HSA ID# 114

cc. LRD/ETH
Doc - 332

MEMORANDUM

YANKEE ATOMIC - BOLTON

To	P.L. Anderson	**Date**	June 24, 1994
		Group #	REG 121/94
From	E.R. Cumming	**W.O.#**	
Subject	RESULTS OF MAY 1994 CLAM AND SEDIMENT SAMPLING	**I.M.S.#**	
		File #	REG121.94

REFERENCES

1. Memo REG 70/94, E. Cumming to P. Anderson, "Clam Sampling Protocol," dated April 15, 1994.

2. Maine Yankee/YNSD Service Request No. M-94-43, "Clam Sampling," issued April 4, 1994.

3. 1993 Annual Radiological Environmental Surveillance Report, Maine Yankee Atomic Power Station.

EXECUTIVE SUMMARY

In response to the anticipated opening of the Bailey Cove to clam sampling, soft-shell clam and sediment samples were collected there on May 16 and May 18, 1994, respectively. Clam samples were also collected from two control locations on May 19, 1994. All samples were analyzed to environmental Lower Limits of Detection (LLDs) at the Yankee Atomic Environmental Laboratory. Only naturally-occurring radionuclides (K-40 and Ac-228) were detected in the clam samples. The sediment samples were all found to have positive concentrations of Cs-137 in addition to naturally-occurring radionuclides (K-40, Ac-228 and in one case, Be-7). The Cs-137 is believed to originate from both plant effluents and weapons testing fallout.

BACKGROUND

The Town of Wiscasset, Maine recently announced its intention to re-open several clam flats, including Bailey Cove, that have been closed to clam digging for many years. A sampling protocol was developed by YNSD (Reference 1) under Service Request M-94-43 (Reference 2), and clam and sediment sampling was performed by the Maine Yankee Environmental Services staff during May 1994. Samples of clams and sediment were analyzed at the Yankee Environmental Laboratory, and the issuance of radioanalytical results was recently completed.

DISCUSSION

Samples of soft-shell clam (Mya arenaria) were collected from four locations in Bailey Cove on May 16, 1994, and from two control locations (in Harpswell and Damariscotta) on May 19, 1994. (See Figure 1, provided by R. O'Clair, for the locations of the four areas sampled for clams.) The body portions were analyzed by gamma spectroscopy at the Yankee Environmental

Laboratory (YAEL) to standard environmental Lower Limits of Detection (LLDs).

Sediment core samples were collected from three sites within Bailey Cove on May 18, 1994. (See Figure 1 for the locations of the three areas sampled for sediment.) The core samples were segmented into 5-cm increments, dried and analyzed by gamma spectroscopy at the YAEL.

Table 1 presents a summary of the results for the clam samples. The actual Analysis Reports from the YAEL are included in Attachment A. No plant-related radionuclides were detected in the clam samples. The only radionuclides detected were naturally-occurring K-40 and Ac-228.

Table 2 presents a summary of the results for the sediment samples. The actual Analysis Reports from the YAEL are included in Attachment B. As expected, naturally-occurring K-40 and Ac-228 were detected in all samples. Beryllium-7, another naturally-occurring radionuclide, was detected in one core segment. Cesium-137 was detected in all samples. This is believed to be due to both weapons testing fallout and plant effluents.

The Cs-137 concentration of 1750 $\pm$ 69 pCi/kg(dry) in the third (10-15 cm) segment from Area 3 (LSN G16680) was confirmed at the YAEL with another analysis of the sample on a different detector. To confirm the non-homogeneous nature of the activity distribution in the sediment, an additional aliquot was taken from the remaining portion of the original sample. Its concentration was 999 $\pm$ 50 pCi/kg(dry).

CONCLUSION

The radioanalytical results for the clam and sediment samples collected in May 1994 have all been issued by the Yankee Atomic Environmental Laboratory, and are included as Attachments A and B. A summary of the results is given in Tables 1 and 2 for the clam and sediment samples, respectively. As expected, Cs-137 was detected in sediment samples. No plant-related radionuclides were detected in the clam samples.

This completes Service Request No. M-94-43.

Edward R. Cumming

Edward R. Cumming
Radiological Engineering Group
Environmental Engineering Dept.

/emd

c: R. Marcello
P. Littlefield
M. Strum
S. Evans
J. Arnold
N. Caristo
R. O'Clair
M. Kralian
E. Moreno

TABLE 1

RADIONUCLIDES DETECTED IN MAINE YANKEE CLAM SAMPLES

MAY 1994

SAMPLE LOCATION	DATE SAMPLED	CONCENTRATION (pCi/kg)		
		Cs-137	K-40	Ac-228
Bailey Cove Area 1	5/16/94	ND (MDC=30)	1270 ± 210	211 ± 45
Bailey Cove Area 2	5/16/94	ND (MDC=29)	1180 ± 210	ND (MDC=130)
Bailey Cove Area 3	5/16/94	ND (MDC=29)	1240 ± 190	ND (MDC=130)
Bailey Cove Area 4	5/16/94	ND (MDC=49)	2050 ± 320	ND (MDC=200)
Harpswell Control	5/19/94	ND (MDC=27)	2430 ± 240	ND (MDC=130)
Damariscotta Control	5/19/94	ND (MDC=25)	2130 ± 240	ND (MDC=140)

Note: "ND" indicates radioactivity not detected (i.e. the concentration was less than three times the standard deviation).

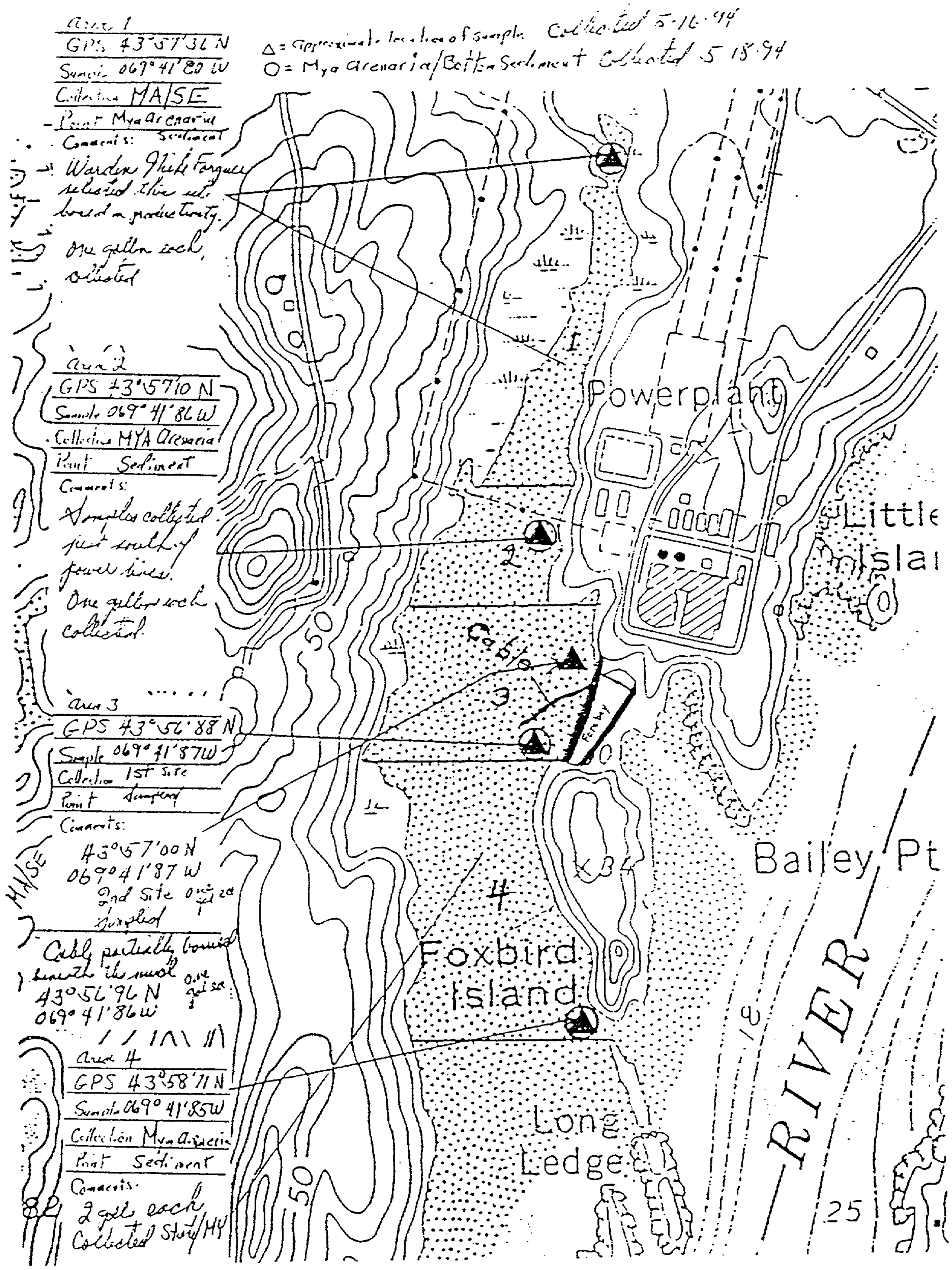
TABLE 2

RADIONUCLIDES DETECTED IN MAINE YANKEE SEDIMENT SAMPLES

MAY 1994

SAMPLE LOCATION	DATE SAMPLED	CORE SEGMENT	CONCENTRATION (pCi/kg-dry)		
			Cs-137	K-40	Ac-228
Bailey Cove Area 1	5/18/94	0-5 cm	303 ± 39	19400 ± 1100	790 ± 130
		5-10 cm	273 ± 44	17000 ± 1200	670 ± 150
		10-15 cm	351 ± 39	18030 ± 870	910 ± 120
Bailey Cove Area 2	5/18/94	0-5 cm	185 ± 24	17020 ± 700	687 ± 90
		5-10 cm	138 ± 21	16490 ± 720	890 ± 110
		10-15 cm	86 ± 20	17150 ± 750	880 ± 100
Bailey Cove Area 3	5/18/94	0-5 cm	310 ± 52	19700 ± 1300	740 ± 160
		5-10 cm	339 ± 44	22600 ± 1300	730 ± 140
		10-15 cm	1750 ± 69	18770 ± 890	910 ± 110

Note: "ND" indicates radioactivity not detected (i.e. the concentration was less than three times the standard deviation).



Area 1
GPS 43°57'36 N
Sample 069°41'80 W
Collection MA/SE
Point Mya arenaria Sediment
Comments:
Warden Mike Farguee selected this site based on productivity.
One gallon each collected
Δ = Approximate location of Sample Collected 5-16-94
O = Mya arenaria/Bottom Sediment Collected 5 18 94
Area 2
GPS 43°57'10 N
Sample 069°41'86 W
Collection MYA arenaria
Point Sediment
Comments:
Samples collected just south of power lines.
One gallon each collected
Area 3
GPS 43°56'88 N
Sample 069°41'87W
Collection 1st Site
Point Sampled
Comments:
43°57'00 N
069°41'87 W
2nd Site sampled
Cable partially buried beneath the mud
43°56'96 N
069°41'86 W
Area 4
GPS 43°58'71 N
Sample 069°41'85W
Collection Mya arenaria
Point Sediment
Comments:
2 gal each collected
MA/SE
Powerplant
Little Island
Cable
Foxbird Island
Long Ledge
Bailey Pt
RIVER
50
25
1
2
3
4

Figure 1

ATTACHMENT A

ANALYSIS REPORTS FOR CLAM SAMPLES

MAILED

MAY 24 1994

YAEC ENVIRONMENTAL LAB.

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Dominic W. Caristo
Mr. Roger R. O'Clair
Mr. Edward Cumming
Mrs. Virginia Withee

Report Date: 05/24/94
Analysis Date: 05/23/94
Receipt Date: 05/18/94
Reference Date: 05/16/94

Soft-shell Clam (Mya Arenaria)

Station No: 11 Bailey Cove - Area 1

Sample Amount: 0.296 kg
Elapsed Time: 7.3328 days
Comment:

Lab Sample #: G16568
Sample Code: MMA 11 2094
Analyses Req: G

	Nuclide	Decay Correction	Activity Conc. ± σ [picoCurie / kilogram]	MDC
	Np-239	1.14E-01	(74 ± 37)E 01	10E 02
	Co-57	9.81E-01	(-60 ± 52)E-01	16E 00
	Ce-144	9.82E-01	(17 ± 45)E 00	15E 01
	Ce-141	8.55E-01	(-9 ± 14)E 00	51E 00
	Mo-99	1.57E-01	(-49 ± 55)E 01	19E 02
	Se-75	9.58E-01	(-207 ± 89)E-01	28E 00
	Cr-51	8.32E-01	(22 ± 76)E 00	24E 01
	I-131	5.31E-01	(4 ± 15)E 00	46E 00
	Be-7	9.08E-01	(113 ± 75)E 00	22E 01
	Ru-103	8.78E-01	(-68 ± 87)E-01	28E 00
x	I-133	———	———	———
	Ba-140	6.72E-01	(-6 ± 13)E 00	49E 00
	Cs-134	9.93E-01	(-6 ± 10)E 00	36E 00
	Ru-106	9.86E-01	(60 ± 77)E 00	23E 01
	Cs-137	9.99E-01	(-78 ± 93)E-01	30E 00
	Ag-110M	9.79E-01	(25 ± 11)E 00	30E 00
	Zr-95	9.24E-01	(-1 ± 13)E 00	42E 00
	Co-58	9.30E-01	(-104 ± 72)E-01	25E 00
	Mn-54	9.83E-01	(34 ± 82)E-01	27E 00
+*	AcTh228	9.99E-01	(211 ± 45)E 00	13E 01
	TeI-132	2.09E-01	(-2 ± 22)E 01	68E 01
	Fe-59	8.92E-01	(-6 ± 15)E 00	48E 00
	Zn-65	9.79E-01	(1 ± 16)E 00	55E 00
	Co-60	9.97E-01	(-14 ± 78)E-01	26E 00
+*	K-40	9.99E-01	(127 ± 21)E 01	57E 01
	Sb-124	9.19E-01	(30 ± 16)E 00	39E 00

Notes:
* Activity greater than 3 standard deviations
+ Peak is found
x Decay correction is less than .01

Reporting level ratio: 0.000

Approved by

D.G. Keefer

D. G. Keefer

MAILED

MAY 2 4 1994

YAEC ENVIRONMENTAL LAB

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Dominic W. Caristo
Mr. Roger R. O'Clair
Mr. Edward Cumming
Mrs. Virginia Withee

Report Date: 05/24/9
Analysis Date: 05/23/9
Receipt Date: 05/18/9
Reference Date: 05/16/9

Soft-shell Clam (Mya Arenaria)

Station No: 12 Bailey Cove - Area 2

Sample Amount: 0.268 kg
Elapsed Time: 7.3472 days
Comment:

Lab Sample #: G16569
Sample Code: MMA 12 2094
Analyses Req: G

	Nuclide	Decay Correction	Activity Conc. ± σ [picoCurie / kilogram]	MDC
	Np-239	1.14E-01	(24 ± 31)E 01	90E 01
	Co-57	9.81E-01	(87 ± 45)E-01	12E 00
	Ce-144	9.82E-01	(-42 ± 41)E 00	14E 01
	Ce-141	8.54E-01	(-17 ± 11)E 00	42E 00
	Mo-99	1.56E-01	(12 ± 49)E 01	16E 02
	Se-75	9.58E-01	(-148 ± 81)E-01	26E 00
	Cr-51	8.32E-01	(49 ± 58)E 00	16E 01
	I-131	5.30E-01	(20 ± 11)E 00	30E 00
	Be-7	9.08E-01	(174 ± 70)E 00	19E 01
	Ru-103	8.78E-01	(197 ± 81)E-01	22E 00
	xI-133	———	———	———
	Ba-140	6.71E-01	(-5 ± 13)E 00	50E 00
	Cs-134	9.93E-01	(-113 ± 89)E-01	30E 00
	Ru-106	9.86E-01	(-86 ± 70)E 00	23E 01
	Cs-137	9.99E-01	(-70 ± 88)E-01	29E 00
	Ag-110M	9.79E-01	(17 ± 12)E 00	33E 00
	Zr-95	9.24E-01	(6 ± 13)E 00	40E 00
	Co-58	9.30E-01	(38 ± 70)E-01	21E 00
	Mn-54	9.83E-01	(-64 ± 86)E-01	31E 00
+	AcTh228	9.99E-01	(79 ± 39)E 00	13E 01
	TeI-132	2.08E-01	(-17 ± 19)E 01	65E 01
	Fe-59	8.91E-01	(-13 ± 13)E 00	45E 00
	Zn-65	9.79E-01	(-13 ± 14)E 00	49E 00
	Co-60	9.97E-01	(7 ± 10)E 00	32E 00
+*	K-40	9.99E-01	(118 ± 21)E 01	61E 01
	Sb-124	9.18E-01	(-4 ± 21)E 00	72E 00

Notes:
* Activity greater than 3 standard deviations
\+ Peak is found
x Decay correction is less than .01

Reporting level ratio: 0.000

Approved by

D. G. Keefer

D. G. Keefer

MAILED

MAY 2 4 1994

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

YAEC

Customer:	Maine Yankee Atomic Power Station	Report Date:	05/24/9
Attention:	Mr. Dominic W. Caristo	Analysis Date:	05/23/9
	Mr. Roger R. O'Clair	Receipt Date:	05/18/9
	Mr. Edward Cumming	Reference Date:	05/16/9
	Mrs. Virginia Withee		

Soft-shell Clam (Mya Arenaria)

Station No: 13 Bailey Cove - Area 3

Sample Amount:	0.305 kg	Lab Sample #:	G16570
Elapsed Time:	7.3472 days	Sample Code:	MMA 13 2094
Comment:		Analyses Req:	G

Nuclide	Decay Correction	Activity Conc. ± σ (picoCurie / kilogram)	MDC
Np-239	1.14E-01	(8 ± 34)E 01	10E 02
Co-57	9.81E-01	(9 ± 48)E-01	14E 00
Ce-144	9.82E-01	(-31 ± 38)E 00	12E 01
Ce-141	8.54E-01	(-2 ± 14)E 00	51E 00
Mo-99	1.56E-01	(118 ± 52)E 01	16E 02
Se-75	9.58E-01	(83 ± 88)E-01	25E 00
Cr-51	8.32E-01	(-161 ± 76)E 00	25E 01
I-131	5.30E-01	(5 ± 13)E 00	41E 00
Be-7	9.08E-01	(132 ± 70)E 00	20E 01
Ru-103	8.78E-01	(76 ± 84)E-01	25E 00
xI-133	——	——	——
Ba-140	6.71E-01	(-15 ± 13)E 00	48E 00
Cs-134	9.93E-01	(68 ± 79)E-01	26E 00
Ru-106	9.86E-01	(-19 ± 70)E 00	22E 01
Cs-137	9.99E-01	(32 ± 11)E 00	29E 00
Ag-110M	9.79E-01	(6 ± 11)E 00	34E 00
Zr-95	9.24E-01	(3 ± 12)E 00	38E 00
Co-58	9.30E-01	(167 ± 68)E-01	17E 00
Mn-54	9.83E-01	(-81 ± 76)E-01	26E 00
AcTh228	9.99E-01	(88 ± 41)E 00	13E 01
TeI-132	2.08E-01	(-1 ± 21)E 01	66E 01
Fe-59	8.91E-01	(11 ± 13)E 00	38E 00
Zn-65	9.79E-01	(26 ± 17)E 00	52E 00
Co-60	9.97E-01	(-11 ± 10)E 00	34E 00
+* K-40	9.99E-01	(124 ± 19)E 01	49E 01
Sb-124	9.18E-01	(45 ± 21)E 00	51E 00

Notes:
* Activity greater than 3 standard deviations
+ Peak is found
x Decay correction is less than .01

Reporting level ratio: 0.000

Approved by

D. G. Keefer

D. G. Keefer

MAILED

MAY 24 1994

YAEC
ENVIRONMENTAL LAB.

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Dominic W. Caristo
Mr. Roger R. O'Clair
Mr. Edward Cumming
Mrs. Virginia Withee

Report Date: 05/24/9
Analysis Date: 05/24/9
Receipt Date: 05/18/9
Reference Date: 05/16/9

Soft-shell Clam (Mya Arenaria)

Station No: 14 Bailey Cove - Area 4

Sample Amount: 0.265 kg
Elapsed Time: 8.0197 days
Comment:

Lab Sample #: G15571
Sample Code: MMA 14 2094
Analyses Req: G

	Nuclide	Decay Correction	Activity Conc. ± σ (picoCurie / kilogram)	MDC
	Np-239	9.39E-02	(-15 ± 67)E 01	20E 02
	Co-57	9.79E-01	(-20 ± 84)E-01	25E 00
	Ce-144	9.80E-01	(-10 ± 64)E 00	21E 01
	Ce-141	8.42E-01	(-21 ± 21)E 00	78E 00
	Mo-99	1.32E-01	(-140 ± 99)E 01	34E 02
	Se-75	9.54E-01	(-12 ± 14)E 00	42E 00
	Cr-51	8.18E-01	(-13 ± 12)E 01	39E 01
	I-131	5.00E-01	(9 ± 24)E 00	74E 00
	Be-7	9.00E-01	(21 ± 12)E 01	33E 01
	Ru-103	8.68E-01	(-1 ± 14)E 00	43E 00
x	I-133	———	———	———
	Ba-140	6.47E-01	(18 ± 14)E 00	35E 00
	Cs-134	9.92E-01	(-11 ± 15)E 00	50E 00
	Ru-106	9.85E-01	(-12 ± 11)E 01	38E 01
	Cs-137	9.99E-01	(-25 ± 14)E 00	49E 00
	Ag-110M	9.78E-01	(8 ± 18)E 00	54E 00
	Zr-95	9.18E-01	(25 ± 18)E 00	48E 00
	Co-58	9.24E-01	(-10 ± 11)E 00	36E 00
	Mn-54	9.82E-01	(8 ± 10)E 00	32E 00
+	AcTh228	9.99E-01	(155 ± 62)E 00	20E 01
	TeI-132	1.80E-01	(-48 ± 38)E 01	13E 02
	Fe-59	8.82E-01	(14 ± 22)E 00	65E 00
	Zn-65	9.77E-01	(-14 ± 27)E 00	89E 00
	Co-60	9.97E-01	(0 ± 13)E 00	43E 00
+*	K-40	9.99E-01	(205 ± 32)E 01	73E 01
	Sb-124	9.11E-01	(-48 ± 25)E 00	11E 01

Notes:
* Activity greater than 3 standard deviations
+ Peak is found
x Decay correction is less than .01

Reporting level ratio: 0.000

Approved by

D. G. Keefer

D. G. Keefer

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MAY 26 1994

YAEC
ENVIRONMENTAL LAB.

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Dominic W. Caristo
Mr. Roger R. O'Clair
Mr. Edward Cumming
Mrs. Virginia Withee

Report Date: 05/26/9
Analysis Date: 05/25/9
Receipt Date: 05/25/9
Reference Date: 05/19/9

Soft-shell Clam (Mya Arenaria)

Station No: 21 Harpswell - Control 1

Sample Amount: 0.323 kg
Elapsed Time: 6.2148 days
Comment:

Lab Sample #: G15670
Sample Code: MMA 21 2094
Analyses Req: G

	Nuclide	Decay Correction	Activity: Conc. ± σ [picoCurie / kilogram]	Activity: MDC [picoCurie / kilogram]
	Np-239	1.59E-01	(-16 ± 27)E 01	80E 01
	Co-57	9.84E-01	(-86 ± 53)E-01	16E 00
	Ce-144	9.84E-01	(-56 ± 42)E 00	13E 01
	Ce-141	8.75E-01	(7 ± 14)E 00	48E 00
	Mo-99	2.08E-01	(-43 ± 41)E 01	14E 02
	Se-75	9.64E-01	(-2 ± 10)E 00	28E 00
	Cr-51	8.55E-01	(24 ± 70)E 00	22E 01
	I-131	5.85E-01	(-18 ± 13)E 00	44E 00
	Be-7	9.22E-01	(119 ± 80)E 00	23E 01
	Ru-103	8.96E-01	(-9 ± 89)E-01	28E 00
x	I-133	—	—	—
	Ba-140	7.14E-01	(5 ± 11)E 00	32E 00
	Cs-134	9.94E-01	(2 ± 10)E 00	33E 00
	Ru-106	9.88E-01	(156 ± 74)E 00	20E 01
	Cs-137	9.99E-01	(-41 ± 84)E-01	27E 00
	Ag-110M	9.82E-01	(5 ± 10)E 00	31E 00
	Zr-95	9.35E-01	(-12 ± 14)E 00	47E 00
	Co-58	9.40E-01	(-55 ± 75)E-01	25E 00
	Mn-54	9.86E-01	(-30 ± 83)E-01	27E 00
	AcTh228	9.99E-01	(71 ± 39)E 00	13E 01
	TeI-132	2.65E-01	(-25 ± 17)E 01	59E 01
	Fe-59	9.07E-01	(11 ± 15)E 00	44E 00
	Zn-65	9.82E-01	(3 ± 21)E 00	71E 00
	Co-60	9.97E-01	(112 ± 86)E-01	25E 00
+*	K-40	9.99E-01	(243 ± 24)E 01	50E 01
	Sb-124	9.30E-01	(0 ± 14)E 00	44E 00

Notes:
* Activity greater than 3 standard deviations
+ Peak is found
x Decay correction is less than .01

Reporting level ratio: 0.000

Approved by

D. G. Keefer

D. G. Keefer

MAILED

MAY 2 6 1994

YAEC
ENVIRONMENTAL LAB.

