. The dose in any quarter is limited to half of the annual limits. Dose calculations were performed for this release, in accordance with ODCM section 2.4, to evaluate the doses relative to this release. The total body dose was 6.66 E-5 mrem (2.2 E-3 % of its annual limit) and the highest organ dose was 7.39 E-5 mrem to the GI-LLI, gastrointestinal track, (7.4 E-4 % of its annual limit). The resultant doses are quite low and essentially do not contribute to the quarterly and/or the annual dose limits. This provides a high degree of assurance that the release in no way presented a threat to the health and safety of a member of the public, even using the very low dilution rate. With a higher dilution value the ECL fraction and the resultant doses are reduced further and become even less significant.

ODCM section 2.1.4 requires that the radwaste system be employed to reduce the radioactivity in the liquid waste prior to its discharge whenever the projected dose due to the release would exceed 0.06 mrem to the total body and 0.2 mrem to any organ. As shown in the previous paragraph, the total body dose due to the release of the RHRSW was much less than 0.06 mrem and the maximum organ dose was much less than 0.2 mrem.

10CFR20.1302 (b)(I) requires that a licensee show compliance with the annual limit of 100 mrem to any member of the public by demonstrating that certain concentration limits of the effluent at the point of release are not exceeded. This was addressed above in the assessment of ODCM section 2.1.2.

10CFR20.1501 (a)(2)(ii) & (iii) requires the licensee to evaluate the concentration or quantities of radioactive materials and the potential radiological hazard, respectively. The concentrations and quantity of the radioactive materials in the release was evaluated by sampling and analysis as discussed above. The potential radiological hazard was also evaluated by performance of the dose calculations, which would be a result of the release, as discussed above in the assessment of ODCM section 2.1.3.

This release does not constitute a Licensee Event Report (LER) based on the following. 10CFR 50.73 (A)(2)(VIII)(B) requires the licensee to report any liquid effluent release which exceeds 20 times the applicable concentration specified in 10CFR20, Appendix B, Table 2, column 2, at the point of entry into the receiving waters (i.e., unrestricted area). This is justified as discussed above in the assessment of ODCM section 2.1.3; it can be seen that the concentrations are much less than the applicable limits.

Design Criterion 64 in Appendix A to 10CFR50 requires the monitoring of effluent discharge paths. Performance of the sampling and analysis of the RHRSW service water before its release complied with this criterion.

Compliance with Appendix I to 10CFR50 was assured by adherence to the applicable ODCM sections as discussed above. Furthermore, Appendix I is the bases for one of these ODCM sections.

40CFR190 is concerned with the annual dose to any member of the public due to releases of radioactivity and to radiation from the uranium fuel cycle sources. This is addressed by TS 5.5.4.j and implemented by ODCM section 5.1.2, which states that additional calculation and reporting is required when any of the dose limits as specified in the ODCM sections 2.1.3, 3.1.3, or 3.1.4 are exceeded by a factor of two. This requirement is not applicable for the release based on the doses as discussed above in the assessment of ODCM section 2.1.3.

NRC Bulletin 80-10, "Contamination of Nonradioactive Systems and Resulting Potential for Unmonitored, Uncontrolled Releases of Radioactivity to the Environment" lists four actions for the licensee. First: identify the affected systems; the Unit 1 RHR "B" loop was identified. Second: establish a sampling/analysis of monitoring program for the affected systems; this was done. Third: restrict use of the system until the cause of the contamination is identified and corrected, and the system is decontaminated. The release was the result of identifying the leakage, implementation of corrective action and of decontaminating the system. The third action also states, that, if it is considered necessary to continue operation of the system as contaminated, then a 10CFR50.59 evaluation must be performed. This was done in 1996. The fourth action calls attention to the regulations to be complied with and states that releases must be monitored and controlled. The release of the RHR service water was sampled and monitored (evaluated) by the sampling and analysis prior to the flush taking place; the release was controlled in the fact that the flush was a planned evolution.

Administrative controls and sampling have been established to ensure that any future releases would be within 10CFR20 limits, reference Lab Standing Order, SO-HPC-001-0402, and 64CH-ADM-001-0S.



**ENCLOSURE 2**

**Joseph M. Farley Nuclear Plant**

**Annual Radioactive Effluent Release Report for 2002**

SOUTHERN NUCLEAR OPERATING COMPANY  
FARLEY NUCLEAR PLANT UNIT NO. ONE  
LICENSE NO. NPF-2  
AND  
FARLEY NUCLEAR PLANT UNIT NO. TWO  
LICENSE NO. NPF-8

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT  
CALENDAR YEAR 2002

FARLEY NUCLEAR PLANT  
ANNUAL RADIOACTIVE EFFLUENT  
RELEASE REPORT

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## 1.0 LIQUID EFFLUENTS

This section contains applicable ODCM limits for liquid effluents as well as the quantities of radioactive liquid effluents released during 2002. These quantities are summarized on a quarterly basis and include any unplanned releases. A tabulation of the total body and organ doses which were calculated in accordance with ODCM 2.4 are presented to show conformance with the limits of ODCM 2.1.3.

### 1.1 Regulatory Requirements

#### 1.1.1 Concentration Limits

Technical Specifications 5.5.4.b and 5.5.4.c state that the concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS (see ODCM Figure 10-1) shall be limited at all times to ten times the concentrations specified in Appendix B, Table 2, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 1.0E-04 uCi/ml total activity.

#### 1.1.2 Dose Limits

Technical Specifications 5.5.4.d and 5.5.4.e state that the dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released, from each unit, to UNRESTRICTED AREAS (see ODCM Figure 10-1) shall be limited:

- a. During any calendar quarter to less than or equal to 1.5 mrem to the total body and to less than or equal to 5 mrem to any organ, and
- b. During any calendar year to less than or equal to 3 mrem to the total body and to less than or equal to 10 mrem to any organ.

#### 1.2 Effluent Concentration Limit (ECL)

ECL values used in determining allowable liquid radwaste release rates and concentrations, for principal gamma emitters, I-131, tritium, Sr-89, Sr-90 and Fe-55, are taken from 10CFR Part 20, Appendix B, Table 2, Column 2. A tolerance factor of up to 10 is utilized to allow flexibility in establishing practical monitor setpoints which can accommodate effluent releases at concentrations higher than the ECL values stated in 10CFR20, Appendix B, Table 2, Column 2.

For dissolved or entrained noble gases in liquid radwaste, the ECL is 1.0E-04 uCi/ml total activity.

For gross alpha in liquid radwaste, the ECL is 2.0E-09 uCi/ml.

Furthermore, for all the above radionuclides, or categories of radioactivity, the overall ECL fraction is determined in accordance with 10CFR Part 20, Appendix B.

### 1.3 Measurements and Approximation of Total Radioactivity

The radionuclides listed below are considered when evaluating liquid effluents:

MN-54	CS-134
FE-59	CS-137
CO-58	CE-141
CO-60	CE-144
ZN-65	MO-99
SR-89	FE-55
SR-90	H-3
I-131	

#### 1.3.1 Total Radioactivity Determination

Batch Releases: Representative pre-release grab samples are obtained and analyzed in accordance with ODCM Table 2-3. Isotopic analyses are performed using the computerized pulse height analysis system utilizing high resolution germanium detectors. Isotopic values thus obtained are used for release rate calculations as specified in the ODCM. Only those nuclides that are detected are used in the calculations. All Strontium and Iron-55 samples are sent offsite to the Georgia Power Environmental Laboratory for analysis. Gross beta and gross alpha determinations are made using 2 pi gas flow proportional counters. Tritium determinations are made using liquid scintillation techniques. Dissolved gases are determined employing grab sampling techniques and then counting on the pulse height analyzer.

The sample analyses results are used along with the ECL values to determine the ECL fraction for the planned release. The ECL fraction is then used, with the appropriate safety factors, and the expected dilution stream flow, to calculate the maximum permissible release rate and a liquid effluent monitor setpoint. The monitor setpoint is calculated to assure that the limits of the ODCM are not exceeded. A monitor reading in excess of the calculated setpoint will result in automatic termination of the liquid radwaste discharge.

Radionuclide concentrations, safety factors, dilution stream flow rate, and liquid effluent radiation monitor calibration factors are used by the computer to generate a pre-release printout. If the release is not permissible, appropriate warnings will be displayed on the computer screen and on the printout. If the release is permissible, it is approved by a Chemistry Technician. The release permit is transferred from the Chemistry Department to the Operations Department for release. When the release is completed, the actual release data are provided to the Chemistry

Department. These release data, including release rate and release duration, are input into the computer and a post-release printout is generated. This printout contains the actual release rates, radionuclide concentrations and quantities, dilution flow, and calculated doses to an individual.

Continuous Releases: Continuous releases are analogous to batch releases except that they are analyzed on a weekly composite basis in accordance with ODCM Table 2-3.

Typically achieved liquid effluent sample analyses minimum detectable concentrations are reported in Table 1-4.

#### 1.3.2 Total Error Estimation

The maximum error associated with volume and flow measurements, based upon plant calibration practice is estimated to be + or - 10%. The average error associated with counting is estimated to be less than + or - 15%.

#### 1.4 Liquid Effluent Release Data

Summaries of all radioactive liquid effluents released from Units 1 and 2 during 2002 are presented in accordance with Regulatory Guide 1.21 Tables 2A and 2B. Information required by Table 2A is found in this report in Tables 1-1A, 1-1B, and 1-1C; Table 2-B information is presented in Tables 1-2A, 1-2B, and 1-2C. Data is presented on a quarterly basis as required by Regulatory Guide 1.21 for all four quarters.

#### 1.5 Radiological Impact Due to Liquid Releases

The total body and organ doses for Units 1 and 2 are provided in the following tables in order to show conformance with the limits of ODCM 2.1.3:

Unit 1 2002 Doses to a Member of the Public due to Liquid Releases: Table 1-3A

Unit 2 2002 Doses to a Member of the Public due to Liquid Releases: Table 1-3B

#### 1.6 Liquid Effluents - Batch Releases

Batch release information for Units 1 and 2 is summarized in the following tables:

Unit 1 2002 Liquid Effluents - Batch Release Summary: Table 1-5A

Unit 2 2002 Liquid Effluents - Batch Release Summary: Table 1-5B

### 1.7 Liquid Effluents - Abnormal Releases

There were no abnormal releases on Unit 1 during 2002.

There were no abnormal releases on Unit 2 during 2002.

Abnormal release information for Units 1 and 2 is summarized in the following tables:

Unit 1 2002 Liquid Effluents - Abnormal Release  
Summary: Table 1-6A

Unit 2 2002 Liquid Effluents - Abnormal Release  
Summary: Table 1-6B

TABLE 1-1A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Summation of All Releases  
 Unit: 1  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	1.39E-02	9.02E-03	2.50E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	8.96E-10	5.70E-10	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	1.04E+02	1.57E+02	2.50E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	6.72E-06	9.90E-06	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. DISSOLVED AND ENTRAINED GASES</b>				
1. TOTAL RELEASE	CURIES	1.31E-05	8.27E-05	2.50E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	8.47E-13	5.23E-12	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>D. GROSS ALPHA RADIOACTIVITY</b>				
1. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00	2.50E+01
<b>E. WASTE VOL RELEASED(PRE-DILUTION)</b>	LITERS	5.20E+07	9.00E+05	1.00E+01
<b>F. VOLUME OF DILUTION WATER USED</b>	LITERS	1.54E+10	1.57E+10	1.00E+01

\*      Applicable limits are expressed in terms of dose.    See Tables 1-3A and 1-3B of this report.

TABLE 1-1A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Summation of All Releases  
 Unit: 1  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	6.69E-03	1.97E-02	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	4.26E-10	1.18E-09	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	2.98E+02	2.54E+02	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.90E-05	1.52E-05	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. DISSOLVED AND ENTRAINED GASES				
-----				
1. TOTAL RELEASE	CURIES	2.86E-04	9.57E-04	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.82E-11	5.74E-11	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
D. GROSS ALPHA RADIOACTIVITY				
-----				
1. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00	2.50E+01
-----				
E. WASTE VOL RELEASED(PRE-DILUTION)	LITERS	1.10E+06	1.30E+06	1.00E+01
-----				
F. VOLUME OF DILUTION WATER USED	LITERS	1.56E+10	1.66E+10	1.00E+01
-----				

\* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.

