

**APPENDIX C-1
SUMMARY OF WATER AND SEDIMENT MONITORING DATA**

TABLE C-1.1.1

TOTAL RADIOACTIVITY OF LIQUID EFFLUENTS RELEASED
FROM WDP LAGOON 3 IN 1987
(CURIES)

	ALPHA	BETA	H-3	Sr-90	I-129	Cs-137
1ST QTR	< 2.4 E-04	6.46 ± 1.5 E-03	1.30 ± 0.1 E-01	9.21 ± 0.7 E-04	1.30 ± 0.2 E-04	6.52 ± 1.2 E-03
2ND QTR	< 2.2 E-04	6.55 ± 1.3 E-03	1.18 ± 0.1 E-01	5.32 ± 0.5 E-04	4.92 ± 1.3 E-05	6.02 ± 1.4 E-03
3RD QTR	< 2.8 E-04	2.01 ± 0.3 E-02	3.48 ± 0.1 E-01	1.90 ± 0.1 E-03	1.52 ± 0.1 E-04	2.06 ± 0.2 E-02
4TH QTR			***NO RELEASE THIS PERIOD***			
1987 TOTALS	< 4.3 E-04	3.31 ± 0.4 E-02	5.96 ± 0.2 E-01	3.35 ± 0.1 E-03	3.31 ± 0.3 E-04	3.31 ± 0.3 E-02
AVERAGE	1.20 E-08	9.25 E-07	1.67 E-05	9.36 E-08	9.25 E-09	9.25 E-07
CONCENTRATION ($\mu\text{Ci/mL}$)						
	U-234	U-235	U-238	Pu-238	Pu-239	Am-241
1ST QTR	1.56 ± 0.2 E-04	4.62 ± 1.6 E-06	7.61 ± 0.9 E-05	1.41 ± 1.4 E-07	1.02 ± 0.4 E-06	1.55 ± 0.4 E-06
2ND QTR	5.14 ± 1.4 E-05	< 1.2 E-06	2.43 ± 0.8 E-05	2.30 ± 2.3 E-07	< 3.0 E-07	4.41 ± 2.9 E-07
3RD QTR	2.99 ± 0.8 E-04	5.42 ± 4.1 E-06	1.18 ± 0.3 E-04	1.59 ± 1.2 E-06	2.39 ± 1.6 E-06	1.77 ± 0.8 E-06
4TH QTR			***NO RELEASE THIS PERIOD***			
1987 TOTALS	5.06 ± 0.8 E-04	1.07 ± 0.5 E-05	2.18 ± 0.3 E-04	1.96 ± 1.2 E-06	3.49 ± 1.7 E-06	3.76 ± 1.1 E-06
AVERAGE	1.41 E-08	2.99 E-10	6.09 E-09	5.48 E-11	9.75 E-11	1.05 E-10
CONCENTRATION ($\mu\text{Ci/mL}$)						

TABLE C-1.1.2

COMPARISON OF 1987 LAGOON 3 LIQUID EFFLUENT
RADIOACTIVITY CONCENTRATIONS WITH DOE GUIDELINES

ISOTOPE	TOTAL μCi RELEASED	AVG CONC ($\mu\text{Ci}/\text{mL}$)	DCG ($\mu\text{Ci}/\text{mL}$)	PERCENT OF DCG
Alpha	<4.3 E+02	1.20 E-08	3.0 E-08 ^a	40
Beta	3.31 E+04	9.25 E-07	1.0 E-06 ^b	93
H-3	5.96 E+05	1.67 E-05	2.0 E-03	0.8
Sr-90	3.35 E+03	9.36 E-08	1.0 E-06	9.4
I-129	3.31 E+02	9.25 E-09	5.0 E-07	1.9
Cs-137	3.31 E+04	9.25 E-07	3.0 E-06	30.8
U-234 ^c	5.06 E+02	1.41 E-08	5.0 E-07	2.8
U-235 ^c	1.07 E+01	2.99 E-10	6.0 E-07	<0.1
U-238 ^c	2.18 E+02	6.09 E-09	6.0 E-07	1.0
Pu-238	1.96 E+00	5.48 E-11	4.0 E-08	0.1
Pu-239	3.49 E+00	9.75 E-11	3.0 E-08	0.3
Am-241	3.76 E+00	1.05 E-10	3.0 E-08	0.4
Total				47.6 ^d

Notes:

Total Volume Released = 3.58 E+10 mL, measured at actual on-site release point.

a Am-241

b Sr-90

c Total U(μgm) = 6.56 E+08 Avg U(mg/L) = 1.83 E-02

d Total percent DCG for specific measured radionuclides

TABLE C-1.2

RADIOACTIVITY CONCENTRATIONS IN SURFACE WATER
UPSTREAM OF WVDP AT FOX VALLEY (WFBCBKG)
($\mu\text{Ci/mL}$)