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Dominic W. Caristo
Mr. Roger R. O'Clair
Mr. Edward Cumming
Mrs. Virginia Withee

Report Date: 05/26/94
Analysis Date: 05/25/94
Receipt Date: 05/25/94
Reference Date: 05/19/94

Soft-shell Clam (Mya Arenaria)

Station No: 22 Dameriscotta - Control 2

Sample Amount: 0.304 kg
Elapsed Time: 6.2241 days
Comment:

Lab Sample #: G16671
Sample Code: MMA 22 2094
Analyses Req: G

	Nuclide	Decay Correction	Activity Conc. ± σ [picoCurie / kilogram]	MDC
	Np-239	1.59E-01	(-29 ± 21)E 01	64E 01
	Co-57	9.84E-01	(9 ± 43)E-01	13E 00
	Ce-144	9.84E-01	(8 ± 34)E 00	99E 00
	Ce-141	8.75E-01	(-12 ± 12)E 00	42E 00
	Mo-99	2.08E-01	(46 ± 37)E 01	12E 02
	Se-75	9.64E-01	(-87 ± 77)E-01	24E 00
	Cr-51	8.55E-01	(43 ± 59)E 00	17E 01
	I-131	5.84E-01	(9 ± 11)E 00	30E 00
	Be-7	9.22E-01	(23 ± 67)E 00	20E 01
	Ru-103	8.96E-01	(-72 ± 73)E-01	24E 00
x	I-133	———	———	———
	Ba-140	7.13E-01	(9 ± 12)E 00	35E 00
	Cs-134	9.94E-01	(-186 ± 92)E-01	32E 00
	Ru-106	9.88E-01	(18 ± 67)E 00	21E 01
	Cs-137	9.99E-01	(-30 ± 78)E-01	25E 00
	Ag-110M	9.82E-01	(13 ± 10)E 00	27E 00
	Zr-95	9.35E-01	(-7 ± 13)E 00	44E 00
	Co-58	9.40E-01	(-56 ± 67)E-01	22E 00
	Mn-54	9.86E-01	(189 ± 80)E-01	21E 00
	AcTh228	9.99E-01	(-29 ± 37)E 00	14E 01
	TeI-132	2.65E-01	(21 ± 17)E 01	49E 01
	Fe-59	9.07E-01	(-14 ± 16)E 00	54E 00
	Zn-65	9.82E-01	(2 ± 17)E 00	54E 00
	Co-60	9.97E-01	(-68 ± 80)E-01	29E 00
+*	K-40	9.99E-01	(213 ± 24)E 01	54E 01
	Sb-124	9.30E-01	(0 ± 16)E 00	53E 00

Notes:
- * Activity greater than 3 standard deviations
- \+ Peak is found
- x Decay correction is less than .01

Reporting level ratio: 0.000

Approved by

D.G. Keefer

D. G. Keefer

ATTACHMENT B

ANALYSIS REPORTS FOR SEDIMENT SAMPLES

MAILED

JUN 0 1 1994

YAEC
ENVIRONMENTAL LAB.

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Dominic W. Caristo
Mr. Roger R. O'Clair
Mr. Edward Cumming
Mrs. Virginia Withee

Report Date: 05/31/94
Analysis Date: 05/29/94
Receipt Date: 05/25/94
Reference Date: 05/18/94

Sediment, 1st section

Station No: 11 Area 1

Sample Amount: 0.370 kg
Elapsed Time: 11.3110 days
Comment: 0 - 5 cm

Lab Sample #: G16672
Sample Code: MSE111 2094
Analyses Req: G

	Nuclide	Decay Correction	Activity: Conc. ± σ [picoCurie / kilogram]	Activity: MDC [picoCurie / kilogram]
	Np-239	3.55E-02	(-18 ± 39)E 02	12E 03
	Co-57	9.71E-01	(0 ± 18)E 00	53E 00
	Ce-144	9.72E-01	(28 ± 14)E 01	44E 01
	Ce-141	7.85E-01	(-8 ± 43)E 00	14E 01
	Mo-99	5.77E-02	(-4 ± 46)E 02	15E 03
	Se-75	9.36E-01	(-32 ± 28)E 00	86E 00
	Cr-51	7.53E-01	(55 ± 27)E 01	76E 01
	I-131	3.77E-01	(68 ± 58)E 00	17E 01
	Be-7	8.62E-01	(35 ± 24)E 01	68E 01
	Ru-103	8.19E-01	(38 ± 28)E 00	81E 00
x	I-133	———	———	———
	Ba-140	5.41E-01	(5 ± 38)E 00	13E 01
	Cs-134	9.89E-01	(-20 ± 26)E 00	97E 00
	Ru-106	9.79E-01	(7 ± 20)E 01	62E 01
+*	Cs-137	9.99E-01	(303 ± 39)E 00	57E 00
	Ag-110M	9.69E-01	(-32 ± 33)E 00	11E 01
	Zr-95	8.86E-01	(-12 ± 45)E 00	14E 01
	Co-58	8.95E-01	(28 ± 23)E 00	65E 00
	Mn-54	9.75E-01	(-34 ± 25)E 00	91E 00
+*	AcTh228	9.99E-01	(79 ± 13)E 01	27E 01
	TeI-132	8.96E-02	(-29 ± 17)E 02	61E 02
	Fe-59	8.38E-01	(98 ± 51)E 00	12E 01
	Zn-65	9.68E-01	(-15 ± 51)E 00	18E 01
	Co-60	9.95E-01	(62 ± 34)E 00	94E 00
+*	K-40	9.99E-01	(194 ± 11)E 02	85E 01
	Sb-124	8.77E-01	(16 ± 42)E 00	13E 01

Notes:
- * Activity greater than 3 standard deviations
- \+ Peak is found
- x Decay correction is less than .01

Reporting level ratio: 0.000

Approved by

E L Laurenzo
E. L. Laurenzo

MAILED

JUN 0 1 1994

YAEC
ENVIRONMENTAL LAB.

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Dominic W. Caristo
Mr. Roger R. O'Clair
Mr. Edward Cumming
Mrs. Virginia Withee

Report Date: 05/31/9
Analysis Date: 05/29/9
Receipt Date: 05/25/9
Reference Date: 05/18/9

Sediment, 2nd section

Station No: 11 Area 1

Sample Amount: 0.336 kg
Elapsed Time: 11.3110 days
Comment: 5 - 10 cm

Lab Sample #: G16673
Sample Code: MSE211 2094
Analyses Req: G

	Nuclide	Decay Correction	Activity Conc. ± σ [picoCurie / kilogram]	MDC
	Np-239	3.55E-02	(65 ± 36) E 02	97E 02
	Co-57	9.71E-01	(-2 ± 17) E 00	49E 00
	Ce-144	9.72E-01	(-11 ± 13) E 01	45E 01
	Ce-141	7.85E-01	(-3 ± 41) E 00	13E 01
	Mo-99	5.77E-02	(19 ± 47) E 02	15E 03
	Se-75	9.36E-01	(-63 ± 27) E 00	89E 00
	Cr-51	7.53E-01	(4 ± 20) E 01	59E 01
	I-131	3.77E-01	(59 ± 59) E 00	16E 01
	Be-7	8.62E-01	(65 ± 28) E 01	75E 01
	Ru-103	8.19E-01	(-28 ± 26) E 00	90E 00
x	I-133	———	———	———
	Ba-140	5.41E-01	(79 ± 43) E 00	10E 01
	Cs-134	9.89E-01	(21 ± 24) E 00	77E 00
	Ru-106	9.79E-01	(17 ± 23) E 01	67E 01
+*	Cs-137	9.99E-01	(273 ± 44) E 00	91E 00
	Ag-110M	9.69E-01	(-19 ± 37) E 00	12E 01
	Zr-95	8.86E-01	(75 ± 50) E 00	13E 01
	Co-58	8.95E-01	(-2 ± 25) E 00	79E 00
	Mn-54	9.75E-01	(-45 ± 33) E 00	12E 01
+*	AcTh228	9.99E-01	(67 ± 15) E 01	34E 01
	TeI-132	8.96E-02	(21 ± 17) E 02	45E 02
	Fe-59	8.38E-01	(-100 ± 59) E 00	21E 01
	Zn-65	9.68E-01	(3 ± 55) E 00	19E 01
	Co-60	9.95E-01	(50 ± 34) E 00	94E 00
+*	K-40	9.99E-01	(170 ± 12) E 02	11E 02
	Sb-124	8.77E-01	(-21 ± 21) E 00	96E 00

Notes:
- * Activity greater than 3 standard deviations
- \+ Peak is found
- x Decay correction is less than .01

Reporting level ratio: 0.000

Approved by

E. L. Laurenzo

MAILED

JUN 0 1 1994

YAEC
ENVIRONMENTAL LAB.

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Dominic W. Caristo
Mr. Roger R. O'Clair
Mr. Edward Cumming
Mrs. Virginia Withee

Report Date: 05/31/
Analysis Date: 05/27/
Receipt Date: 05/25/
Reference Date: 05/18/

Sediment, 3rd section

Station No: 11 Area 1

Sample Amount: 0.365 kg
Elapsed Time: 8.9074 days
Comment: 10 - 15 cm

Lab Sample #: G16674
Sample Code: MSE311 2094
Analyses Req: G

	Nuclide	Decay Correction	Activity: Conc. ± σ [picoCurie / kilogram]	MDC
	Np-239	7.22E-02	(-11 ± 15)E 02	46E 02
	Co-57	9.77E-01	(9 ± 13)E 00	37E 00
	Ce-144	9.78E-01	(-11 ± 11)E 01	38E 01
	Ce-141	8.26E-01	(-14 ± 32)E 00	11E 01
	Mo-99	1.05E-01	(18 ± 21)E 02	68E 02
	Se-75	9.50E-01	(12 ± 22)E 00	62E 00
	Cr-51	8.00E-01	(-1 ± 18)E 01	58E 01
	I-131	4.63E-01	(-26 ± 40)E 00	13E 01
	Be-7	8.90E-01	(-22 ± 18)E 01	60E 01
	Ru-103	8.54E-01	(-25 ± 21)E 00	69E 00
	xI-133	———	———	———
	Ba-140	6.17E-01	(14 ± 21)E 00	67E 00
	Cs-134	9.91E-01	(-11 ± 21)E 00	74E 00
	Ru-106	9.83E-01	(12 ± 17)E 01	51E 01
+*	Cs-137	9.99E-01	(351 ± 39)E 00	91E 00
	Ag-110M	9.75E-01	(16 ± 25)E 00	73E 00
	Zr-95	9.09E-01	(59 ± 35)E 00	97E 00
	Co-58	9.16E-01	(-11 ± 21)E 00	67E 00
	Mn-54	9.80E-01	(4 ± 22)E 00	71E 00
+*	AcTh228	9.99E-01	(91 ± 12)E 01	26E 01
	TeI-132	1.49E-01	(-104 ± 83)E 01	28E 02
	Fe-59	8.70E-01	(-42 ± 43)E 00	14E 01
	Zn-65	9.75E-01	(8 ± 48)E 00	17E 01
	Co-60	9.96E-01	(-15 ± 23)E 00	81E 00
+*	K-40	9.99E-01	(1803 ± 87)E 01	89E 01
	Sb-124	9.02E-01	(32 ± 35)E 00	98E 00

Notes:
- * Activity greater than 3 standard deviations
- \+ Peak is found
- x Decay correction is less than .01

Reporting level ratio: 0.000

Approved by

E L Laurenzo

E. L. Laurenzo

MAILED

JUN 0 1 1994

YAEC
ENVIRONMENTAL LAB.

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Dominic W. Caristo
Mr. Roger R. O'Clair
Mr. Edward Cumming
Mrs. Virginia Withee

Report Date: 05/31/9
Analysis Date: 05/27/9
Receipt Date: 05/25/9
Reference Date: 05/18/9

Sediment, 1st section

Station No: 12 Area 1 2

Sample Amount: 0.396 kg
Elapsed Time: 8.9769 days
Comment: 0 - 5 cm

Lab Sample #: G16675
Sample Code: MSE112 2094
Analyses Req: G

	Nuclide	Decay Correction	Activity Conc. ± σ [picoCurie / kilogram]	MDC
	Np-239	7.08E-02	(20 ± 13)E 02	38E 02
	Co-57	9.77E-01	(7 ± 11)E 00	32E 00
	Ce-144	9.78E-01	(-100 ± 93)E 00	31E 01
	Ce-141	8.25E-01	(-3 ± 27)E 00	87E 00
	Mo-99	1.04E-01	(7 ± 18)E 02	57E 02
	Se-75	9.49E-01	(-8 ± 18)E 00	55E 00
	Cr-51	7.98E-01	(4 ± 15)E 01	48E 01
	I-131	4.61E-01	(22 ± 32)E 00	96E 00
	Be-7	8.89E-01	(35 ± 15)E 01	42E 01
	Ru-103	8.53E-01	(-7 ± 16)E 00	50E 00
x	I-133	——	——	——
	Ba-140	6.15E-01	(-2 ± 15)E 00	56E 00
	Cs-134	9.91E-01	(14 ± 18)E 00	62E 00
	Ru-106	9.83E-01	(-23 ± 14)E 01	47E 01
+*	Cs-137	9.99E-01	(185 ± 24)E 00	47E 00
	Ag-110M	9.75E-01	(23 ± 22)E 00	65E 00
	Zr-95	9.08E-01	(37 ± 29)E 00	83E 00
	Co-58	9.15E-01	(-16 ± 16)E 00	54E 00
	Mn-54	9.80E-01	(-0 ± 15)E 00	49E 00
+*	AcTh228	9.99E-01	(687 ± 90)E 00	20E 01
	TeI-132	1.47E-01	(-50 ± 61)E 01	20E 02
	Fe-59	8.69E-01	(55 ± 37)E 00	11E 01
	Zn-65	9.74E-01	(25 ± 38)E 00	12E 01
	Co-60	9.96E-01	(-5 ± 17)E 00	57E 00
+*	K-40	9.99E-01	(1702 ± 70)E 01	77E 01
	Sb-124	9.01E-01	(-14 ± 31)E 00	11E 01

Notes:
* Activity greater than 3 standard deviations
\+ Peak is found
x Decay correction is less than .01

Reporting level ratio: 0.000

Approved by

E. L. Laurenzo

MAILED

JUN 0 1 1994

YAEC
ENVIRONMENTAL LAB.

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Dominic W. Caristo
Mr. Roger R. O'Clair
Mr. Edward Cumming
Mrs. Virginia Withee

Report Date: 05/31/9
Analysis Date: 05/27/9
Receipt Date: 05/25/9
Reference Date: 05/18/9

Sediment, 2nd section

Station No: 12 Area 2

Sample Amount: 0.433 kg
Elapsed Time: 9.0116 days
Comment: 5 - 10 cm

Lab Sample #: G16676
Sample Code: MSE212 2094
Analyses Req: G

	Nuclide	Decay Correction	Activity Conc. ± σ [picoCurie / kilogram]	MDC
	Np-239	7.00E-02	(24 ± 12)E 02	33E 02
	Co-57	9.77E-01	(4 ± 10)E 00	29E 00
	Ce-144	9.78E-01	(-107 ± 83)E 00	28E 01
	Ce-141	8.25E-01	(-10 ± 23)E 00	74E 00
	Mo-99	1.03E-01	(-14 ± 16)E 02	54E 02
	Se-75	9.49E-01	(-3 ± 16)E 00	48E 00
	Cr-51	7.98E-01	(-0 ± 12)E 01	35E 01
	I-131	4.59E-01	(13 ± 26)E 00	76E 00
	Be-7	8.89E-01	(-11 ± 13)E 01	43E 01
	Ru-103	8.53E-01	(-14 ± 16)E 00	51E 00
	xI-133	———	———	———
	Ba-140	6.13E-01	(13 ± 19)E 00	61E 00
	Cs-134	9.91E-01	(13 ± 16)E 00	52E 00
	Ru-106	9.83E-01	(-15 ± 12)E 01	40E 01
+*	Cs-137	9.99E-01	(138 ± 21)E 00	42E 00
	Ag-110M	9.75E-01	(17 ± 20)E 00	58E 00
	Zr-95	9.08E-01	(-14 ± 26)E 00	83E 00
	Co-58	9.15E-01	(14 ± 14)E 00	41E 00
	Mn-54	9.80E-01	(25 ± 16)E 00	46E 00
+*	AcTh228	9.99E-01	(89 ± 11)E 01	29E 01
	TeI-132	1.46E-01	(32 ± 64)E 01	19E 02
	Fe-59	8.69E-01	(33 ± 31)E 00	90E 00
	Zn-65	9.74E-01	(47 ± 40)E 00	13E 01
	Co-60	9.96E-01	(-17 ± 15)E 00	55E 00
+*	K-40	9.99E-01	(1649 ± 72)E 01	80E 01
	Sb-124	9.01E-01	(-16 ± 27)E 00	96E 00

Notes:
* Activity greater than 3 standard deviations
\+ Peak is found
x Decay correction is less than .01

Reporting level ratio: 0.000

Approved by

E. L. Laurenzo

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JUN 0 1 1994

YAEC
ENVIRONMENTAL LAB

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Dominic W. Caristo
Mr. Roger R. O'Clair
Mr. Edward Cumming
Mrs. Virginia Withee

Report Date: 05/31/94
Analysis Date: 05/27/94
Receipt Date: 05/25/94
Reference Date: 05/18/94

Sediment, 3rd section

Station No: 12 Area 2

Sample Amount: 0.417 kg
Elapsed Time: 9.0116 days
Comment: 10 - 15 cm

Lab Sample #: G16677
Sample Code: MSE312 2094
Analyses Req: G

	Nuclide	Decay Correction	Activity Conc. ± σ [picoCurie / kilogram]	MDC
	Np-239	7.00E-02	(8 ± 13)E 02	39E 02
	Co-57	9.77E-01	(27 ± 11)E 00	31E 00
	Ce-144	9.78E-01	(32 ± 97)E 00	32E 01
	Ce-141	8.25E-01	(37 ± 26)E 00	81E 00
	Mo-99	1.03E-01	(9 ± 18)E 02	59E 02
	Se-75	9.49E-01	(14 ± 19)E 00	55E 00
	Cr-51	7.98E-01	(23 ± 14)E 01	37E 01
	I-131	4.59E-01	(28 ± 29)E 00	83E 00
	Be-7	8.89E-01	(3 ± 14)E 01	43E 01
	Ru-103	8.53E-01	(-8 ± 17)E 00	55E 00
x	I-133	———	———	———
	Ba-140	6.13E-01	(-5 ± 25)E 00	93E 00
	Cs-134	9.91E-01	(0 ± 19)E 00	67E 00
	Ru-106	9.83E-01	(-8 ± 14)E 01	44E 01
+*	Cs-137	9.99E-01	(86 ± 20)E 00	46E 00
	Ag-110M	9.75E-01	(10 ± 22)E 00	66E 00
	Zr-95	9.08E-01	(-38 ± 29)E 00	98E 00
	Co-58	9.15E-01	(-26 ± 16)E 00	54E 00
	Mn-54	9.80E-01	(-12 ± 18)E 00	62E 00
+*	AcTh228	9.99E-01	(88 ± 10)E 01	20E 01
	TeI-132	1.46E-01	(0 ± 63)E 01	20E 02
	Fe-59	8.69E-01	(8 ± 34)E 00	11E 01
	Zn-65	9.74E-01	(-42 ± 44)E 00	16E 01
	Co-60	9.96E-01	(9 ± 17)E 00	53E 00
+*	K-40	9.99E-01	(1715 ± 75)E 01	73E 01
	Sb-124	9.01E-01	(-17 ± 21)E 00	79E 00

Notes:
* Activity greater than 3 standard deviations
\+ Peak is found
x Decay correction is less than .01

Reporting level ratio: 0.000

Approved by

E. L. Laurenzo

E. L. Laurenzo

MAILED

JUN 22 1994

YAEC
ENVIRONMENTAL LAB.

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Dominic W. Caristo
Mr. Roger R. O'Clair
Mr. Edward Cumming
Mrs. Virginia Withee

Report Date: 06/21/9
Analysis Date: 05/29/9
Receipt Date: 05/25/9
Reference Date: 05/18/9

Sediment, 1st section

Station No: 13 Area 3 #

Sample Amount: 0.163 kg
Elapsed Time: 11.3727 days
Comment: 0 - 5 cm

Lab Sample #: G16678
Sample Code: MSE113 2094
Analyses Req: G

	Nuclide	Decay Correction	Activity Conc. ± σ [picoCurie / kilogram]	MDC
	Np-239	3.49E-02	(12 ± 61) E 02	18E 03
	Co-57	9.71E-01	(-27 ± 22) E 00	67E 00
	Ce-144	9.72E-01	(-11 ± 18) E 01	60E 01
	Ce-141	7.84E-01	(59 ± 48) E 00	13E 01
	Mo-99	5.68E-02	(-64 ± 60) E 02	20E 03
	Se-75	9.36E-01	(-61 ± 33) E 00	11E 01
	Cr-51	7.52E-01	(13 ± 25) E 01	71E 01
	I-131	3.75E-01	(-37 ± 64) E 00	20E 01
+*	Be-7	8.62E-01	(109 ± 32) E 01	79E 01
	Ru-103	8.18E-01	(37 ± 30) E 00	80E 00
	xI-133	———	———	———
	Ba-140	5.40E-01	(-51 ± 40) E 00	17E 01
	Cs-134	9.89E-01	(-11 ± 28) E 00	94E 00
	Ru-106	9.79E-01	(33 ± 27) E 01	71E 01
+*	Cs-137	9.99E-01	(310 ± 52) E 00	12E 01
	Ag-110M	9.69E-01	(-36 ± 46) E 00	15E 01
	Zr-95	8.85E-01	(3 ± 58) E 00	18E 01
	Co-58	8.94E-01	(-12 ± 31) E 00	99E 00
	Mn-54	9.75E-01	(-105 ± 40) E 00	16E 01
+*	AcTh228	9.99E-01	(74 ± 16) E 01	41E 01
	TeI-132	8.84E-02	(19 ± 21) E 02	61E 02
	Fe-59	8.37E-01	(-111 ± 63) E 00	23E 01
	Zn-65	9.68E-01	(83 ± 75) E 00	23E 01
	Co-60	9.95E-01	(8 ± 48) E 00	17E 01
+*	K-40	9.99E-01	(197 ± 13) E 02	13E 02
	Sb-124	8.77E-01	(21 ± 55) E 00	17E 01

Notes:
- * Activity greater than 3 standard deviations
- \+ Peak is found
- x Decay correction is less than .01
- \# Updated to reflect correct Area from Area 1 to Area 3

Reporting level ratio: 0.000

Approved by

E. L. Laurenzo

MAILED
JUN 0 1 1994
YAEC
ENVIRONMENTAL LAB.