TABLE 1-1B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Summation of All Releases  
 Unit: 2  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	1.39E-02	1.42E-02	2.50E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	9.37E-10	9.15E-10	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	1.36E+02	2.08E+02	2.50E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	9.18E-06	1.34E-05	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. DISSOLVED AND ENTRAINED GASES</b>				
1. TOTAL RELEASE	CURIES	2.26E-05	3.32E-04	2.50E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.52E-12	2.13E-11	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>D. GROSS ALPHA RADIOACTIVITY</b>				
1. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00	2.50E+01
<b>E. WASTE VOL RELEASED(PRE-DILUTION)</b>	LITERS	5.00E+05	8.00E+05	1.00E+01
<b>F. VOLUME OF DILUTION WATER USED</b>	LITERS	1.47E+10	1.55E+10	1.00E+01

\* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.



TABLE 1-1B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Summation of All Releases  
 Unit: 2  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	5.32E-03	4.65E-02	2.50E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	3.63E-10	3.19E-09	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	2.89E+02	1.77E+02	2.50E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.97E-05	1.22E-05	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. DISSOLVED AND ENTRAINED GASES</b>				
1. TOTAL RELEASE	CURIES	6.73E-04	1.23E-03	2.50E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	4.60E-11	8.46E-11	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>D. GROSS ALPHA RADIOACTIVITY</b>				
1. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00	2.50E+01
<b>E. WASTE VOL RELEASED(PRE-DILUTION)</b>	LITERS	2.72E+07	2.69E+07	1.00E+01
<b>F. VOLUME OF DILUTION WATER USED</b>	LITERS	1.46E+10	1.45E+10	1.00E+01

\* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.

TABLE 1-1C  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Summation of All Releases  
 Unit: Site  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	2.77E-02	2.33E-02	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	9.16E-10	7.41E-10	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	2.40E+02	3.65E+02	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	7.92E-06	1.16E-05	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. DISSOLVED AND ENTRAINED GASES				
-----				
1. TOTAL RELEASE	CURIES	3.57E-05	4.15E-04	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	3.50E-15	1.32E-11	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
D. GROSS ALPHA RADIOACTIVITY				
-----				
1. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00	2.50E+01
-----				
E. WASTE VOL RELEASED(PRE-DILUTION)	LITERS	5.25E+07	1.70E+06	1.00E+01
-----				
F. VOLUME OF DILUTION WATER USED	LITERS	3.01E+10	3.12E+10	1.00E+01
-----				

\* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.

TABLE 1-1C  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Summation of All Releases  
 Unit: Site  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	1.20E-02	6.62E-02	2.50E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	3.95E-10	2.12E-09	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	5.87E+02	4.31E+02	2.50E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.93E-05	1.38E-05	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. DISSOLVED AND ENTRAINED GASES</b>				
1. TOTAL RELEASE	CURIES	9.59E-04	2.19E-03	2.50E+01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	3.16E-11	7.01E-11	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>D. GROSS ALPHA RADIOACTIVITY</b>				
1. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00	2.50E+01
<b>E. WASTE VOL RELEASED(PRE-DILUTION)</b>	LITERS	2.83E+07	2.82E+07	1.00E+01
<b>F. VOLUME OF DILUTION WATER USED</b>	LITERS	3.02E+10	3.11E+10	1.00E+01

\* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.

TABLE 1-2A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents

Unit: 1  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

NUCLIDE	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
H-3	CURIES	0.00E+00	0.00E+00	1.04E+02	1.57E+02

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	1.16E-03	9.86E-04
CO-57	CURIES	0.00E+00	0.00E+00	7.30E-06	7.31E-06
CO-58	CURIES	0.00E+00	0.00E+00	2.61E-03	1.07E-03
CO-60	CURIES	0.00E+00	0.00E+00	1.19E-03	8.85E-04
CR-51	CURIES	0.00E+00	0.00E+00	3.06E-05	0.00E+00
CS-134	CURIES	0.00E+00	0.00E+00	0.00E+00	7.93E-06
CS-137	CURIES	0.00E+00	0.00E+00	1.10E-04	1.06E-04
FE-55	CURIES	0.00E+00	0.00E+00	1.68E-03	2.42E-03
MN-54	CURIES	0.00E+00	0.00E+00	3.44E-05	1.81E-05
MO-90	CURIES	0.00E+00	0.00E+00	0.00E+00	9.93E-07
NB-95	CURIES	0.00E+00	0.00E+00	6.93E-05	8.43E-07
NB-97	CURIES	0.00E+00	0.00E+00	9.01E-05	7.94E-05
SB-125	CURIES	0.00E+00	0.00E+00	2.66E-04	9.47E-05
SN-117M	CURIES	0.00E+00	0.00E+00	5.86E-06	4.16E-06
SR-89	CURIES	0.00E+00	0.00E+00	0.00E+00	2.93E-05
SR-90	CURIES	2.77E-03	0.00E+00	1.05E-05	0.00E+00
SR-92	CURIES	0.00E+00	0.00E+00	4.98E-05	4.22E-05
TE-125M	CURIES	0.00E+00	0.00E+00	2.78E-03	2.55E-03
ZN-65	CURIES	0.00E+00	0.00E+00	9.87E-04	7.21E-04
ZR-95	CURIES	0.00E+00	0.00E+00	6.65E-06	0.00E+00
TOTALS	CURIES	2.77E-03	0.00E+00	1.11E-02	9.02E-03

TABLE 1-2A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents  
 Unit: 1  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
DISSOLVED AND ENTRAINED GASES					
AR-41	CURIES	0.00E+00	0.00E+00	3.08E-06	0.00E+00
XE-131M	CURIES	0.00E+00	0.00E+00	0.00E+00	1.87E-05
XE-133	CURIES	0.00E+00	0.00E+00	1.00E-05	6.40E-05
TOTALS	CURIES	0.00E+00	0.00E+00	1.31E-05	8.27E-05
G-ALPHA	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-4 for typically achieved minimum detectable concentrations.

TABLE 1-2A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents  
 Unit: 1  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
H-3	CURIES	0.00E+00	0.00E+00	2.98E+02	2.54E+02

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	1.83E-03	2.95E-03
CE-139	CURIES	0.00E+00	0.00E+00	0.00E+00	6.09E-07
CO-57	CURIES	0.00E+00	0.00E+00	9.23E-07	1.16E-06
CO-58	CURIES	0.00E+00	0.00E+00	6.74E-04	1.69E-03
CO-60	CURIES	0.00E+00	0.00E+00	1.09E-03	1.66E-03
CR-51	CURIES	0.00E+00	0.00E+00	0.00E+00	1.14E-03
CS-134	CURIES	0.00E+00	0.00E+00	2.27E-06	0.00E+00
CS-137	CURIES	0.00E+00	0.00E+00	1.14E-04	9.40E-05
FE-55	CURIES	0.00E+00	0.00E+00	1.88E-03	1.58E-03
FE-59	CURIES	0.00E+00	0.00E+00	0.00E+00	7.28E-06
MN-54	CURIES	0.00E+00	0.00E+00	3.66E-05	4.53E-05
NB-95	CURIES	0.00E+00	0.00E+00	6.02E-06	4.21E-05
NB-97	CURIES	0.00E+00	0.00E+00	7.70E-05	1.12E-04
PM-149	CURIES	0.00E+00	0.00E+00	2.29E-05	0.00E+00
SN-117M	CURIES	0.00E+00	0.00E+00	0.00E+00	5.66E-05
SR-92	CURIES	0.00E+00	0.00E+00	5.42E-05	9.05E-05
TE-125M	CURIES	0.00E+00	0.00E+00	0.00E+00	9.05E-03
ZN-65	CURIES	0.00E+00	0.00E+00	8.97E-04	1.15E-03
ZR-95	CURIES	0.00E+00	0.00E+00	0.00E+00	2.21E-05
TOTALS	CURIES	0.00E+00	0.00E+00	6.69E-03	1.97E-02

TABLE 1-2A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents  
 Unit: 1  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
DISSOLVED AND ENTRAINED GASES					
XE-131M	CURIES	0.00E+00	0.00E+00	0.00E+00	3.31E-05
XE-133	CURIES	0.00E+00	0.00E+00	2.73E-04	9.24E-04
XE-137	CURIES	0.00E+00	0.00E+00	1.30E-05	0.00E+00
TOTALS	CURIES	0.00E+00	0.00E+00	2.86E-04	9.57E-04
G-ALPHA	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-4 for typically achieved minimum detectable concentrations.

TABLE 1-2B\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents  
 Unit: 2  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

NUCLIDE	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
H-3	CURIES	0.00E+00	0.00E+00	1.36E+02	2.08E+02

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	1.54E-04	1.20E-03
CO-57	CURIES	0.00E+00	0.00E+00	4.40E-05	6.49E-05
CO-58	CURIES	0.00E+00	0.00E+00	4.14E-03	3.70E-03
CO-60	CURIES	0.00E+00	0.00E+00	8.90E-04	2.44E-03
CS-137	CURIES	0.00E+00	0.00E+00	3.05E-05	1.18E-05
FE-55	CURIES	0.00E+00	0.00E+00	3.79E-04	1.46E-03
MN-54	CURIES	0.00E+00	0.00E+00	4.09E-05	8.49E-05
NB-95	CURIES	0.00E+00	0.00E+00	2.22E-06	0.00E+00
NB-97	CURIES	0.00E+00	0.00E+00	7.25E-05	9.69E-05
PR-144	CURIES	0.00E+00	0.00E+00	1.01E-04	0.00E+00
SB-125	CURIES	0.00E+00	0.00E+00	1.34E-04	7.86E-05
SN-117M	CURIES	0.00E+00	0.00E+00	1.75E-05	1.84E-06
SR-89	CURIES	0.00E+00	0.00E+00	1.01E-05	0.00E+00
SR-92	CURIES	0.00E+00	0.00E+00	1.31E-06	6.46E-05
TE-125M	CURIES	0.00E+00	0.00E+00	6.95E-03	2.99E-03
ZN-65	CURIES	0.00E+00	0.00E+00	9.16E-04	2.05E-03
TOTALS	CURIES	0.00E+00	0.00E+00	1.39E-02	1.42E-02



TABLE 1-2B\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents  
 Unit: 2  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
DISSOLVED AND ENTRAINED GASES					
XE-133	CURIES	0.00E+00	0.00E+00	2.26E-05	3.32E-04
TOTALS	CURIES	0.00E+00	0.00E+00	2.26E-05	3.32E-04
G-ALPHA	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-4 for typically achieved minimum detectable concentrations.

TABLE 1-2B\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents  
 Unit: 2  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

NUCLIDE	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
H-3	CURIES	0.00E+00	0.00E+00	2.89E+02	1.77E+02

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	1.40E-03	3.03E-03
CD-109	CURIES	0.00E+00	0.00E+00	0.00E+00	2.12E-05
CO-57	CURIES	0.00E+00	0.00E+00	5.52E-06	8.12E-05
CO-58	CURIES	0.00E+00	0.00E+00	8.15E-04	1.48E-02
CO-60	CURIES	0.00E+00	0.00E+00	1.27E-03	2.39E-03
CR-51	CURIES	0.00E+00	0.00E+00	1.80E-05	3.86E-03
CS-137	CURIES	0.00E+00	0.00E+00	1.23E-05	1.10E-05
FE-55	CURIES	0.00E+00	0.00E+00	1.14E-03	2.70E-03
FE-59	CURIES	0.00E+00	0.00E+00	0.00E+00	5.37E-05
I-133	CURIES	0.00E+00	0.00E+00	0.00E+00	1.22E-06
MN-54	CURIES	0.00E+00	0.00E+00	4.40E-06	1.20E-04
NB-95	CURIES	0.00E+00	0.00E+00	0.00E+00	4.13E-04
NB-97	CURIES	0.00E+00	0.00E+00	1.22E-04	1.89E-04
RB-86	CURIES	0.00E+00	0.00E+00	1.74E-05	0.00E+00
SN-117M	CURIES	0.00E+00	0.00E+00	0.00E+00	7.61E-05
SR-92	CURIES	0.00E+00	0.00E+00	4.56E-05	1.01E-04
TC-101	CURIES	0.00E+00	0.00E+00	0.00E+00	1.35E-06
TE-125M	CURIES	0.00E+00	0.00E+00	0.00E+00	1.50E-02
TE-127M	CURIES	0.00E+00	0.00E+00	0.00E+00	6.99E-05
ZN-65	CURIES	0.00E+00	0.00E+00	4.83E-04	3.38E-03
ZR-95	CURIES	0.00E+00	0.00E+00	0.00E+00	1.89E-04
TOTALS	CURIES	0.00E+00	0.00E+00	5.32E-03	4.65E-02

TABLE 1-2B\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents  
 Unit: 2  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
DISSOLVED AND ENTRAINED GASES					
AR-41	CURIES	0.00E+00	0.00E+00	9.62E-06	0.00E+00
XE-133	CURIES	0.00E+00	0.00E+00	6.64E-04	1.23E-03
TOTALS	CURIES	0.00E+00	0.00E+00	6.73E-04	1.23E-03
G-ALPHA	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-4 for typically achieved minimum detectable concentrations.

