Semi-Annual
Effluent and Waste Disposal Report
Second Half 1989

Consolidated Edison Company of New York, Inc.
Indian Point Unit Nos. 1 and 2
Docket Nos. 50-03 50-247
February, 1990

February 28, 1990

Re: Indian Point Unit Nos. 1 and 2
Docket Nos. 50-3 and 50-247

SEMI-ANNUAL

EFFLUENT AND WASTE DISPOSAL REPORT

JULY 1, 1989 - DECEMBER 31, 1989

FACILITY: Indian Point Station (Units 1 and 2)

LICENSEE: Consolidated Edison Company of New York, Inc.

This information is provided pursuant to 10 CFR 50.36a(a) (2), and employs certain guidance as set forth in Regulatory Guide 1.21, Revision 1. The numbered sections of this part of the report reference corresponding sections of the subject Regulatory Guide, pages 1.21-10 through 1.21-12. This Semi-Annual Effluent and Waste Disposal Report for Indian Point Units 1 and 2 covers discharges for the third and fourth quarters of 1989. The New York Power Authority, licensee of Indian Point Unit 3, will issue a separate semi-annual report.

A. Supplemental Information and Definition

1. Regulatory Limits

Indian Point Units 1 and 2 are presently subject to radioactive waste release specifications that are set forth in Appendix A to Facility Operating Licenses DPR-5 and DPR-26 entitled "Technical Specifications and Bases".

2. Maximum Permissible Concentrations (MPC)

Liquid Effluents

All liquid discharges from Indian Point are made through a common discharge canal with a minimum of 100,000 gpm dilution water. The isotopic content, excluding tritium and dissolved noble gas, of continuous and batch mode discharges for each calendar quarter has been added, and a weighted average fraction of MPC has been calculated for this isotopic mixture. The percent of the applicable limit reported in Table 2A of this document is the percent of MPC concentration of the time-averaged diluted concentration for each calendar quarter.

The tritium limit has been established in the same manner as the limits for other isotopes in liquid effluents. A derived MPC of $2x10^{-4}$ uCi/ml for dissolved noble gases has been conservatively adopted for the liquid effluents due to swimming pathway.

3. Average Energy

The average energy ($\bar{E}$) of the radionuclide mixture in releases of fission and activation gases for the third quarter was 0.072 Mev/Dis. for E-Gamma and 0.149 Mev/Dis. for E-Beta. The corresponding values for the fourth quarter were 0.084 Mev/Dis., and 0.199 Mev/Dis., respectively.

4. Measurements and Approximations of Total Radioactivity

a. Fission and Activation Gases

Analysis of effluent gases has been performed in compliance with the requirements of Table 4.10-3 of the Technical Specifications. In the case of isolated tanks (batch releases), the total activity discharged is based on an isotopic analysis of each batch and the volume of gas in that batch corrected to standard temperature and pressure.

Vapor Containment ventilation discharges have been generally treated as batch releases. At least one complete isotopic concentration analysis of containment air is performed per week. This is applied to gross analysis of the ventilation air performed prior to each discharge. This information is combined with the volume of air in each discharge to calculate the radionuclide composition of these discharges.

The continuous discharges are based on the isotopic content determined from weekly samples of ventilation air. This information is combined with total air volume discharged by this route. The accumulation of batch and containment ventilation releases is then used to determine total discharges.

b&c. Iodines and Particulates

Iodine-131 and particulate releases are quantified by collecting a continuous sample of ventilation air on a potassium-iodine impregnated activated charcoal cartridge and a glass-fiber filter paper. These samples are obtained as required by Table 4.10-3 of the Technical Specifications, and the concentration of isotopes found by analysis of these samples is combined with the volume of air discharged during the sampling period to calculate the amount of activity discharged.

For other iodine isotopes the ratio of each isotope to Iodine-131 is determined by a monthly 24 hour composite sample. This ensures the proper identification of the short-lived I-133 and I-135 isotopes.

d. Liquid Effluents

A sample of each batch discharge is taken and an isotopic analysis is performed in compliance with requirements specified in Table 4.10-1 of the Technical Specifications. This isotopic concentration data is combined with information of volume discharged to determine the amount of each isotope discharged in the period.

Samples of continuous discharges have been taken and analyzed in compliance with Table 4.10-1 of the Technical Specifications. This concentration data is combined with the volume discharged to calculate the amount of each isotope discharged.

The above concentrations are used in conjunction with the actual dilution flow to calculate the fraction of maximum permissible concentration.

February 28, 1990

Re: Indian Point Units 1 and 2
Docket Nos. 50-03 and 50-247

5. Batch Releases:

a. Liquid	3rd Qtr.	4th Qtr.
Number of Batch Releases	20	57
Total Time Period of Batch Releases (Minutes)	1241	2974
Maximum Time Period of Batch Release (Minutes)	120	120
Average Time Period of Batch Release (Minutes)	62	52
Minimum Time Period of Batch Release (Minutes)	31	8
Average Stream Flow (cfs)	N/A(1)	N/A(1)
b. Gaseous		
Number of Batch Releases	123	167
Total Time Period of Batch Releases (Minutes)	27178	29355
Maximum Time Period of Batch Release (Minutes)	992	1605
Average Time Period of Batch Release (Minutes)	221	176
Minimum Time Period of Batch Release (Minutes)	15	10

6. ABNORMAL RELEASES

a. Liquid - None

b. Gaseous - None

(1) This information is obtained from the U.S. Department of Interior. It is not available at this time.

SEMI-ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT

B - GASEOUS EFFLUENTS

SECOND HALF 1989

Consolidated Edison Company of New York, Inc.
Indian Point Unit Nos. 1 and 2
Docket Nos. 50-03 50-247
February, 1990

Con Edison

INDIAN POINT STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1989

GASEOUS EFFLUENTS -- SUMMATION OF ALL RELEASES

	UNITS	QUARTER 3	QUARTER 4	EST. TOTAL ERROR, %
A. FISSION AND ACTIVATION GASES				
1. TOTAL RELEASE	CI	5.41E 00	3.18E 01	5.00E 01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	6.80E-01	4.01E 00	
B. IODINES				
1. TOTAL IODINE-131	CI	9.67E-04	2.55E-04	5.00E 01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	1.22E-04	3.21E-05	
C. PARTICULATES				
1. PARTICULATES WITH HALF-LIVES >8 DAYS	CI	3.09E-04	5.52E-04	5.00E 01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	3.89E-05	6.94E-05	
4. GROSS ALPHA RADIOACTIVITY	CI	0.00E 00	0.00E 00	
D. TRITIUM				
1. TOTAL RELEASE	CI	2.18E-02	1.61E-01	5.00E 01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	2.74E-03	2.03E-02	

Con
Edison

INDIAN POINT STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1989

GASEOUS EFFLUENTS -- SUMMATION OF ALL RELEASES

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNITS	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
1. FISSION AND ACTIVATION GASES					
H3	CI	2.18E-02	1.61E-01	0.00E 00	0.00E 00
C14	CI	2.00E 00	2.00E 00	0.00E 00	0.00E 00
AR41	CI	1.26E-02	1.23E-01	1.18E-01	1.57E-01
KR85M	CI	2.42E-03	1.66E-02	2.30E-03	4.34E-02
KR85	CI	0.00E 00	0.00E 00	0.00E 00	3.23E-01
KR87	CI	2.11E-03	1.04E-01	0.00E 00	0.00E 00
KR88	CI	4.16E-03	3.29E-02	0.00E 00	2.14E-02
XE131M	CI	0.00E 00	0.00E 00	7.38E-03	0.00E 00
XE133M	CI	0.00E 00	0.00E 00	2.32E-02	1.34E-01
XE133	CI	2.41E-02	1.46E 01	2.98E 00	1.10E 01
XE135M	CI	6.20E-02	2.58E-01	0.00E 00	0.00E 00
XE135	CI	4.85E-02	7.15E-01	1.20E-01	2.15E 00
XE138	CI	3.71E-03	1.02E-01	0.00E 00	0.00E 00
TOTAL FOR PERIOD (ABOVE)	CI	2.18E 00	1.81E 01	3.25E 00	1.39E 01

Con
Edison

INDIAN POINT STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1989

GASEOUS EFFLUENTS -- SUMMATION OF ALL RELEASES

		CONTINUOUS MODE	
NUCLIDES RELEASED	UNITS	QUARTER 3	QUARTER 4
2. IODINES			
I131	CI	9.67E-04	2.55E-04
I133	CI	0.00E 00	5.47E-04
I135	CI	0.00E 00	6.75E-04
TOTAL FOR PERIOD (ABOVE)	CI	9.67E-04	1.48E-03
3. PARTICULATES			
CO58	CI	9.65E-06	3.77E-05
CO60	CI	1.78E-04	3.51E-04
CS137	CI	1.20E-04	1.63E-04
NI63	CI	9.80E-07	7.68E-08
TOTAL FOR PERIOD (ABOVE)	CI	3.09E-04	5.52E-04

SEMI-ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT

C - LIQUID EFFLUENTS

SECOND HALF 1989

Consolidated Edison Company of New York, Inc.
Indian Point Unit Nos. 1 and 2
Docket Nos. 50-03 50-247
February, 1990

Con Edison
INDIAN POINT STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1989

LIQUID EFFLUENTS -- SUMMATION OF ALL RELEASES

	UNITS	QUARTER 3	QUARTER 4	EST. TOTAL ERROR, %
A. FISSION AND ACTIVATION PRODUCTS				
1. TOTAL RELEASE (EXCL. TRIT., GASES, ALPHA)	CI	9.49E-02	2.18E-01	2.50E 01
2. AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	2.23E-10	7.88E-10	
3. PERCENT OF MPC	%	2.94E-03	2.35E-02	
B. TRITIUM				
1. TOTAL RELEASE	CI	2.42E 01	1.99E 02	2.50E 01
2. AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	5.68E-08	7.17E-07	
3. PERCENT OF MPC	%	1.89E-03	2.39E-02	
C. DISSOLVED AND ENTRAINED GASES				
1. TOTAL RELEASE	CI	2.07E-03	2.49E-02	2.50E 01
2. AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	4.85E-12	8.99E-11	
3. PERCENT OF MPC	%	2.43E-06	4.49E-05	
D. GROSS ALPHA RADIOACTIVITY				
1. TOTAL RELEASE	CI	0.00E 00	0.00E 00	2.50E 01
E. VOLUME WASTE RELEASED (PRIOR TO DILUTION)	LITERS	7.66E 07	5.52E 07	1.00E 01
F. VOLUME DILUTION WATER USED DURING PERIOD	LITERS	4.27E 11	2.77E 11	1.00E 01

Con Edison
INDIAN POINT STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1989