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Dominic W. Caristo
Mr. Roger R. O'Clair
Mr. Edward Cumming
Mrs. Virginia Withee

Report Date: 05/31/94
Analysis Date: 05/29/94
Receipt Date: 05/25/94
Reference Date: 05/18/94

Sediment, 2nd section

Station No: 13 Area 3

Sample Amount: 0.309 kg
Elapsed Time: 11.3150 days
Comment: 5 - 10 cm

Lab Sample #: G16679
Sample Code: MSE213 2094
Analyses Req: G

	Nuclide	Decay Correction	Activity Conc. ± σ [picoCurie / kilogram]	MDC [picoCurie / kilogram]
	Np-239	3.55E-02	(58 ± 40)E 02	11E 03
	Co-57	9.71E-01	(24 ± 17)E 00	48E 00
	Ce-144	9.72E-01	(-14 ± 14)E 01	47E 01
	Ce-141	7.85E-01	(9 ± 43)E 00	14E 01
	Mo-99	5.77E-02	(-4 ± 49)E 02	16E 03
	Se-75	9.36E-01	(-5 ± 28)E 00	82E 00
	Cr-51	7.53E-01	(-11 ± 22)E 01	66E 01
	I-131	3.77E-01	(-16 ± 55)E 00	16E 01
	Be-7	8.62E-01	(-5 ± 24)E 01	75E 01
	Ru-103	8.19E-01	(-11 ± 28)E 00	89E 00
x	I-133	———	———	———
	Ba-140	5.41E-01	(51 ± 25)E 00	0E-01
	Cs-134	9.89E-01	(-37 ± 30)E 00	11E 01
	Ru-106	9.79E-01	(9 ± 25)E 01	76E 01
+*	Cs-137	9.99E-01	(339 ± 44)E 00	74E 00
	Ag-110M	9.69E-01	(-27 ± 34)E 00	11E 01
	Zr-95	8.86E-01	(7 ± 48)E 00	15E 01
	Co-58	8.95E-01	(14 ± 26)E 00	76E 00
	Mn-54	9.75E-01	(-44 ± 23)E 00	87E 00
+*	AcTh228	9.99E-01	(73 ± 14)E 01	30E 01
	TeI-132	8.95E-02	(16 ± 15)E 02	43E 02
	Fe-59	8.38E-01	(42 ± 61)E 00	18E 01
	Zn-65	9.68E-01	(164 ± 70)E 00	19E 01
	Co-60	9.95E-01	(51 ± 31)E 00	84E 00
+*	K-40	9.99E-01	(226 ± 13)E 02	11E 02
	Sb-124	8.77E-01	(-37 ± 52)E 00	19E 01

Notes:
* Activity greater than 3 standard deviations
+ Peak is found
x Decay correction is less than .01

eporting level ratio: 0.000

Approved by

E. L. Laurenzo

MAILED

JUN 2 4 1994

YAEC
ENVIRONMENTAL LAB

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Dominic W. Caristo
Mr. Roger R. O'Clair
Mr. Edward Cumming
Mrs. Virginia Withee

Report Date: 06/21/94
Analysis Date: 05/27/94
Receipt Date: 05/25/94
Reference Date: 05/18/94

Sediment, 3rd section

Station No: 13 Area 3

Sample Amount: 0.367 kg
Elapsed Time: 8.9769 days
Comment: 10 - 15 cm

Lab Sample #: G16680‡
Sample Code: MSE313 2094
Analyses Req: G

	Nuclide	Decay Correction	Activity Conc. ± σ [picoCurie / kilogram]	MDC
	Np-239	7.08E-02	(12 ± 17) E 02	48E 02
	Co-57	9.77E-01	(-17 ± 14) E 00	43E 00
	Ce-144	9.78E-01	(-5 ± 12) E 01	41E 01
	Ce-141	8.25E-01	(13 ± 34) E 00	11E 01
	Mo-99	1.04E-01	(-21 ± 23) E 02	78E 02
	Se-75	9.49E-01	(24 ± 24) E 00	68E 00
	Cr-51	7.98E-01	(2 ± 21) E 01	66E 01
	I-131	4.61E-01	(43 ± 44) E 00	13E 01
	Be-7	8.89E-01	(19 ± 20) E 01	61E 01
	Ru-103	8.53E-01	(-20 ± 23) E 00	76E 00
x	I-133	———	———	———
	Ba-140	6.15E-01	(13 ± 21) E 00	66E 00
	Cs-134	9.91E-01	(6 ± 25) E 00	86E 00
	Ru-106	9.83E-01	(-29 ± 18) E 01	62E 01
+*	Cs-137	9.99E-01	(1749 ± 69) E 00	77E 00
	Ag-110M	9.75E-01	(-21 ± 24) E 00	81E 00
	Zr-95	9.08E-01	(15 ± 36) E 00	11E 01
	Co-58	9.15E-01	(-14 ± 18) E 00	60E 00
	Mn-54	9.80E-01	(8 ± 23) E 00	74E 00
+*	AcTh228	9.99E-01	(91 ± 11) E 01	22E 01
	TeI-132	1.47E-01	(-91 ± 78) E 01	27E 02
	Fe-59	8.69E-01	(-59 ± 47) E 00	16E 01
	Zn-65	9.74E-01	(54 ± 56) E 00	18E 01
	Co-60	9.96E-01	(11 ± 24) E 00	76E 00
+*	K-40	9.99E-01	(1877 ± 89) E 01	10E 02
	Sb-124	9.01E-01	(-21 ± 30) E 00	11E 01

Notes:
* Activity greater than 3 standard deviations
\+ Peak is found
x Decay correction is less than .01

‡ Cs-137 activity concentration confirmed with sample recount.

Approved by

E. L. Laurenzo

HSA ID# 115

T.63.5052

ATTACHMENT B

ATLAS DOCUMENT INPUT FORM

1. TITLE Licensed Silt Spreading Area	
2. DOCUMENT TYPE Correspondence	3. DOCUMENT FORM mI
4. DOCUMENT LOCATION	5. RETENTION PERIOD
6. TECHNICAL FILE NUMBER 01.08.04.02	
7. DOCUMENT NUMBER	
8. REVISION NUMBER 9. DATE 10/04/1994	10. CLASSIFICATION TYPE D
11. TOPICAL INDUSTRY ISSUE	
12. KEYWORDS	
13. SUBJECT	
14. REFERENCE DOCUMENT	
15. SYSTEM CODE	16. COMPONENT CODE
17. CYCLE NUMBER	
18. ORIGINATOR Admin/Licensing	
19. RECEIVER	
20. VENDOR CODE	
21. ACCESSION NUMBER	
ACTION: ADD/REPLACE/DELETE (CIRCLE ONE)	

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RECORD TYPE 07.C16.004

W.O./P.O. NO. 5915

YANKEE NUCLEAR SERVICES DIVISION
ENVIRONMENTAL ENGINEERING DEPARTMENT

ANALYSIS/CALCULATION FOR

TITLE RADIOLOGICAL CONSEQUENCES ASSOCIATED WITH THE LAND-SPREADING OF SLIGHTLY CONTAMINATED MATERIAL REMOVED FROM THE INTAKE BAYS

PLANT Maine Yankee

Calculation - 176 p.
Review sheets - 2 p.
Total 178

CALCULATION NUMBER MYC-1647

(Nonsafety-Related)

	PREPARED BY DATE	REVIEWED BY* DATE	APPROVED BY DATE	REVIEW LEVEL ASSIGNED*
ORIGINAL	F.X. Bellini 9/6/94 J. Bisson 9/6/94	J. Bisson 9/6/94 F.X. Bellini 9/6/94	[illegible] 9/9/94	
REVISION 1				
REVISION 2				
REVISION 3				

*Level of Review Required: 1 = Review in Detail
2 = General Review for Reasonableness
3 = Review Not Required

KEYWORD: DIDOS, RESRAD, sediment, 10CFR20.302, 10CFR50.75(g), LL

Form: YA-REG-200.1
Revision:

Table of Contents

I. PURPOSE

The purpose of this calculation is to evaluate dose rates and doses associated with land-spreading of material removed from the Intake Bays. This calculation will serve as the basis for either a 10CFR20.302 (.2002) application or become part of the documentation package required under 10CFR50.75(g). This calculation focuses on the radiological consequences to a hypothetical worker and to a hypothetical member of the public. This calculation is performed in response to Service Request No. M-93-112 (Reference 1).

II. METHOD

1. Use sample analyses to develop average radionuclide concentrations in the Intake Bay material.

2. Estimate the volume of material through observations, discussions with MY staff, and by taking area and depth measurements of sediment already in place.

3. Determine the total activity within the subject material.

4. Use DIDOS to calculate the direct dose to a hypothetical worker as a result of land-spreading of the subject material. DIDOS is appropriate for this application because it was designed to calculate shielded and unshielded direct doses from cylindrical sources. In this calculation, the volume of the Intake Bays debris is assumed to be a cylindrical volume source with a set radius and depth (height). DIDOS has been used to calculate similar doses in other engineering problems. EZDIDOS was used to process the input data for the DIDOS runs.

5. Evaluate the consequences of radionuclide migration within the soil using the computer program, RESRAD. Also, RESRAD is used to determine the dose from the activity in the Intake debris via drinking water and seafood pathways. RESRAD, version 4.3, is a U.S. DOE fortran code that runs on a PC. The program reference manual (Reference 2) is in the process of being updated, and is available in total only for version 3. An updated version of Chapter 4 of the User's Guide for RESRAD, is available and was used as guidance.

6. Compare all calculated doses to applicable NRC regulations and limits in 10CFR20 (Reference 3).

III. EXPOSURE PATHWAYS

1. The potential exposure pathways are selected from the checklist in Procedure YA-REG-230 (Reference 4). Applicable pathways are: (a) ground shine or direct external exposure, (b) inhalation of suspended radioactivity, (c) internal exposure via ingesting food grown on site, and (d) exposure via waterborne pathways.

a. Direct external exposure is the most likely exposure pathway. The designated area for spreading is approximately 3 acres of plant property. Although members of the public may have access to the area, their occupation time will not exceed 2000 hrs (a full work year). Therefore, determining a maximum direct dose for a hypothetical worker present 8 hrs per day for 50 work weeks in the area where the Intake debris has been placed will provide a bounding direct dose for a member of the public. The direct dose due to residual activity after site closure (20 yrs) conservatively will assume a spreading thickness of 3" and an occupation time of 8760 hrs.

b. Inhalation due to wind resuspension will be examined although this pathway does not represent a likely potential pathway. Only a very small fraction of the already very low amount of radioactivity in the Intake Bay material will be expected to be subject to resuspension (and hence further diluted via atmospheric dispersion). Resuspension factors range from 10^{-4}–10^{-9} m^{-1} for wind resuspension (Reference 5). Moreover, the intent is to spread the material thin enough to permit growth of underlying vegetation. The vegetation cover would then reduce the chances of significant amount of resuspension and erosion.

c. Ingestion of vegetables grown in the spreading area after site closure (assumed to be 20 yrs, or 2012). Pathway analysis will use the computer code RESRAD.

d. Another potential exposure pathway is via radionuclide migration through the soil to surface water. Consideration of this pathway will account for exposure via ingestion of fish and shellfish, uptake by edible plants, and uptake by milk animals. Although addressed in dose calculations, these pathways are considered remote due to the location of the MY plant (i.e., surface water tends to be of lower quality, and therefore is not used for drinking or irrigation purposes). RESRAD will be used to evaluate all ingestion pathways.

IV. RESULTS

A. Direct Dose

1. Sediment removed from the Intake Bays during the 1993 outage has been spread (with an average thickness of 3 inches) over about 75% of an area 25 ft * 125 ft (Appendix D). The volume for the 1993 sediment is estimated:

$$25 \text{ ft} * 125 \text{ ft} * 0.25 \text{ ft} * 0.75 = 586 \text{ ft}^3$$

In addition, material from 1992 (estimated to be 293 ft^3) has been placed in the same area, making the total volume of material from the Intake Bays = 879 ft^3.

2. Samples of the material were analyzed for radiological content at the Yankee Atomic Environmental Lab. Radiological analysis results of samples are provided in Appendix A. The results are summarized in Tables 1, 2 and 3.

Table 1
1993 Sediment and Debris Sample Data

Sample No.	Ag-110m (uCi/g)	Co-58 (uCi/g)	Co-60 (uCi/g)	Cs-137 (uCi/g)	Total (uCi/g)
SE-2	3.80e-8	6.30e-8	6.60e-8	6.30e-8	2.30e-7
SE-4	3.28e-8	ND	4.40e-8	1.04e-7	1.81e-7
SE-5	2.34e-8	ND	5.67e-8	8.25e-8	1.63e-7
SE-7	ND	ND	ND	1.18e-7	1.18e-7
SE-8	ND	ND	2.62e-8	3.97e-8	6.59e-8
SE-9	ND	ND	ND	ND	----
SE-10	ND	8.00e-8	2.24e-7	2.37e-7	5.41e-7
SE-11	ND	ND	ND	ND	----

ND = not detected.

<u>Assumption</u>: The material removed from the Intake Bays during 1992 possess the same radionuclide distributions and concentrations as found in the 1993 sediment and debris.

III. RESULTS (cont.)

Table 2
1993 Service Water Pipe Debris Sample Data

Sample No.	Ag-110m (uCi/g)	Co-58 (uCi/g)	Co-60 (uCi/g)	Cs-137 (uCi/g)	Total (uCi/g)
SE-3	ND	5.74e-8	2.86e-8	ND	8.60e-8
SE-12	ND	2.47e-8	4.75e-8	3.33e-8	1.06e-7

ND = not detected.

Table 3
1993 Spreading Area Soil Sample Data

Sample No.	Ag-110m (uCi/g)	Co-58 (uCi/g)	Co-60 (uCi/g)	Cs-137 (uCi/g)	Total (uCi/g)
SE-1	ND	ND	2.77e-8	6.90E-8	9.67e-8
SE-6	ND	ND	ND	ND	----

ND = not detected.

3. Average radionuclide concentrations from the 1993 sediment and debris samples (Table 1) are:

Ag-110m = 3.14e-8 uCi/g.
Co-58 = 7.15e-8 uCi/g.
Co-60 = 8.34e-8 uCi/g.
Cs-137 = 1.07e-7 uCi/g.

III. RESULTS (cont.)

Note: as a conservative means of estimating concentration, averages are calculated using only results from samples with detectable levels of a given radionuclide. Service Water Pipe debris data (Table 2) were not used because (i) values were covered by averages in step 3, and (ii) SW Pipe debris volume was small (approximately 0.1%) compared to the Intake Bay material.

4. Equivalent cylinder for 1993 volume:

vol = Pi * r^2 * h
586 ft^3 = Pi * r^2 * (0.25 ft)
586 ft^3/ Pi * 0.25 ft = r^2
746 ft^2 = r^2
27.3 ft = r

Converting to meters: r = 8.3m, h = 0.076m, and approx. vol = 16.5 m^3.

The values for r and h will be used in a DIDOS run.

5. The equivalent cylinder for 1993 and 1992 volume:

879 ft^3 = Pi * r^2 * 0.25
1119.2 ft^2 = r^2
33.5 ft = r

Converting to meters: r = 10.2m, h = 0.076m, and approx. vol = 24.8 m^3.

The values for r and h will also be used in a DIDOS run.

6. Assuming a density for silt of 1.8 g/cc (Reference 6), the total activity by nuclide (no decay) is:

For 1993: Ag-110m = 3.14e-8uCi/g * 1.8g/cc * 10^6cc/m^3 * 16.5m^3 * 1e-6Ci/uCi
= 9.33e-7 Ci, or 9.3e-7 Ci
Co-58 = 7.15e-8uCi/g * 1.8g/cc * 10^6cc/m^3 * 16.5m^3 * 1e-6Ci/uCi
= 2.12e-6 Ci, or 2.1e-6 Ci.
Co-60 = 8.34e-8uCi/g * 1.8g/cc * 10^6cc/m^3 * 16.5m^3 * 1e-6Ci/uCi
= 2.48e-6 Ci, 2.5e-6 Ci.
Cs-137 = 1.07e-7uCi/g * 1.8g/cc * 10^6cc/m^3 * 16.5m^3 * 1e-6Ci/uCi
= 3.18e-6 Ci. or 3.2e-6 Ci.

IV. RESULTS (cont.)

For 1993 and 1992:

Ag-110m = 3.14e-8uCi/g * 1.8g/cc * 10^6cc/m^3 * 24.8m^3 * 1e-6Ci/uCi
= 1.40e-6 Ci, or 1.4e-6 Ci.

Co-58 = 7.15e-8uCi/g * 1.8g/cc * 10^6cc/m^3 * 24.8m^3 * 1e-6Ci/uCi
= 3.19e-6 Ci, or 3.2e-6 Ci.

Co-60 = 8.34e-8uCi/g * 1.8g/cc * 10^6cc/m^3 * 24.8m^3 * 1e-6Ci/uCi
= 3.72e-6 Ci, or 3.7e-6 Ci.

Cs-137 = 1.07e-7uCi/g * 1.8g/cc * 10^6cc/m^3 * 24.8m^3 * 1e-6Ci/uCi
= 4.78e-6 Ci, or 4.8e-6 Ci.

7. Two EZDIDOS runs were made to evaluate the direct dose due to a hypothetical worker standing in the center of the equivalent cylinder for a full work year (2000 hrs). Run #1 evaluated only the 1993 volume. Run #2 evaluated the 1993 plus 1992 volume. In each case, the dose was <1 mrem/work year. The estimated dose from Run #1 was 0.51 mrem/2000 hrs. The estimated dose from Run #2 was 0.53 mrem/2000 hrs. The DIDOS outputs for these runs are included in Appendix B.

8. The volume and radionuclide concentrations were used to estimate volumes and activities for material which will be removed from the Intake Bays during 12 future outages. The initial activity and volume for the Intake debris for each future outage was set to the 1993 sample data. Radioactive decay is considered once the material has been removed from the Intake Bays. The half-life for each radionuclide was taken from Reference 7. The radionuclide activities for each future outage are shown in Table 4.

IV. RESULTS (cont.)

Table 4

Total Cumulative Activities (Ci) and Volume (m^3) for Sediment by Outage

Outage No.	Time Frame	Curies: Ag110m	Co58	Co60	Cs137	Volume (m3)
1	1992	4.65e-07	1.05e-06	1.25e-06	1.60e-06	8.20e+00
2	1993	1.06e-06	2.11e-06	3.56e-06	4.76e-06	2.47e+01
3	+15mos	1.24e-06	2.12e-06	5.52e-06	7.82e-06	4.12e+01
4	+15mos	1.29e-06	2.13e-06	7.18e-06	1.08e-05	5.77e+01
5	+15mos	1.30e-06	2.13e-06	8.59e-06	1.37e-05	7.42e+01
6	+15mos	1.31e-06	2.13e-06	9.78e-06	1.65e-05	9.07e+01
7	+15mos	1.31e-06	2.13e-06	1.08e-05	1.93e-05	1.07e+02
8	+15mos	1.31e-06	2.13e-06	1.17e-05	2.19e-05	1.24e+02
9	+15mos	1.31e-06	2.13e-06	1.24e-05	2.45e-05	1.40e+02
10	+15mos	1.31e-06	2.13e-06	1.30e-05	2.70e-05	1.57e+02
11	+15mos	1.31e-06	2.13e-06	1.35e-05	2.95e-05	1.73e+02
12	+15mos	1.31e-06	2.13e-06	1.40e-05	3.18e-05	1.90e+02
13	+15mos	1.31e-06	2.13e-06	1.43e-05	3.41e-05	2.06e+02
14	+15mos	1.31e-06	2.13e-06	1.47e-05	3.64e-05	2.23e+02
N/A	2012	3.17e-08	3.40e-12	8.95e-06	3.34e-05	2.23e+02

IV. RESULTS (cont.)

Assumption: The activities at the end of 14 outages (from Table 4) are assumed to be homogeneous in the total volume of material (223 m^3) at the end of 14 outages.

Assumption: The material removed from the Intake Bays will be spread such that the underlying vegetation continues to grow. This is possible because there is approximately 3 acres of land available for spreading.

9. Since the killing thickness is unknown, radiological consequences at various thicknesses were examined. Various thicknesses for spreading were examined using the total volume anticipated at the end of 14 outages (223 m^3, including 1992 and 1993). The examined thicknesses were 1", 3", 6", 7", 8", 9", 10" 11", 12" and 13". Each thickness value was converted to metric units, and an appropriate radius was calculated.

1": $222.7\ m^3 = Pi * r^2 * 0.0254m$
$52.8m = r$

3": $222.7\ m^3 = Pi * r^2 * 0.076m$
$30.5m = r$

6": $222.7\ m^3 = Pi * r^2 * 0.152m$
$21.6m = r$

7": $222.7\ m^3 = Pi * r^2 * 0.1778m$
$20.0m = r$

8": $222.7\ m^3 = Pi * r^2 * 0.203m$
$18.7m = r$

9": $222.7\ m^3 = Pi * r^2 * 0.229m$
$17.6m = r$

10": $222.7\ m^3 = Pi * r^2 * 0.254m$
$16.7m = r$

11": $222.7\ m^3 = Pi * r^2 * 0.279m$
$15.9m = r$

12": $222.7\ m^3 = Pi * r^2 * 0.305m$
$15.2m = r$

13": $222.7\ m^3 = Pi * r^2 * 0.330m$
$14.7m = r$

IV. RESULTS (cont.)

10. Several DIDOS runs, Run #3 through #12, were made using the total radionuclide activities at the end of 14 outages and the dimensions from step 9. The DIDOS outputs are in Appendix B. The results are summarized below:

Radius (m)	Thickness (m)	Dose (mrem/2000 hrs)
52.8	0.0254	0.118
30.5	0.076	0.221
21.6	0.152	0.280
20.0	0.178	0.289
18.7	0.203	0.296
17.6	0.229	0.301
16.7	0.254	0.305
15.9	0.279	0.308
15.2	0.305	0.309
14.7	0.330	0.306

Although the dose consequences increase some with the spreading thickness, the dose peaks at 0.309 mrem/2000 hrs with a spreading thickness of 12 inches. However, the spreading thickness is not expected to exceed a few inches (e.g., 3-4 inches) in order to allow continued growth of the underlying vegetation. A spreading thickness of 10-12 inches will inhibit vegetation growth.

The direct dose rate and dose to an individual in 20 yrs is 7.35e-5 mrem/hr and 0.644 mrem, respectively. The results are based on a total volume = 223 m^3, 3" spreading thickness, activities given in Table 4 for the year 2012, and an occupation time = 8760 hrs. The applicable DIDOS results, Run #13, are included in Appendix B. The results indicate that the annual direct dose to an individual who may inhabit the area after site closure will be <1 mrem, even under

IV. RESULTS (cont.)

conservative assumptions. The actual dose to such an individual would be significantly lower than 0.644 mrem.

Note: For a 3 inch spreading thickness dose for material from 14 outages is lower than the dose associated with the 1993 material alone (i.e., 0.21 mrem vs. 0.51 mrem). Using the assumption of homogenous activity at the end of 14 outages may not be conservative. Therefore various spreading thicknesses for the 1993 Intake Bay material were examined to determine a maximum dose to a worker (or member of the public) from a single batch of material. Given the available 3 acres of land, it is not expected that Intake debris from one outage would be spread on top of the Intake Bay debris from an earlier outage.

11. The 1993 volume (16.5 m^3) was adjusted for radius and height as in step 9:

1": $16.5\ m^3 = Pi * r^2 * 0.0254m$
$14.4m = r$

3": $16.5\ m^3 = Pi * r^2 * 0.076m$
$8.3m = r$

6": $16.5\ m^3 = Pi * r^2 * 0.152m$
$5.9m = r$

7": $16.5\ m^3 = Pi * r^2 * 0.1778m$
$5.4m = r$

8": $16.5\ m^3 = Pi * r^2 * 0.203m$
$5.1m = r$

9": $16.5\ m^3 = Pi * r^2 * 0.229m$
$4.8m = r$

10": $16.5\ m^3 = Pi * r^2 * 0.254m$
$4.5m = r$

12": $16.5\ m^3 = Pi * r^2 * 0.305m$
$4.1m = r$

IV. RESULTS (cont.)

12. DIDOS Runs #14 through 21 were made using the total radionuclide activities determined for the 1993 Intake debris (from step 6) and the dimensions from step 11. The DIDOS outputs are in Appendix B. The results are summarized below:

Radius (m)	Thickness (m)	Dose (mrem/2000 hrs)
14.4	0.0254	0.276
8.3	0.076	0.514
5.9	0.152	0.638
5.4	0.178	0.665
5.1	0.203	0.666
4.8	0.229	0.670
4.5	0.254	0.688
4.1	0.305	0.685

The maximum direct dose to a worker is about 0.69 mrem/2000 hrs. However, this is for a spreading thickness = 10", which may not permit growth of underlying vegetation. Although depth measurements for the Intake Bay material already in place indicate some areas where the spreading thickness is 7-8 inches, the average spreading thickness is about 3". When realistic occupancy times and spreading thicknesses are considered, the annual dose to worker (and hence members of the public) can be expected to be significantly below the bounding low annual direct dose of 0.69 mrem.

Given the fact that the material from the Intake Bays is (and will be) placed on owner-controlled land, the most probable exposure pathway is direct exposure to the subject material. The targeted area is not used for cultivating crops or pasture land. Therefore, ingestion exposure pathways are not viable pathways until the site has been released for unconditional use after decommissioning. The targeted area is not normally occupied by plant workers. The exposure period (2000 hrs) assumes a worker is located in the center of the Intake Bay material for 50 work weeks. Therefore, the low maximum annual dose (0.69 mrem) for a hypothetical worker is very conservative. The occupancy times for members of the public are also expected to be much shorter than the 2000 hrs used in the dose calculation.