TABLE 1-2C\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents  
 Unit: Site  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

NUCLIDE	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
H-3	CURIES	0.00E+00	0.00E+00	2.40E+02	3.65E+02

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	1.31E-03	2.19E-03
CO-57	CURIES	0.00E+00	0.00E+00	5.13E-05	7.22E-05
CO-58	CURIES	0.00E+00	0.00E+00	6.75E-03	4.77E-03
CO-60	CURIES	0.00E+00	0.00E+00	2.08E-03	3.32E-03
CR-51	CURIES	0.00E+00	0.00E+00	3.06E-05	0.00E+00
CS-134	CURIES	0.00E+00	0.00E+00	0.00E+00	7.93E-06
CS-137	CURIES	0.00E+00	0.00E+00	1.40E-04	1.18E-04
FE-55	CURIES	0.00E+00	0.00E+00	2.06E-03	3.88E-03
MN-54	CURIES	0.00E+00	0.00E+00	7.53E-05	1.03E-04
MO-90	CURIES	0.00E+00	0.00E+00	0.00E+00	9.93E-07
NB-95	CURIES	0.00E+00	0.00E+00	7.15E-05	8.43E-07
NB-97	CURIES	0.00E+00	0.00E+00	1.63E-04	1.76E-04
PR-144	CURIES	0.00E+00	0.00E+00	1.01E-04	0.00E+00
SB-125	CURIES	0.00E+00	0.00E+00	4.00E-04	1.73E-04
SN-117M	CURIES	0.00E+00	0.00E+00	2.34E-05	6.00E-06
SR-89	CURIES	0.00E+00	0.00E+00	1.01E-05	2.93E-05
SR-90	CURIES	2.77E-03	0.00E+00	1.05E-05	0.00E+00
SR-92	CURIES	0.00E+00	0.00E+00	5.12E-05	1.07E-04
TE-125M	CURIES	0.00E+00	0.00E+00	9.73E-03	5.54E-03
ZN-65	CURIES	0.00E+00	0.00E+00	1.90E-03	2.77E-03
ZR-95	CURIES	0.00E+00	0.00E+00	6.65E-06	0.00E+00
TOTALS	CURIES	2.77E-03	0.00E+00	2.50E-02	2.33E-02

TABLE 1-2C\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents  
 Unit: Site  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
DISSOLVED AND ENTRAINED GASES					
AR-41	CURIES	0.00E+00	0.00E+00	3.08E-06	0.00E+00
XE-131M	CURIES	0.00E+00	0.00E+00	0.00E+00	1.87E-05
XE-133	CURIES	0.00E+00	0.00E+00	3.26E-05	3.96E-04
TOTALS	CURIES	0.00E+00	0.00E+00	3.57E-05	4.15E-04
G-ALPHA	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-4 for typically achieved minimum detectable concentrations.

TABLE 1-2C\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents  
 Unit: Site  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

NUCLIDE	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
H-3	CURIES	0.00E+00	0.00E+00	5.87E+02	4.31E+02

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	3.22E-03	5.98E-03
CD-109	CURIES	0.00E+00	0.00E+00	0.00E+00	2.12E-05
CE-139	CURIES	0.00E+00	0.00E+00	0.00E+00	6.09E-07
CO-57	CURIES	0.00E+00	0.00E+00	6.44E-06	8.24E-05
CO-58	CURIES	0.00E+00	0.00E+00	1.49E-03	1.65E-02
CO-60	CURIES	0.00E+00	0.00E+00	2.36E-03	4.05E-03
CR-51	CURIES	0.00E+00	0.00E+00	1.80E-05	4.99E-03
CS-134	CURIES	0.00E+00	0.00E+00	2.27E-06	0.00E+00
CS-137	CURIES	0.00E+00	0.00E+00	1.26E-04	1.05E-04
FE-55	CURIES	0.00E+00	0.00E+00	3.01E-03	4.28E-03
FE-59	CURIES	0.00E+00	0.00E+00	0.00E+00	6.09E-05
I-133	CURIES	0.00E+00	0.00E+00	0.00E+00	1.22E-06
MN-54	CURIES	0.00E+00	0.00E+00	4.10E-05	1.65E-04
NB-95	CURIES	0.00E+00	0.00E+00	6.02E-06	4.55E-04
NB-97	CURIES	0.00E+00	0.00E+00	1.99E-04	3.00E-04
PM-149	CURIES	0.00E+00	0.00E+00	2.29E-05	0.00E+00
RB-86	CURIES	0.00E+00	0.00E+00	1.74E-05	0.00E+00
SN-117M	CURIES	0.00E+00	0.00E+00	0.00E+00	1.33E-04
SR-92	CURIES	0.00E+00	0.00E+00	9.99E-05	1.92E-04
TC-101	CURIES	0.00E+00	0.00E+00	0.00E+00	1.35E-06
TE-125M	CURIES	0.00E+00	0.00E+00	0.00E+00	2.40E-02
TE-127M	CURIES	0.00E+00	0.00E+00	0.00E+00	6.99E-05
ZN-65	CURIES	0.00E+00	0.00E+00	1.38E-03	4.53E-03
ZR-95	CURIES	0.00E+00	0.00E+00	0.00E+00	2.11E-04
TOTALS	CURIES	0.00E+00	0.00E+00	1.20E-02	6.62E-02

TABLE 1-2C\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents  
 Unit: Site  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
DISSOLVED AND ENTRAINED GASES					
AR-41	CURIES	0.00E+00	0.00E+00	9.62E-06	0.00E+00
XE-131M	CURIES	0.00E+00	0.00E+00	0.00E+00	3.31E-05
XE-133	CURIES	0.00E+00	0.00E+00	9.37E-04	2.16E-03
XE-137	CURIES	0.00E+00	0.00E+00	1.30E-05	0.00E+00
TOTALS	CURIES	0.00E+00	0.00E+00	9.59E-04	2.19E-03
G-ALPHA	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-4 for typically achieved minimum detectable concentrations.

TABLE 1-3A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO LIQUID RELEASES  
 Unit: 1  
 Starting: 01-Jan-2002                      Ending: 30-Jun-2002

Cumulative Doses per Quarter

Organ	ODCM Limit	Units	Quarter 1	% of ODCM Limit	Quarter 2	% of ODCM Limit
Bone	5.0	mrem	5.45E-02	1.09E+00	1.63E-03	3.27E-02
Liver	5.0	mrem	1.78E-03	3.55E-02	2.15E-03	4.30E-02
TBody	1.5	mrem	1.42E-02	9.49E-01	1.61E-03	1.07E-01
Thyroid	5.0	mrem	1.15E-03	2.29E-02	1.47E-03	2.94E-02
Kidney	5.0	mrem	5.47E-03	1.09E-01	5.14E-03	1.03E-01
Lung	5.0	mrem	2.30E-03	4.59E-02	1.89E-03	3.77E-02
GILLI	5.0	mrem	7.78E-03	1.56E-01	5.63E-03	1.13E-01

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	10.0	mrem	5.61E-02	5.61E-01
Liver	10.0	mrem	3.93E-03	3.93E-02
TBody	3.0	mrem	1.58E-02	5.28E-01
Thyroid	10.0	mrem	2.62E-03	2.62E-02
Kidney	10.0	mrem	1.06E-02	1.06E-01
Lung	10.0	mrem	4.18E-03	4.18E-02
GILLI	10.0	mrem	1.34E-02	1.34E-01



TABLE 1-3A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO LIQUID RELEASES  
 Unit: 1  
 Starting: 01-Jul-2002                      Ending: 31-Dec-2002

Cumulative Doses per Quarter

Organ	ODCM Limit	Units	Quarter 3	% of ODCM Limit	Quarter 4	% of ODCM Limit
Bone	5.0	mrem	5.68E-04	1.14E-02	3.81E-03	7.62E-02
Liver	5.0	mrem	2.93E-03	5.86E-02	3.69E-03	7.38E-02
TBody	1.5	mrem	2.64E-03	1.76E-01	2.68E-03	1.79E-01
Thyroid	5.0	mrem	2.36E-03	4.72E-02	2.95E-03	5.90E-02
Kidney	5.0	mrem	2.49E-03	4.98E-02	1.56E-02	3.12E-01
Lung	5.0	mrem	2.52E-03	5.05E-02	2.09E-03	4.18E-02
GILLI	5.0	mrem	3.00E-03	6.00E-02	1.62E-02	3.23E-01

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	10.0	mrem	6.05E-02	6.05E-01
Liver	10.0	mrem	1.05E-02	1.05E-01
TBody	3.0	mrem	2.11E-02	7.05E-01
Thyroid	10.0	mrem	7.91E-03	7.91E-02
Kidney	10.0	mrem	2.87E-02	2.87E-01
Lung	10.0	mrem	8.79E-03	8.79E-02
GILLI	10.0	mrem	3.26E-02	3.26E-01

TABLE 1-3B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO LIQUID RELEASES  
 Unit: 2  
 Starting: 01-Jan-2002                      Ending: 30-Jun-2002

Cumulative Doses per Quarter

Organ	ODCM Limit	Units	Quarter 1	% of ODCM Limit	Quarter 2	% of ODCM Limit
Bone	5.0	mrem	5.45E-02	1.09E+00	1.63E-03	3.27E-02
Liver	5.0	mrem	1.78E-03	3.55E-02	2.15E-03	4.30E-02
TBody	1.5	mrem	1.42E-02	9.49E-01	1.61E-03	1.07E-01
Thyroid	5.0	mrem	1.15E-03	2.29E-02	1.47E-03	2.94E-02
Kidney	5.0	mrem	5.47E-03	1.09E-01	5.14E-03	1.03E-01
Lung	5.0	mrem	2.30E-03	4.59E-02	1.89E-03	3.77E-02
GILLI	5.0	mrem	7.78E-03	1.56E-01	5.63E-03	1.13E-01

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	10.0	mrem	5.61E-02	5.61E-01
Liver	10.0	mrem	3.93E-03	3.93E-02
TBody	3.0	mrem	1.58E-02	5.28E-01
Thyroid	10.0	mrem	2.62E-03	2.62E-02
Kidney	10.0	mrem	1.06E-02	1.06E-01
Lung	10.0	mrem	4.18E-03	4.18E-02
GILLI	10.0	mrem	1.34E-02	1.34E-01

TABLE 1-3B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO LIQUID RELEASES  
 Unit: 2

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Cumulative Doses per Quarter

Organ	ODCM Limit	Units	Quarter 3	% of ODCM Limit	Quarter 4	% of ODCM Limit
Bone	5.0	mrem	2.62E-04	5.25E-03	6.12E-03	1.22E-01
Liver	5.0	mrem	2.55E-03	5.09E-02	4.24E-03	8.48E-02
TBody	1.5	mrem	2.40E-03	1.60E-01	2.63E-03	1.76E-01
Thyroid	5.0	mrem	2.24E-03	4.49E-02	3.00E-03	6.01E-02
Kidney	5.0	mrem	2.29E-03	4.58E-02	2.37E-02	4.74E-01
Lung	5.0	mrem	2.33E-03	4.66E-02	1.60E-03	3.19E-02
GILLI	5.0	mrem	2.86E-03	5.73E-02	2.59E-02	5.19E-01

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	10.0	mrem	1.05E-02	1.05E-01
Liver	10.0	mrem	1.13E-02	1.13E-01
TBody	3.0	mrem	8.48E-03	2.83E-01
Thyroid	10.0	mrem	8.85E-03	8.85E-02
Kidney	10.0	mrem	4.34E-02	4.34E-01
Lung	10.0	mrem	7.60E-03	7.60E-02
GILLI	10.0	mrem	4.80E-02	4.80E-01

TABLE 1-4  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 MINIMUM DETECTABLE CONCENTRATION - LIQUID SAMPLE ANALYSES

The values in this table represent a priori Minimum Detectable Concentrations (MDC) that are typically achieved in laboratory analyses of liquid radwaste samples.