LIQUID EFFLUENTS FOR ALL RELEASE POINTS

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNITS	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
H3	CI	1.86E 00	5.78E 00	2.24E 01	1.93E 02
NA24	CI	0.00E 00	2.51E-03	0.00E 00	0.00E 00
CR51	CI	0.00E 00	9.28E-04	9.28E-05	7.01E-04
MN54	CI	3.01E-06	0.00E 00	1.36E-04	4.21E-05
MN56	CI	0.00E 00	1.96E-04	0.00E 00	0.00E 00
FE55	CI	0.00E 00	0.00E 00	4.54E-03	3.58E-03
CO58	CI	6.83E-04	3.54E-02	1.18E-02	4.67E-03
CO60	CI	2.75E-03	7.48E-03	4.37E-03	8.21E-03
NI63	CI	0.00E 00	0.00E 00	3.98E-02	3.30E-03
SR89	CI	0.00E 00	0.00E 00	3.50E-04	0.00E 00
SR90	CI	0.00E 00	0.00E 00	2.65E-04	0.00E 00
ZR95	CI	0.00E 00	1.24E-04	0.00E 00	0.00E 00
NB95	CI	0.00E 00	3.59E-04	1.44E-05	6.29E-05
TC99M	CI	0.00E 00	5.21E-04	0.00E 00	0.00E 00
RU106	CI	0.00E 00	4.38E-03	0.00E 00	0.00E 00
AG110M	CI	0.00E 00	0.00E 00	0.00E 00	6.32E-06
I131	CI	1.10E-04	5.14E-03	0.00E 00	0.00E 00

Con Edison
INDIAN POINT STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1989

LIQUID EFFLUENTS FOR ALL RELEASE POINTS

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE QUARTER 3	CONTINUOUS MODE QUARTER 4	BATCH MODE QUARTER 3	BATCH MODE QUARTER 4
LIQUID EFFLUENTS (CONTD)					
I132	CI	3.39E-03	1.81E-02	0.00E 00	0.00E 00
I133	CI	7.83E-03	3.47E-02	0.00E 00	0.00E 00
I134	CI	1.61E-03	1.67E-02	0.00E 00	0.00E 00
I135	CI	2.31E-03	3.31E-02	0.00E 00	0.00E 00
CS134	CI	0.00E 00	0.00E 00	7.11E-05	4.07E-06
CS137	CI	4.18E-04	8.66E-04	1.07E-02	7.96E-03
CS138	CI	0.00E 00	1.01E-02	0.00E 00	0.00E 00
BA139	CI	0.00E 00	5.01E-03	0.00E 00	0.00E 00
CO57	CI	0.00E 00	0.00E 00	4.29E-05	1.56E-06
SB125	CI	0.00E 00	7.38E-04	2.97E-03	1.02E-02
SB124	CI	0.00E 00	1.21E-03	6.24E-04	2.10E-03
TOTAL FOR PERIOD (ABOVE)	CI	1.88E 00	5.96E 00	2.24E 01	1.93E 02

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE QUARTER 3	CONTINUOUS MODE QUARTER 4	BATCH MODE QUARTER 3	BATCH MODE QUARTER 4
XE133	CI	0.00E 00	4.78E-04	0.00E 00	4.13E-04
XE135	CI	3.58E-04	4.21E-03	0.00E 00	0.00E 00
XE135M	CI	1.71E-03	1.98E-02	0.00E 00	0.00E 00

SEMI-ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT

D - SOLID WASTE

SECOND HALF 1989

Consolidated Edison Company of New York, Inc.
Indian Point Unit Nos. 1 and 2
Docket Nos. 50-03 50-247
February, 1990

February 28, 1990

Re: Indian Point Unit No. 1 & 2
Docket Nos. 50-3 and 50-247

Solid Radwaste Disposal Report July 1, 1989 through December 31, 1989.

Solid Radwaste Shipped Offsite for Burial, Reprocessing, or Disposal (No irradiated fuel).

6 MONTH PERIOD

1. Type of Waste	Units	Class A	Class B	Class C	Total Error, %
a. Spent Resins,	m^3	12.58	--	5.5	--
sludges, etc.	Ci	14.503	--	4.51	1.00E+2
b. DAW	m^3	267.31	1.084	1.084	--
	Ci	8.583	1.017	2.554	1.00E+2
c. Irradiated	m^3	--	--	--	--
components	Ci	--	--	--	--
control rods, etc.					

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

a.	Cs-134	-	0.9	Mn-54	-	2.05
	Cs-137	-	31.6	Fe-55	-	4.1
	Co-60	-	17.0	Ni-63	-	11.4
	Co-58	-	27.4	Sb-125	-	3.5
				H3	-	1.2
				Others*	-	0.85
b.	H-3	-	10.0	Co-60	-	24.9
	Fe-55	-	7.6	Zr-95	-	4.0
	Co-58	-	9.1	Cs-134	-	7.7
	Mn-54	-	3.1	Cs-137	-	16.3
	Nb-95	-	0.9	C-14	-	0.3
	Ni-63	-	13.4	Sr-90	-	0.2
				I-129	-	0.001
				Pu-241	-	2.5

* Others in Section 2.a include - Cr-51,I-129, Tc-99, Sr-90, C-14, H-3, Co-57, Pu-238, Pu-239, Cm-242, Cm-244, Am-241

February 28, 1990

Re: Indian Point Unit No. 1 and 2
Docket Nos. 50-3 and 50-247

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
18	Truck	Barnwell, SC Channahon, Ill. Oakridge, Tenn.

4. Solid Waste Containers

a. 5 High Integrity Containers

b. 6 High Integrity Containers
23 Crates
3 Cargo Containers
320 Steel Drums
3 Reheaters

5. Waste Class

Container	Class A	Class B	Class C
Carbon Steel Solidification Liners	--	--	--
High Integrity Container	8	1	2
Steel Crates	23	--	--
Steel Drums	320	--	--
Cargo Container	3	--	--
Reheaters	3	--	--

Note: Items "4 and 5" are the number of steel crates, cargo containers and steel drums shipped offsite for volume reduction and direct burial not the total number of containers buried.

SEMI-ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT

E - RADIOLOGICAL IMPACT ON MAN

SECOND HALF 1989

Consolidated Edison Company of New York, Inc.
Indian Point Unit Nos. 1 and 2
Docket Nos. 50-03 50-247
February, 1990

February 28, 1990

Re: Indian Point Unit No. 2
Docket No. 50-247

RADIOLOGICAL IMPACT EVALUATION

Doses from gaseous immersion, inhalation, ground deposition, and vegetation ingestion were evaluated for the nearest residence likely to be occupied in the critical sector for each pathway and were combined to provide a conservative determination of the maximum individual offsite radiation dose from these pathways. Calculations were performed for members of the public on site for this reporting period. Doses to such individuals were found to be significantly less than one percent of the maximum individual offsite dose. Doses were also evaluated for all sectors assuming an individual ingesting milk and meat from a cow located at a 5.0 mile distance. In all cases these evaluations were performed using the models presented in Regulatory Guide 1.109.

All releases were evaluated using actual meteorological conditions existing during the release period.

Integrated doses from the population within 50 miles of Indian Point from gaseous effluents were computed based on the most current population data.

Dose calculations for liquid pathways to individuals and populations are computed for a year. The LADTAP II computer program that is utilized for these calculations incorporated the calculation model and parameters that are presented in Regulatory Guide 1.109.

The fish, invertebrate, algae, drinking, shoreline, swimming and boating pathways are calculated for the adult, teenager, child and infant. These calculations are performed for reasons such as estimating the population water consumption dose, the population recreation dose, and cost-benefit analysis.

NUREG-0017, "Calculation of Release of Radioactive Materials in Gaseous and Liquid effluents from Pressurized Water Reactors", assumes an annual release of 8.0 Ci/yr of Carbon-14. Therefore, to be consistent with NUREG-0017, a release of 4.0 Curies of Carbon-14 was assumed for the six month period in addition to the radioactive materials measured in Indian Point gaseous effluents.

This impact evaluation demonstrates that the dose commitment to man from the operation of Indian Point Unit Nos. 1 and 2 is negligible, and is well below the levels set forth in 10 CFR 20, 10 CFR 50 and the Indian Point Unit Nos. 1 and 2 Technical Specifications.

B. Population

(1) Pathways (Gaseous)

	Total Body (man-rem)	Thyroid (man-rem)
a) Noble Gas Immersion	4.9E-2	4.9E-2
b) Inhalation	1.0E-1	1.0E-1
c) Ground Deposition	9.8E-2	9.8E-2
d) Totals	2.5E-1	2.5E-2

(2) Pathways (Liquid)

a) All — See Attached "LADTAP" printout, Attachment I

C. Average Doses to Individuals

(1) Pathways

a) Liquid-Total Body 8.61E-6 millirem

b) Gaseous-Total Body 1.20E-5 millirem

Indian Point Units 1 & 2

RADIOLOGICAL IMPACT ON MAN

(Reference Regulatory Guide 1.21, Page 12)

A. Maximum Individual Doses

(1) Pathways (Gaseous)

Pathways (Gaseous)	Total Body mRem	Skin mRem	Thyroid mRem	Bone
a) Noble Gas Immersion	1.88E-3	4.66E-3	N/A	N/A
b) Inhalation	1.54E-2	N/A	4.33E-3	2.89E-3
c) Ground Deposition	4.43E-3	5.21E-3	4.43E-3	4.43E-3
d) Milk Ingestion	2.09E-2	N/A	3.27E-2	9.78E-2
e) Meat Ingestion	3.21E-3	N/A	3.27E-3	1.60E-2
f) Vegetable Ingestion	2.23E-1	N/A	2.32E-1	1.12E-0

(2) Pathways (Liquid)

a) All — See Attached "LADTAP" printout, Attachment I

N/A = Not Applicable

B. Population

(1) Pathways (Gaseous)

	Total Body (man-rem)	Thyroid (man-rem)
a) Noble Gas Immersion	4.9E-2	4.9E-2
b) Inhalation	1.0E-1	1.0E-1
c) Ground Deposition	9.8E-1	9.8E-1
d) Totals	1.1E-0	1.1E-0

(2) Pathways (Liquid)

a) All — See Attached "LADTAP" printout, Attachment I

C. Average Doses to Individuals

(1) Pathways

a) Liquid-Total Body	8.61E-6	millirem
b) Gaseous-Total Body	1.20E-5	millirem

IP2 SEMI-ANNUAL EFFLUENT REPORT 2ND HALF 1989 - USNRC LADTAP II CODE

DISCHARGE=1.56E+03 CFS SOURCE TERM MULTIPLIER=1.00E+00

50-MILE POPULATION=2.09E+07 FRACTION --- CATEGORY I=0.71
                                CATEGORY II=0.11
                                CATEGORY III=0.18