IV. RESULTS (cont.)

B. Dose Due to Inhalation

1. Dose resulting from inhalation of resuspended radioactivity in the Intake Bay material after land-spreading represents a remote exposure pathway. A resuspension factor range of 10^{-4}–10^{-10} m^{-1} for wind resuspension has been reported (Reference 5). To conservatively estimate a dose due to inhalation of resuspended radioactivity the 10^{-4} m^{-1} (upper end of range) will be used as the resuspension factor.

Assumption: The radionuclide activities calculated for the 1993 material (step A.6) are assumed to be dispersed uniformly over the surface area defined by the 8.3m radius (3" spreading thickness). This assumption is conservative in that the total activities in the volume of the 1993 material are now brought to the material/air interface and are assumed available for resuspension.

2. The surface activity is calculated as follows:

The area is defined by a 8.3m radius, or Pi*$(8.3m)^2$ = 216 m^2.
Ag110m = 9.3e-7 Ci/216 m^2 = 4.3e-9 Ci/m^2.
Co58 = 2.1e-6 Ci/216 m^2 = 9.7e-9 Ci/m^2.
Co60 = 2.5e-6 Ci/216 m^2 = 1.2e-8 Ci/m^2.
Cs137 = 3.2e-6 Ci/216 m^2 = 1.5e-8 Ci/m^2.

3. The relationship between the airborne concentration and surface deposition is:

A	=	S	*	RF
Airborne Concentration		Surface Concentration		Resuspension Factor
(Ci/m^3)		(Ci/m^2)		(1/m)

The airborne concentrations are:
Ag110m = 4.3e-9 * 1e-4 = 4.3e-13 Ci/m^3.
Co58 = 9.7e-9 * 1e-4 = 9.7e-13 Ci/m^3.
Co60 = 1.2e-8 * 1e-4 = 1.2e-12 Ci/m^3.
Cs137 = 1.5e-8 * 1e-4 = 1.5e-12 Ci/m^3.

4. The inhalation dose rates were calculated according the general equation:

DR	=	A	*	DRF
Dose Rate		Airborne Concentration		Dose Rate Factor
(mrem/hr)		(Ci/m^3)		(mrem-m^3/Ci-hr)

Note: The dose rate factor from Table 2.1 in Reference 8 incorporates a breathing rate (20 l/min - applicable to light activity).

IV. RESULTS (cont.)

The DRF are:

Ag110m: CEDE = 1.3e7 mrem-m^3/Ci-hr, CDE = 1.3e6 mrem-m^3/Ci-hr (gonad)
Co58: CEDE = 1.3e7 mrem-m^3/Ci-hr, CDE = 7.1e7 mrem-m^3/Ci-hr (lung)
Co60: CEDE = 2.6e8 mrem-m^3/Ci-hr, CDE = 1.5e9 mrem-m^3/Ci-hr (lung)
Cs137: CEDE = 3.8e7 mrem-m^3/Ci-hr, CDE = 3.9e7 mrem-m^3/Ci-hr (lung)

The CEDE from inhalation:

Ag110m = 4.3e-13 * 1.3e7 = 5.6e-6 mrem/hr
Co58 = 9.7e-13 * 1.3e7 = 1.3e-5 mrem/hr
Co60 = 1.2e-12 * 2.6e8 = 3.1e-4 mrem/hr
Cs137 = 1.5e-12 * 3.8e7 = 5.7e-5 mrem/hr
total CEDE = 3.9e-4 mrem/hr

<u>Assumption</u>: An exposure period = 8 hrs is assumed to be conservative for the time required for MY worker(s) to spread the Intake Bay material. Also, the air concentration within the area defined by the 8.3 m radius is held constant for 8 hrs, which adds to the conservatism.

The CEDE for an 8-hr exposure = 3.9e-4 * 8 = <u>3.1e-3 mrem</u>.

The CDE from inhalation:

Ag110m = 4.3e-13 * 1.3e6 = 5.6e-7 mrem/hr
Co58 = 9.7e-13 * 7.1e7 = 6.9e-5 mrem/hr
Co60 = 1.2e-12 * 1.5e9 = 1.8e-3 mrem/hr
Cs137 = 1.5e-12 * 3.9e7 = 5.9e-5 mrem/hr
total CEDE = 1.9e-3 mrem/hr

The CDE for an 8-hr exposure = 1.9e-3 * 8 = <u>1.5e-2 mrem</u>.

<u>Note</u>: The 8-hr exposure period assumes a worker is located in the center of an area where the Intake Bay material has been placed. Additionally, the dose rate is based on the assumptions (i) that 100% of the radioactivity in the Intake Bay material is available for wind resuspension (i.e, at the material/air interface), (ii) that resuspension of radioactivity in the material is relatively high (i.e., the upper end of the range for wind resuspension factors was used - realistic resuspension for the Intake Bay material may be several orders of magnitude lower), and (iii) that the airborne concentration remains at the maximum level for the entire duration of the exposure period (i.e., not accounting for dispersion or transport of radioactivity by the wind which causes its resuspension). Nevertheless, even when based on extremely conservative assumptions, the inhalation doses (CEDE = 0.003 mrem, and CDE = 0.02 mrem) do not present a health hazard.

IV. RESULTS (cont.)

C. Water Borne Pathways

1. Dose due to water borne pathways is evaluated for a hypothetical ground water/drinking water and seafood pathways using the U.S. DOE code, RESRAD (Reference 2). Justification for data inputs and interpretation of data outputs are discussed below. Figures 2 through 19 are time-dose curves representing summary results for three cases:

1) 1993 sediment volume only
2) 1992 and 1993 sediment volume combined
3) anticipated volume from 14 outages.

Code input/output text summaries are included in Appendix C.

2. RESRAD Inputs and Assumptions

Inputs to RESRAD are organized by topic, each of which has a separate input screen when the program is prepared for a run. Each screen has a unique designation, such as R011, R012, D001, etc.

a. Contaminated Zone Parameters R011:

Areas of contaminated soil for the three cases, respectively, are: 206, 308 and 2787.5 m^2. The 1993 area was based on volume measurements of the actual material (Appendix D). Estimates were made for 1992+1993 and 14 Outages volumes are based on conservative estimates from MY as follows:

- area of 1992+93 sediment = 1993 area + 0.5*1993 area
- area of 14 outages sediment = 13.5*1993 area

Thickness: 3" = 0.076 m is estimated from measurements in the field from 1992 & 3 placements (Appendix D).

IV. RESULTS (cont.)

Length (of spreading area) parallel to aquifer flow for the three cases are estimated as 39, 45 and 500 m. Maximum dimension concentrates leachate.

Time since material placement is input as 0 years to provide an initial time assessment of dose.

b. Initial Concentrations of Radionuclides R012:

Total concentration data are taken directly from data in Table 4 for the 1992+1993 case and for the 14 Outages case. For the 1993 case inputs are taken from step A.6:

Co-60 = 2.5e-6 Ci
Cs-137 = 3.2e-6 Ci

Input values for RESRAD in pCi/g were then calculated using the formula:

$$\frac{\text{total activity, Ci}}{\text{total volume, m}^3} \times \frac{1\ \text{cm}^3}{1.8\ \text{g}} \times \frac{1\ \text{m}^3}{1\text{e}6\ \text{cm}^3} \times \frac{1\text{e}12\ \text{pCi}}{\text{Ci}} = \text{pCi/g}$$

as:

1993: Co-60 0.084, Cs-137 0.108 pCi/g
1992+1993: Co-60 0.080, Cs-137 0.106 pCi/g
14 Outages: Co-60 0.037, Cs-137 0.091 pCi/g

c. Cover and Contaminated Zone Hydrologic Data R013:

Cover depth (thickness): 0 m. Soil is spread without cover.

Contaminated Zone Parameters

Density (dry) of soil: 1.8 g/cc. This is a standard value for silt (Reference 6).

Erosion rate is assigned as 0 m/yr. For conservatism all soil is left uneroded, leaving a maximum amount to provide dose.

Total porosity for silt is 0.45 per Table E.7, Reference 2.

Effective porosity for silt is 0.2 per Table E.7, Reference 2.

Hydraulic conductivity is 5×10^{-4} cm/sec = 158 m/yr for underlying material, Presumpscot clay-silt (Reference 9). 500 m/yr used for fill and silt is conservative.

IV. RESULTS (cont.)

B parameter is 4.05, representing a soil-specific exponential parameter used to define a saturation ratio. Low value maximizes leaching and so dose potential for ground water; high value maximizes ground contact dose (Table E.2, Reference 2).

Evapotranspiration coefficient is 0.6. This standard value is also RESRAD default.

Precipitation at the site is 46"/yr = 1.2 m/yr (Reference 10).

Runoff coefficient is 0.4, that is the portion of rainfall that appears as stream flow. This is derived from Table E.1 (Reference 5): 1 - 0.2 - 0.3 - 0.1 = 0.4. This low value is conservative.

Watershed Area: 2000' x 275' = 550,000 ft^2 = (approx) 50000 m^2 Low value is conservative, allowing less water for dilution.

d. Saturated Soil Hydrologic Data R014:

Density of soil is assumed as 1.6 g/cc. This is a standard value for sand and gravel fill.

Total porosity is 0.4 (Table E.7, Reference 2)

Effective porosity is 0.3 (Table E.7, Reference 2)

Hydraulic conductivity is 1000 m/yr assumed to represent fill.
Hydraulic gradient is calculated as 0.34. Considerations included:
Drop in elevation/Maximum distance to stream: 25'/150' = 0.34
Drop in elevation/Minimum distance to stream: 25'/1000 = 0.025
High value is conservative for water borne dose.

B parameter is 4.05 (see B parameter for Contaminated Zone).

Drop rate of ground water table is assigned as 0 m/yr.
0 m/yr drop rate is conservative for ground water dose assessment, as all radionuclides continue to be in contact with ground water through time.

Well intake depth: 0 m
Low value is most conservative. 0 m depth is very conservative.

Dispersion model: ND (non-dispersion) for any size area. MB (mass-balance) is for small areas, <1000 m^2. Sensitivity analyses show ND model to be more conservative for this case.

e. Uncontaminated, Unsaturated Zone Parameters R015:

Strata between contaminated sediment and ground water is assumed to be absent. This is a conservative assumption made due to seasonally high ground water table.

IV. RESULTS (cont.)

f. Distribution Coefficients and Leach Rates R016:

Distribution coefficients considerations were as follows:
RESRAD defaults are Co-60 100; Cs-137 100
Reference 11 for moderately permeable soils are Co-60 198; Cs-137 39.5. The latter values were chosen. These values are:

- conservative for silt, (moderate to low permeability); - - -
- adequate for construction fill (reworked natural soils with moderate permeability) and shot-rock; and
- conservative for natural soils, silt-clay and till (moderate to low permeabilities).

Leach rates are calculated by RESRAD based on distribution coefficients.

g. Ingestion Pathway Data R018

Fruit, vegetables and grain consumption
520 kg/yr per References 12 and 13 is very conservative.

Leafy vegetable consumption
64 kg/yr per Reference 12 and Reg Guide 1.109 is very conservative.

Fish Consumption
21 kg/yr per Reference 12 is very conservative.

Other Seafood Consumption
5 kg/yr per Reference 12 is very conservative.

Fraction of Aquatic Food from Site
1.0 for conservativeness all seafood assumed to be from site area.

h. Effective Dose Equivalent Conversion Factors from Ingestion D-1:

f1 - GI Tract Fraction
RESRAD defaults are used: Co-60 3.0E-1; Cs-137 1.0

Dose Conversion Factor
RESRAD defaults are used: Co-60 2.60E-5 mrem/pCi; Cs-137 5.00E-5 mrem/pCi

IV. RESULTS (cont.)

i. Aquatic Bioaccumulation Factors for Fresh/Salt Water D-5:

Co: Fish 100 L/kg, Invertebrates 1000 l/kg
Cs: Fish 40 L/kg, Invertebrates 25 L/kg
Data source is Reference 13.

Sensitivity of certain RESRAD input parameters are known from prior work, readily understood, or were demonstrated by sensitivity analyses which are easily performed using this code.

Where input values were not clearly applicable to the site or the existing circumstances of the sediment spreading, conservative values were used. Results are also conservative for the drinking water pathway due to the facts that: (i) the position of the drinking water well is at the down-gradient edge of the material placed and thus accumulating the maximum level of radionuclides, and (ii) the assumed depth of the pump intake in the hypothetical water well used to calculate dose is assigned as 0 meters. A reduction in dose for this pathway of an order of magnitude can be achieved if the intake depth is set at a surficial (dug) well's typical depth of 3 meters.

Results are conservative for the seafood pathway due to the fact that RESRAD takes no credit for time necessary to transport radionuclides to the point of seepage. In addition, inflow and outflow to the subject water body are assumed to be in a steady-state equilibrium, and not open to typical tidal or open ocean flushing.

Assumed concentrations of radionuclides are also conservative, as they are calculated as averages, but ignoring samples which showed no detectable levels of these elements.

RESRAD does not allow for input of radionuclide with half-lives shorter than one year, i.e., Co-58 and Ag-110M). However, the impact of omitting two nuclides from RESRAD runs was evaluated. The calculated average concentrations for Co-58 and Ag110M are significantly lower than those for Co-60 and Cs-137 (see step A.6). In addition, ingestion dose factors for both Co-60 and Cs-137 are significantly lower than dose factors for Co-58 and Ag119M (Table E-14 in Reference 13). Based on these data we conclude that the preponderance of total dose via ingestion would be delivered by Co-60 and Cs-137, with no significant contribution from Co-58 and Ag110M.

IV. RESULTS (cont.)

2. RESRAD Results for Ground Water and Seafood Pathways

Results of the RESRAD runs are summarized in Figures 2 through 19. Table 5 lists maximum doses calculated for each case.

Table 5
Summary of RESRAD Results*: Maximum Doses for Water Borne Pathways

Figure No.	Pathway	Case	Nuclides	Maximum Annual Dose (mrem/yr)
2	Drinking Water	1993	Co-60, Cs-137	0.107
3	Drinking Water	1993	Co-60	0.008
4	Drinking Water	1993	Cs-137	0.099
5	Seafood	1993	Co-60, Cs-137	0.024
6	Seafood	1993	Co-60	9E-5
7	Seafood	1993	Cs-137	0.024
8	Drinking Water	1992+93	Co-60, Cs-137	0.105
9	Drinking Water	1992+93	Co-60	0.008
10	Drinking Water	1992+93	Cs-137	0.097
11	Seafood	1992+93	Co-60, Cs-137	0.035
12	Seafood	1992+93	Co-60	1E-4
13	Seafood	1992+93	Cs-137	0.035
14	Drinking Water	14 Outages	Co-60, Cs-137	0.087
15	Drinking Water	14 Outages	Co-60	0.004
16	Drinking Water	14 Outages	Cs-137	0.083
17	Seafood	14 Outages	Co-60, Cs-137	0.273
18	Seafood	14 Outages	Co-60	0.001
19	Seafood	14 Outages	Cs-137	0.272

* See Appendix C for RESRAD output summary files.

IV. RESULTS (cont.)

As shown in Table 5, the maximum annual dose for the drinking water pathway (0.107 mrem/yr) from the individual consideration 1993 increment. This is expected based on the facts that:

- initial concentration input are the highest for this case

- The case for 14 outages is based on average concentrations which are adjusted for decay. The total radionuclide concentration is assumed to be homogeneous through the entire sediment volume (Table 4).

The dose from Cs-137 completely dominates the dose from Co-60. This is due to the higher initial concentration of Cs-137, and dose factors.

Table 5 also shows a maximum annual dose from seafood pathway (0.27 mrem/yr) occurring at the end of 14 outages. In this case very conservative assumptions were applied to estimate a "worst case" dose. Although each batch of sediment would be spread at different times (and hence low activity from each batch would enter the seafood pathway at different times therefore spreading the low dose over a period of several years), it is assumed here that the accumulated activity from 14 batches of sediment enters the pathway as a single "slug." In addition, no time is assumed for migration of radionuclides from the spreading area to the ocean. Even under this unrealistic, conservative assumption the total activity in the sediment from 14 Outages results in only a small dose and thus a very low health risk. A more realistic and still conservative annual dose for this pathway is that calculated for a single batch of sediment (0.024 mrem/yr), i.e., the dose associated with a single increment of sediment and represented by the case which considers the 1993 sediment increment only.

Dose via the drinking water pathway is not feasible until the plant is decommissioned and the site is released from administrative controls. The time interval used for this analysis is minimal, making the result very conservative.

IV. RESULTS (cont.)

D. Vegetation Ingestion Pathway

Assumption: A garden is grown in the spreading area directly after site closure (t+20 yrs). Vegetables from this particular garden are ingested by an individual.

This case is considered using RESRAD for the 14 Outage case at t=3.75 years, that is 20 years after the first placement of sediment. The value calculated by RESRAD for this pathway at this time juncture is 2E-4 mrem/year.

This pathway analysis requires input of dietary parameters including fruit and vegetable consumption and leafy vegetable consumption. Because RESRAD will not accept input values as high as those in Reference 12 (520 and 64 kg/yr, respectively for fruit and vegetables and, leafy vegetables, respectively) a result was derived by halving these input values and doubling the resultant dose. This method was verified as accurate by performing sensitivity analysis with other program runs. In these runs dose varied in direct proportion to consumption amounts. Data from the RESRAD run for 14 Outages (run MYND14.OUT), including that for the 20 year dose from vegetation ingestion is included in Appendix C. Figure 19 is a RESRAD time vs. dose curve for vegetation ingestion with the point for t=3.75.

This pathway is not a feasible one until such time that the plant is decommissioned and the site is released from administrative controls. The time interval used for this analysis is minimal, making the result very conservative.

E. Radiological Summary

Table 6 is a summary of potential maximum annual doses as a result of the proposed placement of sediment.

Table 6
Dose Summary

Exposure Pathway	Maximum Annual Dose to Worker (mrem)	Maximum Annual Dose to Member of Public (mrem)
Direct: During plant operation After site closure	0.7[a] NA	NA 0.6
Inhalation: CEDE CDE	0.003 0.02	NA NA
Drinking Water/Ground Water	NA	0.1[b]
Vegetation Ingestion	NA	0.0002[c]
Seafood Ingestion	NA	0.03[b]
Total Dose	0.7	0.7

[a] Also provides a bounding dose for member of the public during plant operation
[b] Estimated dose to a member of the public after site closure/decommissioning. Dose associated with a single batch of sediment.
[c] Estimated dose to a member of the public after site closure/decommissioning. Dose associated with accumulated residual activity.

IV. RESULTS (cont.)

Table 7 shows a comparison between maximum calculated potential dose and regulatory dose limits. Maximum potential dose from the sediment is less than 1 mrem/yr.

Table 7
Maximum Calculated Potential Dose Compared with Regulatory Dose Limits for Feasible Pathways

Standard	Applicability	Allowable Dose Limit	Maximum Calculated Potential Dose	% of Limit
10CFR20.1201	Occupational Dose Limit	500 mrem/yr (TEDE)	0.7 mrem/yr	0.14%
10CFR20.1301	General Public under current operating license	2 mrem/hr 100 mrem/yr	3e-4 mrem/hr 0.7 mrem/yr	6e-5% 0.7%
	General Public after plant decommissioning	2 mrem/hr 100 mrem/yr	7e-5 mrem/hr 0.7 mrem/yr	4e-3% 0.7%

IV. RESULTS (cont.)

F. Non-radiological Properties of the Sediment

The non-radiological chemical properties of the sediment are required to be determined by analyses done in keeping with state regulations for land spreading of sediment.

The sediment consists of silt with some mussel shells, minor amounts of sand and traces of marine organic constituents. Some clay-sized materials and trace organics are also assumed to be present, although the material is also low in plasticity. The sediment may occasionally vary from mostly silt to material that is mostly sand. Its mineralogy is inferred to be typical of New England ocean shoreline sediment with a general mineral composition of mostly silica dioxide (quartz) with minor amounts of other silicate minerals. The subject sediment is inferred to contain no reactive properties.

Trace element chemical analyses have been performed on samples of the sediment and underlying soil, in accordance with DEP regulations. Tables 8 and 9 include results of these analyses which include determinations for heavy metals, oil and grease, volatile components and PCB's. None of these components is present in the sediment in concentrations which exceed the Maine state criteria for land application of sludge, as set forth in Reference 14. The sediment thus presents no known chemical hazard given its proper situation, as outlined in the state license for its placement, Reference 15.

IV. RESULTS (cont.)

Table 8
1993 Inorganic Chemical Analyses of Soil Samples

Analysis	Underlying Soil 9/1/92	Underlying Soil 10/22/93	Intake Sediment 10/22/93	SW Pipe Debris 9/7/93	ME DEP Limits, CH. 567
pH	5.88	7.63	7.73	4.36	NA
Cation Exchange Capacity	14	22	35	25	NA
potassium	3700	5000	3800	5000	NA
phosphorus	1030	1000	1600	1000	NA
magnesium	5800	6400	6200	2000	NA
calcium	33000	10700	125900	7400	NA
cadmium	<0.2	<0.2	<0.2	<0.2	10
chromium	57	61	46	28	1000
copper	21	24	87	90	1000
lead	6	6	20	4	700
mercury	0.02	0.01	0.15	0.06	10
nickel	26	40	45	<1	200
zinc	60	70	72	136	2000
arsenic	10.1	8.3	7.4	2.4	NA

Notes: Elemental concentrations are in mg/kg, dry weight.

Table 9
1992 Inorganic Chemical Analyses of Soil Samples

Analysis	S-1 2/12/92	S-2 2/12/92	S-3 2/12/92	ME DEP Limits, CH. 567
cadmium	<0.2	<0.2	<0.2	10
chromium	44	56	66	1000
copper	610	440	500	1000
lead	32	27	26	700
mercury	0.13	0.29	0.26	10
nickel	32	37	31	200
arsenic	8.4	13.9	13.4	NA
PCB's	<100 ug/kg	<100 ug/kg	<100 ug/kg	10
Total Solids	62.07%	40.98%	38.17%	NA
Total Volatile Solids	6.81%	15.35%	12.35%	NA
Oil & Grease	0.08%	0.23%	0.22%	NA

Notes: Elemental concentrations are in mg/kg, dry weight, except as noted.

IV. RESULTS (cont.)

G. Environmental and Administrative Concerns

1. As required by state regulations the material will not be stockpiled or spread within 1000 feet of a public water supply, within 300 feet of a private water supply or over a sand and gravel aquifer, or within 300 feet of the ocean shoreline. The MY site spreading area meets or exceeds all of these criteria. The closest public potable water source is the well used as a source for the MY plant, 1000 feet distant from the spreading area (Figure 1). The closest private dwelling is 1500 feet away and across Bailey Cove, which forms a hydrologic barrier to ground water flow in that direction beyond that feature. Reference 5, Figure 7C, identifies that no sand and gravel aquifers are located within two miles of the MY plant. In addition, no wells can be located in surficial deposits down-gradient of the site without the knowledge and permission of MYAPC.

2. The physical environment of the spreading site consists of a man-made early-successional field established through the placement of sediment excavated for the construction of the MY plant. It is under or in the vicinity of the electric transmission lines as they exit the MY plant switchyard. The fill was obtained from bedrock and soil foundation excavations for plant structures, clayey bottom sediments from Montsqueag Bay, and other construction materials. This fill ranges from 5 to 15 feet thick. Natural soil underlying the fill consists of the clay-silt Presumpscot formation which has a thickness of 10 or more feet thick in the spreading area (Reference 11). Bedrock occurs beneath the Presumpscot.

3. Waste form poses no danger to placement site environment. No physical or administrative barriers exist to prevent present or future use of this area for these purposes. The plant's Environmental Statement (Reference 11, pg. III-19) had originally identified that debris captured in the intake structure would be placed in a suitable land fill on plant property.

4. No adverse environmental impacts will result from placement of sediment, as proposed, on the site. A number of specific characteristics of the material make this true. The plant-related radioactivity in this sediment derives from radionuclides which have short half lives of 30 years or less. The material is in a chemical and physical form that poses no hazard to the environment. The natural properties of the radionuclides and the underlying soils are such that migration from the spreading site will be prevented. The total activity is very small. The material is placed in a location which is under the direct control of plant management.

V. CONCLUSIONS

1. The total concentration of radionuclides in subject sediment is very small, 2.9E-7 uCi/g.

2. All plant-related radionuclides contained in the sediment have short half-lives, 30 years or less.

3. Exposure due to the most significant pathway, direct exposure, is minimized by normal and existing administrative controls area chosen for placement.