Nuclide	MDC(uCi/ML)
MN-54	3.14E-08
CO-58	4.92E-08
FE-59	7.19E-08
CO-60	4.77E-08
ZN-65	8.11E-08
MO-99	1.29E-07
I-131	2.53E-08
CS-134	3.51E-08
CS-137	4.28E-08
CE-141	5.41E-08
CE-144	1.95E-07

TABLE 1-5A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Batch Release Summary  
 Unit: 1  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

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 -----  
 LIQUID RELEASES  
 -----

NUMBER OF BATCH RELEASES	:	114	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	10586.00	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	110.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	92.86	MINUTES
MINIMUM TIME PERIOD FOR A BATCH RELEASE	:	82.00	MINUTES
AVERAGE STREAM FLOW DURING PERIODS OF RELEASE OF LIQUID EFFLUENT INTO A FLOWING STREAM	:	4.88E+03	CFS *

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\* Average River Flow Rate, taken at Walter F. George Lock and Dam, located 30.7 miles above Farley Nuclear Plant.

TABLE 1-5A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Batch Release Summary  
 Unit: 1  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

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 -----  
 LIQUID RELEASES  
 -----

NUMBER OF BATCH RELEASES	:	162	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	14992.00	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	112.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	92.54	MINUTES
MINIMUM TIME PERIOD FOR A BATCH RELEASE	:	65.00	MINUTES
AVERAGE STREAM FLOW DURING PERIODS OF RELEASE OF LIQUID EFFLUENT INTO A FLOWING STREAM :		2.56E+03	CFS *

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\* Average River Flow Rate, taken at Walter F. George Lock and Dam, located 30.7 miles above Farley Nuclear Plant.

TABLE 1-5B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Batch Release Summary  
 Unit: 2  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

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 -----  
 LIQUID RELEASES  
 -----

NUMBER OF BATCH RELEASES	:	93	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	9171.00	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	113.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	98.61	MINUTES
MINIMUM TIME PERIOD FOR A BATCH RELEASE	:	67.00	MINUTES
AVERAGE STREAM FLOW DURING PERIODS OF RELEASE OF LIQUID EFFLUENT INTO A FLOWING STREAM :		4.88E+03	CFS *

-----

\* Average River Flow Rate, taken at Walter F. George Lock and Dam, located 30.7 miles above Farley Nuclear Plant.

TABLE 1-5B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Batch Release Summary  
 Unit: 2  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

-----  
 -----  
 LIQUID RELEASES  
 -----

NUMBER OF BATCH RELEASES	:	161	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	15840.00	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	115.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	98.39	MINUTES
MINIMUM TIME PERIOD FOR A BATCH RELEASE	:	55.00	MINUTES
AVERAGE STREAM FLOW DURING PERIODS OF RELEASE OF LIQUID EFFLUENT INTO A FLOWING STREAM :		2.56E+03	CFS *

-----

\* Average River Flow Rate, taken at Walter F. George Lock and Dam, located 30.7 miles above Farley Nuclear Plant.



TABLE 1-6A  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
Liquid Effluents - Abnormal Release Summary  
Unit: 1  
Starting : 1-Jan-2002      Ending : 30-Jun-2002

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-----  
LIQUID RELEASES  
-----

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0.00	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0.00	MINUTES
AVERAGE TIME FOR A RELEASE	:	0.00	MINUTES
MINIMUM TIME FOR A RELEASE	:	0.00	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

-----

TABLE 1-6A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Liquid Effluents - Abnormal Release Summary  
 Unit: 1  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

-----  
 -----  
 LIQUID RELEASES  
 -----

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0.00	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0.00	MINUTES
AVERAGE TIME FOR A RELEASE	:	0.00	MINUTES
MINIMUM TIME FOR A RELEASE	:	0.00	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

-----

TABLE 1-6B  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
Liquid Effluents - Abnormal Release Summary  
Unit: 2  
Starting : 1-Jan-2002      Ending : 30-Jun-2002

-----  
-----  
LIQUID RELEASES  
-----

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0.00	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0.00	MINUTES
AVERAGE TIME FOR A RELEASE	:	0.00	MINUTES
MINIMUM TIME FOR A RELEASE	:	0.00	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

-----

TABLE 1-6B  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
Liquid Effluents - Abnormal Release Summary  
Unit: 2  
Starting : 1-Jul-2002      Ending : 31-Dec-2002

-----  
-----  
  
LIQUID RELEASES  
-----

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0.00	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0.00	MINUTES
AVERAGE TIME FOR A RELEASE	:	0.00	MINUTES
MINIMUM TIME FOR A RELEASE	:	0.00	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

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## 2.0 GASEOUS EFFLUENTS

This section contains applicable ODCM limits for gaseous effluents as well as the quantities of radioactive gaseous effluents released during 2002. These quantities are summarized on a quarterly basis and include any unplanned releases. Tabulations are provided of the offsite air doses calculated in accordance with ODCM 3.4.2 to show conformance with the limits of ODCM 3.1.3, and the offsite organ doses to a member of the public calculated in accordance with ODCM 3.4.3 to show conformance with ODCM 3.1.4.

### 2.1 Regulatory Requirements

The requirements presented in this section are for Unit 1 and Unit 2.

#### 2.1.1 Dose Rate Limits

The dose rates due to radioactive materials released in gaseous effluents from the site to areas at and beyond the SITE BOUNDARY shall be limited to the following:

- a. For noble gases: Less than or equal to 500 mrem/yr. to the whole body and less than or equal to 3000 mrem/yr. to the skin, and
- b. For Iodine-131, Iodine-133, tritium and for all radionuclides in particulate form with half-lives greater than 8 days: Less than or equal to 1500 mrem/yr. to any organ.

#### 2.1.2 Air Doses Due to Noble Gases in Gaseous Releases

Technical Specifications 5.5.4.e and 5.5.4.h state that the air dose due to noble gases released in gaseous effluents, from each reactor unit, to areas at and beyond the SITE BOUNDARY (see ODCM Figure 10-1) shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation, and
- b. During any calendar year: Less than or equal to 10 mrad for gamma radiation and less than or equal to 20 mrad for beta radiation.

### 2.1.3 Doses to a Member of the Public

Technical Specifications 5.5.4.e and 5.5.4.i state that the dose to a MEMBER OF THE PUBLIC from I-131, I-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released, from each reactor unit, to areas at and beyond the SITE BOUNDARY (see ODCM Figure 10-1) shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 7.5 mrem to any organ, and
- b. During any calendar year: Less than or equal to 15 mrem to any organ.

### 2.2 Measurements and Approximation of Total Radioactivity

The following noble gases are considered in evaluating gaseous effluents:

KR-87	XE-133
KR-88	XE-135
XE-133M	XE-138

The following radioiodines and radioactive materials in particulate form are specifically considered in evaluating gaseous effluents:

MN-54	MO-99
FE-59	I-131
CO-58	CS-134
CO-60	CS-137
ZN-65	CE-141
SR-89	CE-144
SR-90	H-3

#### 2.2.1 Sample collection and Analysis

Periodic grab samples from plant effluent streams are analyzed by a computerized pulse height analyzer system utilizing high resolution germanium detectors. Samples are obtained and analyzed in accordance with ODCM Table 3-3. Isotopic values thus obtained are used for release rate calculations as specified in ODCM 3.4.2 and ODCM 3.4.3. Only those nuclides which are detected are used in calculations. For radioiodines and particulates, in addition to the nuclides listed above other nuclides with half-lives greater than 8 days which are identified are also considered.

Continuous Releases: Continuous sampling is performed on the continuous release points (i.e. the Plant Vent Stack, Containment Purge, and the Turbine Building Vent). Particulate material is collected by filtration. Periodically these filters are removed and analyzed on the pulse height analyzer to identify and quantify radioactive materials collected on the filters. Particulate filters

are then analyzed for gross alpha and strontium as required. Gross alpha determinations are made using a 2 pi gas flow proportional counter. All Sr-89 and SR-90 samples are sent offsite to the Georgia Power Environmental Laboratory for analysis.

**Batch Releases:** The processing of batch type releases (from Containment or Waste Gas Decay Tanks) is analogous to continuous releases, except that the release is not commenced until samples have been obtained and analyzed.

Typically achieved minimum detectable concentrations for gaseous effluent sample analyses are reported in Table 2-6.

#### 2.2.2 Total Quantities of Radioactivity, Dose Rates, and Cumulative Doses

The methods for determining release quantities of radioactivity, dose rates, and cumulative doses follow:

##### 2.2.2.1 Fission and Activation Gases

The released radioactivity is determined using sample analyses results collected as described in section 2.2.1 and the average release flow rates over the period represented by the collected sample.

Dose rates due to noble gases, radioiodines, tritium, and particulates are calculated (with computer assistance). The calculated dose rates are compared to the dose rate limits specified in ODCM 3.1.2 for noble gases, radioiodine, tritium, and particulates. Dose rate calculation methodology is presented in the ODCM.

Beta and gamma air doses due to noble gases are calculated for the location in the unrestricted area with the potential for the highest exposure due to gaseous releases. Air doses are calculated for each release period and cumulative totals are kept for each unit for the calendar quarter and year. Cumulative air doses are compared to the dose limits specified in ODCM 3.1.3. The current percent of the ODCM limits are shown on the printout for each release period. Air dose calculation methodology is presented in the ODCM.

##### 2.2.2.2 Radioiodine, Tritium, and Particulate Releases

Released quantities of radioiodines are determined using the weekly samples and release flow rates for the six routine release points. Radioiodine concentrations are determined by gamma spectroscopy.

Release quantities of particulates are determined using the weekly (filter) samples and release flow rates for the six routine release points. Gamma spectroscopy is used to quantify concentrations of principal gamma emitters.

After each quarter, the particulate filters from each applicable vent (plant vent stack and containment purge) are combined, fused, and a strontium separation is performed. Since sample flows and vent flows are almost constant over each quarterly period the filters from each vent can be dissolved together. Decay corrections are performed back to the middle of the quarterly collection period. If Sr-89 or Sr-90 is not detected, MDC's are calculated. Strontium concentrations are input into the composite file of the computer and used for release dose rate and individual dose calculations.

Tritium samples are obtained monthly from each vent (with the exception of containment purge, which is sampled weekly) by passing the sample stream through a cold trap or by using the bubble method. The grams of water vapor/cubic meter is measured upstream of the cold trap in order to alleviate the difficulties in determining water vapor collection efficiencies. The tritium samples are analyzed onsite and the results furnished in uCi/ml of water. The tritium concentration in water is converted to the tritium concentration in air and this value is input into the composite file of the computer and used in release, dose rate, and individual dose calculations.

Dose rates due to radioiodine, tritium and particulates are calculated for a hypothetical child exposed to the inhalation pathway at the location in the unrestricted area where the potential dose rate is expected to be the highest. Dose rates are calculated, for each release point for each release period, and the dose rates from each release point is compared to the dose rate limits specified in ODCM 3.1.2, allocated for each release point as described in ODCM 3.3.2.

Doses to a Member of the Public (individual doses) due to radioiodine, tritium and particulates are calculated for the controlling receptor, which is described in the ODCM. Individual doses are calculated for each release period, and cumulative totals are kept for each unit, for the current calendar quarter and year. Cumulative individual doses are compared to the dose limits specified in ODCM 3.1.4. The current percent of ODCM limits are shown on the printout for each release period.