FRESHWATER SITE

SOU[illegible]RM FOLLOWS
NO INTERNAL RECONCENTRATION MODEL EMPLOYED

* * * CATEGORY I DOSE FACTORS * * *

NUCLIDE		CURIE/YEAR	INGESTION DOSE FACTORS (MREM/PCI INTAKE) BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI	SHORELINE (MREM/HR)/(PCI/M**2) SKIN	TOTAL BODY	RECON
1H	3	2.23E+02	0.00E+00	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	0.00E+00	0.00E+00	1.00E+00
11NA	24	2.51E-03	1.70E-06	1.70E-06	1.70E-06	1.70E-06	1.70E-06	1.70E-06	1.70E-06	2.90E-08	2.50E-08	1.00E+00
24CR	51	1.72E-03	0.00E+00	0.00E+00	2.66E-09	1.59E-09	5.86E-10	3.53E-09	6.69E-07	2.60E-10	2.20E-10	1.00E+00
25MN	54	1.81E-04	0.00E+00	4.57E-06	8.72E-07	0.00E+00	1.36E-06	0.00E+00	1.40E-05	6.80E-09	5.80E-09	1.00E+00
25MN	56	1.96E-04	0.00E+00	1.15E-07	2.04E-08	0.00E+00	1.46E-07	0.00E+00	3.67E-06	1.30E-08	1.10E-08	1.00E+00
26FE	55	8.12E-03	2.75E-06	1.90E-06	4.43E-07	0.00E+00	0.00E+00	1.06E-06	1.09E-06	0.00E+00	0.00E+00	1.00E+00
27CO	58	5.26E-02	0.00E+00	7.45E-07	1.67E-06	0.00E+00	0.00E+00	0.00E+00	1.51E-05	8.20E-09	7.00E-09	1.00E+00
27CO	60	2.28E-02	0.00E+00	2.14E-06	4.72E-06	0.00E+00	0.00E+00	0.00E+00	4.02E-05	2.00E-08	1.70E-08	1.00E+00
28NI	63	4.31E-02	1.30E-04	9.01E-06	4.36E-06	0.00E+00	0.00E+00	0.00E+00	1.88E-06	0.00E+00	0.00E+00	1.00E+00
38SR	89	3.50E-04	3.08E-04	0.00E+00	8.84E-06	0.00E+00	0.00E+00	0.00E+00	4.94E-05	6.50E-13	5.60E-13	1.00E+00
38SR	90	2.65E-04	3.84E-03	0.00E+00	1.03E-03	0.00E+00	0.00E+00	0.00E+00	2.19E-04	0.00E+00	0.00E+00	1.00E+00
41NB	95	4.36E-04	6.22E-09	3.46E-09	1.86E-09	0.00E+00	3.42E-09	0.00E+00	2.10E-05	5.10E-09	6.00E-09	1.00E+00
40ZR	95	1.24E-04	3.04E-08	9.75E-09	6.60E-09	0.00E+00	1.53E-08	0.00E+00	3.09E-05	5.80E-09	5.00E-09	1.00E+00
43TC	99M	5.21E-04	2.47E-10	6.98E-10	8.89E-09	0.00E+00	1.06E-08	3.42E-10	4.13E-07	1.10E-09	9.60E-10	1.00E+00
44RU	106	4.38E-03	2.75E-06	0.00E+00	3.48E-07	0.00E+00	5.31E-06	0.00E+00	1.78E-04	1.50E-09	1.80E-09	1.00E+00
47AG	110M	6.32E-06	1.60E-07	1.48E-07	8.79E-08	0.00E+00	2.91E-07	0.00E+00	6.04E-05	2.10E-08	1.80E-08	1.00E+00
53I	131	5.25E-03	4.16E-06	5.95E-06	3.41E-06	1.95E-03	1.[illegible]E-05	0.00E+00	1.57E-06	3.40E-09	2.80E-09	1.00E+00
53I	132	2.15E-02	2.03E-07	5.43E-07	1.90E-07	1.90E-05	8.65E-07	0.00E+00	1.02E-07	1.70E-08	2.00E-08	1.00E+00
53I	133	4.25E-02	1.42E-06	2.47E-06	7.53E-07	3.63E-04	4.31E-06	0.00E+00	2.22E-06	4.50E-09	3.70E-09	1.00E+00
53I	134	1.83E-02	1.06E-07	2.88E-07	1.03E-07	4.99E-06	4.58E-07	0.00E+00	2.51E-10	1.90E-08	1.60E-08	1.00E+00
53I	135	3.54E-02	4.43E-07	1.16E-06	4.28E-07	7.65E-05	1.86E-06	0.00E+00	1.31E-06	1.20E-08	1.40E-08	1.00E+00
55CS	134	7.52E-05	6.22E-05	1.48E-04	1.21E-04	0.00E+00	4.79E-05	1.59E-05	2.59E-06	1.40E-08	1.20E-08	1.00E+00
55CS	137	1.99E-02	7.97E-05	1.09E-04	7.14E-05	0.00E+00	3.70E-05	1.23E-05	2.11E-06	4.90E-09	4.20E-09	1.00E+00
55CS	138	1.01E-02	5.52E-08	1.09E-07	5.40E-08	0.00E+00	8.01E-08	7.91E-09	4.65E-13	2.40E-08	2.10E-08	1.00E+00
56BA	139	5.01E-03	9.70E-08	6.91E-11	2.84E-09	0.00E+00	6.46E-11	3.92E-11	1.72E-07	2.70E-09	2.40E-09	1.00E+00
27CO	57	4.45E-05	0.00E+00	1.75E-07	2.91E-07	0.00E+00	0.00E+00	0.00E+00	4.44E-06	1.00E-09	9.10E-10	1.00E+00
51SB	124	3.93E-03	2.80E-06	5.29E-08	1.11E-06	6.79E-09	0.00E+00	2.18E-06	7.95E-05	1.50E-08	1.30E-08	1.00E+00
51SB	125	1.39E-02	1.79E-06	2.00E-08	4.26E-07	1.82E-09	0.00E+00	1.38E-06	1.97E-05	3.50E-09	3.10E-09	1.00E+00

* * * CATEGORY II DOSE FACTORS * * *

NUCLIDE		CURIE/YEAR	INGESTION DOSE FACTORS (MREM/PCI INTAKE) BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI	SHORELINE (MREM/HR)/(PCI/M**2) SKIN	TOTAL BODY	RECON
1H	3	2.23E+02	0.00E+00	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07			
11NA	24	2.51E-03	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06			
24CR	51	1.72E-03	0.00E+00	0.00E+00	3.60E-09	2.00E-09	7.89E-10	5.14E-09	6.05E-07			
25MN	54	1.81E-04	0.00E+00	5.90E-06	1.17E-06	0.00E+00	1.76E-06	0.00E+00	1.21E-05			
25MN	56	1.96E-04	0.00E+00	1.58E-07	2.81E-08	0.00E+00	2.00E-07	0.00E+00	1.04E-05			
26FE	55	8.12E-03	3.78E-06	2.68E-06	6.25E-07	0.00E+00	0.00E+00	1.70E-06	1.16E-06			
27CO	58	5.26E-02	0.00E+00	9.72E-07	2.24E-06	0.00E+00	0.00E+00	0.00E+00	1.34E-05			
27CO	60	2.28E-02	0.00E+00	2.81E-06	6.33E-06	0.00E+00	0.00E+00	0.00E+00	3.66E-05			
28NI	63	4.31E-02	1.77E-04	1.25E-05	6.00E-06	0.00E+00	0.00E+00	0.00E+00	1.99E-06			
38SR	89	3.50E-04	4.40E-04	0.00E+00	1.26E-05	0.00E+00	0.00E+00	0.00E+00	5.24E-05			
38SR	90	2.65E-04	4.48E-03	0.00E+00	1.20E-03	0.00E+00	0.00E+00	0.00E+00	2.33E-04			
41NB	95	4.36E-04	8.22E-09	4.56E-09	2.51E-09	0.00E+00	4.42E-09	0.00E+00	1.95E-05			
40ZR	95	1.24E-04	4.12E-08	1.30E-08	8.94E-09	0.00E+00	1.91E-08	0.00E+00	3.00E-05			
43TC	99M	5.21E-04	3.32E-10	9.26E-10	1.20E-08	0.00E+00	1.38E-08	5.14E-10	6.08E-07			
44RU	106	4.38E-03	3.92E-06	0.00E+00	4.94E-07	0.00E+00	7.56E-06	0.00E+00	1.88E-04			
47AG	110M	6.32E-06	2.05E-07	1.94E-07	1.18E-07	0.00E+00	3.70E-07	0.00E+00	5.45E-05			
53I	131	5.25E-03	5.85E-06	8.19E-06	4.40E-06	2.39E-03	1.41E-05	0.00E+00	1.62E-06			

53I	[illegible]	2.15E-02	2.79E-07	7.36E-07	2.62E-07	2.46E-05	1.15E-[illegible]	[illegible]0E+00	3.18E-07
53I	[illegible]	4.25E-02	2.01E-06	3.41E-06	1.04E-06	4.76E-04	5.98E-[illegible]	[illegible]00E+00	2.58E-06
53I	[illegible]	1.83E-02	1.46E-07	3.87E-07	1.39E-07	6.45E-06	6.10E-07	0.00E+00	5.10E-09
53I	135	3.54E-02	6.10E-07	1.57E-06	5.82E-07	1.01E-04	2.48E-06	0.00E+00	1.74E-06
55CS	134	7.52E-05	8.37E-05	1.97E-04	9.14E-05	0.00E+00	6.26E-05	2.39E-05	2.45E-06
55CS	137	1.99E-02	1.12E-04	1.49E-04	5.19E-05	0.00E+00	5.07E-05	1.97E-05	2.12E-06
55CS	138	1.01E-02	7.76E-08	1.49E-07	7.45E-08	0.00E+00	1.10E-07	1.28E-08	6.76E-11
56BA	139	5.01E-03	1.39E-07	9.78E-11	4.05E-09	0.00E+00	9.22E-11	6.74E-11	1.24E-06
27CO	57	4.45E-05	0.00E+00	2.38E-07	3.99E-07	0.00E+00	0.00E+00	0.00E+00	4.44E-06
51SB	124	3.93E-03	3.87E-06	7.73E-08	1.31E-06	8.78E-09	0.00E+00	3.38E-06	7.80E-05
51SB	125	1.39E-02	2.48E-06	2.71E-08	5.80E-07	2.37E-09	0.00E+00	2.18E-06	1.93E-05