4. A very conservative analysis of the seafood pathway results in minimal potential dose for an individual who eats seafood exclusively from a hypothetical ocean bay immediately adjacent to the placement site.

5. A very conservative analysis of an inhalation pathway results in a very low potential dose to exposed workers.

6. Until decommissioning and release of administrative control of plant property, exposure from other pathways are not feasible.

7. A very conservative analysis of potential exposure due to drinking of water from a hypothetical well in the worst possible location with respect to the waste results in only minimal exposure.

8. A conservative analysis of potential exposure due to ingestion of crops grown directly on the sediment shows that dose from this pathway results in minimal exposure to an individual consuming large amounts of these crops.

9. Analyses show the non-radiological chemistry of the sediment meets the requirements of the state of Maine for land placement.

10. No adverse environmental impacts will result from placement of the subject sediment, as proposed.

11. The maximum potential dose from the placed sediment, calculated using conservative assumptions represents a very small percentage of allowable dose per federal regulations.

VI. REFERENCES

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3. U.S. NRC, 10CFR, Part 20, Standards for Protection Against Radiation; Final Rule, Federal Register, v.56, no.98, p.23359-23474, May, 1991.

4. Waste Disposal Alternative Methods, YAEC Environmental Engineering Department Procedure YA-REG-230, December, 1988.

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6. Peck, R.B., Hanson, W.E., and Thornburn, T.H., 1974, Foundation Engineering, John Wiley & Sons.

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8. U.S. EPA Federal Guidance Report No. 11, Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion, EPA-520/1-88-020, 1988.

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10. Maine Yankee Atomic Power Company, 1971, Final Safety Analysis Report, Section 2.2, Meteorology, Docket 50-309.

11. Licensing Requirements for Land Disposal of Radioactive Waste, Draft Environmental Impact Statement on 10CFR Part 61, USNRC NUREG-0782, Vol. 2, Main Report, Sep, 1981.

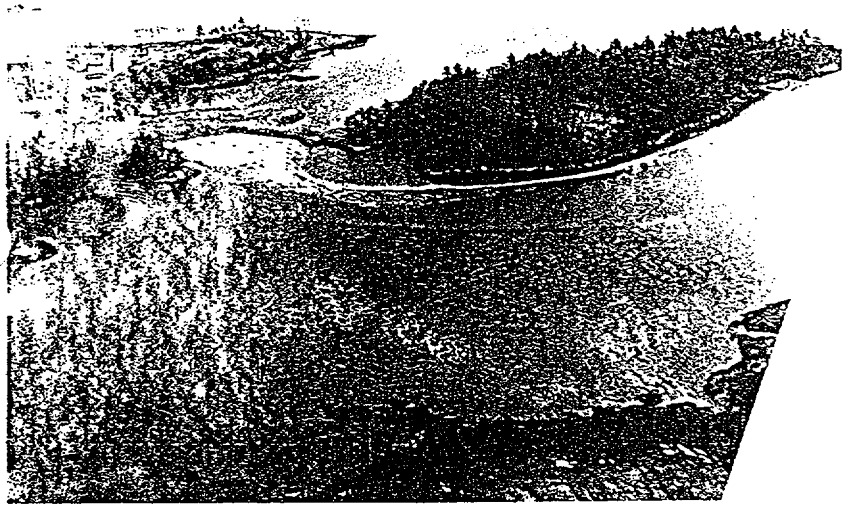
12. Maine Yankee Off-Site Dose Calculation Manual, YAEC NSD, March 23, 1993

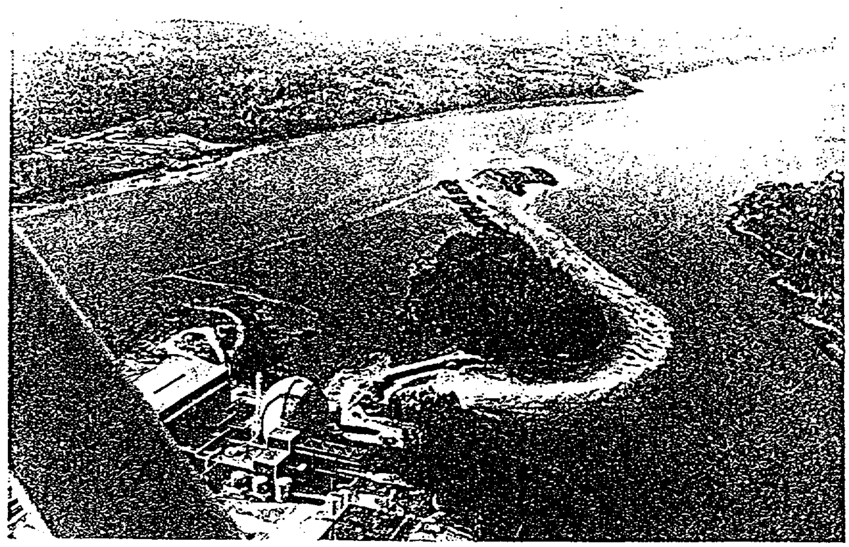
13. Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10CFR50, Appendix I, U.S. NRC Regulatory Guide 1.109, October, 1977.

14. Rules for Land Application of Sludge and Residuals, Maine Department of Environmental Protection, Chapter 567, Section B-1b.

15. License for the Disposal of Dredge Spoils S-20814-SS-A-N, Approval with Conditions, issued to Maine Yankee by the State of Maine Department of Environmental Protection, July 15, 1992.

HSA ID# 116





HSA ID# 117

NUREG/CR-5512
PNL-7994
Vol. 1

Residual Radioactive Contamination From Decommissioning

Technical Basis for Translating Contamination Levels to Annual Total Effective Dose Equivalent

Final Report

Prepared by
W. E. Kennedy, Jr., D. L. Strenge

Pacific Northwest Laboratory
Operated by
Battelle Memorial Institute

Prepared for
U.S. Nuclear Regulatory Commission

Reprinted June 1994

HSA ID# 118

MAINE YANKEE RADIATION PROTECTION
Shift Log Book

Date 3/6/98 Shift Days
Technician Cross
Duratek running Y / N
RMS Monitor out of service:

1. Reviewed logs / RCS1.0 / N.O / Relieved watch
2. Ops turnover - P59B clean sump
   - Cycle 8 of Chem Decon in Progress
3. Issued 98-16 to work P59A & P17A check valve.

10:15 4. P&N sluicing resin @ Eq. Hatch - Dose rates @ EQ Hatch Door @ 4 mr/hr @ Guard shack 0.2 mr/hr

1:30 5. Resin transfer complete.

1:20 6. Notified by PSS activity found during site characterization @ #6 outfall west side to Bailey Cove 112 pci/gram top 3" of soil & 5 pci/gram bottom 3" of soil sample.

Note - Location was NOT #6 outfall - the sample taken at forebay
SDW
2/7/98

HSA ID# 119

MARCH 4, 1998

SOIL WITH ACTIVITY LOCATED ADJACENT TO THE PRIMARY WATER STORAGE TANK

Surveys were conducted inside the posted Restricted Area around the Primary Water Storage Tank (PWST). The objective of these surveys was to free release this area to facilitate the installation of insulation on the PWST. Initial survey results by direct scan of the soil surface with an RM-14 and HP 210 probe, identified activity levels up to 10,000 ccpm located in an area North East of the tank. Excavation by the survey technician revealed levels up to 1,500 ccpm several inches below the soil surface. This location is thought to be the former temporary storage site of the Core Support Barrel Radiation Shield. Employee interviews revealed that this item was stored outdoors for extended periods of time in the late 1970s and early 1980s. It is reported that the CSB was contaminated and was covered with a protective layer of polyethylene sheeting for contamination control. It is also reported that when the CSB shield was stored for extended periods of time the integrity of the protective cover was compromised due to weathering. It is believed that this loss of integrity of the protective cover and subsequent precipitation events are the causal factors responsible for the soil contamination identified at this location. These residually contaminated soils have been left in place and are now covered by a concrete pad poured for the Spent Fuel Pool "island" "pagoda." Control of these soils is being maintained through the Historical Site Assessment (HSA) process as detailed in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). Area survey documentation is included in the HSA. Remediation of the identified soils will be completed when the Spent Fuel Pool "island" is no loner needed.

HSA ID# 120

QUESTIONNAIRE FOR MAINE YANKEE SITE CHARACTERIZATION

NAME David Ackerman EMPLOYED FROM 9/96 TO Present

CURRENT TITLE Environmental Engineer DEPT 3/9/98

(Leave the above blank if you choose to remain anonymous.)

PLEASE CIRCLE THE APPROPRIATE ANSWER CONCERNING ACTIVITIES AT MAINE YANKEE. ARE YOU AWARE, OR WERE YOU ASSOCIATED WITH ANY OF THE FOLLOWING ACTIVITIES:

1. A spill of Radioactive Material on the plant site?	Yes	No
2. Inappropriate storage or control of Radioactive Material on the plant site?	Yes	No
3. An effort to cover over or isolate Radioactive Material on the plant site?	Yes	No
4. A spill of Asbestos Material on the site?	Yes	No
5. Inappropriate storage or control of Asbestos Material on the plant site?	Yes	No
6. An effort to cover over or isolate Asbestos Material on the plant site?	Yes	No
7. A spill of Petroleum Products on the plant site?	Yes	No
8. Inappropriate storage or control of Petroleum Products on the plant site?	Yes	No
9. An effort to cover over or isolate Petroleum Products on the plant site?	Yes	No
10. A Chemical spill on the plant site?	Yes	No
11. Inappropriate storage or control of Chemicals on the plant site?	Yes	No
12. An effort to cover over or isolate Chemicals on the plant site?	Yes	No
13. Any Raw Lead inadequately stored or contained on the plant site?	Yes	No

If you answered YES to any of the above questions, please add the appropriate details (date, time, location, etc.) **related to the questions above. If you know of or have a concern about any other Hazardous Material associated with Maine Yankee, please attach that information as well. Return this completed form to Dennis Hickey of Radiation Protection.**

Discovery of low levels of contamination in N.E. corner of Lot A (Pagoda construction area) led to questioning possible source with. In fall of 1996, surplus soil from flood relief drainage project (protected area) and Lot A sidewalk was stockpiled in Lot A. Soil removed from site by Jack Shaw & Sons. ~~Soil~~ A gamma scan was conducted on a composite soil sample from flood relief drainage and tested clean. Data provided to Lee McCabe (Project Manager). Removal of soil from site resulted in Learning Bank issue 97-00017

Data Attached.

YANKEE ATOMIC ENVIRONMENTAL LABORATORY

TELECOPY TRANSMITTAL SHEET

RECORD KEEPING FAX PHONE NUMBER: (508) 568-2531

FAX PHONE NUMBER: (508) 836-9815

TO: David Ackerman

FROM: [redacted] JANE REILLY

DATE: 11/14/96

PAGES: 2 (INCLUDING TELECOPY TRANSMITTAL SHEET)

IF YOU HAVE ANY QUESTIONS ABOUT THE CONTENT OF THIS FAX,

PLEASE CONTACT: [redacted] JANE REILLY

AT (508) 568-[redacted] 2507

NOTES:

MAILED

NOV 14 1996

YAEC
ENVIRONMENTAL LAB.

Yankee Atomic Electric Company
Environmental Laboratory

Analysis Report

Customer: Maine Yankee Atomic Power Station
Attention: Mr. Roger R. O'Clair
Mr. Edward Cumming

Report Date: 11/14/96
Analysis Date: 11/14/96
Receipt Date: 11/06/96
Reference Date: 11/04/96

Sediment

Station No: 07 Turbine Hall (N)

Sample Amount: 0.653 kg-dry
Elapsed Time: 10.1226 days
Comment: Soil Composite Yard Area

Lab Sample #: G32682
Sample Code: MSE 07 4596
Analyses Req: G

	Nuclide	Decay Correction	Activity Conc. ± σ [picoCurie / kg - dry]	MDC
	Co-57	9.74E-01	(-41 ± 21)E 00	79E 00
	Ce-144	9.75E-01	(-13 ± 16)E 01	56E 01
	Ce-141	8.05E-01	(2 ± 41)E 00	14E 01
	Mo-99	7.79E-02	(-41 ± 25)E 02	12E 03
	Se-75	9.43E-01	(25 ± 35)E 00	12E 01
	Cr-51	7.76E-01	(6 ± 27)E 01	96E 01
	I-131	4.17E-01	(-87 ± 59)E 00	25E 01
	Be-7	8.76E-01	(-12 ± 27)E 01	11E 02
	Ru-103	8.36E-01	(9 ± 28)E 00	10E 01
x	I-133	———	———	———
	Ba-140	5.77E-01	(-43 ± 43)E 00	23E 01
	Cs-134	9.90E-01	(-4 ± 26)E 00	99E 00
	Ru-106	9.81E-01	(15 ± 28)E 01	10E 02
	Cs-137	9.99E-01	(79 ± 44)E 00	14E 01
	Ag-110M	9.72E-01	(-3 ± 40)E 00	16E 01
	Zr-95	8.96E-01	(55 ± 53)E 00	18E 01
	Co-58	9.05E-01	(-10 ± 30)E 00	12E 01
	Mn-54	9.77E-01	(37 ± 35)E 00	12E 01
+*	AcTh228	1.00E 00	(69 ± 17)E 01	48E 01
	TeI-132	1.16E-01	(12 ± 27)E 01	10E 02
	Fe-59	8.54E-01	(83 ± 94)E 00	34E 01
	Zn-65	9.71E-01	(27 ± 16)E 01	59E 01
	Co-60	9.96E-01	(-12 ± 38)E 00	16E 01
+*	K-40	1.00E 00	(183 ± 16)E 02	17E 02
	Sb-124	8.90E-01	(-37 ± 33)E 00	25E 01

Notes:
- * Activity greater than 3 standard deviations
- \+ Peak is found
- x Decay correction is less than .01

Reporting level ratio: 0.000

Approved by

E. M. Moreno

11/13/97

To: Dennis Hickey FAX 5317

From: David Ackerman
x 4548

Analysis report from composite soil sample collected - Turbine Hall north yard - for Flood Relief Drainage Project.

6 Pages Total

MAINE YANKEE MEMORANDUM

Reliable Electricity for Maine Since 1972

To: Lee McCabe **Date:** November 15, 1996

CC: Pamela Bacon
Steve Evans
Pat Lydon
John Arnold

From: David Asherman, ext. 4367 **File:** DWA-96-021

Subject: Flood Relief Panel Drainage Project
Disposal of Surplus Soil
(a) Memo From D. Asherman Dated 11/4/96

****

Background:

Item (a) above provides a summary of regulatory issues associated with the proposed project. On 11/4/96, a composite soil sample was collected from four locations along the center line of the proposed 13' wide paved trench. The sample was split and analyzed by Maine Environmental Laboratory for Oil & Grease and by the Yankee Atomic electric Company Environmental Laboratory for radionuclides.

Test Results:

1. Composite sample contains 0.04 % Oil & Grease. The analytical Method Detection Limit is 0.01%. Chapter 405 of the Maine Solid Waste Regulations establish an Oil & Grease threshold of 0.25% Oil & Grease for disposal of dredge spoils as inert fill (meaning clean and not restricted). Therefore disposal of the surplus soil from the proposed project is not limited by Oil & Grease.

2. Composite sample only contains naturally occurring nuclides; no plant-related radionuclides were detected. Therefore soil is not contaminated and disposal is not restricted.

Concerns/Issues:

1. It is presently anticipated that the surplus soils will be disposed of on the contractors parking lot. Expansion of the parking lot was approved by permit from the Maine Department of Environmental Protection in May 1992. That approval was for expansion, regrading and stripping the parking lot. Conditions of approval included:

   - Initiation of construction within two years of permit issuance. It is assumed that this condition has been met.

- Completion of project within five years. The completion date is to be by May 1997. If the project is not completed by that date, an extension should be obtained.

- Project construction must in accordance with plans submitted as part of the permit application including limits on the extent of the parking lot expansion and adherence to erosion and sedimentation control plans.

2. This project can be constructed without obtaining prior MDEP approval using the 30,000 sq. ft. exemption. EHS/EP will prepare and submit appropriate notification.

3. If an alternative disposal location(s) is planned, please contact EHS/EP prior to placement of soil to ensure environmental regulations are complied with.

...DIFIED CATCH BASIN/MANHOLE #20

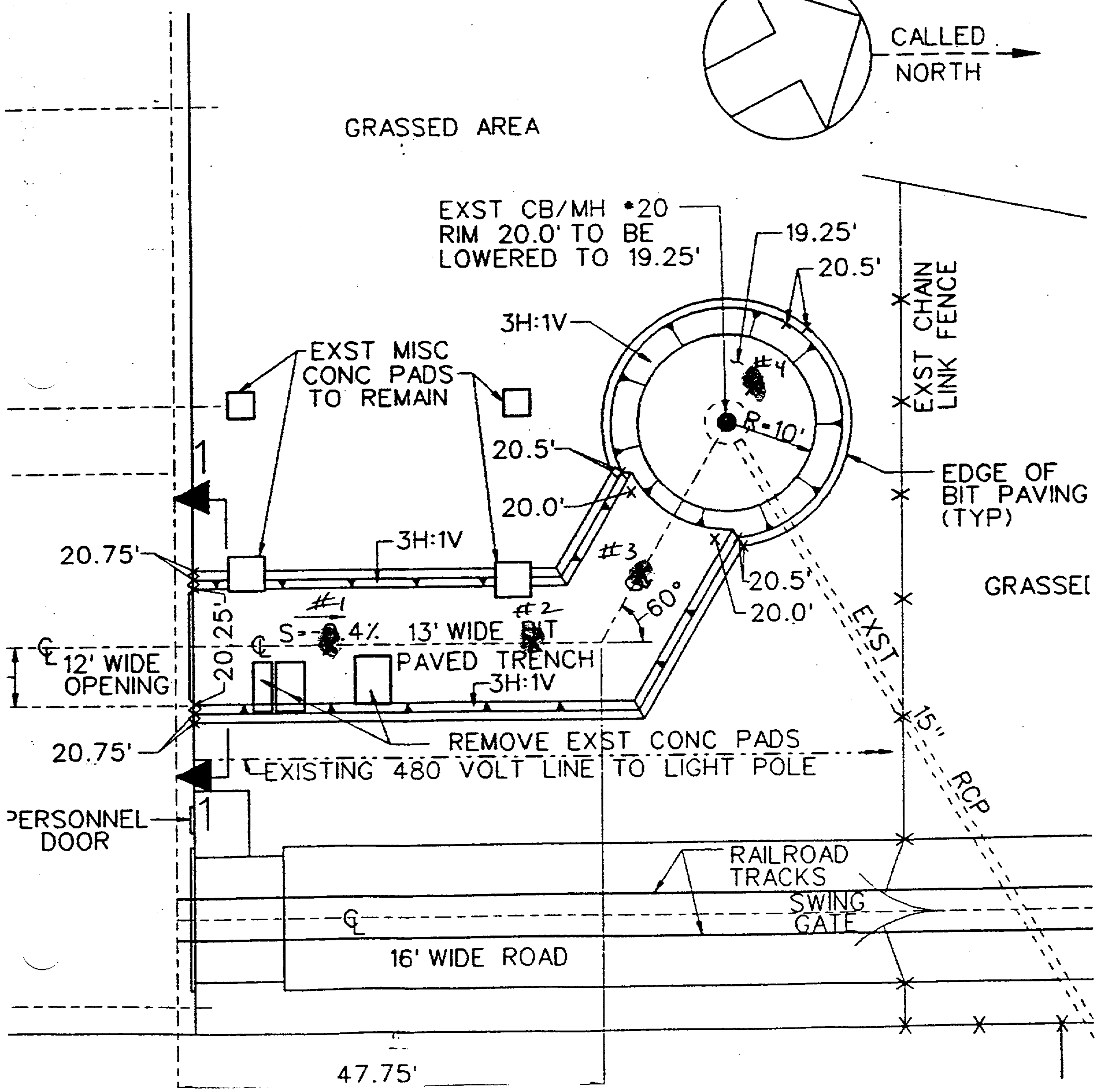
N.T.S.

Composite soil sample collected following protocol developed by Robert G. Gerber, Inc. for Maine Yankee Dredge Material Land Application.

Station redesignated by YAEC Environmental Lab.

Four discreet samples collected & composited into sample M-SE-07. Sample analyzed by Maine Environmental Laboratory for Oil & Grease and by Bolton for radionuclides (split sample).

Original Chain of Custody in Landspreading file.



MAINE ENVIRONMENTAL LABORATORY

198 Main Street • Yarmouth, Maine 04096-1690 • (207) 846-6569 • FAX (207) 846-9066

Chain of Custody

PROJECT MANAGER: David Asherman | TELEPHONE: 798-4367 | FAX #: 798-4230

COMPANY: Maine Yankee | PURCHASE ORDER #: Req #36502

ADDRESS: Old Bath Rd, Brunswick, ME

PROJECT NAME: Flood Relief Panel Drainage / Dredge Material Land Application | SAMPLER NAME: David Asherman

ANALYTICAL PARAMETERS

SAMPLE IDENTIFICATION	# CONTAINERS	TYPE OF CONTAINERS	FIELD FILTRATION		SAMPLE MATRIX	GRAB	COMP.	METHOD PRESERVED	SAMPLING		pH, potassium, magnesium, calcium, cadmium, chromium, copper, lead, mercury, nickel	zinc, arsenic, total P, % solids	Oil & Grease					
			YES	NO					DATE	TIME								
11-4-96-001	1	1 l		✓	Soil		X	N/A	11/4/96	1550	✓	✓						
M-SE-~~02~~ 07	1	1 l		✓	soil		X	N/A	11/4/96	1500			✓					

RELINQUISHED BY SAMPLER: [illegible signature]	DATE 11/4/96	TIME 1702	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE [illegible]	TIME 1705	RECEIVED BY LABORATORY: [illegible signature]

TURNAROUND REQUEST

11-4-96-001
☒ – Standard

☒ Priority (SURCHARGE)
M-SE-02

Received within hold time ☒ yes ☐ no

Received in good condition ☒ yes ☐ no

Temp. Blank °C / Frozen ice packs.

Samples received preserved ☐ yes ☒ no

REMARKS

Quote # ____________

Req# 36502

MAINE YANKEE MEMORANDUM

Reliable Electricity for Maine Since 1972

To: File **Date:** November 4, 1996

From: D. Asherman, ext. 4367 **File:** DWA-96- 017

Subject: Analytical Services Procurement

****

Procurement of analytical services is required for two MY projects as described below. Vendor for services will be:

Attn: Herbert S. Kodis, Laboratory Director
Maine Environmental Laboratory
198 Main Street
Yarmouth, ME 04096-1690
(207) 846-4673/FAX (207) 846-9066

1. Analysis of one composite soil sample for Oil & Grease for the purpose of disposal of surplus excavated soil generated by the Flood Relief Drainage Project. Sample to be collected from the yard area north of the Turbine Hall.

Cost per sample	$55.00	# of samples = 1	Total	$55.00
Ten-day turn around surcharge %50				x 1.5
Total				$82.00

2. Analysis of one composite soil sample from the landspreading area for pH, CEC, potassium, phosphorus, magnesium,calcium, cadmium, chromium, copper, lead, mercury, nickel, zinc, and arsenic. Analysis required annually for permit condition compliance by the Maine Department of Environmental Protection.

Cost per sample	$231.00
# of samples =	x 1
Total	$231.00

Total for this requisition $313.00

MAINE ENVIRONMENTAL LABORATORY
198 Main Street, Yarmouth, Maine 04096-1690

TEL. 207-846-6569
TEL. 207-846-4673
FAX 207-846-9066

D. Asherman
Maine Yankee
329 Bath Road
Brunswick, ME 04011

November 12, 1996

Report No: MEY023-96

Enclosed are the results of the analysis of your sample(s). Samples were received in acceptable condition and were analyzed within the holding times specified in the referenced methods. All quality control data including method blank samples, matrix spike samples, duplicate samples and laboratory control samples were within laboratory acceptance limits. If you have questions regarding this report, please do not hesitate to call.

Sample Identification	Laboratory ID	Comments
M-SE-02	MEY02396-01	

REFERENCES

SW8 - SW/846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, USEPA, Third Edition, 1986.

EPA - EPA600/4-79-020, Methods for Chemical Analysis of Water and Wastes USEPA, Cincinnati, Ohio, March, 1983.

STM - Standard Methods for the Examination of Water and Wastewater, 18th Edition, APHA,AWWA,WPCF, 1992.

CLP - USEPA CLP SOW for Inorganics ILMO3.0

Maine Environmental Laboratory is certified by the states of Maine, Massachusetts and New Hampshire. A list of actual certified tests is available upon request.