#### 2.2.2.3 Gross Alpha Release

The gross alpha release is computed each month by counting the particulate filters, for each week for gross alpha activity in a proportional counter. The highest concentration calculated for any of these weeks is used for the monthly value. This value is input into the composite file of the computer and used for release calculations.



### 2.2.3 Total Error Estimation

The maximum errors associated with monitor readings, sample flow, vent flow, sample collection, monitor calibration and laboratory procedure are collectively estimated to be:

Fission and Activation Gases	Iodine	Particulates	Tritium
75%	60%	50%	45%

The average error associated with counting is estimated to be:

Fission and Activation Gases	Iodine	Particulates	Tritium
19%	28%	20%	8%

### 2.3 Gaseous Effluent Release Data

Regulatory Guide 1.21 Tables 1A, 1B and 1C are found in this report as Tables 2-1A, 2-1B, 2-1C, 2-2A, 2-2B, 2-2C, 2-3A, 2-3B, and 2-3C. Data are presented on a quarterly basis as required by Regulatory Guide 1.21.

To complete Tables 2-1A and 2-1B, the total release for each of the four categories (fission and activation gases, radioiodines, particulates and tritium) was divided by the number of seconds in the quarter to obtain a release rate in uCi/second for each category. However, the percent of the ODCM limits are not applicable because FNP has no curie limit for gaseous releases. Applicable limits are expressed in terms of dose. Noble gases are limited as specified in ODCM 3.1.2. The other three categories (tritium, radioiodines, and particulates) are limited as a group as specified in ODCM 3.1.2.

Dose rates due to noble gas releases and due to radioiodines, tritium and particulate releases were calculated as part of the pre-release and post-release permits. No limits were exceeded for this reporting period.

Gross alpha radioactivity is reported in Tables 2-1A, 2-1B and 2-1C as curies released in each quarter.

Limits for cumulative beta and gamma air doses due to noble gases are presented in Tables 2-4A and 2-4B along with the percent of ODCM limits.

Limits for cumulative doses to an individual due to radioiodines, tritium and particulates are specified in ODCM 3.1.4. Cumulative individual doses are presented in Tables 2-5A and 2-5B along with percent of ODCM limits.

## 2.4 Radiological Impact Due to Gaseous Releases

The air doses due to noble gases and doses to a Member of the Public due to radioiodines, tritium and particulates in gaseous effluents for Units 1 and 2 are provided in the following tables in order to show conformance with the limits of ODCM 3.1.3 and ODCM 3.1.4:

Unit 1 2002 Air Doses Due to Noble Gases  
in Gaseous Releases: Table 2-4A

Unit 2 2002 Air Doses Due to Noble Gases  
in Gaseous Releases: Table 2-4B

Unit 1 2002 Doses to a Member of the Public  
Due to Radioiodines, Tritium, and Particulates  
in Gaseous Releases: Table 2-5A

Unit 2 2002 Doses to a Member of the Public  
Due to Radioiodines, Tritium, and Particulates  
in Gaseous Releases: Table 2-5B

## 2.5 Gaseous Effluents - Batch Releases

Batch release information for Units 1 and 2 is summarized in the following tables:

Unit 1 2002 Gaseous Effluents - Batch Release  
Summary: Table 2-7A

Unit 2 2002 Gaseous Effluents - Batch Release  
Summary: Table 2-7B

## 2.6 Gaseous Effluents - Abnormal Releases

There were no abnormal releases on Unit 1 during 2002.

There were no abnormal releases on Unit 2 during 2002.

Abnormal release information for Units 1 and 2 is summarized in the following tables:

Unit 1 2002 Gaseous Effluents - Abnormal Release Summary: Table 2-8A

Unit 2 2002 Gaseous Effluents - Abnormal Release Summary: Table 2-8B

TABLE 2-1A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Summation of All Releases  
 Unit: 1  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE	CURIES	1.37E+01	1.45E+01	9.40E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.77E+00	1.85E+00	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. RADIOIODINES</b>				
1. TOTAL IODINE-131	CURIES	3.97E-06	1.10E-06	8.80E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	5.11E-07	1.40E-07	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. PARTICULATES</b>				
1. PARTICULATES (HALF-LIVES > 8 DAYS)	CURIES	1.49E-06	1.38E-07	7.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.91E-07	1.76E-08	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
4. GROSS ALPHA RADIOACTIVITY	CURIES	3.91E-08	3.98E-08	
<b>D. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	9.67E-01	2.29E+00	5.30E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.24E-01	2.91E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

TABLE 2-1A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Summation of All Releases  
 Unit: 1  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE	CURIES	1.53E+01	1.52E+01	9.40E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.92E+00	1.92E+00	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. RADIOIODINES</b>				
1. TOTAL IODINE-131	CURIES	7.69E-07	0.00E+00	8.80E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	9.67E-08	0.00E+00	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. PARTICULATES</b>				
1. PARTICULATES (HALF-LIVES > 8 DAYS)	CURIES	3.02E-06	0.00E+00	7.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	3.80E-07	0.00E+00	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
4. GROSS ALPHA RADIOACTIVITY	CURIES	5.25E-08	2.65E-08	
<b>D. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	1.11E+00	1.28E+00	5.30E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.40E-01	1.60E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

TABLE 2-1B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Summation of All Releases  
 Unit: 2

Starting : 1-Jan-2002      Ending : 30-Jun-2002

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE	CURIES	1.63E+01	1.69E+01	9.40E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.10E+00	2.15E+00	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. RADIOIODINES</b>				
1. TOTAL IODINE-131	CURIES	0.00E+00	0.00E+00	8.80E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	0.00E+00	0.00E+00	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. PARTICULATES</b>				
1. PARTICULATES (HALF-LIVES>8 DAYS)	CURIES	2.90E-05	0.00E+00	7.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	3.73E-06	0.00E+00	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
4. GROSS ALPHA RADIOACTIVITY	CURIES	3.09E-08	2.44E-08	
<b>D. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	1.59E+00	7.05E-01	5.30E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.05E-01	8.97E-02	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

TABLE 2-1B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Summation of All Releases  
 Unit: 2  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE	CURIES	1.59E+01	1.96E+01	9.40E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.00E+00	2.46E+00	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. RADIOIODINES</b>				
1. TOTAL IODINE-131	CURIES	1.75E-06	1.15E-07	8.80E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.20E-07	1.45E-08	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. PARTICULATES</b>				
1. PARTICULATES (HALF-LIVES>8 DAYS)	CURIES	2.70E-07	2.77E-07	7.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	3.40E-08	3.48E-08	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
4. GROSS ALPHA RADIOACTIVITY	CURIES	1.91E-08	1.83E-07	
<b>D. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	1.62E+00	2.20E+00	5.30E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.04E-01	2.77E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

TABLE 2-1C  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Summation of All Releases  
 Unit: Site  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
<b>A. FISSION &amp; ACTIVATION PRODUCTS</b>				
1. TOTAL RELEASE	CURIES	3.00E+01	3.14E+01	9.40E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	3.86E+00	4.00E+00	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>B. RADIOIODINES</b>				
1. TOTAL IODINE-131	CURIES	3.97E-06	1.10E-06	8.80E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	5.11E-07	1.40E-07	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
<b>C. PARTICULATES</b>				
1. PARTICULATES (HALF-LIVES > 8 DAYS)	CURIES	3.05E-05	1.38E-07	7.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	3.92E-06	1.76E-08	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
4. GROSS ALPHA RADIOACTIVITY	CURIES	7.00E-08	6.42E-08	
<b>D. TRITIUM</b>				
1. TOTAL RELEASE	CURIES	2.56E+00	2.99E+00	5.30E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	3.29E-01	3.81E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

TABLE 2-1C  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Summation of All Releases  
 Unit: Site  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE	CURIES	3.12E+01	3.48E+01	9.40E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	3.92E+00	4.38E+00	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. RADIOIODINES				
-----				
1. TOTAL IODINE-131	CURIES	2.52E-06	1.15E-07	8.80E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	3.17E-07	1.45E-08	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. PARTICULATES				
-----				
1. PARTICULATES (HALF-LIVES>8 DAYS)	CURIES	3.29E-06	2.77E-07	7.00E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	4.14E-07	3.48E-08	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
4. GROSS ALPHA RADIOACTIVITY	CURIES	7.16E-08	2.09E-07	
-----				
D. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	2.73E+00	3.47E+00	5.30E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	3.44E-01	4.37E-01	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				

\*      Applicable limits are expressed in terms of dose.    See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.



TABLE 2-2A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Mixed-Mode Level Releases  
 Unit: 1  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
<b>FISSION GASES</b>					
AR-41	CURIES	1.35E+01	1.45E+01	0.00E+00	0.00E+00
KR-85M	CURIES	0.00E+00	0.00E+00	4.23E-04	0.00E+00
XE-135	CURIES	2.50E-02	0.00E+00	3.32E-02	0.00E+00
XE-133M	CURIES	0.00E+00	0.00E+00	5.54E-03	0.00E+00
XE-133	CURIES	0.00E+00	0.00E+00	2.21E-01	4.26E-03
<b>TOTAL FOR PERIOD</b>	<b>CURIES</b>	<b>1.35E+01</b>	<b>1.45E+01</b>	<b>2.60E-01</b>	<b>4.26E-03</b>
<b>IODINES</b>					
I-133	CURIES	8.59E-05	1.68E-05	1.76E-08	0.00E+00
I-131	CURIES	3.95E-06	1.10E-06	1.77E-08	0.00E+00
<b>TOTAL FOR PERIOD</b>	<b>CURIES</b>	<b>8.99E-05</b>	<b>1.79E-05</b>	<b>3.54E-08</b>	<b>0.00E+00</b>
<b>PARTICULATES</b>					
SR-89	CURIES	0.00E+00	1.38E-07	0.00E+00	0.00E+00
Y-88	CURIES	0.00E+00	0.00E+00	1.49E-06	0.00E+00
<b>TOTAL FOR PERIOD</b>	<b>CURIES</b>	<b>0.00E+00</b>	<b>1.38E-07</b>	<b>1.49E-06</b>	<b>0.00E+00</b>
H-3	CURIES	9.67E-01	2.29E+00	0.00E+00	0.00E+00
G-ALPHA	CURIES	3.91E-08	3.98E-08	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typically achieved minimum detectable concentrations.

TABLE 2-2A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Mixed-Mode Level Releases  
 Unit: 1  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
<b>FISSION GASES</b>					
AR-41	CURIES	1.51E+01	1.49E+01	0.00E+00	0.00E+00
XE-135	CURIES	1.60E-01	3.20E-01	0.00E+00	0.00E+00
XE-133	CURIES	0.00E+00	0.00E+00	9.70E-03	2.43E-03
TOTAL FOR PERIOD	CURIES	1.53E+01	1.52E+01	9.70E-03	2.43E-03
<b>IODINES</b>					
I-133	CURIES	1.13E-05	1.60E-06	0.00E+00	0.00E+00
I-131	CURIES	7.69E-07	0.00E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.20E-05	1.60E-06	0.00E+00	0.00E+00
<b>PARTICULATES</b>					
CR-51	CURIES	2.16E-06	0.00E+00	0.00E+00	0.00E+00
SR-89	CURIES	1.47E-09	0.00E+00	0.00E+00	0.00E+00
CO-58	CURIES	1.19E-07	0.00E+00	0.00E+00	0.00E+00
MN-54	CURIES	5.52E-07	0.00E+00	0.00E+00	0.00E+00
CO-60	CURIES	1.91E-07	0.00E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	3.02E-06	0.00E+00	0.00E+00	0.00E+00
H-3	CURIES	1.11E+00	1.27E+00	0.00E+00	0.00E+00
G-ALPHA	CURIES	5.25E-08	2.65E-08	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typically achieved minimum detectable concentrations.

TABLE 2-2B\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Mixed-Mode Level Releases  
 Unit: 2  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
<b>FISSION GASES</b>					
AR-41	CURIES	1.62E+01	1.69E+01	0.00E+00	0.00E+00
XE-133	CURIES	6.18E-02	0.00E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.63E+01	1.69E+01	0.00E+00	0.00E+00
<b>IODINES</b>					
I-133	CURIES	1.10E-07	0.00E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.10E-07	0.00E+00	0.00E+00	0.00E+00
<b>PARTICULATES</b>					
SR-89	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	CURIES	2.90E-05	0.00E+00	0.00E+00	0.00E+00
SR-90	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	2.90E-05	0.00E+00	0.00E+00	0.00E+00
H-3	CURIES	1.59E+00	7.05E-01	0.00E+00	0.00E+00
G-ALPHA	CURIES	3.09E-08	2.44E-08	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typically achieved minimum detectable concentrations.