* * * CATEGORY III DOSE FACTORS * * *

			INGESTION DOSE FACTORS (MREM/PCI INTAKE)							SHORELINE (MREM/HR)/(PCI/M**2)		
NUCLIDE		CURIE/YEAR	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY	RECON
1H	3	2.23E+02	0.00E+00	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07			
11NA	24	2.51E-03	5.80E-06	5.80E-06	5.80E-06	5.80E-06	5.80E-06	5.80E-06	5.80E-06			
24CR	51	1.72E-03	0.00E+00	0.00E+00	8.90E-09	4.94E-09	1.35E-09	9.02E-09	4.72E-07			
25MN	54	1.81E-04	0.00E+00	1.07E-05	2.85E-06	0.00E+00	3.00E-06	0.00E+00	8.98E-06			
25MN	56	1.96E-04	0.00E+00	3.34E-07	7.54E-08	0.00E+00	4.04E-07	0.00E+00	4.84E-05			
26FE	55	8.12E-03	1.15E-05	6.10E-06	1.89E-06	0.00E+00	0.00E+00	3.45E-06	1.13E-06			
27CO	58	5.26E-02	0.00E+00	1.80E-06	5.51E-06	0.00E+00	0.00E+00	0.00E+00	1.05E-05			
27CO	60	2.28E-02	0.00E+00	5.29E-06	1.56E-05	0.00E+00	0.00E+00	0.00E+00	2.93E-05			
28NI	63	4.31E-02	5.38E-04	2.88E-05	1.83E-05	0.00E+00	0.00E+00	0.00E+00	1.94E-06			
38SR	89	3.50E-04	1.32E-03	0.00E+00	3.77E-05	0.00E+00	0.00E+00	0.00E+00	5.11E-05			
38SR	90	2.65E-04	1.13E-02	0.00E+00	3.03E-03	0.00E+00	0.00E+00	0.00E+00	2.29E-04			
41NB	95	4.36E-04	2.25E-08	8.76E-09	6.26E-09	0.00E+00	8.23E-09	0.00E+00	1.62E-05			
40ZR	95	1.24E-04	1.16E-07	2.55E-08	2.27E-08	0.00E+00	3.65E-08	0.00E+00	2.66E-05			
43TC	99M	5.21E-04	9.23E-10	1.81E-09	3.00E-08	0.00E+00	2.63E-08	9.19E-10	1.03E-06			
44RU	106	4.38E-03	1.17E-05	0.00E+00	1.46E-06	0.00E+00	1.58E-05	0.00E+00	1.82E-04			
47AG	110M	6.32E-06	5.39E-07	3.64E-07	2.91E-07	0.00E+00	6.78E-07	0.00E+00	4.33E-05			
53I	131	5.25E-03	1.72E-05	1.73E-05	9.83E-06	5.72E-03	2.84E-05	0.00E+00	1.54E-06			
53I	132	2.15E-02	8.00E-07	1.47E-06	6.76E-07	6.82E-05	2.25E-06	0.00E+00	1.73E-06			
53I	133	4.25E-02	5.92E-06	7.32E-06	2.77E-06	1.36E-03	1.22E-05	0.00E+00	2.95E-06			
53I	134	1.83E-02	4.19E-07	7.78E-07	3.58E-07	1.79E-05	1.19E-06	0.00E+00	5.16E-07			
53I	135	3.54E-02	1.75E-06	3.15E-06	1.49E-06	2.79E-04	4.83E-06	0.00E+00	2.40E-06			
55CS	134	7.52E-05	2.34E-04	3.84E-04	8.10E-05	0.00E+00	1.19E-04	4.27E-05	2.07E-06			
55CS	137	1.99E-02	3.27E-04	3.13E-04	4.62E-05	0.00E+00	1.02E-04	3.67E-05	1.96E-06			
55CS	138	1.01E-02	2.28E-07	3.17E-07	2.01E-07	0.00E+00	2.23E-07	2.40E-08	1.46E-07			
56BA	139	5.01E-03	4.14E-07	2.21E-10	1.20E-08	0.00E+00	1.93E-10	1.30E-10	2.39E-05			
27CO	57	4.45E-05	0.00E+00	4.93E-07	9.98E-07	0.00E+00	0.00E+00	0.00E+00	4.04E-06			
51SB	124	3.93E-03	1.11E-05	1.44E-07	3.89E-06	2.45E-08	0.00E+00	6.16E-06	6.94E-05			
51SB	125	1.39E-02	7.16E-06	5.52E-08	1.50E-06	6.63E-09	0.00E+00	3.99E-06	1.71E-05			

* * * CATEGORY IV DOSE FACTORS * * *

			INGESTION DOSE FACTORS (MREM/PCI INTAKE)							SHORELINE (MREM/HR)/(PCI/M**2)		
NUCLIDE		CURIE/YEAR	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY	RECON
1H	3	2.23E+02	0.00E+00	3.08E-07	3.08E-07	3.08E-07	3.08E-07	3.08E-07	3.08E-07			
11NA	24	2.51E-03	1.01E-05	1.01E-05	1.01E-05	1.01E-05	1.01E-05	1.01E-05	1.01E-05			
24CR	51	1.72E-03	0.00E+00	0.00E+00	1.41E-08	9.20E-09	2.01E-09	1.79E-08	4.11E-07			
25MN	54	1.81E-04	0.00E+00	1.99E-05	4.51E-06	0.00E+00	4.41E-06	0.00E+00	7.31E-06			
25MN	56	1.96E-04	0.00E+00	8.18E-07	1.41E-07	0.00E+00	7.03E-07	0.00E+00	7.43E-05			
26FE	55	8.12E-03	1.39E-05	8.98E-06	2.40E-06	0.00E+00	0.00E+00	4.39E-06	1.14E-06			
27CO	58	5.26E-02	0.00E+00	3.60E-06	8.98E-06	0.00E+00	0.00E+00	0.00E+00	8.97E-06			
27CO	60	2.28E-02	0.00E+00	1.08E-05	2.55E-05	0.00E+00	0.00E+00	0.00E+00	2.57E-05			
28NI	63	4.31E-02	6.34E-04	3.92E-05	2.20E-05	0.00E+00	0.00E+00	0.00E+00	1.95E-06			

38SR	[illegible]	3.50E-04	2.51E-03	0.00E+00	7.20E-05	0.00E+00	0.00E+[illegible]	[illegible]E+00	5.16E-05
38SR	[illegible]	2.65E-04	1.2[illegible]E-03	0.00E+00	3.37E-03	0.00E+00	0.00E+[illegible]	[illegible]E+00	2.31E-04
41NB	95	4.36E-04	4.20E-08	1.73E-08	1.00E-08	0.00E+00	1.24E-08	0.00E+00	1.46E-05
40ZR	95	1.24E-04	2.06E-07	5.02E-08	3.56E-08	0.00E+00	5.41E-08	0.00E+00	2.50E-05
43TC	99M	5.21E-04	1.92E-09	3.96E-09	5.10E-08	0.00E+00	4.26E-08	2.07E-09	1.15E-06
44RU	106	4.38E-03	2.41E-05	0.00E+00	3.01E-06	0.00E+00	2.85E-05	0.00E+00	1.83E-04
47AG	110M	6.32E-06	9.96E-07	7.27E-07	4.81E-07	0.00E+00	1.04E-06	0.00E+00	3.77E-05
53I	131	5.25E-03	3.59E-05	4.23E-05	1.86E-05	1.39E-02	4.94E-05	0.00E+00	1.51E-06
53I	132	2.15E-02	1.66E-06	3.37E-06	1.20E-06	1.58E-04	3.76E-06	0.00E+00	2.73E-06
53I	133	4.25E-02	1.25E-05	1.82E-05	5.33E-06	3.31E-03	2.14E-05	0.00E+00	3.08E-06
53I	134	1.[illegible]E-02	8.69E-07	1.70E-06	6.33E-07	4.15E-05	1.99E-06	0.00E+00	1.84E-06
53I	135	3.54E-02	3.64E-06	7.24E-06	2.64E-06	6.49E-04	8.07E-06	0.00E+00	2.62E-06
55CS	134	7.52E-05	3.77E-04	7.03E-04	7.10E-05	0.00E+00	1.81E-04	7.42E-05	1.91E-06
55CS	137	1.99E-02	5.22E-04	6.11E-04	4.33E-05	0.00E+00	1.64E-04	6.64E-05	1.91E-06
55CS	138	1.01E-02	4.81E-07	7.82E-07	3.79E-07	0.00E+00	3.90E-07	6.09E-08	1.35E-06
56BA	139	5.01E-03	8.81E-07	5.84E-10	2.55E-08	0.00E+00	3.51E-10	3.54E-10	5.58E-05
27CO	57	4.45E-05	0.00E+00	1.15E-06	1.87E-06	0.00E+00	0.00E+00	0.00E+00	3.92E-06
51SB	124	3.93E-03	2.14E-05	3.15E-07	6.63E-06	5.68E-08	0.00E+00	1.34E-05	6.60E-05
51SB	125	1.39E-02	1.23E-05	1.19E-07	2.53E-06	1.54E-08	0.00E+00	7.12E-06	1.64E-05

TOTAL NUMBER IN SOURCE TERM IS 28 TOTAL RELEASE IS 2.2331E+02

* * * AS LOW AS RE[illegible]BLY ACHIEVABLE * * *

CATEGORY I DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.14E-02	1.33E-02	8.77E-03	7.97E-04	4.52E-03	1.54E-03	1.45E-03
INVERTEBRATE		6.49E-04	3.00E-04	1.97E-04	7.35E-05	8.95E-05	5.28E-05	6.30E-04
ALGAE		2.49E-09	1.68E-09	1.36E-09	9.62E-10	6.38E-10	2.79E-10	4.16E-09
DRINKING		1.20E-13	3.73E-13	3.65E-13	4.38E-13	3.46E-13	3.39E-13	3.81E-13
SHORELINE	1.62E-04	1.39E-04	1.39E-04	1.39E-04	1.39E-04	1.39E-04	1.39E-04	1.39E-04
SWIMMING	0.00E+00	2.53E-06	2.53E-06	2.53E-06	2.53E-06	2.53E-06	2.53E-06	2.53E-06
BOATING	0.00E+00	2.53E-06	2.53E-06	2.53E-06	2.53E-06	2.53E-06	2.53E-06	2.53E-06
TOTAL	1.62E-04	1.21E-02	1.37E-02	9.11E-03	1.01E-03	4.75E-03	1.74E-03	2.22E-03

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)
FISH	21.0	5.0	25.00
INVERTEBRATE	5.0	5.0	25.00
ALGAE	0.0	5.0	25.00
DRINKING	0.0	500.0	112.00
SHORELINE	50.0	5.0	1.00
SWIMMING	50.0	5.0	1.00
BOATING	100.0	5.0	1.00

SHOREWIDTH FACTOR=0.2

CATEGORY II DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.21E-02	1.38E-02	4.92E-03	7.54E-04	4.70E-03	1.86E-03	1.04E-03
INVERTEBRATE		6.66E-04	3.06E-04	1.48E-04	6.76E-05	8.83E-05	5.74E-05	4.52E-04
ALGAE		3.31E-09	2.29E-09	1.15E-09	1.21E-09	8.67E-10	4.26E-10	4.21E-09
DRINKING		1.62E-13	3.91E-13	3.65E-13	4.65E-13	3.54E-13	3.44E-13	3.83E-13
SHORELINE	2.17E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04
SWIMMING	0.00E+00	5.07E-06	5.07E-06	5.07E-06	5.07E-06	5.07E-06	5.07E-06	5.07E-06
BOATING	0.00E+00	2.53E-06	2.53E-06	2.53E-06	2.53E-06	2.53E-06	2.53E-06	2.53E-06
TOTAL	2.17E-04	1.29E-02	1.43E-02	5.26E-03	1.01E-03	4.98E-03	2.11E-03	1.69E-03

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)
FISH	16.0	5.0	25.00
INVERTEBRATE	3.8	5.0	25.00
ALGAE	0.0	5.0	25.00
DRINKING	0.0	500.0	112.00
SHORELINE	67.0	5.0	1.00
SWIMMING	100.0	5.0	1.00
BOATING	100.0	5.0	1.00