1987	ALPHA	BETA	H-3	SR-90	CS-137
JAN	< 6.0 E-10	2.01 \pm 1.0 E-09	< 1.0 E-07		
FEB	< 4.5 E-10	4.76 \pm 1.4 E-09	1.74 \pm 1.0 E-07		
MAR	< 6.5 E-10	2.75 \pm 1.2 E-09	< 1.0 E-07		
1ST QTR				3.86 \pm 2.5 E-09	5.52 \pm 4.7 E-08
APR	< 8.5 E-10	4.55 \pm 1.3 E-09	3.19 \pm 1.2 E-07		
MAY	< 3.4 E-10	< 2.7 E-09	1.00 \pm 1.0 E-07		
JUN	< 1.4 E-09	5.67 \pm 1.3 E-09	< 1.0 E-07		
2ND QTR				4.06 \pm 2.0 E-09	< 2.1 E-08
JUL	1.46 \pm 1.2 E-09	4.17 \pm 1.2 E-09	< 1.0 E-07		
AUG	< 9.3 E-10	3.39 \pm 2.1 E-09	< 1.0 E-07		
SEP	< 6.8 E-10	5.02 \pm 1.3 E-09	< 1.0 E-07		
3RD QTR				5.73 \pm 2.6 E-09	< 2.1 E-08
OCT	< 3.6 E-10	4.02 \pm 1.2 E-09	< 1.0 E-07		
NOV	< 6.1 E-10	1.51 \pm 1.0 E-09	< 1.0 E-07		
DEC	< 6.9 E-10	2.45 \pm 1.2 E-09	1.02 \pm 1.0 E-07		
4TH QTR				< 1.5 E-09	< 2.1 E-08

TABLE C-1.3

RADIOACTIVITY CONCENTRATIONS IN SURFACE WATER
DOWNSTREAM OF WVDP AT THOMAS CORNERS (WFBCTCB)
($\mu\text{Ci/mL}$)

1987	ALPHA	BETA	H-3	SR-90	CS-137
JAN	< 5.9 E-10	4.01 \pm 1.3 E-09	< 1.0 E-07		
FEB	< 1.0 E-09	6.81 \pm 1.7 E-09	3.11 \pm 1.2 E-07		
MAR	< 1.4 E-09	7.09 \pm 1.7 E-09	< 1.0 E-07		
1ST QTR				3.99 \pm 2.2 E-09	< 2.1 E-08
APR	< 7.2 E-10	5.42 \pm 1.4 E-09	< 1.0 E-07		
MAY	< 6.5 E-10	1.87 \pm 1.3 E-09	2.80 \pm 1.3 E-07		
JUN	< 1.6 E-09	7.68 \pm 1.6 E-09	< 1.0 E-07		
2ND QTR				4.50 \pm 1.9 E-09	< 2.1 E-08
JUL	1.21 \pm 1.2 E-09	7.56 \pm 1.6 E-09	< 1.0 E-07		
AUG	1.61 \pm 1.4 E-09	6.21 \pm 1.5 E-09	< 1.0 E-07		
SEP	1.88 \pm 1.5 E-09	8.54 \pm 1.7 E-09	< 1.0 E-07		
3RD QTR				5.77 \pm 2.2 E-09	< 2.1 E-08
OCT	< 1.1 E-09	5.74 \pm 1.4 E-09	< 1.0 E-07		
NOV	< 1.1 E-09	5.23 \pm 1.4 E-09	< 1.0 E-07		
DEC	< 9.8 E-10	3.24 \pm 1.3 E-09	< 1.0 E-07		
4TH QTR				6.85 \pm 2.2 E-09	4.43 \pm 3.6 E-08

TABLE C-1.4

RADIOACTIVITY CONCENTRATIONS IN SURFACE WATER
DOWNSTREAM OF WVPD AT FRANKS CREEK (WNSPO06)
($\mu\text{Ci/mL}$)