Authorized signature

Herbert S. Kodis, Laboratory Director

MAINE ENVIRONMENTAL LABORATORY
198 Main Street, Yarmouth, Maine 04096-1690

TEL. 207-846-6569
TEL. 207-846-4673
FAX 207-846-9066

Maine Yankee
Brunswick, ME
D. Asherman

Sampler : D. Asherman
Sampling Date : 11/04/96
Sample Matrix : Soil
Date Received : 11/04/96

LAB ID : MEY02396-01
Sample : M-SE-02
Report : 11/12/96
Project : Flood Relief Panel
Drainage/Dredge Material
hand Application

Data reported on a dry weight basis

Sample ID	Data	Units	MDL	Analyzed	Methodology	
Oil & Grease	0.04	%	0.01	11/06/96	9071A	SW8
Total Solids	88.91	%	0.01	11/06/96	CLP 4F	CLP

MAINE ENVIRONMENTAL LABORATORY

198 Main Street • Yarmouth, Maine 04096-1690 • (207) 846-6569 • FAX (207) 846-9066

Chain of Custody

PROJECT MANAGER: David Asherman
TELEPHONE: 798-4367
FAX #: 798-4230

COMPANY: Maine Yankee
PURCHASE ORDER #: Req #36502

ADDRESS: Old Bath Rd, Brunswick, ME

PROJECT NAME: Flood Relief Pond Drainage / Dredge Material Land Application
SAMPLER NAME: David Asherman

ANALYTICAL PARAMETERS: (1) pH, potassium, magnesium, calcium, cadmium, chromium, copper, lead, mercury, nickel; (2) zinc, arsenic, total P, % solids; (3) [illegible] GX-[illegible]

SAMPLE IDENTIFICATION	# CONTAINERS	TYPE OF CONTAINERS	FIELD FILTRATION YES	FIELD FILTRATION NO	SAMPLE MATRIX	GRAB	COMP.	METHOD PRESERVED	SAMPLING DATE	SAMPLING TIME	(1)	(2)	(3)
11-4-96-001	1	1 l		✓	Soil		X	N/A	11/4/96	1550	✓	✓	
M-SE-02	1	1 l		✓	soil		X	N/A	11/4/96	1500			✓

RELINQUISHED BY SAMPLER: [signature]
RECEIVED BY: — TIME: 1702 — DATE: 11/4/96
RELINQUISHED BY:
RECEIVED BY: — TIME: — DATE:
RELINQUISHED BY:
RECEIVED BY LABORATORY: [signature] — TIME: 1705 — DATE: 11/4/96

TURNAROUND REQUEST
11-4-96-001
Standard
(SURCHARGE)

Received within hold time ☒ yes ☐ no
Received in good condition ☒ yes ☐ no
Temp. Blank °C ___ / Frozen ice packs.
Samples received preserved ☐ yes ☒ no

REMARKS

Quo

HSA ID# 121

QUESTIONNAIRE FOR MAINE YANKEE SITE CHARACTERIZATION

NAME Dennis Hickey **EMPLOYED FROM** 8/81 **TO** Present

CURRENT TITLE RP Supervisor **DEPT** Radiation Protection

(Leave the above blank if you choose to remain anonymous.)

PLEASE CIRCLE THE APPROPRIATE ANSWER CONCERNING ACTIVITIES AT MAINE YANKEE. ARE YOU AWARE, OR WERE YOU ASSOCIATED WITH ANY OF THE FOLLOWING ACTIVITIES:

1. A spill of Radioactive Material on the plant site?	Yes	No
2. Inappropriate storage or control of Radioactive Material on the plant site?	Yes	No
3. An effort to cover over or isolate Radioactive Material on the plant site?	Yes	No
4. A spill of Asbestos Material on the site?	Yes	No
5. Inappropriate storage or control of Asbestos Material on the plant site?	Yes	No
6. An effort to cover over or isolate Asbestos Material on the plant site?	Yes	No
7. A spill of Petroleum Products on the plant site?	Yes	No
8. Inappropriate storage or control of Petroleum Products on the plant site?	Yes	No
9. An effort to cover over or isolate Petroleum Products on the plant site?	Yes	No
10. A Chemical spill on the plant site?	Yes	No
11. Inappropriate storage or control of Chemicals on the plant site?	Yes	No
12. An effort to cover over or isolate Chemicals on the plant site?	Yes	No
13. Any Raw Lead inadequately stored or contained on the plant site?	Yes	No

If you answered YES to any of the above questions, please add the appropriate details (date, time, location, etc.) **related to the questions above. If you know of or have a concern about any other Hazardous Material associated with Maine Yankee, please attach that information as well. Return this completed form to Dennis Hickey of Radiation Protection.**

Adjacent to the road to the staff building, across from the LLWETSB a fenced in area was constructed to hold 3 trailers for the Radiation Protection group. One trailer held Equipment hatch dunage, one scrap hot-side lumber (i.e. staging planks), and one held clean un-used protective clothing. Time frame was mid to late 80's.

HSA ID# 122

Maine Yankee
RELIABLE ELECTRICITY SINCE 1972

MAINE YANKEE GENERAL SURVEY RECORD FORM

Map#: MSC-001 Revision#: 00	Date: 17 MAR 98	Time: 1530	Reactor Pwr %: N/A	Tech File Number:	RWP's Used: N/A	Dose Received: N/A mR

Surveyor Name: (Printed)	Surveyor Name: (Signature)	Location/Job Description:
ANDREA SALIB	Andrea Salib	WISCASSET DUMP

[1] Required R.P. Review / Date	[2] Required ALARA Supervisor Review / Date	REASON FOR SURVEY
3/17/98	N/A →	☐ ROUTINE[1] ☐ JOB-COVERAGE[1] ☐ SHIELDING[1,2] ☑ OTHER[1] (Specify): INVESTIGATE

INSTRUMENTS USED

MODEL	SERIAL #	CAL DUE	MDA
3	65877-90	7-16-98	N/A
N/A			

CONTAMINATION RESULTS

SAMPLE #	RESULTS	SAMPLE #	RESULTS	SAMPLE #	RESULTS	SAMPLE #	RESULTS
N/A							

KEY:
- Contact exposure rates denoted by: *
- Smear locations denoted by: ⊙
- Boundaries or barriers denoted by: -x-x-
- Dose rates denoted by:
- Large area smears denoted by:
- Air sample location denoted by: AS-#

Sample Continuation Sheet Used. ☐ YES

2 CEMENT LINED BARRELS

NO COUNT RATES > BKG

BKG 100 - 200 CPM

CHIPS TAKEN FROM DOWNHILL DRUM TO PLANT FOR FURTHER ANALYSES.

```
****************************************************************************************
*                                                                                      *
*                  G A M M A   S P E C T R U M   A N A L Y S I S                       *
*                                                                                      *
****************************************************************************************

C.NBERRA APOGEE V2.4

Canberra Industries, Inc.                                      17-MAR-98   17:05:54

                    A N A L Y S I S   P A R A M E T E R S

Spectrum file number      :  100.0       Sample no.           :    1.0
MCA unit number           :    2         ADC unit number      :   3.0
Detector number           :    3         Geometry number      :     6

Search threshold 1        :  2.0         Search threshold 2   :  3.0
Search  FROM channel      :   50         Search TO channel    : 4095
Id energy tolerance       :  1.0         Order of background  : linear
Smoothing factor          :    0         Random sum corr      : disabled
GRA parameter             :    0         Baseline channels    : disabled

Confidence threshold index :  0.100
Confidence levels      LLD :  1.645 (95.0%)        MDA :  1.645 (95.0%)

Analysis library       : SPF$LIBRARY:SPFANL.LIB;1
Background subtract    : enabled

Sample description     : D.HICKEY-CEMENT        Analyzed by: S

  mple size            :  1.000000E+00  EA       Conv. factor    :    1.000
 andard size           :  1.000000E+00  EA

Sample taken on        : 17-MAR-98     at  15:00:00
Collect started on     : 17-MAR-98     at  16:48:34
Decay time             :         108.6 minutes

live time              :   1000.0  seconds    real time      :    1000.0  seconds
dead time              :   0.00 %

Energy      calibration used done on     3 / 17 / 1998
Efficiency calibration used done on     11 / 18 / 1996
```

*** P E A K   S E A R C H   R E P O R T ***   17-MAR-98   17:05:54

first search channel : 50
last search channel : 4095
first significance limit for found peaks: 2.00
second significance limit for found peaks: 3.00
average Gaussian peak width (in channels): 1.56

i	peak channel	peak energy	signif of peak	check-1 signif	check-2 shape	accept channels number
1	679.536	339.7	2.168	small		

*** P E A K   F I T   R E P O R T ***   17-MAR-98   17:05:54

peak no.	nuclide(s)	centroid channel	energy keV	FWHM keV	net area counts	error %	gammas per second	erro %

B - Environmental background peak. Will be subtracted from the peak above.

Background subtraction performed using file SPF$DATA:BK0003.MC2
background description: 3/9 50K SEC BKG

*** R A D I O N U C L I D E   R E P O R T ***   17-MAR-98   17:05:54

mple description :D.HICKEY-CEMENT
nalyzed by :S

number nuclide cont.value ---------- Activity (uCi/EA) ----------
measured decay corrected

Errors quoted at 1.000 sigma (68.3%)

*** N E W 1 0 C F R 2 0 R E P O R T *** 17-MAR-98 17:05:54

I n h a l a t i o n D A C V a l u e s

nuclide	activity uCi/EA	Inhalation DAC uCi/ML	fraction of Inhalation DAC
			----------
		total	0.0000E+00

Spill Log

3748(3737) 6 48A5

ATTACHMENT C

ATLAS DOCUMENT INPUT FORM

1. DOCUMENT TITLE* Main Yankee Commitments
Spill Logs
2. DOCUMENT TYPE* Reports 3. DOCUMENT FORM* MI
4. DOCUMENT LOCATION* 5. RETENTION PERIOD
6. TECHNICAL FILE NUMBER 01.08.04.02
7. DOCUMENT NUMBER
8. REVISION NUMBER 9. DATE 07/10/1997 10. CLASSIFICATION TYPE D
11. TOPICAL INDUSTRY ISSUE
12. KEYWORDS
13. SUBJECT
14. REFERENCE DOCUMENT
15. SYSTEM CODE 16. COMPONENT CODE
17. CYCLE NUMBER
18. ORIGINATOR Operations
19. RECEIVER
20. VENDOR CODE
21. ACCESSION NUMBER
ACTION: ADD/REPLACE/DELETE (CIRCLE ONE)

NOTE: Required fields are identified by an asterisk (*).

SPILL LOG (As required by 06-096 CMR 691.12.A.2.a) for 1997

DATE OF DISCOVERY	SOURCE	FACILITY LOCATION	DATE AND METHOD OF CLEAN UP	LB Issue #	NATIONAL RESPONSE CTR CASE NUMBER	MAINE, CWA, CERCLA VIOLATION	WRITTEN RPT TO AGENCY	$ FINE
2/20	1 pint leak of lube oil from vehicle	Contractor Parking Lot	2/20 - pads	None	N/A	N/A	N/A	N/A
2/26	< 1 gal leak of transformer oil from X 26	berm area	2/26 - pads	97-01229	N/A	N/A	N/A	N/A
3/6	1-2 gal diesel fuel oil spill during delivery truck unloading	Fuel Oil delivery containment area	3/6 - pads	97-01393	N/A	N/A	N/A	N/A
3/13	1 cup diesel oil spill from rented compressor	Road in South yard	3/13 - pads	97-01453	N/A	N/A	N/A	N/A
4/23	1 qt kerosene from hose of diesel fuel delivery truck	Fuel oil delivery containement area	4/23 - rags	97-02161	N/A	N/A	N/A	N/A
4/30	1 pt diesel fuel from berm under oil truck to pavement	Just west of drug testing center	4/30 -pads and boom	97-02184	N/A	N/A	N/A	N/A
5/19	< 5 gal PCC liquid from leaking drain hose	outside water treatment loading dock	5/19 - pigs and absorbant	97-02608	N/A	N/A	N/A	N/A
5/19	< 1 cup gas/oil from employee car	Parking lot C roadway	5/19 - pads	None	N/A	N/A	N/A	N/A
6/17	< 2 gal gas from car tank overflow	Parking lot C	5/19 - absorbant	97-02827	N/A	N/A	N/A	N/A

This report is accurate to the best of my knowledge and belief. David W. Asherman 7/10/97
D.W.Asherman/Date

c: On a Quarterly Basis:
Document Control for Filing in Decommissioning File, Planned Activities: 1.8.4.2
Control Room-STA
R. Blackmore, Plant Manager
S. Evans, EHS/EP Section Head
E. Robinson - RGGI
P. Coughlin- Hazardous Materials Specialist

n:\ehs\spil-log.97-8/6/97

MAINE YANKEE MEMORANDUM

Pursuing Environmental, Health, and Safety (EHS) Excellence

To: **Spill Files**
Control Room-STA
Document Control-File in Decommissioning, Planned Activities 1.8.4.2
Tom Stacey
E. Robinson, RGGI

Date: April 14, 1997

From: **J.H. Arnold (ext 4213)**

File: JHA-97-21

Subject: Spill Logs 1992-96

Reference: Regulatory Affairs Department Self Assessment SA-97-15, Corrective Action Item #2

****

The above cited self assessment noted that the spill logs for 1992-1996 did not include date and method and a signature certifying the accuracy of the reports. The purpose of this memo is to address this deficiency for these reports for this time frame.

These reports were all prepared by me using information provided to me by knowledgeable employees at the Maine Yankee plant.

Date and method of cleanup

It is Maine Yankee's policy to clean up all spills as soon as possible. For spills of oil to the ground of less than 10 gallons during the period 1992-1996 all were cleaned up within 24 hours of discovery. The normal clean up method is use of absorbent pads or speedy dry.

Certification or Accuracy

The "List of Oil and Hazardous Spills and Internally Reported Potential Spills" for the period 1992-1996 are accurate to the best of my knowledge and belief.

J. H. Arnold 4/14/97
J.H. Arnold Date

Please place this memo in your spill log file front of the "List of Oil and Hazardous Spills and Internally Reported Potential Spills" for 1992-1996.

c: S.D. Evans

n:\ehs\sa9715-2.wpd

LIST OF OIL AND HAZARDOUS SPILLS AND INTERNALLY REPORTED POTENTIAL SPILLS 1996						
SPILL RELEASE DATE	RELEASE DESCRIPTION	UOR #	DOT (USCG) VIOLATION LETTER (CASE NUMBER)	MAINE, CWA, CERCLA VIOLATION	WRITTEN REPORT/FOLLOW UP	$ FINE
1/1	Small (2 lin ft)Asbestos Spill in Containment	96-001	N/A	Not Reportable-Contained within a MY Structure	None-Safety review of maint work & asbestos integrity. AI 96-001-1	N/A
2/3	"A" Boron Waste Storage Tank Leak	96-010	N/A	Not Reportable-Contained within a MY Structure	None-Ops maintain pipes above freezing temp.	N/A
4/23	Small Chromated Cooling water and fuel leaks from DG-1A in Diesel Room.	96-030	N/A	Not Reportable-Contained within a MY Structure	None-Maintenance Dept Root Cause.AI 96-030-1	N/A
4/26	Spill of >10 gallons of #2 oil at Wiscasset Fire Training Site by MY trainees from 1982-1995	96-034	N/A	38 MRSA 541	JRH-96-104	
7/22	Small (one-half cup) spill of Sodium Hydroxide Solution on tarmack outside of boiler room	NONE	N/A	Not Reportable <RQ	None	N/A
10/3	One pint spill of capacitor oil in 115 Kv Yard	None	N/A	Not Reportable <RQ	None	N/A
10/28	< 1 lin ft asbestos insulation from 3" air removal line	None	N/A	Not Reportable < RQ	None	N/A
11/5	One quart spill of Diesel Fuel on to pavement near DG-2	None	N/A	Not Reportable <RQ	None	N/A
12/4	< 2 gals of antifreeze (ethylene glycol) leakage to ground	None	N/A	Not Reportable <RQ	None	N/A
12/18	<1 gal leak of antifreeze (ethylene glycol) from vendor (Ecolochem) truck on to pavement	None	N/A	Not Reportable < RQ	None	N/A
12/19	1 gal leak of diesel fuel from Grove on to pavement	None	N/A	Not Reportable < RQ	None	N/A

c: Document Control for Filing in Decommissioning File, Planned Activities: 1.8.4.2
Control Room-STA
S. Evans
J. Grant
P. Ouellette
E. Robinson - RGGI

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LIST OF OIL AND HAZARDOUS SPILLS AND INTERNALLY REPORTED POTENTIAL SPILLS 1995						
SPILL RELEASE DATE	RELEASE DESCRIPTION	UOR #	DOT (USCG) VIOLATION LETTER (CASE NUMBER)	MAINE, CWA, CERCLA VIOLATION	WRITTEN REPORT	$ FINE
12/08	13 gallons hydraulic oil to ground/pavement	95-097	N/A	38 MRSA 543	MY-ME 12/27/95	
11/27	10-15 gallons EHC fluid to Turbine Hall sump	None	N/A	Not Reportable. No Overboard Discharge.		
11/02	Sheen on new parking lot paving job near storm drain	None	N/A	Not Reportable. No Overboard Discharge.		
10/23	100 gals SCC water to Turbine Hall sump	None	N/A	Not Reportable Spill <RQ		
06/16	18 lbs R-12 release to air while maintaining compressor C-60	95-052	N/A	Not Reportable Spill <RQ	SHE Memo of 9/5	
06/13	1 pt. Diesel Fuel to roadway	None	B/A	Not Reportable Spill <RQ	Form C-1	
05/24	1 cup hydraulic oil to pavement from truck	None	N/A	Not Reportable Spill <RQ	Form C-1	
04/17-23	<1000 gallon SCC to Turbine Hall Sump from valve	None	N/A	Not Reportable Spill <RQ NACRO, <10 ppb		
04/17	1 gallon SCC to Turbine Hall Sump from leaking fitting on exciter cooler	None	N/A	Not Reportable Spill <RQ	Form C-1	
[illegible]/04	½ cup light oil to Back River via Storm Drain E (009)	95-040	285642	Clean Water Act	MY-ME 4/27/95 MY-Other 5/30/95	
03/31	1 qt. oil to Back River [via "E" (009)] from Turbine Hall Roof	95-039	285155	Clean Water Act	MY-ME 4/27/95 MY-Other 5/30/95	$250
03/08	Eroded Underground Waste Neutralization Tank Discharge Pipe	95-025	N/A	Not Reportable spill <RQ		
03/03	Chemical Reaction in Chemistry Lab Trash Can	95-022	N/A	Not Reportable spill <RQ		
02/16	10 Gallons Condensate to Ground from CST Vent	None	N/A	Not Reportable spill <RQ		
01/15	5000 Gallon Condensate Spill to Storm Drain	None	N/A	Not Reportable Spill <RQ		

c: S. H. Edgerly
S. O. Evans
J. R. Hebert
M. A. Lynch
E. C. Robinson - RGGI
Ken Gray - Pierce/Atwood
J.H. Snooks - YNSD

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LIST OF OIL AND HAZARDOUS SPILLS AND INTERNALLY REPORTED POTENTIAL SPILLS 1994

SPILL RELEASE DATE	RELEASE DESCRIPTION	UOR #	DOT (USCG) VIOLATION LETTER (CASE NUMBER)	MAINE, CWA, CERCLA VIOLATION	WRITTEN REPORT	$ FINE
11/29	3-5 gallons EJ-5 Seal Oil to Catch Basin on Roof	94-105	N/A	Not Reportable	None	
10/27	Oil Sheen on Ground Water and Soil Found When Removing Diesel Oil UST's	94-093	N/A	Reportable - UST Regs Chapter 691	Form 2-1 JRH-94-296 (12/21/94)	
07/01	<.1 quarts 35% hydrazine in several hundred gallons of clean water to sanitary sewer system	94-046	N/A	Not Reportable - Spill <RQ	Form 2-1 JRH-94-174 (8/2/94)	
06/30	<1 pint oil to Back River from unknown source (thought to be oil entrained in seaweed along bank)	94-047	Spill No. 247126	Clean Water Act (CWA)	Form 2-1 JRH-94-173 (8/9/94)	
06/23	About 20 gallons Kerosene Oil through leak in the supply line to the furnace of spare generator storage building from the heating oil storage tank	94-043	N/A	38 MRSA 543	Form 2-1 JRH-94-176 (8/10/94)	
06/18	1 pint oil to Back River from turbine hall roof vent via storm drain	94-040	Spill No. 244728	Clean Water Act (CWA)	Form 2-1 JRH-94-173 (8/9/94)	
06/15	1 pint oil to Back River from turbine hall roof vent via storm drain	94-038	Spill No. 244219	Clean Water Act (CWA)	Form 2-1 JRH-94-173 (8/9/94)	
05/24	1 Gallon Interlux Under Water Primer spilled on floor and other paint cans - cleaned-up in 30 min.	none	N/A	Not Reportable - Inside a Maine Yankee Structure	Form 2-1	
04/25	<5 gallons form oil (mineral oil) to ground with immediate clean-up	none	N/A	Not Reportable - Spill to ground <RQ	Form 2-1	
04/02	While recirculating contents of Waste Neutralization Tank (WNT) acid was added to trench and caused chemical vaporization (I-6 Regeneration Incident).	94-025	N/A	Not Reportable - Spill <RQ	PRC#186 MYTTS #27-05	
03/11	Cracks in the botton of sump liner in the water treatment area sump	94-019	N/A	Not Reportable - No spill pathway	Form 2-1	
01/28	<10 Gallons diesel fuel at fire pump house and intermittently along ground to gate house	none	N/A	Not Reportable	Post-Incident Report	

JHA 3/95

SPILL RELEASE DATE	RELEASE DESCRIPTION	UOR #	DOT (USCG) VIOLATION LETTER (CASE NUMBER)	MAINE, FWPCA, CERCLA VIOLATION	WRITTEN REPORT	$ FINE
10/15/93	5000 Gallon Condensate spill to North Yard from CST	93-096	N/A	Not Reportable-Spill <RQ	None	
09/19/93	3-5 gallon leak of SCC water (0.5 ppm CrO_4) to ground and storm drain	None	N/A	Not Reportable-Spill <RQ	Form 2-1 only (SHE)	
08/31/93	½ cup light mineral oil to boomed area around intake	93-072	USCG Case No. MY 93008966	Clean Water Act (CWA)	MYM 9/24/93 JRH-93-198	$100
08/26/93	One pint chomated water spill to floor of diesel generator room 1A.	93-068	N/A	Not reportable-Contained within Maine Yankee structure and Spill <RQ	None	
08/24/93 1200	Asbestos release in 1A diesel generator room from gasget grinding	93-065	N/A	Not reportable-contained within Maine Yankee structure and spill <RQ.	None	
08/24/93 0600	½ gallon PCC water (1-2 pp $NaCrO_4$) from treatment trailer connection in primary side of plant.	None	N/A	Not reportable-contained within Maine Yankee structure and spill <RQ	Table 2-2 Only (SHE)	
08/23/93	5 lbs raw water sludge to storm drain.	93-064	N/A	Reported in absence of analytical info. Later determined to be non- reportable.	MYM 9/10/93 JRH-93-185	
8/14/93	1 gallon Automatic Transmission oil to ground with immediate clean-up	None	N/A	Not reportable IAW Spill Plan (MYM 04/15/92)	Hazardous material response-Post Incident Report (PIR) No 93-01	
08/13/93	½ gallon hydraulic oil to ground with immediate clean up	None	N/A	Not reportable IAW Spill Plan (MYM 04/15/92)	Table 2-2 Only (SHE)	
8/10/93	1 gallon Transformer oil to ground with immediate clean-up	None	N/A	Not reportable IAW Spill Plan (MYM 04/15/92)	PIR No 93-01	
08/10/93	1 gallon Photographic Fixer to pavement	None	N/A	Not reportable-contained within Maine Yankee on structure & spill <RQ.	Table 2-2 Only (SHE)	
08/03/93	3 pints transformer oil to ground with immediate clean up 2 spills.	None	N/A	Not reportable IAW Spill Plan (MYM 4/15/92)	Table 2-2 (SHE)	