TABLE 2-2B\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Mixed-Mode Level Releases  
 Unit: 2  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
<b>FISSION GASES</b>					
AR-41	CURIES	1.59E+01	1.96E+01	9.57E-06	0.00E+00
XE-133	CURIES	0.00E+00	0.00E+00	0.00E+00	1.96E-03
TOTAL FOR PERIOD	CURIES	1.59E+01	1.96E+01	9.57E-06	1.96E-03
<b>IODINES</b>					
I-131	CURIES	1.75E-06	1.15E-07	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.75E-06	1.15E-07	0.00E+00	0.00E+00
<b>PARTICULATES</b>					
SR-89	CURIES	0.00E+00	1.69E-07	0.00E+00	0.00E+00
CO-58	CURIES	2.70E-07	1.08E-07	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	2.70E-07	2.77E-07	0.00E+00	0.00E+00
H-3	CURIES	1.62E+00	2.20E+00	0.00E+00	0.00E+00
G-ALPHA	CURIES	1.91E-08	1.83E-07	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typically achieved minimum detectable concentrations.

TABLE 2-2C\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Mixed-Mode Level Releases  
 Unit: Site  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
<b>FISSION GASES</b>					
AR-41	CURIES	2.97E+01	3.14E+01	0.00E+00	0.00E+00
KR-85M	CURIES	0.00E+00	0.00E+00	4.23E-04	0.00E+00
XE-135	CURIES	2.50E-02	0.00E+00	3.32E-02	0.00E+00
XE-133M	CURIES	0.00E+00	0.00E+00	5.54E-03	0.00E+00
XE-133	CURIES	6.18E-02	0.00E+00	2.21E-01	4.26E-03
<b>TOTAL FOR PERIOD</b>	<b>CURIES</b>	<b>2.98E+01</b>	<b>3.14E+01</b>	<b>2.60E-01</b>	<b>4.26E-03</b>
<b>IODINES</b>					
I-133	CURIES	8.61E-05	1.68E-05	1.76E-08	0.00E+00
I-131	CURIES	3.95E-06	1.10E-06	1.77E-08	0.00E+00
<b>TOTAL FOR PERIOD</b>	<b>CURIES</b>	<b>9.00E-05</b>	<b>1.79E-05</b>	<b>3.54E-08</b>	<b>0.00E+00</b>
<b>PARTICULATES</b>					
SR-89	CURIES	0.00E+00	1.38E-07	0.00E+00	0.00E+00
TE-125M	CURIES	2.90E-05	0.00E+00	0.00E+00	0.00E+00
Y-88	CURIES	0.00E+00	0.00E+00	1.49E-06	0.00E+00
SR-90	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
<b>TOTAL FOR PERIOD</b>	<b>CURIES</b>	<b>2.90E-05</b>	<b>1.38E-07</b>	<b>1.49E-06</b>	<b>0.00E+00</b>
H-3	CURIES	2.56E+00	2.99E+00	0.00E+00	0.00E+00
G-ALPHA	CURIES	7.00E-08	6.42E-08	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typically achieved minimum detectable concentrations.

TABLE 2-2C\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Mixed-Mode Level Releases  
 Unit: Site  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
<b>FISSION GASES</b>					
AR-41	CURIES	3.10E+01	3.45E+01	9.57E-06	0.00E+00
XE-135	CURIES	1.60E-01	3.20E-01	0.00E+00	0.00E+00
XE-133	CURIES	0.00E+00	0.00E+00	9.70E-03	4.39E-03
TOTAL FOR PERIOD	CURIES	3.12E+01	3.48E+01	9.71E-03	4.39E-03
<b>IODINES</b>					
I-133	CURIES	1.13E-05	1.60E-06	0.00E+00	0.00E+00
I-131	CURIES	2.52E-06	1.15E-07	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.38E-05	1.71E-06	0.00E+00	0.00E+00
<b>PARTICULATES</b>					
CR-51	CURIES	2.16E-06	0.00E+00	0.00E+00	0.00E+00
SR-89	CURIES	1.47E-09	1.69E-07	0.00E+00	0.00E+00
CO-58	CURIES	3.89E-07	1.08E-07	0.00E+00	0.00E+00
MN-54	CURIES	5.52E-07	0.00E+00	0.00E+00	0.00E+00
CO-60	CURIES	1.91E-07	0.00E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	3.29E-06	2.77E-07	0.00E+00	0.00E+00
H-3	CURIES	2.73E+00	3.47E+00	0.00E+00	0.00E+00
G-ALPHA	CURIES	7.16E-08	2.09E-07	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typically achieved minimum detectable concentrations.

TABLE 2-3A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Ground Level Releases  
 Unit: 1  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
FISSION GASES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IODINES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	CURIES	4.81E-05	1.17E-04	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typically achieved minimum detectable concentrations.

TABLE 2-3A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Ground Level Releases  
 Unit: 1  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IODINES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	CURIES	1.70E-04	8.99E-04	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typically achieved minimum detectable concentrations.



TABLE 2-3B\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Ground Level Releases  
 Unit: 2  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
<b>FISSION GASES</b>					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
<b>IODINES</b>					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
<b>PARTICULATES</b>					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	CURIES	4.99E-04	2.10E-05	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typically achieved minimum detectable concentrations.

TABLE 2-3B\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Ground Level Releases  
 Unit: 2  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IODINES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	CURIES	4.54E-05	4.78E-06	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typically achieved minimum detectable concentrations.

TABLE 2-3C\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Ground Level Releases  
 Unit: Site  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
FISSION GASES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IODINES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	CURIES	5.47E-04	1.38E-04	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typically achieved minimum detectable concentrations.

TABLE 2-3C\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents-Ground Level Releases  
 Unit: Site  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IODINES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	CURIES	2.15E-04	9.04E-04	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-6 for typically achieved minimum detectable concentrations.

TABLE 2-4A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 AIR DOSES DUE TO NOBLE GASES IN GASEOUS RELEASES  
 Unit: 1

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Cumulative Doses per Quarter

Type of Radiation	ODCM Limit	Units	Quarter 1	% of ODCM Limit	Quarter 2	% of ODCM Limit
Gamma	5.0	mrad	4.29E-03	8.58E-02	4.63E-03	9.26E-02
Beta	10.0	mrad	1.52E-03	1.52E-02	1.63E-03	1.63E-02

Cumulative Doses per Year

Type of Radiation	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Gamma	10.0	mrad	8.92E-03	8.92E-02
Beta	20.0	mrad	3.16E-03	1.58E-02

TABLE 2-4A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 AIR DOSES DUE TO NOBLE GASES IN GASEOUS RELEASES  
 Unit: 1

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Cumulative Doses per Quarter

Type of Radiation	ODCM Limit	Units	Quarter 3	% of ODCM Limit	Quarter 4	% of ODCM Limit
Gamma	5.0	mrad	4.82E-03	9.65E-02	4.77E-03	9.54E-02
Beta	10.0	mrad	1.71E-03	1.71E-02	1.70E-03	1.70E-02

Cumulative Doses per Year

Type of Radiation	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Gamma	10.0	mrad	1.85E-02	1.85E-01
Beta	20.0	mrad	6.57E-03	3.28E-02

TABLE 2-4B  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002

AIR DOSES DUE TO NOBLE GASES IN GASEOUS RELEASES

Unit: 2

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Cumulative Doses per Quarter

Type of Radiation	ODCM Limit	Units	Quarter 1	% of ODCM Limit	Quarter 2	% of ODCM Limit
Gamma	5.0	mrad	5.17E-03	1.03E-01	5.38E-03	1.08E-01
Beta	10.0	mrad	1.83E-03	1.83E-02	1.90E-03	1.90E-02

Cumulative Doses per Year

Type of Radiation	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Gamma	10.0	mrad	1.06E-02	1.06E-01
Beta	20.0	mrad	3.72E-03	1.86E-02

TABLE 2-4B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 AIR DOSES DUE TO NOBLE GASES IN GASEOUS RELEASES  
 Unit: 2

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Cumulative Doses per Quarter

Type of Radiation	ODCM Limit	Units	Quarter 3	% of ODCM Limit	Quarter 4	% of ODCM Limit
Gamma	5.0	mrad	5.06E-03	1.01E-01	6.24E-03	1.25E-01
Beta	10.0	mrad	1.78E-03	1.78E-02	2.20E-03	2.20E-02

Cumulative Doses per Year

Type of Radiation	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Gamma	10.0	mrad	2.19E-02	2.19E-01
Beta	20.0	mrad	7.71E-03	3.85E-02



TABLE 2-5A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO RADIOIODINES, TRITIUM,  
 AND PARTICULATES IN GASEOUS RELEASES

Unit: 1

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Cumulative Doses per Quarter

Organ	ODCM Limit	Unit	Quarter 1	% of ODCM Limit	Quarter 2	% of ODCM Limit
Bone	7.5	mrem	4.46E-07	5.95E-06	1.79E-06	2.38E-05
Liver	7.5	mrem	1.33E-04	1.77E-03	3.13E-04	4.17E-03
TBody	7.5	mrem	1.32E-04	1.76E-03	3.13E-04	4.17E-03
Thyroid	7.5	mrem	2.36E-04	3.14E-03	3.39E-04	4.52E-03
Kidney	7.5	mrem	1.33E-04	1.77E-03	3.13E-04	4.17E-03
Lung	7.5	mrem	1.32E-04	1.76E-03	3.13E-04	4.17E-03
GILLI	7.5	mrem	1.32E-04	1.76E-03	3.13E-04	4.17E-03

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	15.0	mrem	2.23E-06	1.49E-05
Liver	15.0	mrem	4.45E-04	2.97E-03
TBody	15.0	mrem	4.45E-04	2.97E-03
Thyroid	15.0	mrem	5.74E-04	3.83E-03
Kidney	15.0	mrem	4.46E-04	2.97E-03
Lung	15.0	mrem	4.45E-04	2.97E-03
GILLI	15.0	mrem	4.45E-04	2.97E-03

TABLE 2-5A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO RADIOIODINES, TRITIUM,  
 AND PARTICULATES IN GASEOUS RELEASES

Unit: 1

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Cumulative Doses per Quarter

Organ	ODCM Limit	Unit	Quarter 3	% of ODCM Limit	Quarter 4	% of ODCM Limit
Bone	7.5	mrem	1.73E-06	2.30E-05	3.85E-09	5.14E-08
Liver	7.5	mrem	1.54E-04	2.06E-03	1.75E-04	2.34E-03
TBody	7.5	mrem	1.54E-04	2.06E-03	1.75E-04	2.34E-03
Thyroid	7.5	mrem	1.72E-04	2.30E-03	1.76E-04	2.35E-03
Kidney	7.5	mrem	1.54E-04	2.06E-03	1.75E-04	2.34E-03
Lung	7.5	mrem	1.54E-04	2.06E-03	1.75E-04	2.34E-03
GILLI	7.5	mrem	1.54E-04	2.06E-03	1.75E-04	2.34E-03

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	15.0	mrem	3.97E-06	2.64E-05
Liver	15.0	mrem	7.75E-04	5.17E-03
TBody	15.0	mrem	7.75E-04	5.17E-03
Thyroid	15.0	mrem	9.22E-04	6.15E-03
Kidney	15.0	mrem	7.75E-04	5.17E-03
Lung	15.0	mrem	7.74E-04	5.16E-03
GILLI	15.0	mrem	7.75E-04	5.17E-03

TABLE 2-5B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO RADIOIODINES, TRITIUM,  
 AND PARTICULATES IN GASEOUS RELEASES

Unit: 2

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Cumulative Doses per Quarter