1987	ALPHA	BETA	H-3	SR-90	CS-137
JAN	< 6.2 E-10	1.69 \pm 0.2 E-08	1.13 \pm 1.0 E-07		
FEB	< 4.2 E-09	1.04 \pm 0.1 E-07	4.73 \pm 0.4 E-06		
MAR	2.63 \pm 2.6 E-09	5.48 \pm 0.5 E-08	9.53 \pm 1.6 E-07		
1ST QTR				2.78 \pm 0.4 E-08	1.96 \pm 0.7 E-07
APR	< 1.1 E-09	2.34 \pm 0.3 E-08	7.67 \pm 1.5 E-07		
MAY	< 1.0 E-09	3.29 \pm 0.4 E-08	2.45 \pm 0.3 E-06		
JUN	3.52 \pm 3.0 E-09	6.32 \pm 0.6 E-08	< 1.0 E-07		
2ND QTR				1.61 \pm 0.3 E-08	1.62 \pm 0.4 E-07
JUL	< 2.1 E-09	4.86 \pm 0.5 E-08	9.86 \pm 1.6 E-07		
AUG	< 3.4 E-09	4.67 \pm 0.4 E-08	1.50 \pm 0.1 E-06		
SEP	< 4.2 E-09	7.67 \pm 0.7 E-08	2.24 \pm 0.3 E-06		
3RD QTR				3.48 \pm 0.6 E-08	3.98 \pm 0.7 E-07
OCT	< 1.5 E-09	3.11 \pm 0.4 E-08	< 1.0 E-07		
NOV	< 9.2 E-10	1.86 \pm 0.2 E-08	< 1.1 E-07		
DEC	< 7.3 E-10	1.29 \pm 0.2 E-08	3.21 \pm 1.2 E-07		
4TH QTR				8.15 \pm 2.6 E-09	< 2.1 E-08

TABLE C-1.5

RADIOACTIVITY CONCENTRATIONS IN SURFACE WATER
DOWNSTREAM OF BUTTERMILK CREEK AT FELTON BRIDGE (WFFELBR)
($\mu\text{Ci/mL}$)

1987	ALPHA	BETA	H-3	SR-90	CS-137
JAN	< 1.1 E-09	3.76 \pm 1.4 E-09	1.29 \pm 1.0 E-07	5.09 \pm 1.1 E-09	< 2.1 E-08
FEB	< 1.2 E-09	3.25 \pm 1.3 E-09	< 1.0 E-07	8.95 \pm 3.4 E-09	< 2.1 E-08
MAR	< 6.1 E-10	4.33 \pm 1.5 E-09	< 1.0 E-07	7.35 \pm 2.3 E-09	< 2.1 E-08
APR	< 5.9 E-10	5.23 \pm 1.4 E-09	< 1.0 E-07	5.37 \pm 2.1 E-09	< 2.1 E-08
MAY	< 1.1 E-09	3.29 \pm 1.2 E-09	< 1.0 E-07	3.60 \pm 1.7 E-09	< 2.1 E-08
JUN	< 7.6 E-10	3.11 \pm 1.1 E-09	< 1.0 E-07	3.38 \pm 1.9 E-09	< 2.1 E-08
JUL	9.27 \pm 8.9 E-10	5.71 \pm 1.3 E-09	< 1.0 E-07	7.00 \pm 2.2 E-09	< 2.1 E-08
AUG	< 8.7 E-10	7.42 \pm 1.6 E-09	< 1.0 E-07	4.00 \pm 1.6 E-09	< 2.1 E-08
SEP	< 5.1 E-10	6.62 \pm 1.5 E-09	< 1.0 E-07	6.86 \pm 2.3 E-09	< 2.1 E-08
OCT	< 7.1 E-10	7.34 \pm 1.6 E-09	< 1.0 E-07	7.70 \pm 2.5 E-09	< 2.1 E-08
NOV	< 6.3 E-10	2.20 \pm 1.2 E-09	< 1.0 E-07	2.50 \pm 1.8 E-09	< 2.1 E-08
DEC	< 9.9 E-10	2.43 \pm 1.2 E-09	< 1.0 E-07	< 1.5 E-09	< 2.1 E-08

TABLE C-1.6
 RADIOACTIVITY CONCENTRATIONS IN POTABLE WELL WATER
 AROUND THE WWP SITE - 1987
 ($\mu\text{Ci/mL}$)

<u>Sample I.D.</u>	<u>Alpha</u>	<u>Beta</u>	<u>Tritium</u>	<u>Cs-137</u>
WFWEL 02	< 6.9 E-10	1.40 \pm 1.0 E-09	4.00 \pm 1.1 E-07	< 2.1 E-08
WFWEL 05	< 6.6 E-10	3.10 \pm 1.2 E-09	< 1.0 E-07	< 2.1 E-08
WFWEL 06	< 4.9 E-10	< 9.2 E-10	< 1.0 E-07	< 2.1 E-08
WFWEL 08	< 7.1 E-10	1.91 \pm 1.1 E-09	< 1.0 E-07	< 2.1 E-08
WFWEL 09	< 1.1 E-09	1.33 \pm 1.0 E-09	< 1.0 E-07	< 2.1 E-08
WFWEL 10	< 1.5 E-09	1.46 \pm 1.0 E-09	< 1.0 E-07	< 2.1 E-08

TABLE C-1.7
 RADIOACTIVITY CONCENTRATIONS IN STREAM SEDIMENT AROUND WVDP SITE IN 1987
 ($\mu\text{Ci/mL}$, dry weight from upper 15 cm)