Caption: LIST OF OIL AND HAZARDOUS SPILLS AND INTERNALLY REPORTED POTENTIAL SPILLS

1/13

All spills on this page are related to 1993 Refueling Outage

LIST OF OIL AND HAZARDOUS SPILLS AND INTERNALLY REPORTED POTENTIAL SPILLS

SPILL RELEASE DATE	RELEASE DESCRIPTION	UOR #	DOT (USCG) VIOLATION LETTER (CASE NUMBER)	MAINE, FWPCA, CERCLA VIOLATION	WRITTEN REPORT	$ FINE
06/15/93	P-2C lube oil spill to bermed area around P-2C.	93-038	N/A	Not reportable-contained within Maine Yankee structure.	None	
11/03/92	One gallon oil from pavement into storm drain during rain storm. (From X1A Scrapping).	92-095	DEP Spill No. 143-162	CWA	MYM 11/17/92 (JRH-92-162)	
04/30/92	One pint gasoline from a vehicle to the Staff Bldg. parking lot.	None	N/A	Not reportable.	N/A	
04/15/92	About 1/2 gallon of 25% NaOH solution from "empty" drums near water treatment area loading dock.	92-051	N/A	38M.R.S.A.1317	MYM 05/04/92 (SEN-92-148)	
03/28/92	About 2 gallons oil from storm drain during rain storm.	92-043	DEP Spill No. 112169	CWA	MYM 04/09/92 (SEN-92-120)	
03/15/92	Four gallons NaOH solution onto asphalt.	92-037	N/A	38M.R.S.A.1317	MYM 04/09/92 (SEN-92-119)	
03/06/92	One quart diesel fuel oil from parked truck onto ground.	92-034	N/A	38M.R.S.A.1317	MYM 03/25/92 (SEN-92-84)	
02/21/92	One pint of yard crane lube oil onto ground.	92-028	N/A	38M.R.S.A.1317	MYM 03/25/92 (SEN-92-84)	
01/23/92	Two hundred (200) gallon sewage spill on Maine Yankee land.	92-011	N/A	No violation-reportable per Condition G of Waste Discharge License.	MYM 01/29/92 (SEN-92-36)	
12/16/91	One gallon of demineralized water containing 600 ppm NaCrO, into bermed area around dechromating sled.	91-100	Not reportable	N/A	N/A	
11/06/91	Less than one gallon of dimineralized water containing 600 ppm NaCrO, into Turbine Hall Sump.	91-094	DEP Spill No. 95330		MYM 08/04/92 (JRH-92-69) 11/25/91 (SEN-91-328)	
11/01/91	Possible discharge of 25 ml of diesel oil into storm drain.	91-092	DEP Spill No. 94718	CWA	MYM 11/25/92 (SEN-91-327)	
08/14/91	One quart diesel fuel onto pavement while pumping out DG-2 tank.	91-061	DEP Spill No. 83746		N/A	
05/09/91	Five gallons transformer oil leaked onto ground from oil processing trailer next to X18.	91-039	N/A	38M.R.S.A.543	MYM 06/04/91 (SEN-91-159)	
12/6/91	Gasoline Tank Removal ground water exceedance	91-098	N/A	UST Regs		

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LIST OF OIL AND HAZARDOUS SPILLS AND INTERNALLY REPORTED POTENTIAL SPILLS

SPILL RELEASE DATE	RELEASE DESCRIPTION	UOR #	DOT (USCG) VIOLATION LETTER (CASE NUMBER)	MAINE, FWPCA, CERCLA VIOLATION	WRITTEN REPORT	$ FINE
04/29/91	Two hundred (200) gallon transformer oil discharged to river in connection with transformer failure.	91-037	USCG Case No. 01219100616500	CWA	MYM 05/29/91 (SEN-91-157) 05/09/91 (SEN-91-132)	$1,000 USCG Ltr. 07/29/92
04/25/91	Leak of 1/2 pint lubricating oil discharged to river because vent and drain plugs on trash rack motor switched. (SEN-91-126B)	91-036		CWA	MYM 05/06/91 (SEN-91-126)	
04/20/91	One pint water with NaCrO, when conducting maintenance work on air compressor cooling water system.	91-034	N/A	38M.R.S.A.1317	MYM 05/15/91 (SEN-91-147)	
04/13/91	Leak of ~1 gallon waste solvents from 55 gallon drum (SEN-91-126A)	91-032	N/A	38M.R.S.A.1317	MYM 04/29/91 (SEN-91-126)	
09/19/90	Twenty (20) gallons water with NaOH on pavement.	90-124	N/A	38M.R.S.A.1317	MYM 10/19/90 (SEN-90-291)	
04/18/90	Leak of water with sodium chromate from tank truck - one gallon went down storm drain.	90-051	N/A	38M.R.S.A.1317	MYM 05/02/90 (SEN-90-125)	
01/15/90	Twenty (20) gallons water with NaCrO, discharged overboard when shifting air compressor from chromated cooling water supply to backup non-chromated supply.	90-007	N/A	38M.R.S.A.1317	MYM 01/31/90 (GDW-90-41)	
04/06/89	Rain washed about one gallon of diesel fuel from the roof of the service building into storm drains.			CWA		
12/02/88	SCC Chromate leak	88-133	12/08/88 (None)	No 38M.R.S.A.1317	MYM 02/21/89 (GDW-89-56)	
11/17/88	One gallon lube oil from blown gasket on submersible vacuum pump.	88-124	USCG Case No. 01018900468600	CWA	MYO 04/23/90 (SEN-90-117) 12/06/88 (GDW-88-326)	$250 Aqua-Tech Responsible
02/23/88	Discovered two small leaks of water from RWST to ground.		N/A	N/A - 10CFR20.302(a) approval received from NRC 08/82/89		
03/28/87	Oil/water separator valve mis-alignment caused 2-3 gallons oil discharge.		USCG Ref. Case No. (#MV87004284)	CWA		$50.00
02/25/87	RWST Heater leak to storm drain.	97-17	N/A	N/A	N/A	

JHA 08\22\94

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LIST OF OIL AND HAZARDOUS SPILLS AND INTERNALLY REPORTED POTENTIAL SPILLS

SPILL RELEASE DATE	RELEASE DESCRIPTION	UOR #	DOT (USCG) VIOLATION LETTER (CASE NUMBER)	MAINE, FWPCA, CERCLA VIOLATION	WRITTEN REPORT	$ FINE
10/05/85	PCC leak.			CWA		
03/29/83	Forty (40) gallons oil from waste oil collection tank.		1P35041 (USCG)	CWA		$500.00

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JHA 08\22\94

MAINE YANKEE MEMORANDUM

Pursuing Environmental, Health, and Safety (EHS) Excellence

To: **Spill Files** | **Date:** April 14, 1997
Control Room-STA
Document Control-File in Decommissioning, Planned Activities 1.8.4.2
Tom Stacey
E. Robinson, RGGI

From: **J.H. Arnold (ext 4213)** | **File:** JHA-97-21

Subject: Spill Logs 1992-96

Reference: Regulatory Affairs Department Self Assessment SA-97-15, Corrective Action Item #2

****

The above cited self assessment noted that the spill logs for 1992-1996 did not include date and method and a signature certifying the accuracy of the reports. The purpose of this memo is to address this deficiency for these reports for this time frame.

These reports were all prepared by me using information provided to me by knowledgeable employees at the Maine Yankee plant.

Date and method of cleanup

It is Maine Yankee's policy to clean up all spills as soon as possible. For spills of oil to the ground of less than 10 gallons during the period 1992-1996 all were cleaned up within 24 hours of discovery. The normal clean up method is use of absorbent pads or speedy dry.

Certification or Accuracy

The "List of Oil and Hazardous Spills and Internally Reported Potential Spills" for the period 1992-1996 are accurate to the best of my knowledge and belief.

J. H. Arnold — 4/14/97
J.H. Arnold — Date

Please place this memo in your spill log file front of the "List of Oil and Hazardous Spills and Internally Reported Potential Spills" for 1992-1996.

c: S.D. Evans

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SPILL LOG (As required by 06-096 CMR 691.12.A.2.a) for 1997								
DATE OF DISCOVERY	SOURCE	FACILITY LOCATION	DATE AND METHOD OF CLEAN UP	LB Issue #	NATIONAL RESPONSE CTR CASE NUMBER	MAINE, CWA, CERCLA VIOLATION	WRITTEN RPT TO AGENCY	$ FINE
2/20	1 pint leak of lube oil from vehicle	Contractor Parking Lot	2/20 - pads	None	N/A	N/A	N/A	N/A
2/26	< 1 gal leak of transformer oil from X 26	berm area	2/26 - pads	97-01229	N/A	N/A	N/A	N/A
3/6	1-2 gal diesel fuel oil spill during delivery truck unloading	Fuel Oil delivery containment area	3/6 - pads	97-01393	N/A	N/A	N/A	N/A
3/13	1 cup diesel oil spill from rented compressor	Road in South yard	3/13 - pads	97-01453	N/A	N/A	N/A	N/A
4/23	1 qt kerosene from hose of diesel fuel delivery truck	Fuel oil delivery containement area	4/23 - rags	97-02161	N/A	N/A	N/A	N/A
4/30	1 pt diesel fuel from berm under oil truck to pavement	Just west of drug testing center	4/30 -pads and boom	97-02184	N/A	N/A	N/A	N/A
5/19	< 5 gal PCC liquid from leaking drain hose	outside water treatment loading dock	5/19 - pigs and absorbant	97-02608	N/A	N/A	N/A	N/A
5/19	< 1 cup gas/oil from employee car	Parking lot C roadway	5/19 - pads	None	N/A	N/A	N/A	N/A
6/17	< 2 gal gas from car tank overflow	Parking lot C	5/19 - absorbant	97-02827	N/A	N/A	N/A	N/A

This report is accurate to the best of my knowledge and belief. David W. Asherman 7/10/97
D.W.Asherman/Date

c: On a Quarterly Basis:
Document Control for Filing in Decommissioning File, Planned Activities: 1.8.4.2
Control Room-STA
R. Blackmore, Plant Manager
S. Evans, EHS/EP Section Head
E. Robinson - RGGI
P. Coughlin- Hazardous Materials Specialist

LIST OF OIL AND HAZARDOUS SPILLS AND INTERNALLY REPORTED POTENTIAL SPILLS 1996						
SPILL RELEASE DATE	RELEASE DESCRIPTION	UOR #	DOT (USCG) VIOLATION LETTER (CASE NUMBER)	MAINE, CWA, CERCLA VIOLATION	WRITTEN REPORT/FOLLOW UP	$ FINE
1/1	Small (2 lin ft)Asbestos Spill in Containment	96-001	N/A	Not Reportable-Contained within a MY Structure	None-Safety review of maint work & asbestos integrity. AI 96-001-1	N/A
2/3	"A" Boron Waste Storage Tank Leak	96-010	N/A	Not Reportable-Contained within a MY Structure	None-Ops maintain pipes above freezing temp.	N/A
4/23	Small Chromated Cooling water and fuel leaks from DG-1A in Diesel Room.	96-030	N/A	Not Reportable-Contained within a MY Structure	None-Maintenance Dept Root Cause.AI 96-030-1	N/A
4/26	Spill of >10 gallons of #2 oil at Wiscasset Fire Training Site by MY trainees from 1982-1995	96-034	N/A	38 MRSA 541	JRH-96-104	
7/22	Small (one-half cup) spill of Sodium Hydroxide Solution on tarmack outside of boiler room	NONE	N/A	Not Reportable <RQ	None	N/A
10/3	One pint spill of capacitor oil in 115 Kv Yard	None	N/A	Not Reportable <RQ	None	N/A
10/28	< 1 lin ft asbestos insulation from 3" air removal line	None	N/A	Not Reportable < RQ	None	N/A
11/5	One quart spill of Diesel Fuel on to pavement near DG-2	None	N/A	Not Reportable <RQ	None	N/A
12/4	< 2 gals of antifreeze (ethylene glycol) leakage to ground	None	N/A	Not Reportable <RQ	None	N/A
12/18	<1 gal leak of antifreeze (ethylene glycol) from vendor (Ecolochem) truck on to pavement	None	N/A	Not Reportable < RQ	None	N/A
12/19	1 gal leak of diesel fuel from Grove on to pavement	None	N/A	Not Reportable < RQ	None	N/A

c: Document Control for Filing in Decommissioning File, Planned Activities: 1.8.4.2
Control Room-STA
S. Evans
J. Grant
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E. Robinson - RGGI

LIST OF OIL AND HAZARDOUS SPILLS AND INTERNALLY REPORTED POTENTIAL SPILLS 1995						
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11/02	Sheen on new parking lot paving job near storm drain	None	N/A	Not Reportable. No Overboard Discharge.		
10/23	100 gals SCC water to Turbine Hall sump	None	N/A	Not Reportable Spill <RQ		
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05/24	1 cup hydraulic oil to pavement from truck	None	N/A	Not Reportable Spill <RQ	Form C-1	
04/17-23	<1000 gallon SCC to Turbine Hall Sump from valve	None	N/A	Not Reportable Spill <RQ NACRO, <10 ppb		
04/17	1 gallon SCC to Turbine Hall Sump from leaking fitting on exciter cooler	None	N/A	Not Reportable Spill <RQ	Form C-1	
04/04	½ cup light oil to Back River via Storm Drain E (009)	95-040	285642	Clean Water Act	MY-ME 4/27/95 MY-Other 5/30/95	
03/31	1 qt. oil to Back River [via "E" (009)] from Turbine Hall Roof	95-039	285155	Clean Water Act	MY-ME 4/27/95 MY-Other 5/30/95	$250
03/08	Eroded Underground Waste Neutralization Tank Discharge Pipe	95-025	N/A	Not Reportable spill <RQ		
03/03	Chemical Reaction in Chemistry Lab Trash Can	95-022	N/A	Not Reportable spill <RQ		
02/16	10 Gallons Condensate to Ground from CST Vent	None	N/A	Not Reportable spill <RQ		
01/15	5000 Gallon Condensate Spill to Storm Drain	None	N/A	Not Reportable Spill <RQ		

3/..

c: S. H. Edgerly
S. D. Evans
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LIST OF OIL AND HAZARDOUS SPILLS AND INTERNALLY REPORTED POTENTIAL SPILLS 1994						
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06/18	1 pint oil to Back River from turbine hall roof vent via storm drain	94-040	Spill No. 244728	Clean Water Act (CWA)	Form 2-1 JRH-94-173 (8/9/94)	✓
06/15	1 pint oil to Back River from turbine hall roof vent via storm drain	94-038	Spill No. 244219	Clean Water Act (CWA)	Form 2-1 JRH-94-173 (8/9/94)	✓
05/24	1 Gallon Interlux Under Water Primer spilled on floor and other paint cans - cleaned-up in 30 min.	none	N/A	Not Reportable - Inside a Maine Yankee Structure	Form 2-1	
04/25	<5 gallons form oil (mineral oil) to ground with immediate clean-up	none	N/A	Not Reportable - Spill to ground <RQ	Form 2-1	
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03/11	Cracks in the botton of sump liner in the water treatment area sump	94-019	N/A	Not Reportable - No spill pathway	Form 2-1	
01/28	<10 Gallons diesel fuel at fire pump house and intermittently along ground to gate house	none	N/A	Not Reportable	Post-Incident Report	

5/c

LIST OF OIL AND HAZARDOUS SPILLS AND INTERNALLY REPORTED POTENTIAL SPILLS						
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8/14/93	1 gallon Automatic Transmission oil to ground with immediate clean-up	None	N/A	Not reportable IAW Spill Plan (MYM 04/15/92)	Hazardous material response-Post Incident Report (PIR) No 93-01	
08/13/93	½ gallon hydraulic oil to ground with immediate clean up	None	N/A	Not reportable IAW Spill Plan (MYM 04/15/92)	Table 2-2 Only (SHE)	
8/10/93	1 gallon Transformer oil to ground with immediate clean-up	None	N/A	Not reportable IAW Spill Plan (MYM 04/15/92)	PIR No 93-01	
08/10/93	1 gallon Photographic Fixer to pavement	None	N/A	Not reportable-contained within Maine Yankee on structure & spill <RQ.	Table 2-2 Only (SHE)	
08/03/93	3 pints transformer oil to ground with immediate clean up 2 spills.	None	N/A	Not reportable IAW Spill Plan (MYM 4/15/92)	Table 2-2 (SHE)	

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All spills on this page are related to 1993 Refueling Outage

LIST OF OIL AND HAZARDOUS SPILLS AND INTERNALLY REPORTED POTENTIAL SPILLS						
SPILL RELEASE DATE	RELEASE DESCRIPTION	UOR #	DOT (USCG) VIOLATION LETTER (CASE NUMBER)	MAINE, FWPCA, CERCLA VIOLATION	WRITTEN REPORT	$ FINE
06/15/93	P-2C lube oil spill to bermed area around P-2C.	93-038	N/A	Not reportable-contained within Maine Yankee structure.	None	
11/03/92	One gallon oil from pavement into storm drain during rain storm. (From X1A Scrapping).	92-095	DEP Spill No. 143-162	CWA	MYM 11/17/92 (JRH-92-162)	
04/30/92	One pint gasoline from a vehicle to the Staff Bldg. parking lot.	None	N/A	Not reportable.	N/A	
04/15/92	About 1/2 gallon of 25% NaOH solution from "empty" drums near water treatment area loading dock.	92-051	N/A	38M.R.S.A.1317	MYM 05/04/92 (SEN-92-148)	
03/28/92	About 2 gallons oil from storm drain during rain storm.	92-043	DEP Spill No. 112169	CWA	MYM 04/09/92 (SEN-92-120)	
03/15/92	Four gallons NaOH solution onto asphalt.	92-037	N/A	38M.R.S.A.1317	MYM 04/09/92 (SEN-92-119)	
03/06/92	One quart diesel fuel oil from parked truck onto ground.	92-034	N/A	38M.R.S.A.1317	MYM 03/25/92 (SEN-92-84)	
02/21/92	One pint of yard crane lube oil onto ground.	92-028	N/A	38M.R.S.A.1317	MYM 03/25/92 (SEN-92-84)	
01/23/92	Two hundred (200) gallon sewage spill on Maine Yankee land.	92-011	N/A	No violation-reportable per Condition G of Waste Discharge License.	MYM 01/29/92 (SEN-92-36)	
12/16/91	One gallon of demineralized water containing 600 ppm $NaCrO_4$ into bermed area around dechromating sled.	91-100	Not reportable	N/A	N/A	
11/06/91	Less than one gallon of dimineralized water containing 600 ppm $NaCrO_4$ into Turbine Hall Sump.	91-094	DEP Spill No. 95330		MYM 08/04/92 (JRH-92-69) 11/25/91 (SEN-91-328)	
11/01/91	Possible discharge of 25 ml of diesel oil into storm drain.	91-092	DEP Spill No. 94718	CWA	MYM 11/25/92 (SEN-91-327)	
08/14/91	One quart diesel fuel onto pavement while pumping out DG-2 tank.	91-061	DEP Spill No. 83746		N/A	
05/09/91	Five gallons transformer oil leaked onto ground from oil processing trailer next to X1B.	91-039	N/A	38M.R.S.A.543	MYM 06/04/91 (SEN-91-159)	
12/6/91	Gasoline Tank Removal ground water exceedance	91-098	N/A	UST Regs		

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LIST OF OIL AND HAZARDOUS SPILLS AND INTERNALLY REPORTED POTENTIAL SPILLS						
SPILL RELEASE DATE	RELEASE DESCRIPTION	UOR #	DOT (USCG) VIOLATION LETTER (CASE NUMBER)	MAINE, FWPCA, CERCLA VIOLATION	WRITTEN REPORT	$ FINE
04/29/91	Two hundred (200) gallon transformer oil discharged to river in connection with transformer failure.	91-037	USCG Case No. 01219100616500	CWA	MYM 05/29/91 (SEN-91-157) 05/09/91 (SEN-91-132)	$1,000 USCG Ltr. 07/29/92
04/25/91	Leak of 1/2 pint lubricating oil discharged to river because vent and drain plugs on trash rack motor switched. (SEN-91-126B)	91-036		CWA	MYM 05/06/91 (SEN-91-126)	
04/20/91	One pint water with $NaCrO_4$ when conducting maintenance work on air compressor cooling water system.	91-034	N/A	38M.R.S.A.1317	MYM 05/15/91 (SEN-91-147)	
04/13/91	Leak of ~1 gallon waste solvents from 55 gallon drum (SEN-91-126A)	91-032	N/A	38M.R.S.A.1317	MYM 04/29/91 (SEN-91-126)	
09/19/90	Twenty (20) gallons water with NaOH on pavement.	90-124	N/A	38M.R.S.A.1317	MYM 10/19/90 (SEN-90-291)	
04/18/90	Leak of water with sodium chromate from tank truck - one gallon went down storm drain.	90-051	N/A	38M.R.S.A.1317	MYM 05/02/90 (SEN-90-125)	
01/15/90	Twenty (20) gallons water with $NaCrO_4$ discharged overboard when shifting air compressor from chromated cooling water supply to backup non-chromated supply.	90-007	N/A	38M.R.S.A.1317	MYM 01/31/90 (GDW-90-41)	
04/06/89	Rain washed about one gallon of diesel fuel from the roof of the service building into storm drains.			CWA		
12/02/88	SCC Chromate leak	88-133	12/08/88 (None)	No 38M.R.S.A.1317	MYM 02/21/89 (GDW-89-56)	
11/17/88	One gallon lube oil from blown gasket on submersible vacuum pump.	88-124	USCG Case No. 01018900468600	CWA	MYO 04/23/90 (SEN-90-117) 12/06/88 (GDW-88-326)	$250 Aqua-Tech Responsib le
02/23/88	Discovered two small leaks of water from RWST to ground.		N/A	N/A - 10CFR20.302(a) approval received from NRC 08/82/89		
03/28/87	Oil/water separator valve mis-alignment caused 2-3 gallons oil discharge.		USCG Ref. Case No. (#MV87004284)	CWA		$50.00
02/25/87	RWST Heater leak to storm drain.	87-17	N/A	N/A	N/A	

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LIST OF OIL AND HAZARDOUS SPILLS AND INTERNALLY REPORTED POTENTIAL SPILLS						
SPILL RELEASE DATE	RELEASE DESCRIPTION	UOR #	DOT (USCG) VIOLATION LETTER (CASE NUMBER)	MAINE, FWPCA, CERCLA VIOLATION	WRITTEN REPORT	$ FINE
10/05/85	PCC leak.			CWA		
03/29/83	Forty (40) gallons oil from waste oil collection tank.	1983	1P35041 (USCG)	CWA		$500.00

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No Comment

QUESTIONNAIRE FOR MAINE YANKEE SITE CHARACTERIZATION

NAME George Selee EMPLOYED FROM 1986 TO 1997

CURRENT TITLE Senior Instructor DEPT Spec. TRG.

(Leave the above blank if you choose to remain anonymous.)

PLEASE CIRCLE THE APPROPRIATE ANSWER CONCERNING ACTIVITIES AT MAINE YANKEE. ARE YOU AWARE, OR WERE YOU ASSOCIATED WITH ANY OF THE FOLLOWING ACTIVITIES:

1. A spill of Radioactive Material on the plant site? Yes No
2. Inappropriate storage or control of Radioactive Material on the plant site? Yes No
3. An effort to cover over or isolate Radioactive Material on the plant site? Yes No
4. A spill of Asbestos Material on the site? Yes No
5. Inappropriate storage or control of Asbestos Material on the plant site? Yes No
6. An effort to cover over or isolate Asbestos Material on the plant site? Yes No
7. A spill of Petroleum Products on the plant site? Yes No
8. Inappropriate storage or control of Petroleum Products on the plant site? Yes No
9. An effort to cover over or isolate Petroleum Products on the plant site? Yes No
10. A Chemical spill on the plant site? Yes No
11. Inappropriate storage or control of Chemicals on the plant site? Yes No
12. An effort to cover over or isolate Chemicals on the plant site? Yes No
13. Any Raw Lead inadequately stored or contained on the plant site? Yes No

If you answered YES to any of the above questions, please add the appropriate details (date, time, location, etc.) **related to the questions above. If you know of or have a concern about any other Hazardous Material associated with Maine Yankee, please attach that information as well. Return this completed form to Dennis Hickey of Radiation Protection.**

QUESTIONNAIRE FOR MAINE YANKEE SITE CHARACTERIZATION

NAME Tibby EMPLOYED FROM _______ TO _______________

CURRENT TITLE Instructor DEPT Training

(Leave the above blank if you choose to remain anonymous.)