SHOREWIDTH FACTOR=0.2

CATEGORY III DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.53E-02	1.25E-02	2.01E-03	8.30E-04	4.07E-03	1.49E-03	4.05E-04
INVERTEBRATE		8.84E-04	2.84E-04	1.27E-04	7.50E-05	7.71E-05	5.00E-05	1.77E-04
ALGAE		9.40E-06	4.80E-06	1.68E-06	3.11E-06	1.75E-06	7.97E-07	3.93E-06
DRINKING		4.79E-10	7.59E-10	6.94E-10	9.55E-10	6.79E-10	6.59E-10	6.86E-10
SHORELINE	4.54E-05	3.88E-05	3.88E-05	3.88E-05	3.88E-05	3.88E-05	3.88E-05	3.88E-05
SWIMMING	0.00E+00	1.27E-06	1.27E-06	1.27E-06	1.27E-06	1.27E-06	1.27E-06	1.27E-06
BOATING	0.00E+00	2.53E-06	2.53E-06	2.53E-06	2.53E-06	2.53E-06	2.53E-06	2.53E-06

TOTAL	4.54E-05	1.42E-02	1.29E-02	2.18E-03	9.51E-04	4.19E-03	1.59E-03	6.28E-04

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)	SHOREWIDTH FACTOR=0.2
FISH	6.9	5.0	25.00	
INVERTEBRATE	1.7	5.0	25.00	
ALGAE	0.0	5.0	25.00	
DRINKING	0.0	500.0	112.00	
SHORELINE	14.0	5.0	1.00	
SWIMMING	25.0	5.0	1.00	
BOATING	100.0	5.0	1.00	

C A T E G O R Y I V D O S E S

	DOSE (MREM PER YEAR INTAKE)							
PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.70E-03	1.77E-03	1.41E-04	1.44E-04	4.74E-04	1.95E-04	2.87E-05
INVERTEBRATE		6.57E-05	3.00E-05	9.84E-06	1.02E-05	7.20E-06	4.46E-06	9.89E-06
ALGAE		1.34E-08	9.27E-09	1.96E-09	7.51E-09	2.84E-09	1.42E-09	3.87E-09
DRINKING		6.08E-13	1.19E-12	1.04E-12	1.73E-12	1.03E-12	1.00E-12	1.02E-12
SHORELINE	9.73E-06	8.32E-06	8.32E-06	8.32E-06	8.32E-06	8.32E-06	8.32E-06	8.32E-06
SWIMMING	0.00E+00	5.07E-13	5.07E-13	5.07E-13	5.07E-13	5.07E-13	5.07E-13	5.07E-13
BOATING	0.00E+00	1.27E-08	1.27E-08	1.27E-08	1.27E-08	1.27E-08	1.27E-08	1.27E-08
TOTAL	9.73E-06	1.77E-03	1.81E-03	1.60E-04	1.62E-04	4.90E-04	2.07E-04	4.69E-05

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)	SHOREWIDTH FACTOR=0.2
FISH	0.5	5.0	25.00	
INVERTEBRATE	0.1	5.0	25.00	
ALGAE	0.0	5.0	25.00	
DRINKING	0.0	500.0	112.00	
SHORELINE	3.0	5.0	1.00	
SWIMMING	0.0	5.0	1.00	
BOATING	0.5	5.0	1.00	

* * * SELECTED LOCATION * * *

LOCATION IS DOWNSTREAM

C A T E G O R Y I D O S E S

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		8.11E-03	9.50E-03	6.26E-03	5.21E-04	3.23E-03	1.10E-03	1.03E-03
INVERTEBRATE		4.64E-04	2.14E-04	1.41E-04	4.86E-05	6.38E-05	3.77E-05	4.50E-04
ALGAE		1.78E-09	1.20E-09	9.68E-10	6.26E-10	4.55E-10	1.99E-10	2.97E-09
DRINKING		8.63E-12	2.68E-11	2.61E-11	4.25E-11	2.49E-11	2.42E-11	2.74E-11
SHORELINE	1.16E-04	9.90E-05	9.90E-05	9.90E-05	9.90E-05	9.90E-05	9.90E-05	9.90E-05
SWIMMING	0.00E+00	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06
BOATING	0.00E+00	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06
TOTAL	1.16E-04	8.68E-03	9.82E-03	6.51E-03	6.71E-04	3.39E-03	1.24E-03	1.58E-03

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)
FISH	21.0	7.0	31.00
INVERTEBRATE	5.0	7.0	31.00
ALGAE	0.0	7.0	31.00
DRINKING	0.0	7.0	19.00
SHORELINE	50.0	7.0	7.00
SWIMMING	50.0	7.0	7.00
BOATING	100.0	7.0	7.00

SHOREWIDTH FACTOR=0.2

LOCATION IS DOWNSTREAM

C A T E G O R Y I I D O S E S

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		8.63E-03	9.88E-03	3.52E-03	4.90E-04	3.35E-03	1.33E-03	7.42E-04
INVERTEBRATE		4.76E-04	2.18E-04	1.06E-04	4.44E-05	6.30E-05	4.10E-05	3.23E-04
ALGAE		2.36E-09	1.63E-09	8.20E-10	7.82E-10	6.13E-10	3.04E-10	3.00E-09
DRINKING		1.16E-11	2.80E-11	2.62E-11	4.76E-11	2.55E-11	2.46E-11	2.75E-11
SHORELINE	1.55E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04
SWIMMING	0.00E+00	3.02E-06	3.02E-06	3.02E-06	3.02E-06	3.02E-06	3.02E-06	3.02E-06
BOATING	0.00E+00	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06
TOTAL	1.55E-04	9.24E-03	1.02E-02	3.76E-03	6.72E-04	3.55E-03	1.50E-03	1.20E-03

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)
FISH	16.0	7.0	31.00
INVERTEBRATE	3.8	7.0	31.00
ALGAE	0.0	7.0	31.00
DRINKING	0.0	7.0	19.00
SHORELINE	67.0	7.0	7.00
SWIMMING	100.0	7.0	7.00
BOATING	100.0	7.0	7.00

SHOREWIDTH FACTOR=0.2

LOCATION IS DOWNSTREAM

C A T E G O R Y I I I D O S E S

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.09E-02	8.96E-03	1.43E-03	5.35E-04	2.91E-03	1.07E-03	2.08E-04

INVERTEBRATE		6.31E-04	2.03E-04	9.05E-05	4.88E-05	5.50E-05	3.56E-05	1.24E-04
ALGAE		6.71E-06	3.43E-06	1.20E-06	2.00E-06	1.25E-06	5.69E-07	2.80E-06
DRINKING		3.44E-08	5.45E-08	4.97E-08	1.08E-07	4.87E-08	4.71E-08	4.92E-08
SHORELINE	3.24E-05	2.77E-05	2.77E-05	2.77E-05	2.77E-05	2.77E-05	2.77E-05	2.77E-05
SWIMMING	0.00E+00	7.56E-07	7.56E-07	7.56E-07	7.56E-07	7.56E-07	7.56E-07	7.56E-07
BOATING	0.00E+00	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06
TOTAL	3.24E-05	1.16E-02	9.19E-03	1.55E-03	6.16E-04	2.99E-03	1.13E-03	4.47E-04

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)	SHOREWIDTH FACTOR=0.2
FISH	6.9	7.0	31.00	
INVERTEBRATE	1.7	7.0	31.00	
ALGAE	0.0	7.0	31.00	
DRINKING	0.0	7.0	19.00	
SHORELINE	14.0	7.0	7.00	
SWIMMING	25.0	7.0	7.00	
BOATING	100.0	7.0	7.00	

LOCATION IS DOWNSTREAM

C A T E G O R Y I V D O S E S

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.21E-03	1.26E-03	1.01E-04	9.23E-05	3.39E-04	1.39E-04	2.04E-05
INVERTEBRATE		4.69E-05	2.14E-05	7.02E-06	6.59E-06	5.14E-06	3.48E-06	7.05E-06
ALGAE		9.59E-09	6.62E-09	1.40E-09	4.82E-09	2.03E-09	1.01E-09	2.76E-09
DRINKING		4.38E-11	8.56E-11	7.44E-11	2.19E-10	7.45E-11	7.18E-11	7.29E-11
SHORELINE	6.95E-06	5.94E-06	5.94E-06	5.94E-06	5.94E-06	5.94E-06	5.94E-06	5.94E-06
SWIMMING	0.00E+00	3.02E-13	3.02E-13	3.02E-13	3.02E-13	3.02E-13	3.02E-13	3.02E-13
BOATING	0.00E+00	7.56E-09	7.56E-09	7.56E-09	7.56E-09	7.56E-09	7.56E-09	7.56E-09
TOTAL	6.95E-06	1.26E-03	1.29E-03	1.14E-04	1.05E-04	3.50E-04	1.48E-04	3.34E-05

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)	SHOREWIDTH FACTOR=0.2
FISH	0.5	7.0	31.00	
INVERTEBRATE	0.1	7.0	31.00	
ALGAE	0.0	7.0	31.00	
DRINKING	0.0	7.0	19.00	
SHORELINE	3.0	7.0	7.00	
SWIMMING	0.0	7.0	7.00	
BOATING	0.5	7.0	7.00	

* * * FISH CONSUMPTION POPULATION DOSES * * *
MAN-REM

_____SPORT HARVEST_____

PATHWAY	AGE GROUP	USAGE	DOSE (MAN-REM) BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH	CATEGORY I	7.60E+04	2.88E-02	3.38E-02	2.23E-02	8.08E-04	1.15E-02	3.92E-03	3.42E-03
FISH	CATEGORY II	8.97E+03	4.70E-03	5.38E-03	1.92E-03	1.42E-04	1.83E-03	7.22E-04	3.78E-04
FISH	CATEGORY III	6.14E+03	9.55E-03	7.83E-03	1.25E-03	1.79E-04	2.54E-03	9.32E-04	2.37E-04
FISH	TOTAL	9.10E+04	4.31E-02	4.70E-02	2.54E-02	1.10E-03	1.58E-02	5.58E-03	4.04E-03

LOCATION DILUTION CATCH TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 1.68E+02 HR POPULATION=1.55E+04
7.00E+00 9.10E+04 1.68E+02

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) CATEGORY I=6.90E+00 CATEGORY II=5.20E+00 CATEGORY IV=2.20E+00

* * * FISH CONSUMPTION POPULATION DOSES * * *
MAN-REM

COMMERCIAL HARVEST

DOSE (MAN-REM)

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH	CATEGORY I	1.02E+08	1.37E-01	1.60E-01	1.06E-01	3.11E-03	5.44E-02	1.86E-02	1.57E-02
FISH	CATEGORY II	1.20E+07	2.23E-02	2.56E-02	9.09E-03	4.27E-04	8.67E-03	3.43E-03	1.74E-03
FISH	CATEGORY III	8.28E+06	4.53E-02	3.72E-02	5.94E-03	6.77E-04	1.21E-02	4.42E-03	1.09E-03
FISH	TOTAL	1.23E+08	2.04E-01	2.23E-01	1.21E-01	4.22E-03	7.51E-02	2.65E-02	1.85E-02