Location	Date	Gross Alpha	Gross Beta	K-40	Sr-90	Cs-137	
SFBCSED	June 1987	$8.7 \pm 5.5 \text{ E-06}$	$1.51 \pm 0.7 \text{ E-05}$	$1.28 \pm 0.1 \text{ E-05}$	$< 5.3 \text{ E-08}$	$< 7.4 \text{ E-08}$	
SFSDSED	June 1987	$< 9.0 \text{ E-06}$	$3.00 \pm 0.8 \text{ E-05}$	$1.39 \pm 0.1 \text{ E-05}$	$< 2.0 \text{ E-07}$	$5.23 \pm 0.6 \text{ E-07}$	
SFTCED	June 1987	$< 1.7 \text{ E-05}$	$2.58 \pm 0.9 \text{ E-05}$	$1.62 \pm 0.1 \text{ E-05}$	$< 5.0 \text{ E-08}$	$2.71 \pm 0.1 \text{ E-06}$	
SFCCSED	June 1987	$6.7 \pm 5.6 \text{ E-06}$	$1.60 \pm 0.8 \text{ E-05}$	$1.38 \pm 0.1 \text{ E-05}$	$< 4.1 \text{ E-08}$	$6.10 \pm 1.0 \text{ E-07}$	
SFBISED	June 1987	$< 4.1 \text{ E-06}$	$1.93 \pm 0.8 \text{ E-05}$	$1.34 \pm 0.1 \text{ E-05}$	$< 2.0 \text{ E-07}$	$< 6.5 \text{ E-08}$	
SFBCSED	Nov. 1987	$< 5.6 \text{ E-06}$	$2.14 \pm 0.7 \text{ E-05}$	$1.49 \pm 0.1 \text{ E-05}$	$1.02 \pm 0.2 \text{ E-07}$	$7.56 \pm 4.0 \text{ E-08}$	
SFSDSED	Nov. 1987	$7.7 \pm 6.0 \text{ E-06}$	$3.37 \pm 0.9 \text{ E-05}$	$1.60 \pm 0.1 \text{ E-05}$	$< 1.2 \text{ E-07}$	$4.92 \pm 0.7 \text{ E-07}$	
SFTCED	Nov. 1987	$5.4 \pm 3.5 \text{ E-06}$	$1.90 \pm 0.7 \text{ E-05}$	$1.57 \pm 0.1 \text{ E-05}$	$2.29 \pm 0.4 \text{ E-07}$	$2.59 \pm 0.1 \text{ E-06}$	
SFCCSED	Nov. 1987	$3.6 \pm 2.9 \text{ E-06}$	$1.60 \pm 0.8 \text{ E-05}$	$1.48 \pm 0.1 \text{ E-05}$	$< 8.0 \text{ E-08}$	$4.56 \pm 0.8 \text{ E-07}$	
SFBISED	Nov. 1987	$3.6 \pm 3.6 \text{ E-06}$	$3.16 \pm 0.9 \text{ E-05}$	$1.36 \pm 0.1 \text{ E-05}$	$< 1.7 \text{ E-07}$	$< 3.4 \text{ E-08}$	
		U-234	U-235	U-238	Pu-238	Pu-239	Am-241
SFBCSED	Nov. 1987	$6.89 \pm 0.7 \text{ E-07}$	$3.59 \pm 0.9 \text{ E-08}$	$6.91 \pm 0.7 \text{ E-07}$	$3.39 \pm 2.5 \text{ E-09}$	$3.81 \pm 3.4 \text{ E-09}$	$6.24 \pm 1.4 \text{ E-09}$
SFTCED	Nov. 1987	$5.56 \pm 0.5 \text{ E-07}$	$2.87 \pm 0.7 \text{ E-08}$	$6.14 \pm 0.6 \text{ E-07}$	$< 5.9 \text{ E-10}$	$3.55 \pm 2.4 \text{ E-09}$	$3.92 \pm 3.0 \text{ E-09}$

TABLE C-1.8

1987 CONTRIBUTION BY NEW YORK STATE LOW-LEVEL WASTE
DISPOSAL AREA TO RADIOACTIVITY IN WVDP LIQUID EFFLUENTS
(Ci)

	<u>Gross Alpha</u>	<u>Gross Beta</u>	<u>Tritium</u>	<u>Sr-90</u>	<u>I-129</u>	<u>Cs-137</u>
1987 Totals	< 8.8 E-07	6.58 ± 0.1 E-04	6.40 ± 0.2 E-02	4.68 ± 0.1 E-04	1.31 ± 0.6 E-06	< 7.7 E-06
	<u>U-234</u>	<u>U-235</u>	<u>U-238</u>	<u>Pu-238</u>	<u>Pu-239</u>	
1987 Totals	2.18 ± 0.3 E-07	1.16 ± 0.6 E-08	1.97 ± 0.2 E-07	1.80 ± 0.2 E-07	4.90 ± 4.1 E-09	