Organ	ODCM Limit	Unit	Quarter 1	% of ODCM Limit	Quarter 2	% of ODCM Limit
Bone	7.5	mrem	8.88E-06	1.18E-04	2.84E-14	3.79E-13
Liver	7.5	mrem	2.20E-04	2.94E-03	9.63E-05	1.28E-03
TBody	7.5	mrem	2.19E-04	2.92E-03	9.63E-05	1.28E-03
Thyroid	7.5	mrem	2.20E-04	2.94E-03	9.63E-05	1.28E-03
Kidney	7.5	mrem	2.18E-04	2.90E-03	9.63E-05	1.28E-03
Lung	7.5	mrem	2.18E-04	2.91E-03	9.63E-05	1.28E-03
GILLI	7.5	mrem	2.26E-04	3.02E-03	9.63E-05	1.28E-03

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	15.0	mrem	8.88E-06	5.92E-05
Liver	15.0	mrem	3.17E-04	2.11E-03
TBody	15.0	mrem	3.15E-04	2.10E-03
Thyroid	15.0	mrem	3.17E-04	2.11E-03
Kidney	15.0	mrem	3.14E-04	2.09E-03
Lung	15.0	mrem	3.15E-04	2.10E-03
GILLI	15.0	mrem	3.23E-04	2.15E-03

TABLE 2-5B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO RADIOIODINES, TRITIUM,  
 AND PARTICULATES IN GASEOUS RELEASES

Unit: 2

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Cumulative Doses per Quarter

Organ	ODCM Limit	Unit	Quarter 3	% of ODCM Limit	Quarter 4	% of ODCM Limit
Bone	7.5	mrem	1.39E-07	1.85E-06	2.07E-06	2.76E-05
Liver	7.5	mrem	2.21E-04	2.95E-03	3.00E-04	4.00E-03
TBody	7.5	mrem	2.21E-04	2.95E-03	3.00E-04	4.00E-03
Thyroid	7.5	mrem	2.53E-04	3.37E-03	3.02E-04	4.03E-03
Kidney	7.5	mrem	2.21E-04	2.95E-03	3.00E-04	4.00E-03
Lung	7.5	mrem	2.21E-04	2.95E-03	3.00E-04	4.00E-03
GILLI	7.5	mrem	2.21E-04	2.95E-03	3.00E-04	4.00E-03

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	15.0	mrem	1.11E-05	7.40E-05
Liver	15.0	mrem	8.38E-04	5.59E-03
TBody	15.0	mrem	8.37E-04	5.58E-03
Thyroid	15.0	mrem	8.71E-04	5.81E-03
Kidney	15.0	mrem	8.35E-04	5.57E-03
Lung	15.0	mrem	8.36E-04	5.57E-03
GILLI	15.0	mrem	8.44E-04	5.63E-03

TABLE 2-6  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 MINIMUM DETECTABLE CONCENTRATIONS - GASEOUS EFFLUENT ANALYSES

The values in this table represent a priori Minimum Detectable Concentrations (MDC) that are typically achieved in laboratory analyses of gaseous radwaste samples.

Nuclide	MDC(uCi/ML)
MN-54	3.21E-15
CO-58	1.53E-14
FE-59	7.96E-15
CO-60	1.95E-14
ZN-65	2.34E-14
MO-99	1.81E-13
CS-134	1.41E-14
CS-137	7.83E-15
CE-141	6.96E-15
CE-144	3.47E-14
KR-87	8.18E-07
KR-88	3.94E-08
XE-133	4.30E-08
XE-133M	4.82E-08
XE-135	1.78E-08
XE-138	1.99E-07
I-131	9.67E-15
I-133	1.80E-13

TABLE 2-7A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Batch Release Summary  
 Unit: 1  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

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 -----  
 GASEOUS RELEASES  
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NUMBER OF BATCH RELEASES	:	14	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	5767.00	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	758.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	411.93	MINUTES
MINIMUM TIME FOR A BATCH RELEASE	:	222.00	MINUTES

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TABLE 2-7A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Batch Release Summary  
 Unit: 1  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

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 -----  
 GASEOUS RELEASES

NUMBER OF BATCH RELEASES	:	13	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	5205.00	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	846.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	400.38	MINUTES
MINIMUM TIME FOR A BATCH RELEASE	:	240.00	MINUTES

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TABLE 2-7B  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
Gaseous Effluents - Batch Release Summary  
Unit: 2  
Starting : 1-Jan-2002      Ending : 30-Jun-2002

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-----  
GASEOUS RELEASES  
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NUMBER OF BATCH RELEASES	:	1	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	450.00	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	450.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	450.00	MINUTES
MINIMUM TIME FOR A BATCH RELEASE	:	450.00	MINUTES

-----



TABLE 2-7B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Batch Release Summary  
 Unit: 2  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

-----  
 -----  
 GASEOUS RELEASES  
 -----

NUMBER OF BATCH RELEASES	:	15	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	6401.00	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	705.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	426.73	MINUTES
MINIMUM TIME FOR A BATCH RELEASE	:	175.00	MINUTES

-----

TABLE 2-8A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Abnormal Release Summary  
 Unit: 1  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

-----  
 -----

GASEOUS RELEASES

-----			
NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0.00	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0.00	MINUTES
AVERAGE TIME FOR A RELEASE	:	0.00	MINUTES
MINIMUM TIME FOR A RELEASE	:	0.00	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES
-----			

TABLE 2-8A  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
Gaseous Effluents - Abnormal Release Summary  
Unit: 1  
Starting : 1-Jul-2002      Ending : 31-Dec-2002

-----  
-----  
GASEOUS RELEASES  
-----

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0.00	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0.00	MINUTES
AVERAGE TIME FOR A RELEASE	:	0.00	MINUTES
MINIMUM TIME FOR A RELEASE	:	0.00	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

-----

TABLE 2-8B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Abnormal Release Summary  
 Unit: 2  
 Starting : 1-Jan-2002      Ending : 30-Jun-2002

-----  
 -----  
 GASEOUS RELEASES  
 -----

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0.00	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0.00	MINUTES
AVERAGE TIME FOR A RELEASE	:	0.00	MINUTES
MINIMUM TIME FOR A RELEASE	:	0.00	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

-----

TABLE 2-8B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 Gaseous Effluents - Abnormal Release Summary  
 Unit: 2  
 Starting : 1-Jul-2002      Ending : 31-Dec-2002

-----  
 -----  
 GASEOUS RELEASES  
 -----

NUMBER OF RELEASES	:	0	
TOTAL TIME FOR ALL RELEASES	:	0.00	MINUTES
MAXIMUM TIME FOR A RELEASE	:	0.00	MINUTES
AVERAGE TIME FOR A RELEASE	:	0.00	MINUTES
MINIMUM TIME FOR A RELEASE	:	0.00	MINUTES
TOTAL ACTIVITY FOR ALL RELEASES	:	0.00E+00	CURIES

-----

### 3.0 SOLID WASTE

#### 3.1 Regulatory Requirements

##### 3.1.1 Solid Radioactive Waste System

PCP B.3.1 states in part that the radwaste solidification system shall be operable and used for the solidification and packaging of radioactive wastes to ensure meeting the requirements of 10CFR Part 20 and 10CFR Part 71 prior to shipment of radioactive wastes from the site.

##### 3.1.2 Reporting Requirements

PCP B.5.1.1 states in part that the Annual Radioactive Effluent Release Report, submitted in accordance with Technical Specification 5.6.3, shall include a summary of the quantities of solid radwaste released from the units as outlined in Regulatory Guide 1.21, with data summarized on a six-month basis following the format of Appendix B thereof.

#### 3.2 Solid Waste Data

Regulatory Guide 1.21 Table 3 is found in this report as Table 3-1.

The error involved in determining the contents of solid radwaste shipments is estimated to be less than + or - 15%.

TABLE 3-1  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2001  
 SOLID WASTE AND IRRADIATED FUEL SHIPMENTS  
 Starting: 01-Jan-2001                      Ending: 30-Jun-2001

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

1. Type of Waste.	UNITS	6-Months
	3	
a. Spent resins, Filter sludges, evaporator bottoms, etc.	m Ci*	6.710E+00 3.710E+01
	3	
b. Dry compressible waste, contaminated equipment, etc.	m Ci*	6.787E+01 1.052E+00
	3	
c. Irradiated components, control rods, etc.	m Ci*	None None
	3	
d. Other (describe)	m Ci*	None None

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

a.	FE-55	52.5%
	CO-60	14.9%
	NI-63	10.6%
	C-14	6.2%
	CO-58	5.9%
	AG-110M	4.9%
	ZN-65	2.2%
b.	CO-58	58.5%
	NB-95	12.1%
	ZN-65	8.4%
	ZR-95	5.7%
	FE-55	5.6%
	CR-51	3.3%
	CO-60	2.7%
	NI-63	1.5%

\* Measured and/or estimated by correlations in accordance with 10CFR61.55.

TABLE 3-1  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2001  
 SOLID WASTE AND IRRADIATED FUEL SHIPMENTS  
 Starting: 01-Jan-2001                      Ending: 30-Jun-2001

(continued)

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
7	Highway	Chem-Nuclear Systems, Inc. Barnwell, South Carolina.
32	Highway	Envirocare of Utah

4. Type of Containers (Shipped offsite for burial/processing)

Container Description	Type of Container	Number of Containers	Container 3 Volume (m )
a. CNS 60 Gallon HIC	High Integrity Container	20	2.900E-01
b. 55 Gallon Drum	Strong Tight Container	81	2.100E-01
c. 20' Seavan	Strong Tight Container	26	2.945E+01

5. Solidification Agent

- a. None
- b. None



TABLE 3-1  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2001  
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS  
Starting: 01-Jan-2001                      Ending: 30-Jun-2001

(continued)

B. IRRADIATED FUEL SHIPMENTS (Disposition)

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

TABLE 3-1  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2001  
 SOLID WASTE AND IRRADIATED FUEL SHIPMENTS  
 Starting: 01-Jul-2001                      Ending: 31-Dec-2001

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

1. Type of Waste.	UNITS	6-Months
	3	
a. Spent resins, Filter sludges, evaporator bottoms, etc.	m Ci*	1.820E+00 7.730E+00
	3	
b. Dry compressible waste, contaminated equipment, etc.	m Ci*	8.163E+01 9.317E+00
	3	
c. Irradiated components, control rods, etc.	m Ci*	None None
	3	
d. Other (describe)	m Ci*	None None

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

a.	FE-55	26.3%
	C-14	25.1%
	NI-63	17.9%
	CO-60	16.5%
	H-3	4.6%
	SB-125	3.4%
	ZN-65	2.2%
	AG-110M	1.5%
	CS-137	1.3%
b.	CO-60	28.3%
	CO-58	25.2%
	FE-55	22.3%
	ZN-65	9.9%
	NI-63	4.7%
	NB-95	3.1%
	ZR-95	1.7%
	H-3	1.2%

\* Measured and/or estimated by correlations in accordance with 10CFR61.55.



#### 4.0 DOSES TO MEMBERS OF THE PUBLIC INSIDE THE SITE BOUNDARY

##### 4.1 Regulatory Requirements

Current FNP effluent controls as established by ODCM 6.1 do not require assessment of the radiation doses from radioactive liquid and gaseous effluents to MEMBERS OF THE PUBLIC due to their activities inside the SITE BOUNDARY (ODCM Figure 10-1).

##### 4.2 Demonstration of Compliance

However, this assessment has been performed for 2002 using the methods described in ODCM 6.2 and is included in this section as Table 4-1.