LOCATION	DILUTION	CATCH	TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 2.40E+02 HR	POPULATION=2.09E+07
	7.00E+00	1.55E+05	2.40E+02	

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) CATEGORY I=6.90E+00 CATEGORY II=5.20E+00 CATEGORY IV=2.20E+00

NEPA DOSES

NOTE--TOTAL NEPA DOSE INCLUDES SPORT CATCH

DOSE (MAN-REM)

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH	CATEGORY I	2.05E+05	7.79E-02	9.13E-02	6.02E-02	1.93E-03	3.10E-02	1.06E-02	9.06E-03
FISH	CATEGORY II	2.40E+04	1.27E-02	1.46E-02	5.18E-03	2.65E-04	4.94E-03	1.95E-03	1.00E-03
FISH	CATEGORY III	1.66E+04	2.58E-02	2.12E-02	3.38E-03	4.22E-04	6.87E-03	2.52E-03	6.28E-04
FISH	TOTAL	2.46E+05	1.16E-01	1.27E-01	6.87E-02	2.61E-03	4.28E-02	1.51E-02	1.07E-02

* * * INVERTEBRATE CONSUMPTION POPULATION DOSES * * *
MAN-REM

SPORT HARVEST

DOSE (MAN-REM)

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
INVER	CATEGORY I	8.33E+03	7.59E-04	3.50E-04	2.30E-04	4.13E-05	1.04E-04	6.14E-05	7.24E-04
INVER	CATEGORY II	9.68E+02	1.19E-04	5.44E-05	2.63E-05	5.44E-06	1.56E-05	1.02E-05	7.94E-05
INVER	CATEGORY III	6.97E+02	2.54E-04	8.14E-05	3.61E-05	8.68E-06	2.20E-05	1.43E-05	5.00E-05
INVER	TOTAL	1.00E+04	1.13E-03	4.85E-04	2.92E-04	5.54E-05	1.41E-04	8.59E-05	8.53E-04

LOCATION	DILUTION	CATCH	TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 1.68E+02 HR	POPULATION=1.17E+04
	7.00E+00	1.00E+04	1.68E+02	

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) CATEGORY I=1.00E+00 CATEGORY II=7.50E-01 CATEGORY IV=3.30E-01

* * * INVERTEBRATE CONSUMPTION POPULATION DOSES * * *
MAN-REM

COMMERCIAL HARVEST

PATHWAY	AGE GROUP	USAGE	DOSE (MAN-REM) BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
INVER	CATEGORY I	1.48E+07	5.87E-04	2.70E-04	1.77E-04	2.77E-05	8.01E-05	4.75E-05	5.55E-04
INVER	CATEGORY II	1.72E+06	9.20E-05	4.20E-05	2.03E-05	3.60E-06	1.21E-05	7.90E-06	6.09E-05
INVER	CATEGORY III	1.24E+06	1.97E-04	6.29E-05	2.78E-05	5.65E-06	1.70E-05	1.11E-05	3.84E-05
INVER	TOTAL	1.78E+07	8.75E-04	3.75E-04	2.25E-04	3.69E-05	1.09E-04	6.64E-05	6.55E-04

LOCATION DILUTION CATCH TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 2.40E+02 HR POPULATION=2.09E+07
7.00E+00 1.00E+03 2.40E+02

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) CATEGORY I=1.00E+00 CATEGORY II=7.50E-01 CATEGORY IV=3.30E-01

NEPA DOSES

NOTE--TOTAL NEPA DOSE INCLUDES SPORT CATCH

PATHWAY	AGE GROUP	USAGE	DOSE (MAN-REM) BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
INVER	CATEGORY I	9.17E+03	8.34E-04	3.84E-04	2.53E-04	4.49E-05	1.14E-04	6.75E-05	7.95E-04
INVER	CATEGORY II	1.07E+03	1.31E-04	5.99E-05	2.89E-05	5.91E-06	1.72E-05	1.12E-05	8.73E-05
INVER	CATEGORY III	7.67E+02	2.79E-04	8.95E-05	3.97E-05	9.41E-06	2.42E-05	1.57E-05	5.49E-05
INVER	TOTAL	1.10E+04	1.24E-03	5.34E-04	3.21E-04	6.02E-05	1.55E-04	9.45E-05	9.38E-04

* * * POPULATION WATER CONSUMPTION DOSES * * *

SUPPLIER-

PATHWAY	AGE GROUP	USAGE	DOSE (MAN-REM) BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
DRINKING	CATEGORY I	2.63E+02	4.95E-09	6.88E-10	4.53E-10	7.25E-11	1.73E-10	1.06E-10	1.52E-10
DRINKING	CATEGORY II	2.86E+01	7.33E-10	1.00E-10	5.05E-11	7.97E-12	2.29E-11	1.38E-11	1.71E-11
DRINKING	CATEGORY III	4.68E+01	3.62E-09	3.58E-10	1.80E-10	2.50E-11	7.42E-11	4.27E-11	3.95E-11
DRINKING	TOTAL	3.38E+02	9.31E-09	1.15E-09	6.83E-10	1.05E-10	2.70E-10	1.62E-10	2.08E-10

POPULATION=1.00E+00 DILUTION=1.00E+02 TRANSIT TIME=1.00E+06 HR (INCLUDING 24 HR FOR TREATMENT FACILITY)

AVERAGE INDIVIDUAL CONSUMPTION (L/YR) CATEGORY I =3.70E+02 CATEGORY II=2.60E+02 CATEGORY III=2.60E+02

------CUMULATIVE TOTAL------

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
DRINKING	CUMUL TOTAL	3.38E+02	9.31E-09	1.15E-09	6.83E-10	1.05E-10	2.70E-10	1.62E-10	2.08E-10

HYDROSPHERE TRITIUM DOSE

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
WATER	TOTAL	2.20E+00	1.83E-03	1.83E-03	1.83E-03	1.83E-03	1.83E-03	1.83E-03	1.83E-03

* * * RECREATION POPULATION DOSES * * *

LOCATION- DOWNSTREAM

DILUTION=0.70E+01 TRANSIT TIME=0.40E+01 HR SWF=0.2

PATHWAY	AGE GROUP	USAGE	DOSE(MAN-REM) SKIN	TOTAL BODY	THYROID
SHORELINE	TOTAL POPUL	1.66E+07	3.85E-02	3.29E-02	3.29E-02

LOCATION- 0.2D0

DILUTION=0.70E+01 TRANSIT TIME=0.40E+01 HR

PATHWAY	AGE GROUP	USAGE	DOSE(MAN-REM) SKIN	TOTAL BODY	THYROID
SWIMMING	TOTAL POPUL	1.66E+07	0.00E+00	5.17E-04	5.17E-04

LOCATION- 0.2D0

DILUTION=0.70E+01 TRANSIT TIME=0.40E+01 HR

PATHWAY	AGE GROUP	USAGE	DOSE(MAN-REM) SKIN	TOTAL BODY	THYROID
BOATING	TOTAL POPUL	1.66E+07	0.00E+00	2.59E-04	2.59E-04

* * * DOSE TO BIOTA * * *

MRADS PER YEAR

DILUTION= 7.00E+00 TRANSIT TIME= 4.00E+00 HR

	INTERNAL	EXTERNAL	TOTAL
FISH	2.61E-02	8.70E-02	1.13E-01
INVERTEBRATE	2.28E-02	1.74E-01	1.97E-01
ALGAE	5.07E-02	2.73E-04	5.10E-02
MUSKRAT	1.63E-01	5.79E-02	2.21E-01
RACCOON	8.71E-03	4.34E-02	5.21E-02
HERON	6.67E-01	5.79E-02	7.25E-01
DUCK	1.52E-01	8.68E-02	2.39E-01

* * * COST-BENEFIT ANALYSIS * * *

NUCLIDE	RELEASE CI/YR	MAN-REM DOSE TOTAL BODY	MAN-REM DOSE THYROID	MAN-REM PER CURIE TOTAL BODY	MAN-REM PER CURIE THYROID
1H 3	2.23E+02	1.22E-03	1.22E-03	5.45E-06	5.45E-06
11NA 24	2.51E-03	2.87E-05	2.87E-05	1.14E-02	1.14E-02
24CR 51	1.72E-03	5.60E-07	5.35E-07	3.26E-04	3.11E-04
25MN 54	1.81E-04	4.49E-05	1.14E-05	2.48E-01	6.29E-02
25MN 56	1.96E-04	3.64E-07	3.64E-07	1.86E-03	1.86E-03
26FE 55	8.12E-03	4.95E-05	8.82E-10	6.10E-03	1.09E-07
27CO 58	5.26E-02	1.32E-03	1.03E-03	2.50E-02	1.96E-02
27CO 60	2.28E-02	2.19E-02	2.16E-02	9.62E-01	9.45E-01
28NI 63	4.31E-02	1.28E-03	0.00E+00	2.97E-02	0.00E+00
38SR 89	3.50E-04	6.03E-06	3.05E-09	1.72E-02	8.73E-06
38SR 90	2.65E-04	5.49E-04	2.43E-10	2.07E+00	9.16E-07
41NB 95	4.36E-04	4.33E-06	3.06E-06	9.92E-03	7.02E-03
40ZR 95	1.24E-04	1.64E-06	1.64E-06	1.32E-02	1.32E-02
43TC 99M	5.21E-04	1.36E-07	1.36E-07	2.62E-04	2.62E-04
44RU 106	4.38E-03	9.87E-05	9.67E-05	2.25E-02	2.21E-02
47AG 110M	6.32E-06	1.00E-06	1.00E-06	1.59E-01	1.59E-01
53I 131	5.25E-03	1.81E-05	4.19E-03	3.44E-03	7.98E-01
53I 132	2.15E-02	4.12E-07	4.12E-07	1.92E-05	1.92E-05
53I 133	4.25E-02	6.46E-05	7.86E-05	1.52E-03	1.85E-03
53I 134	1.83E-02	5.50E-06	5.50E-06	3.01E-04	3.01E-04
53I 135	3.54E-02	2.98E-06	2.98E-06	8.42E-05	8.42E-05
55CS 134	7.52E-05	9.28E-04	2.28E-05	1.23E+01	3.03E-01
55CS 137	1.99E-02	1.51E-01	8.98E-03	7.58E+00	4.51E-01
55CS 138	1.01E-02	3.96E-07	3.96E-07	3.92E-05	3.92E-05
56BA 139	5.01E-03	9.02E-08	9.02E-08	1.80E-05	1.80E-05
27CO 57	4.45E-05	4.28E-07	3.82E-07	9.61E-03	8.60E-03
51SB 124	3.93E-03	1.27E-04	1.27E-04	3.23E-02	3.22E-02
51SB 125	1.39E-02	1.44E-03	1.44E-03	1.03E-01	1.03E-01
TOTAL		1.80E-01	3.88E-02		

NOTE ON AGE GROUP:

CATEGORY I (17 YEARS OLD OR OLDER)
CATEGORY II (11 TO 17 YEARS OLD)
CATEGORY III (1 TO 11 YEARS OLD)
CATEGORY IV (0 TO 1 YEAR OLD)

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

INDIAN POINT JULY-SEPT 1989
10 METER WIND SPEED & DIR. WITH 61-10 METER DELTA T
PASQUILL CLASS A

WIND DIRECTION	WIND SPEED (MPH)						
	01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	9.	81.	10.	0.	0.	0.	100.
NNE	2.	20.	2.	0.	0.	0.	24.
NE	0.	2.	0.	0.	0.	0.	2.
ENE	0.	1.	0.	0.	0.	0.	1.
E	1.	2.	0.	0.	0.	0.	3.
ESE	1.	1.	0.	0.	0.	0.	2.
SE	1.	3.	0.	0.	0.	0.	4.
SSE	3.	37.	0.	0.	0.	0.	40.
S	6.	44.	3.	0.	0.	0.	53.
SSW	1.	24.	7.	0.	0.	0.	32.
SW	2.	12.	0.	0.	0.	0.	14.
WSW	0.	6.	0.	0.	0.	0.	6.
W	3.	9.	0.	0.	0.	0.	12.
WNW	2.	9.	0.	0.	0.	0.	11.
NW	14.	5.	0.	0.	0.	0.	19.
NNW	8.	12.	0.	0.	0.	0.	20.
TOTAL	53.	268.	22.	0.	0.	0.	343.

Periods of calm (hours): 0
Hours of missing data: 47 hours for this quarter. Pasquill A through G

[a]In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

INDIAN POINT JULY-SEPT 1989
10 METER WIND SPEED & DIR. WITH 61-10 METER DELTA T
PASQUILL CLASS B

WIND DIRECTION	WIND SPEED (MPH)						
	01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	3.	12.	4.	0.	0.	0.	19.
NNE	5.	14.	4.	0.	0.	0.	23.
NE	2.	3.	0.	0.	0.	0.	5.
ENE	0.	1.	0.	0.	0.	0.	1.
E	0.	0.	0.	0.	0.	0.	0.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	3.	0.	0.	0.	0.	0.	3.
SSE	1.	9.	0.	0.	0.	0.	10.
S	2.	21.	5.	0.	0.	0.	28.
SSW	1.	9.	3.	0.	0.	0.	13.
SW	1.	2.	0.	0.	0.	0.	3.
WSW	1.	2.	0.	0.	0.	0.	3.
W	1.	3.	0.	0.	0.	0.	4.
WNW	2.	0.	0.	0.	0.	0.	2.
NW	3.	2.	0.	0.	0.	0.	5.
NNW	0.	1.	0.	0.	0.	0.	1.
TOTAL	25.	79.	16.	0.	0.	0.	120.

Periods of calm (hours): 0
Hours of missing data:

[a]In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

INDIAN POINT JULY-SEPT 1989
10 METER WIND SPEED & DIR. WITH 61-10 METER DELTA T
PASQUILL CLASS C

WIND DIRECTION	WIND SPEED (MPH)						
	01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	4.	14.	0.	0.	0.	0.	18.
NNE	2.	10.	4.	0.	0.	0.	16.
NE	2.	3.	0.	0.	0.	0.	5.
ENE	0.	0.	0.	0.	0.	0.	0.
E	0.	0.	0.	0.	0.	0.	0.
ESE	3.	0.	0.	0.	0.	0.	3.
SE	2.	1.	0.	0.	0.	0.	3.
SSE	8.	6.	1.	0.	0.	0.	15.
S	1.	6.	2.	0.	0.	0.	9.
SSW	0.	2.	1.	0.	0.	0.	3.
SW	1.	2.	0.	0.	0.	0.	3.
WSW	3.	2.	0.	0.	0.	0.	5.
W	2.	2.	0.	0.	0.	0.	4.
WNW	3.	0.	0.	0.	0.	0.	3.
NW	2.	1.	0.	0.	0.	0.	3.
NNW	0.	0.	0.	0.	0.	0.	0.
TOTAL	33.	49.	8.	0.	0.	0.	90.

Periods of calm (hours): 0
Hours of missing data:

[a]In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

INDIAN POINT JULY-SEPT 1989
10 METER WIND SPEED & DIR. WITH 61-10 METER DELTA T
PASQUILL CLASS D

WIND DIRECTION	WIND SPEED (MPH)						
	01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	7.	56.	12.	0.	0.	0.	75.
NNE	17.	108.	43.	0.	0.	0.	168.
NE	54.	60.	0.	0.	0.	0.	114.
ENE	32.	3.	0.	0.	0.	0.	35.
E	33.	0.	0.	0.	0.	0.	33.
ESE	14.	1.	0.	0.	0.	0.	15.
SE	15.	1.	0.	0.	0.	0.	16.
SSE	12.	22.	4.	0.	0.	0.	38.
S	5.	21.	12.	7.	1.	0.	46.
SSW	7.	13.	5.	0.	0.	0.	25.
SW	4.	2.	0.	0.	0.	0.	6.
WSW	0.	0.	0.	0.	0.	0.	0.
W	8.	5.	0.	0.	0.	0.	13.
WNW	2.	11.	0.	0.	0.	0.	13.
NW	4.	4.	0.	0.	0.	0.	8.
NNW	2.	4.	1.	0.	0.	0.	7.
TOTAL	216.	311.	77.	7.	1.	0.	612.

Periods of calm (hours): 2
Hours of missing data:

[a]In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

INDIAN POINT JULY-SEPT 1989
10 METER WIND SPEED & DIR. WITH 61-10 METER DELTA T
PASQUILL CLASS E

WIND DIRECTION	WIND SPEED (MPH)						
	01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	6.	16.	0.	0.	0.	0.	22.
NNE	68.	82.	7.	0.	0.	0.	157.
NE	163.	112.	0.	0.	0.	0.	275.
ENE	82.	7.	0.	0.	0.	0.	89.
E	43.	0.	0.	0.	0.	0.	43.
ESE	32.	2.	0.	0.	0.	0.	34.
SE	24.	3.	0.	0.	0.	0.	27.
SSE	19.	21.	0.	0.	0.	0.	40.
S	8.	48.	5.	5.	0.	0.	66.
SSW	5.	13.	1.	0.	0.	0.	19.
SW	1.	2.	0.	0.	0.	0.	3.
WSW	3.	2.	0.	0.	0.	0.	5.
W	4.	2.	0.	0.	0.	0.	6.
WNW	2.	2.	0.	0.	0.	0.	4.
NW	5.	3.	0.	0.	0.	0.	8.
NNW	9.	5.	0.	0.	0.	0.	14.
TOTAL	474.	320.	13.	5.	0.	0.	812.

Periods of calm (hours): 3
Hours of missing data:

[a]In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

INDIAN POINT JULY-SEPT 1989
10 METER WIND SPEED & DIR. WITH 61-10 METER DELTA T
PASQUILL CLASS F

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	4.	0.	0.	0.	0.	0.	4.
NNE	27.	6.	0.	0.	0.	0.	33.
NE	52.	38.	0.	0.	0.	0.	90.
ENE	21.	4.	0.	0.	0.	0.	25.
E	11.	0.	0.	0.	0.	0.	11.
ESE	3.	0.	0.	0.	0.	0.	3.
SE	2.	0.	0.	0.	0.	0.	2.
SSE	0.	0.	0.	0.	0.	0.	0.
S	2.	3.	0.	0.	0.	0.	5.
SSW	0.	0.	0.	0.	0.	0.	0.
SW	1.	0.	0.	0.	0.	0.	1.
WSW	0.	0.	0.	0.	0.	0.	0.
W	1.	0.	0.	0.	0.	0.	1.
WNW	0.	0.	0.	0.	0.	0.	0.
NW	0.	0.	0.	0.	0.	0.	0.
NNW	0.	0.	0.	0.	0.	0.	0.
TOTAL	124.	51.	0.	0.	0.	0.	175.

Periods of calm (hours): 1
Hours of missing data:

[a]In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

INDIAN POINT JULY-SEPT 1989
10 METER WIND SPEED & DIR. WITH 61-10 METER DELTA T
PASQUILL CLASS G

WIND DIRECTION	WIND SPEED (MPH)						
	01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	1.	0.	0.	0.	0.	0.	1.
NNE	0.	0.	0.	0.	0.	0.	0.
NE	1.	1.	0.	0.	0.	0.	2.
ENE	0.	0.	0.	0.	0.	0.	0.
E	0.	0.	0.	0.	0.	0.	0.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	0.	0.	0.	0.	0.	0.	0.
SSE	0.	0.	0.	0.	0.	0.	0.
S	0.	0.	0.	0.	0.	0.	0.
SSW	0.	0.	0.	0.	0.	0.	0.
SW	0.	0.	0.	0.	0.	0.	0.
WSW	0.	0.	0.	0.	0.	0.	0.
W	0.	0.	0.	0.	0.	0.	0.
WNW	0.	0.	0.	0.	0.	0.	0.
NW	0.	0.	0.	0.	0.	0.	0.
NNW	0.	0.	0.	0.	0.	0.	0.
TOTAL	2.	1.	0.	0.	0.	0.	3.

Periods of calm (hours): 0
Hours of missing data:

[a]In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

INDIAN POINT OCT-DEC 1989
10 METER WIND SPEED & DIR. WITH 61-10 METER DELTA T
PASQUILL CLASS A

WIND DIRECTION	WIND SPEED (MPH)						
	01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	0.	2.	1.	0.	0.	0.	3.
NNE	0.	0.	0.	0.	0.	0.	0.
NE	0.	0.	0.	0.	0.	0.	0.
ENE	0.	0.	0.	0.	0.	0.	0.
E	0.	0.	0.	0.	0.	0.	0.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	0.	0.	0.	0.	0.	0.	0.
SSE	1.	3.	0.	0.	0.	0.	4.
S	0.	4.	1.	0.	0.	0.	5.
SSW	1.	1.	0.	0.	0.	0.	2.
SW	0.	0.	0.	0.	0.	0.	0.
WSW	0.	0.	0.	0.	0.	0.	0.
W	0.	1.	0.	0.	0.	0.	1.
WNW	1.	5.	2.	0.	0.	0.	8.
NW	1.	10.	7.	0.	0.	0.	18.
NNW	0.	11.	1.	0.	0.	0.	12.
TOTAL	4.	37.	12.	0.	0.	0.	53.

Periods of calm (hours): 0
Hours of missing data: 1 hour for this quarter A through G

[a]In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

INDIAN POINT OCT-DEC 1989
10 METER WIND SPEED & DIR. WITH 61-10 METER DELTA T
PASQUILL CLASS B

WIND DIRECTION	WIND SPEED (MPH)						
	01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	2.	4.	2.	0.	0.	0.	8.
NNE	0.	0.	0.	0.	0.	0.	0.
NE	0.	0.	0.	0.	0.	0.	0.
ENE	0.	0.	0.	0.	0.	0.	0.
E	0.	0.	0.	0.	0.	0.	0.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	0.	0.	0.	0.	0.	0.	0.
SSE	0.	5.	1.	0.	0.	0.	6.
S	0.	1.	5.	0.	0.	0.	6.
SSW	0.	0.	2.	1.	0.	0.	3.
SW	0.	1.	0.	0.	0.	0.	1.
WSW	0.	1.	0.	0.	0.	0.	1.
W	1.	2.	1.	0.	0.	0.	4.
WNW	0.	7.	1.	0.	0.	0.	8.
NW	0.	4.	10.	0.	0.	0.	14.
NNW	0.	3.	3.	0.	0.	0.	6.
TOTAL	3.	28.	25.	1.	0.	0.	57.