TABLE 4-1  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSE TO A MEMBER OF THE PUBLIC  
 DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
 Unit: Site

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Page: 1

Location Name	VISITOR LOCATION 1 (VIS.CENTER)	
Distance (kilometers)	3.06E-01	
Sector	WSW	
Occupancy Factor	1.37E-03	(1.20E+01 hr/yr)
Age Group	CHILD	

Ground Level Releases:

Noble Gas X/Q (sec/m3)	1.04E-04
Particulate X/Q (sec/m3)	1.04E-04
Particulate D/Q (m-2)	4.80E-07

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	8.80E-06
Particulate X/Q (sec/m3)	8.80E-06
Particulate D/Q (m-2)	6.20E-08

Elevated Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

	Units	Quarter 1	Quarter 2	Quarters 1 and 2	Year to Ending Date
Bone	mrem	1.03E-04	1.07E-04	2.10E-04	2.10E-04
Liver	mrem	1.04E-04	1.08E-04	2.12E-04	2.12E-04
TBody	mrem	1.04E-04	1.08E-04	2.12E-04	2.12E-04
Thyroid	mrem	1.04E-04	1.08E-04	2.12E-04	2.12E-04
Kidney	mrem	1.04E-04	1.08E-04	2.12E-04	2.12E-04
Lung	mrem	1.04E-04	1.08E-04	2.12E-04	2.12E-04
GI-LLI	mrem	1.04E-04	1.08E-04	2.12E-04	2.12E-04

TABLE 4-1  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSE TO A MEMBER OF THE PUBLIC  
 DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
 Unit: Site

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Page: 2

Location Name	VISITOR LOCATION 2 (SW POND)	
Distance (kilometers)	9.66E-01	
Sector	SSW	
Occupancy Factor	7.53E-03	(6.60E+01 hr/yr)
Age Group	CHILD	

Ground Level Releases:

Noble Gas X/Q (sec/m3)	4.74E-05
Particulate X/Q (sec/m3)	4.74E-05
Particulate D/Q (m-2)	1.31E-07

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	9.75E-07
Particulate X/Q (sec/m3)	9.75E-07
Particulate D/Q (m-2)	2.78E-08

Elevated Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

	Units	Quarter 1	Quarter 2	Quarters 1 and 2	Year to Ending Date
Bone	mrem	6.27E-05	6.50E-05	1.28E-04	1.28E-04
Liver	mrem	6.34E-05	6.58E-05	1.29E-04	1.29E-04
TBody	mrem	6.34E-05	6.58E-05	1.29E-04	1.29E-04
Thyroid	mrem	6.35E-05	6.58E-05	1.29E-04	1.29E-04
Kidney	mrem	6.34E-05	6.58E-05	1.29E-04	1.29E-04
Lung	mrem	6.34E-05	6.58E-05	1.29E-04	1.29E-04
GI-LLI	mrem	6.34E-05	6.58E-05	1.29E-04	1.29E-04

TABLE 4-1  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSE TO A MEMBER OF THE PUBLIC  
 DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
 Unit: Site

Starting: 01-Jan-2002

Ending: 30-Jun-2002

Page: 3

Location Name	VISITOR LOCATION 3 (RW DISCH.)	
Distance (kilometers)	1.64E+00	
Sector	SE	
Occupancy Factor	1.14E-02	(9.99E+01 hr/yr)
Age Group	CHILD	

Ground Level Releases:	
Noble Gas X/Q (sec/m3)	1.63E-05
Particulate X/Q (sec/m3)	1.63E-05
Particulate D/Q (m-2)	4.55E-08

Mixed Mode Releases:	
Noble Gas X/Q (sec/m3)	7.05E-07
Particulate X/Q (sec/m3)	7.05E-07
Particulate D/Q (m-2)	1.39E-08

Elevated Releases:	
Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

	Units	Quarter 1	Quarter 2	Quarters 1 and 2	Year to Ending Date
Bone	mrem	6.86E-05	7.12E-05	1.40E-04	1.40E-04
Liver	mrem	6.94E-05	7.20E-05	1.41E-04	1.41E-04
TBody	mrem	6.94E-05	7.20E-05	1.41E-04	1.41E-04
Thyroid	mrem	6.95E-05	7.20E-05	1.42E-04	1.42E-04
Kidney	mrem	6.94E-05	7.20E-05	1.41E-04	1.41E-04
Lung	mrem	6.94E-05	7.20E-05	1.41E-04	1.41E-04
GI-LLI	mrem	6.94E-05	7.20E-05	1.41E-04	1.41E-04

TABLE 4-1  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSE TO A MEMBER OF THE PUBLIC  
 DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
 Unit: Site

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Page: 1

Location Name	VISITOR LOCATION 1 (VIS.CENTER)	
Distance (kilometers)	3.06E-01	
Sector	WSW	
Occupancy Factor	1.37E-03	(1.20E+01 hr/yr)
Age Group	CHILD	

Ground Level Releases:

Noble Gas X/Q (sec/m3)	1.04E-04
Particulate X/Q (sec/m3)	1.04E-04
Particulate D/Q (m-2)	4.80E-07

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	8.80E-06
Particulate X/Q (sec/m3)	8.80E-06
Particulate D/Q (m-2)	6.20E-08

Elevated Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

	Units	Quarter 3	Quarter 4	Quarters 3 and 4	Year to Ending Date
Bone	mrem	1.02E-04	1.17E-04	2.19E-04	4.28E-04
Liver	mrem	1.03E-04	1.18E-04	2.21E-04	4.33E-04
TBody	mrem	1.03E-04	1.18E-04	2.21E-04	4.33E-04
Thyroid	mrem	1.03E-04	1.18E-04	2.21E-04	4.34E-04
Kidney	mrem	1.03E-04	1.18E-04	2.21E-04	4.33E-04
Lung	mrem	1.03E-04	1.18E-04	2.21E-04	4.33E-04
GI-LLI	mrem	1.03E-04	1.18E-04	2.21E-04	4.33E-04



TABLE 4-1  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSE TO A MEMBER OF THE PUBLIC  
 DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
 Unit: Site

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Page: 2

Location Name	VISITOR LOCATION 2 (SW POND)	
Distance (kilometers)	9.66E-01	
Sector	SSW	
Occupancy Factor	7.53E-03	(6.60E+01 hr/yr)
Age Group	CHILD	

Ground Level Releases:

Noble Gas X/Q (sec/m3)	4.74E-05
Particulate X/Q (sec/m3)	4.74E-05
Particulate D/Q (m-2)	1.31E-07

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	9.75E-07
Particulate X/Q (sec/m3)	9.75E-07
Particulate D/Q (m-2)	2.78E-08

Elevated Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

	Units	Quarter 3	Quarter 4	Quarters 3 and 4	Year to Ending Date
Bone	mrem	6.21E-05	7.11E-05	1.33E-04	2.61E-04
Liver	mrem	6.28E-05	7.20E-05	1.35E-04	2.64E-04
TBody	mrem	6.28E-05	7.20E-05	1.35E-04	2.64E-04
Thyroid	mrem	6.28E-05	7.20E-05	1.35E-04	2.64E-04
Kidney	mrem	6.28E-05	7.20E-05	1.35E-04	2.64E-04
Lung	mrem	6.28E-05	7.20E-05	1.35E-04	2.64E-04
GI-LLI	mrem	6.28E-05	7.20E-05	1.35E-04	2.64E-04

TABLE 4-1  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2002  
 DOSE TO A MEMBER OF THE PUBLIC  
 DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
 Unit: Site

Starting: 01-Jul-2002

Ending: 31-Dec-2002

Page: 3

Location Name	VISITOR LOCATION 3 (RW DISCH.)	
Distance (kilometers)	1.64E+00	
Sector	SE	
Occupancy Factor	1.14E-02	(9.99E+01 hr/yr)
Age Group	CHILD	

Ground Level Releases:

Noble Gas X/Q (sec/m3)	1.63E-05
Particulate X/Q (sec/m3)	1.63E-05
Particulate D/Q (m-2)	4.55E-08

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	7.05E-07
Particulate X/Q (sec/m3)	7.05E-07
Particulate D/Q (m-2)	1.39E-08

Elevated Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

	Units	Quarter 3	Quarter 4	Quarters 3 and 4	Year to Ending Date
Bone	mrem	6.79E-05	7.79E-05	1.46E-04	2.86E-04
Liver	mrem	6.88E-05	7.88E-05	1.48E-04	2.89E-04
TBody	mrem	6.88E-05	7.88E-05	1.48E-04	2.89E-04
Thyroid	mrem	6.88E-05	7.88E-05	1.48E-04	2.89E-04
Kidney	mrem	6.88E-05	7.88E-05	1.48E-04	2.89E-04
Lung	mrem	6.88E-05	7.88E-05	1.48E-04	2.89E-04
GI-LLI	mrem	6.88E-05	7.88E-05	1.48E-04	2.89E-04

## 5.0 TOTAL DOSE FROM URANIUM FUEL CYCLE (40CFR190)

### 5.1 Regulatory Requirements

Technical Specification 5.5.4.j states that the dose or dose commitment to any MEMBER OF THE PUBLIC over a calendar year, due to releases of radioactivity and to radiation from uranium fuel cycle sources, shall be limited to less than or equal to 25 mrem to the total body or to any organ, except the thyroid, which shall be limited to less than or equal to 75 mrem (as stated in ODCM 5.1).

With the calculated doses from the release of radioactive materials in liquid or gaseous effluents exceeding twice the limits of ODCM 2.1.3, 3.1.3, or 3.1.4, calculations shall be made according to ODCM 5.2 methods to determine whether the above (ODCM 5.1) limits have been exceeded (as stated in ODCM 5.1.2).

### 5.2 Demonstration of Compliance

Since none of the ODCM 2.1.3, 3.1.3, or 3.1.4 limits were exceeded during 2002, no calculations were required.

## 6.0 METEOROLOGICAL DATA

Meteorological data are retained onsite; these data are available to the NRC upon request. The meteorological data include annual as well as quarterly summaries of hourly measurements of wind speed, wind direction and atmospheric stability in the form of joint frequency distribution tables.

## 7.0 PROGRAM DEVIATIONS

### 7.1 Inoperable Liquid or Gaseous Effluent Monitoring Instrumentation

#### 7.1.1 Regulatory Requirements

ODCM 7.2.2.6 states in part that the Annual Radioactive Effluent Release Report (the report) shall include deviations from the liquid and gaseous effluent monitoring instrumentation operability requirements included in Sections 2.1.1 and 3.1.1 of the ODCM. The report must also include an explanation as to why the inoperability was not corrected in a timely manner.

#### 7.1.2 Description of Deviations

There were no deviations during 2002.

## 7.2 Effluent Sample Analysis Exceeding Minimum Detectable Concentration (MDC)

### 7.2.1 Regulatory Requirements

ODCM 7.2.2.6 states in part that the report shall include deviations from the MDC requirements included in ODCM Tables 2-3 and 3-3.

### 7.2.2 Description of Deviations

There were no deviations during 2002.

## 7.3 Incorrect Compositing of Liquid or Gaseous Effluent Samples

### 7.3.1 Regulatory Requirements

ODCM 7.2.2.6 states in part that the report shall include deviations from composite sampling requirements included in ODCM Tables 2-3 and 3-3.

### 7.3.2 Description of Deviations

There were two deviations from the composite sampling requirements of ODCM Table 2-3 during 2002. On 01/28/2002, a unit-2 turbine building sump sample was missed due to equipment failure. Details of this event are documented in condition report # 2002000237. On 10/21/2002, a unit-2 turbine building sump sample was missed when a sump which was on batch release was released prior to a sample being taken. A dip sample was taken of the water remaining in the sump which showed no measured activity. Details of this event are documented in condition report # 2002002573.

## 8.0 CHANGES TO THE PLANT FARLEY ODCM

### 8.1 Regulatory Requirements

Pursuant to Technical Specification 5.5.1.c and ODCM 7.2.2.5, licensee initiated changes to the ODCM shall be submitted to the Nuclear Regulatory Commission as a part of or concurrent with the Annual Radioactive Effluent Release Report for the period in which any changes were made. Included are changes to the radiological environmental monitoring program sampling locations or dose calculation locations or pathways, including any changes made pursuant to ODCM 4.1.2.2.2 (land use census).

### 8.2 Description of Changes

There were no changes to the ODCM during 2002.

## 9.0 MAJOR CHANGES TO LIQUID, GASEOUS, OR SOLID RADWASTE TREATMENT SYSTEMS

### 9.1 Regulatory Requirements

ODCM 7.2.2.7 states in part that, as required by ODCM 2.1.5 and 3.1.6, licensee initiated MAJOR CHANGES TO RADIOACTIVE WASTE TREATMENT SYSTEMS (liquid and gaseous) shall be reported to the Nuclear Regulatory Commission in the Annual Radioactive Effluents Release Report covering the period in which the change was reviewed and accepted for implementation.

Process Control Program (PCP) B.5.1.2 states that licensee initiated major changes to the solid radioactive waste treatment system shall be reported to the Nuclear Regulatory Commission in the Annual Radioactive Effluent Release Report for the period in which the change was implemented. The discussion of each change shall include the information specified in PCP B.4.1.

### 9.2 Description of Major Changes

There were no major changes during 2002.