Periods of calm (hours): 0
Hours of missing data:

[a]In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

INDIAN POINT OCT-DEC 1989
10 METER WIND SPEED & DIR. WITH 61-10 METER DELTA T
PASQUILL CLASS C

WIND DIRECTION	WIND SPEED (MPH)						
	01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	0.	9.	6.	0.	0.	0.	15.
NNE	0.	1.	0.	0.	0.	0.	1.
NE	0.	0.	0.	0.	0.	0.	0.
ENE	0.	0.	0.	0.	0.	0.	0.
E	0.	0.	0.	0.	0.	0.	0.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	0.	0.	0.	0.	0.	0.	0.
SSE	1.	7.	0.	0.	0.	0.	8.
S	0.	3.	8.	0.	0.	0.	11.
SSW	0.	1.	2.	0.	0.	0.	3.
SW	0.	1.	1.	0.	0.	0.	2.
WSW	0.	1.	0.	0.	0.	0.	1.
W	0.	4.	0.	0.	0.	0.	4.
WNW	0.	4.	1.	0.	0.	0.	5.
NW	0.	4.	13.	2.	0.	0.	19.
NNW	0.	12.	8.	0.	0.	0.	20.
TOTAL	1.	47.	39.	2.	0.	0.	89.

Periods of calm (hours): 0
Hours of missing data:

[a]In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

INDIAN POINT OCT-DEC 1989
10 METER WIND SPEED & DIR. WITH 61-10 METER DELTA T
PASQUILL CLASS D

WIND DIRECTION	WIND SPEED (MPH)						
	01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	13.	84.	24.	1.	0.	0.	122.
NNE	30.	83.	71.	0.	0.	0.	184.
NE	20.	32.	10.	0.	0.	0.	62.
ENE	8.	0.	0.	0.	0.	0.	8.
E	14.	1.	0.	0.	0.	0.	15.
ESE	11.	2.	0.	0.	0.	0.	13.
SE	13.	2.	0.	0.	0.	0.	15.
SSE	8.	33.	2.	1.	0.	0.	44.
S	7.	67.	33.	1.	0.	0.	108.
SSW	8.	26.	12.	0.	0.	0.	46.
SW	3.	28.	2.	0.	0.	0.	33.
WSW	2.	14.	4.	0.	0.	0.	20.
W	1.	39.	13.	0.	0.	0.	53.
WNW	8.	68.	26.	5.	0.	0.	107.
NW	7.	77.	74.	15.	0.	0.	173.
NNW	6.	62.	35.	3.	0.	0.	106.
TOTAL	159.	618.	306.	26.	0.	0.	1109.

Periods of calm (hours): 0
Hours of missing data:

[a]In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

INDIAN POINT OCT-DEC 1989
10 METER WIND SPEED & DIR. WITH 61-10 METER DELTA T
PASQUILL CLASS E

WIND DIRECTION	WIND SPEED (MPH)						
	01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	11.	13.	0.	0.	0.	0.	24.
NNE	30.	27.	0.	0.	0.	0.	57.
NE	74.	43.	0.	0.	0.	0.	117.
ENE	56.	7.	0.	0.	0.	0.	63.
E	41.	1.	0.	0.	0.	0.	42.
ESE	25.	1.	0.	0.	0.	0.	26.
SE	30.	0.	0.	0.	0.	0.	30.
SSE	22.	28.	8.	2.	1.	0.	61.
S	17.	54.	21.	1.	2.	0.	95.
SSW	9.	17.	0.	0.	0.	0.	26.
SW	4.	4.	0.	0.	0.	0.	8.
WSW	3.	5.	0.	0.	0.	0.	8.
W	6.	22.	0.	0.	0.	0.	28.
WNW	6.	14.	10.	0.	0.	0.	30.
NW	6.	12.	0.	0.	0.	0.	18.
NNW	6.	7.	0.	0.	0.	0.	13.
TOTAL	346.	255.	39.	3.	3.	0.	646.

Periods of calm (hours): 4
Hours of missing data:

[a]In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

INDIAN POINT OCT-DEC 1989
10 METER WIND SPEED & DIR. WITH 61-10 METER DELTA T
PASQUILL CLASS F

WIND DIRECTION	WIND SPEED (MPH) 01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	1.	0.	0.	0.	0.	0.	1.
NNE	27.	11.	0.	0.	0.	0.	38.
NE	70.	27.	0.	0.	0.	0.	97.
ENE	16.	4.	0.	0.	0.	0.	20.
E	7.	1.	0.	0.	0.	0.	8.
ESE	4.	0.	0.	0.	0.	0.	4.
SE	3.	0.	0.	0.	0.	0.	3.
SSE	2.	0.	0.	0.	0.	0.	2.
S	4.	3.	1.	0.	0.	0.	8.
SSW	1.	0.	0.	0.	0.	0.	1.
SW	0.	0.	0.	0.	0.	0.	0.
WSW	0.	0.	0.	0.	0.	0.	0.
W	0.	0.	0.	0.	0.	0.	0.
WNW	0.	0.	0.	0.	0.	0.	0.
NW	0.	0.	0.	0.	0.	0.	0.
NNW	0.	0.	0.	0.	0.	0.	0.
TOTAL	135.	46.	1.	0.	0.	0.	182.

Periods of calm (hours): 3
Hours of missing data:

[a]In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

INDIAN POINT OCT-DEC 1989
10 METER WIND SPEED & DIR. WITH 61-10 METER DELTA T
PASQUILL CLASS G

WIND DIRECTION	WIND SPEED (MPH)						
	01-03	04-07	08-12	13-18	19-24	>24	TOTAL
N	0.	0.	0.	0.	0.	0.	0.
NNE	15.	4.	0.	0.	0.	0.	19.
NE	17.	22.	1.	0.	0.	0.	40.
ENE	4.	0.	0.	0.	0.	0.	4.
E	0.	0.	0.	0.	0.	0.	0.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	0.	0.	0.	0.	0.	0.	0.
SSE	0.	0.	0.	0.	0.	0.	0.
S	1.	0.	0.	0.	0.	0.	1.
SSW	0.	0.	0.	0.	0.	0.	0.
SW	0.	0.	0.	0.	0.	0.	0.
WSW	0.	0.	0.	0.	0.	0.	0.
W	0.	0.	0.	0.	0.	0.	0.
WNW	0.	0.	0.	0.	0.	0.	0.
NW	0.	0.	0.	0.	0.	0.	0.
NNW	0.	0.	0.	0.	0.	0.	0.
TOTAL	37.	26.	1.	0.	0.	0.	64.

Periods of calm (hours): 0
Hours of missing data:

[a]In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

SEMI-ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT

F - REPORTABLE CHANGES

TO THE PROCESS CONTROL ROOM (PCP)

OFFSITE DOSE CALCULATION MANUAL (ODCM)

AND RADIOACTIVE WASTE SYSTEMS

G - REPORTABLE ITEMS

THE RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

H - UNPLANNED RELEASES

SECOND HALF - 1989

Consolidated Edison Company of New York, Inc.
Indian Point Unit Nos. 1 and 2
Docket Nos. 50-03 50-247
February, 1990

February 28, 1990

Re: Indian Point Unit Nos. 1 and 2
Docket Nos. 50-03 and 50-247

SECTION F

Reportable Changes

A. Process Control Program (PCP)

Section 6.14.1 of the Indian Point Unit No. 2 Technical Specifications require that licensee initiated changes to PCP be reported to the Commission in the Semi-Annual Radioactive Effluent Release Report. During the 2nd half of 1989, there were no changes made.

B. Offsite Dose Calculation Manual (ODCM)

Section 6.15.2 of the Indian Point Unit No. 2 Technical Specifications require that changes to ODCM be reported to the Commission in the Semi-Annual Radioactive Effluent Release Report. During the 2nd half of 1989, there were no changes made.

C. Radioactive Waste Systems (RWS)

Section 6.16.1 of the Indian Point Unit No. 2 Technical Specifications require that major changes to RWS be reported to the Commission in the Semi-Annual Radioactive Effluent Release Report. During the 2nd half of 1989, there were no changes made.

February 28, 1990

Re: Indian Point Unit Nos. 1 and 2
Docket Nos. 50-03 and 50-247

SECTION G

Reportable Items

A. Radioactive Liquid Effluent Monitoring Instrumentation

During this reporting period there were no Radioactive Liquid Effluent Monitoring Instrumentations that were inoperable for greater than 30 days.

B. Radioactive Gaseous Effluent Monitoring Instrumentation

(i) The trip valves for Unit No. 1 stack vent, which isolate two pathways on high alarm, have been placed in the closed position since they are no longer used.

(ii) The Unit No. 2 plant vent monitor (R-14) was out of service from August 4, 1989 through the end of this reporting period. Its detectors are located on a rack. The rack, the detectors, and the tracks upon which the rack rides, are located inside the plant vent duct, approximately forty feet above the ground floor.

Maintenance required by one of the tracks supporting the rack impeded the repairs to the detector system. However, both the detector system and the track were accessed and repaired, and the plant vent was returned to service in January 25, 1990. During the period the detectors were out of service, sampling was performed in accordance with the Technical Specifications.

February 28, 1990

Re: Indian Point Unit Nos. 1 and 2
Docket Nos. 50-03 and 50-247

SECTION H

Unplanned Releases

A. Unplanned Liquid Releases

None

B. Unplanned Gaseous Releases

None

SEMI-ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT

Addendum to First Half 1989

In Section D of the report entitled "SOLID WASTE", Item 5 erroneously lists the number of Class A High Integrity Containers as 797, the correct number is 7. The corrected page is attached with a margin bar indicating the change.

Consolidated Edison Company of New York, Inc.
Indian Point Unit Nos. 1 and 2
Docket Nos. 50-03 50-247
February, 1989

August 31, 1989

Re: Indian Point Unit No. 1 and 2
Docket Nos. 50-3 and 50-247

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
23	Truck	Barnwell, SC Channahon, Ill. Oakridge, Tenn.

4. Solid Waste Containers

a. 3 High Integrity Containers
1 Solidification Steel Liner

b. 6 High Integrity Containers
32 Crates
12 Cargo Containers
915 Steel Drums

5. Waste Class

Container	Class A	Class B	Class C
Carbon Steel Solidification Liners	1	--	--
High Integrity Container	7	1	1
Steel Crates	32	--	--
Steel Drums	915	--	--
Cargo Container	12	--	--

R

Note: Items "4 and 5" are the number of steel crates, cargo containers and steel drums shipped offsite for volume reduction and direct burial not the total number of containers buried.