PLEASE CIRCLE THE APPROPRIATE ANSWER CONCERNING ACTIVITIES AT MAINE YANKEE. ARE YOU AWARE, OR WERE YOU ASSOCIATED WITH ANY OF THE FOLLOWING ACTIVITIES:

1. A spill of Radioactive Material on the plant site? Yes No
2. Inappropriate storage or control of Radioactive Material on the plant site? Yes No
3. An effort to cover over or isolate Radioactive Material on the plant site? Yes No
4. A spill of Asbestos Material on the site? Yes No
5. Inappropriate storage or control of Asbestos Material on the plant site? Yes No
6. An effort to cover over or isolate Asbestos Material on the plant site? Yes No
7. A spill of Petroleum Products on the plant site? Yes No
8. Inappropriate storage or control of Petroleum Products on the plant site? Yes No
9. An effort to cover over or isolate Petroleum Products on the plant site? Yes No
10. A Chemical spill on the plant site? Yes No
11. Inappropriate storage or control of Chemicals on the plant site? Yes No
12. An effort to cover over or isolate Chemicals on the plant site? Yes No
13. Any Raw Lead inadequately stored or contained on the plant site? Yes No

If you answered YES to any of the above questions, please add the appropriate details (date, time, location, etc.) **related to the questions above. If you know of or have a concern about any other Hazardous Material associated with Maine Yankee, please attach that information as well. Return this completed form to Dennis Hickey of Radiation Protection.**

QUESTIONNAIRE FOR MAINE YANKEE SITE CHARACTERIZATION

NAME R. D. Emerich EMPLOYED FROM 1973 TO 1997

CURRENT TITLE I/C Tech. DEPT Maint.

(Leave the above blank if you choose to remain anonymous.)

PLEASE CIRCLE THE APPROPRIATE ANSWER CONCERNING ACTIVITIES AT MAINE YANKEE. ARE YOU AWARE, OR WERE YOU ASSOCIATED WITH ANY OF THE FOLLOWING ACTIVITIES:

1. A spill of Radioactive Material on the plant site? Yes No
2. Inappropriate storage or control of Radioactive Material on the plant site? Yes No
3. An effort to cover over or isolate Radioactive Material on the plant site? Yes No
4. A spill of Asbestos Material on the site? Yes No
5. Inappropriate storage or control of Asbestos Material on the plant site? Yes No
6. An effort to cover over or isolate Asbestos Material on the plant site? Yes No
7. A spill of Petroleum Products on the plant site? Yes No
8. Inappropriate storage or control of Petroleum Products on the plant site? Yes No
9. An effort to cover over or isolate Petroleum Products on the plant site? Yes No
10. A Chemical spill on the plant site? Yes No
11. Inappropriate storage or control of Chemicals on the plant site? Yes No
12. An effort to cover over or isolate Chemicals on the plant site? Yes No
13. Any Raw Lead inadequately stored or contained on the plant site? Yes No

If you answered YES to any of the above questions, please add the appropriate details (date, time, location, etc.) **related to the questions above. If you know of or have a concern about any other Hazardous Material associated with Maine Yankee, please attach that information as well. Return this completed form to Dennis Hickey of Radiation Protection.**

QUESTIONNAIRE FOR MAINE YANKEE SITE CHARACTERIZATION

NAME D. Rivard EMPLOYEED FROM 6/87 TO Present

CURRENT TITLE RE Supervisor DEPT ____

PLEASE CHECK ONE OF THE FOLLOWING:

__ I prefer not to be contacted further

X Please feel free to contact me for more information @ Tel# 5722

PLEASE CIRCLE THE APPROPRIATE ANSWER CONCERNING ACTIVITIES AT MAINE YANKEE. ARE YOU AWARE, OR WERE YOU ASSOCIATED WITH ANY OF THE FOLLOWING ACTIVITIES:

1. A spill of Radioactive Material on the plant site? Yes **No**
2. Inappropriate storage or control of Radioactive Material on the plant site? Yes **No**
3. An effort to cover over or isolate Radioactive Material on the plant site? **Yes** No
4. A spill of Asbestos Material on the site? Yes **No**
5. Inappropriate storage or control of Asbestos Materail on the plant site? Yes **No**
6. An effort to cover over or isolate Asbestos Material on the plant site? **Yes** No
7. A spill of Petroleum Products on the plant site? **Yes** No
8. Inappropriate storage or control of Petroleum Products on the plant site? Yes **No**
9. An effort to cover over or isolate Petroleum Products on the plant site? **Yes** No
10. A Chemical spill on the plant site? **Yes** No
11. Inappropriate storage or control of Chemicals on the plant site? **Yes** No
12. An effort to cover over or isolate Chemicals on the plant site? **Yes** No
13. Any Raw Lead inadequately stored or contained on the plant site? **Yes** No

If you answered YES to any of the above questions, please add the appropriate details related to the questions above. If you know of or have a concern about any other Hazardous Material associated with Maine Yankee, please attach that information as well. Return this completed form to Dennis Hickey of Radiation Protection.

My knowledge of events listed above was through reporting and tracking methods utilized at Maine Yankee ie. UOI's, LER's etc. I am not aware of any unique or unidentified instances concerning materials questioned above.

Miscellaneous

ORIGINAL INDEX

	IDENTIFIER	LOCATION	DESCRIPTION	TYPE
1	UOR 90-030	I&C Hotshop	Mercury spill. 2 teaspoons of mercury from transmitters.	HAZ MAT.
	March 3,1990			
2	UOR 94-105	Turbine Hall roof, and	Oil spill from P-2C blew onto Turbine Hall roof. Approx.	HAZ MAT.
	Nov. 29,1994	outside adjacent to P-2C	3 tp 5 gals. recovered. 1 qt. of oil droplets blew to ground.	
3	UOR 124-88	Main Transformer Sump	Pumped down transformer sump pit. Oil sheen of approx.	HAZ MAT.
	Nov. 17,1988	Trash boom/Screen	500 sq ft. seen in river.	
		wash trough		
4	UOR 89-106	Spray Bld. 6' from out-	Fuel oil from leak in line to RWST furnace entered Spray	HAZ MAT.
	Oct 29,1989	side. Rwst Greenhouse	Bld. during heavy rain.	
5	UOR 92-028	Circ Water Pump House	Oil spill of approx. 1 pint from crane operations.	HAZ MAT.
	Feb.21,1992			
6	UOR 95-039	Back River/Circ Water	Oil spill. Approx. 1 quart to Back River from outfall of	HAZ MAT.
	March 31,1995	Pump House	storm drain from C/W pump house.	
7	UOR 95-040	Circ Water P/H South	Oil at Plant intake due to heavy rains carrying oil from	HAZ MAT.
	April 4,1995	side outside	previous spills and oil under crane.	
8	UOR 95-096	CTMT -2' Head L/D	BD-56 left open while filling sec. side of s/g. Water to the	
	Dec. 7,1995		floor of Head L/D area.	
9	UOR 96-01	CTMT Loop 1 by RCM-	Asbestos spill from broken pipe insulation.	HAZ MAT.
	Jan. 1,1996	11		
10	UOR 90-62	CTMT -2'	Water spill from sec. side s/g.Hydrazine level 230 ppm.	HAZ MAT.
	May 2,1990			
11	from employee	Outside by Vehicle Bar-	Gasoline spill. Approx. 10 gal. in front of vehicle barrier.	HAZ MAT.
	2 to 4, 1997	rier		
12	employee	Under transmission lines	Sludge with some activity disposed of on site. Sludge was from	RADIOACTIVE
	closeout interview		Circ. Water Pumphouse intake screen.	
13	Rad Inf. 86-268	Sewerage treatment	Radioactive water from Hot side sinks and decon shower	RADIOACTIVE
	May-05-1986	Plant	go directly to the Sewerage Treatment Plant.	
14	Rad Inf. 86-246	Bailey Point outside	Contaminated dirt and asphalt from CTMT alleyway dumped	RADIOACTIVE
	Apr-25-1986	protected area fence	on ground on point.	
15	R.I.R. 86-01	Bailey Point outside	Contaminated dirt and asphalt from CTMT alleyway dumped	RADIOACTIVE
	Aug-29-1986	protected area fence	on Bailey point. 300 ccpm to 50 mr/hr found upon removal	
16	R.C.I. 86-228	?	Unsurveyed item released. Grove released from RCA	RADIOACTIVE
	Apr-24-1986		without a proper survey.	
17	R.C.I. 86-191	HV-9 area pit	Contaminated area.HV-9 pit area is contaminated even	RADIOACTIVE
	Apr-10-1986		though there are contam. system components in area.	
18	R.C.I. 86-135	Backyard	Contamination and Particles.Crane laying in backyard is	RADIOACTIVE
	Apr-03-1986		contaminated with particles from Core Barrel & not wrapped	

19	R.C.I. 86-132 Apr-02-1986	CTMT Alleyway	Contaminated sand. Sand swept up from alleyway has spot reading 35mr/hr.	RADIOACTIVE
20	R.C.I. 86-111 Mar-27-1986	RCA, TK-85 Cubicle	Contaminated water from leaking P-120/123 leked onto clean floor.	RADIOACTIVE
21	R.I.R. 84-04 Sep-13-1984	RCA / RCA roof	Airborne Contamination. High airborne in RCA with roof hatch opened. Fuel Rack work.	RADIOACTIVE
22	Tech. file 19-11-4 no date given	Restricted Area	Radioactive particles. Machining on Core Barrel generated particles that got throughout the Plant. Many percons resulted.	RADIOACTIVE
23	R.I.R. 83-02 Nov-02-1983	RCA building	Contaminated water and crud sprayed onto RCA floor.	RADIOACTIVE
24	employee	CTMT Alleyway	PCC leak. CTMT Alleway.	HAZ MAT.
	UOR 79-85 Oct-10-85	CTMT Alleyway	PCC leak. CTMT Alleway.	
25	R.I.R 87-01 Feb-25-1987	RWST Area outside	Contaminated water leaking from the RWST onto the ground running down the storm drain.	RADIOACTIVE
26	R.I.R. 88-04 apr-26-1988	RWST outside area	Contaminated water leaking onto ground from hole in plastic sleeving.80 mrad/hr on ground. smears up to 135k dpm.	RADIOACTIVE
27	R.I.R 88-23 Nov-26-1988	CONDO inside Wiscasst Wall	Contaminated liquid leaking from CONDO due to being less than weather tight.Contaminated liquid samples outside bld.	RADIOACTIVE
28	Nov. 17,1989	Restricted Area	Hot Particles. Numerous hot particles found throughout the Plant.	RADIOACTIVE
29	R.I.R 90-03 Feb-06-1990	Cold Side Trailer	Contaminated wood found in Burns and Roe trailers. Other yellow painted wood found on the cold side. Contaminated snow found on clean side. Wood from planing operation.	RADIOACTIVE
30	R.I.R. 90-04 Feb-07-1990	BWST Diked Area	Contaminated liquid in BWST diked area due to siphon heater leak and overflow.	RADIOACTIVE
31	R.I.R. 92-13 Nov-19-1992	Cold side Tool Crib	Contaminated tools found in Cold side Tool Crib.	RADIOACTIVE
32		Baseball Field	Snow was removed from the restricted area and disposed of on the baseball field.	RADIOACTIVE
33	Jul-24-1989	Wiscasset Wall	Contaminated liquids and items.Leaking barrels and unwrapped contam. items inside Wiscasset Wall.	RADIOACTIVE
34		Backyard by RCA bld.	Contaminated liquid spilled into backyard due to overflow of Tk-109.	RADIOACTIVE
35		RCA Roof, Roof Drains, Storm Drains	Contaminated equipment. A contaminated crane was stored on the RCA roof for several years.	RADIOACTIVE
36		Outside behind Gas House	Contaminated equipment. CEA extension shafts in degraded boxes were stored in a shed behind the Gas House. Shed and contents removed. Gravel from this area spread in "trailer park.	RADIOACTIVE

37		Outside in front of LSA	Contaminated equipment. It has been rumored that minor	RADIOACTIVE
		building	contaminated spills have ocurred in front of LSA building.	
38	RIR 88-02	Outside at RWST	Contaminated liquid. Flange leak on RWST leaked water onto	RADIOACTIVE
	Feb-23-1988		ground.	
39	May-22-1987	Donut Trailer in CTMT	Discrete Radioactive Particle found in the Donut Trailer.	RADIOACTIVE
		Alleyway		
40	May-04-1987	Outside Backyard	Contamination Discrete Radioactive Particles found in backyard	RADIOACTIVE
			due to water dripping from CSB Shield being moved from CTMT.	
41	Sep-30-1985	CTMT Alleyway by Test	Discrete Radioactive Particles found in CTMT Alleyway.	RADIOACTIVE
		Tanks		
42	Oct-03-1985	CTMT Alleyway	Discrete Radioactive Particles. Numerous DRP's found in CTMT	RADIOACTIVE
			Alleyway. Water being drained form valve in Steam and Valve House	
			running to storm drain through area with particles.	
43	Apr-12-1984	Outside by RWST	Contaminated Insulation and from flange leak on RWST.	RADIOACTIVE
44	Apr-01-1987	Equipment Hatch "Pit"	Contamination. Low levels of contamination (up to 925 dpm) was	
			found in the Equipment Hatch Pit area.	RADIOACTIVE
45	Feb-22-1987	Outside in front of LSA	Hot Particles (up to 190 mr/hr) found outside in front of the LSA	RADIOACTIVE
		bld.	bld.	
46	R.I.R. 95-16	Guardhouse/ I&C Train-	Radioactive Material. Reed switches (100k fixed) were improperly	RADIOACTIVE
	Feb-02-1995	ing Lab	released from the R.A. and found by portal alarm at the Gatehouse.	
			Additional survys discovered equipment with smearable contamina-	
			ation in the I&C Training Lab.	
47	R.I.R. 95-30	Gatehouse	Contaminated clothing. A worker with contaminated modesty	RADIOACTIVE
	Oct-01-1995		garments was identified by alarm at Gatehouse portal monitor.	
48	R.I.R. 96-11	Backyard in SFP Rerack	Contaminated spill. Approximately 100 gallons of water spilled out	RADIOACTIVE
	Jul-27-1997	bathtub	of old SFP rack when downended in bathtub in backyard.	
49	R.I.R. 96-15	Cold side Tool Crib	Radioactive tools. Tools with fixed contamination found in the	RADIOACTIVE
	Oct-16-1997		Coldside Tool Crib.	
50	UOR 88-33	Outside RWST Siphon	Contaminated Spill. Crack in the RWST siphon heater return line.	RADIOACTIVE
	Apr-26-1988	Heater piping		
51	UOR 88-21	Outside at RWST siphon	Contaminated leak. Siphon heater return line isolation valve leak.	RADIOACTIVE
	Feb-24-1988	heater piping		
52	UOR 88-20	Outside at RWST siphon	Contaminated liquid leak.RWST siphon heater flange leak.	RADIOACTIVE
	Feb-23-1988	heater piping	200 ml/min.	
53	UOR 87-159	Outside at RWST siphon	Contaminated liquid leak. RWST siphon heater return line has a crack	RADIOACTIVE
	Oct-24-1987	heater piping	and leaks.	
54	UOR-87-153	Outside at RWST siphon	Contaminated liquid leak into the RWST siphon heater sump well.	RADIOACTIVE

	Oct-11-1987	heater piping		
55	UOR 1983	Back River	Oil spill into the Back River. Approx.40 gallons of oil from Tk-75	HAZ MAT.
	Mar-29-1983		overfilled and spilled out of vent pipe onto roof. Oil to river via	
			storm drain system.	
56	UOR-87-59	Backyard	Chromated water spill in backyard.	HAZ MAT.
	May-11-1987			
57	UOR 85-55	Boiler Room	Mercury spill.14 lbs of mercury spilled in aux. Boiler Room.	HAZ MAT.
	Aug-14-1985			
58	UOR 85-42	X-1A and surrounding	Oil spill form X-1A due to safety valve lifting. Oil on transformer	HAZ MAT.
	Aug-06-1985	area	and on gravel around transformer.	
59	UOR 1984	RWST down the Storm	Contaminated liquid spill. Approx. 5000 gallons of water leaked	RADIOACTIVE
	Mar-30-1984	Drain	from the RWST and went down the storm drain.	
60	UOR ?	Aux. Feedpump Room	Contaminated liquid spill. Wet vac barrel of contaminated water	RADIOACTIVE
	Feb-27-1984	outside to storm drain	spilled in Aux F?P Room and ran outside and down the stormdrain.	
61	Jul/Aug-1989	Backyard	Discrete radioactive particles found in outside areas while attempting	RADIOACTIVE
			to free release the area.	
62	Nov-16-1989	LSA bld./ Storm Drain	Contaminated liquid spilled in the LSA bld. some of which went	RADIOACTIVE
			down the storm drain.	
63	May/June 1988	RWST outside areas of	Contaminated soil. Surveys of excavated area around base of RWST.	RADIOACTIVE
		previous spills		
64	UOR 95-25	Water Treatment &	Waste neutralization tank sump has crack and leaks. Discharge piping	
	Mar-08-1995	Outside Underground	at Service Water connection eroded away.	
65	UOR 94-93	Outside by old undergroun	Oil shen seen on water puddle at area near the location of the old	
	Nov-27-1994	Fuel oil tanks	underground fuel oil storage tanks.	
66	UOR 94-47	Circ. Water Pump House	Oil sheen seen at Circ. Water Intake Structure., inside the boom.	
	Jun-30-1994	Intake Structure		
67	UOR 94-43	Spare Generator Storage	Kerosene spill. Small kerosene spill in spare generator storage building.	
	Jun-23-1994	Building		
68	UOR 92-51	Outside near Water Treat-	Sodium Hydroxide spill. Approx. one half gallon NaOH spill.	
	Apr-15-1992	ment loadng dock		
69	UOR-92-37	Outside by SCAT Tank	Sodium Hydroxide spill from leaking flange on tanker truck.4 gallons.	
	Mar-15-1992			
70	UOR 92-34	Outside by C/W Pump	Oil spill. Oil leakage from fuel truck onto ground. Approx. 1 quart.	
	Mar-6-1992	House		
71	UOR 92-11	Outside at Baseball Field	Sewer line rupture at area near baseball field. Approx. 200 gallon leak.	
	Jan-23-1992			
72	UOR 91-98	Udergroung Gasoline	Gasoline levels in soil in area around underground storage tank are	
	Dec-06-1991	Storage Tank area	over DEP levels.	
73	UOR 91-92	Outside by DG-2	Oil Spill. Small oil spill approx.1 gallons.	

	Nov-[illegible]-1991			
74	UOR 91-61	Outside by DG-2	Oil spill. Small oil spill outside by DG-2. Approx. 1 quart.	
	Aug-14-1991			
75	UOR 91-39	Outside by X-1B	Oil leak from oil processing trailer.	
	May-09-1991			
76	UOR 91-19	BWST diked area	Contaminated water. Leak from BWST siphon heater.Approx.12" of	
	Feb-18-1991		water in diked area.	
77	UOR 91-05	BWST diked area	Contaminated water. Leak from BWST siphon heater.Approx.12" of	
	Jan-09-1991		water in diked area. Approx 2400 gallons.	
78	UOR 90-124	RWST Greenhouse	Sodium Hydroxide leak. Approx.20 gallons of NAOH onto paved area.	
	Sep-19-1990			
79	UOR 90-93	X-1B bermed area	Oil leak. Approx. 5 gallons.	
	Jul-05-1990			
80	UOR 90-51	Outside	SCC leak while filling tank truck. Approx. 1 gallon of SCC (1000 ppm	
	Apr-18-1990		sodium chromate) went down the storm drain.	
81	UOR 90-07	Weir/diffusers/Backriver	Scc was pumped to the service water header and ultimately to the river.	
	Jan-15-1990		Approx. 20 gallons.	
82	UOR 89-102	Outside by RWST Green-	Fuel oil spill. Leak in supply line to RWST Greenhouse furnace.	
	Oct-20-1989	house		
83	employee interview	Bailey Point	Storage area for large amount of items on tip of Bailey Point. Items	
			included wood, scrap, trveling screens, dunnage from equip hatch.	
84	UOR 135-88	Underground piping	SCC leak from underground pipe.	
	Dec-05-1988			
85	UOR 124-88	Main Transformer Sump	Milky liquid found in the Main Transformer sump.`	
	Nov-17-1988			
86	UOR 43-88	BWST Drain lines and	Drain lines from BWSt sump to the storm drain system found open.	
	Jun-02-1988	Storm Sewer		
87	UOR 42-88	RWST Siphon Heater	RWST siphon heater return line valve leaking to pavement.	
	May-27-1988	return line		
88	UOR 39-88	RWST	Contaminated water from leak collection barrel on ground.	
	May-22-1988			
89	employee interview	Boiler Room Storage Cab-	Mercury contamination.Expect to find residual mercury contamination	
	Nov-08-1997	inets	in storage cabinets.	
90	AI-89-49-1	Turbine Hall Sumps	Low levels of activity found in all Turbine Hall sumps except for the	
			service water heat exchanger. Also along railroad track rails.	
91	isotopic analysis	CR-3	Activity found in bird droppings from CR-3.	
	Aug-15-1989			
92	tech file 01-08-04-02	Outside by RWST	Request for in place disposal of slightly contaminated soil around the	
	Nov-02-1988		RWST.	

	IDENTIFIER	LOCATION	DESCRIPTION	TYPE
93	tech file 01-08-04-02	?	Approval for in place disposal of residual contam. solis at M.Y.	RAD
	Aug-31-1989			
94	tech file 01-08-04-02	Outside by Circ Water	Ferrous sulfate tank underground by the Circ. Water Pumphouse.	HAZ
		Pumphouse		
95	N/A	N/A	Various indexes and sorts. RIRs, UORs etc.	
96	Nov-15-1996	Outside by CST	Flood relief drainage project soil sample analysis.	RAD
97	Nov-17-1997 to	Information Center	Activity discovered by GTS Duratek on carpet at Information Center.	RAD
	Dec-02-1997			
98	Nov-18-1997	Outside by PWST	Activity found in dirt next to the PWST.	RAD
99	Dec-02-1997	Blowdown Heat Exchang.	30k dpm loose surface contam. found in E - 100.	RAD
100	Dec-10-1997	N-P-43 PAB 21'	1.2k dpm found inside piping at N-P-43.	RAD
101	Dec-12-1997	Outside by Warehouse	30k dpm cobalt 60 particle found in crack in pavement by warehouse.	RAD
102	Jan-20-1998	Turbine Hall	5k to 50k dpm/100cm2 found inside valve SW-42, Test Tank	RAD
			overboard to Service Water system.	
103	Jan-21-1998	Turbine Hall	100 to 200 ccpm fixed contamination found inside SCC Pumps.	RAD
104	Jan-21-1998	Yard Area	Hydraulic oil spill from T&R trash truck. <1gallon.	HAZ.
105	Jan-22-1998	Turbine Hall	List provided by GTS Duratek listing components having detectable	RAD
			activity, by direct frisk, which is >background.	
106	1973 to 1978	Outside Areas	"Soil and sediment history in the vicinity of Maoine Yankee"	
107	1975	Outside	"Measurements of radionuclides as a function of position in the	
			estuary of the Maine Yankee Atomic Power Plant"	
108	Feb. 1974		A Radioactive Isotopic Characterization of the Environment Near	
			Maine Yankee Atomic Power Plant.	
			Wiscasset, Maine:A Preoperational Survey in the Vicinity of the	
109	May 1976	Outside	"Radioactive isotopic characterization of the environment near	
			Wiscasset, Maine using pre and post-operational surveys in the	
			vicinity of the Maine Yankee Nuclear Reactor"	
110	Jan-30-1998	Outside by Wier	Soil taken at Duratek sample location R900 010L1 grid 130	RAD
			has indication of Co-60 and Cs-137.	
111	Jan-22-1998	Water Treatment Area	Isotopic analysis of TK-37, alum storage tank, sludge.	RAD
112	Jan-23-1998	Site Characterization	Letter from H.G.Brack to NRC regarding deficiencies in Site Char-	RAD
			acterization and MARSSIM.	
113	March 1981	Estuary	The Environmental Behavior of Transuranic Nuclides Released	RAD
			from Water Cooled Nuclear Power Plants"	
114	June-24-1997	Estuary	Results of May 1994 clam and sediment sampling.	RAD
115	Oct-04-1994	Outside	Licensed silt spreading area.	RAD

116	?	Back Bay	Photos of water flow from M.Y. prior to construction of weir.	
117			Residual Radioactive Contamination from Decommissioning	
			NUREG/CR-5512 Tech Basis for translating contam. levels to	
			annual total effective dose equivalent.	
118	Mar-02-1998	Bailey Cove	Number 6 outfall to Bailey Cove, 11.2 pci/gram at 0"-3", 5pci/gm	RAD
			at 3"-6". GTS Duratek soil/sediment sample.	
119	Mar-04-1998	Outside by PWST	Activity found in soil North West of the PWST. Area now covered	RAD
			with SFP "Island""pagoda".	
120	Mar-06-1998	Contractor Parking Lot	Soil samples taken in the contractor parking lot indicated elevated	RAD
			activity levels.	
121	Mar-12-1998	Outside across from the	Cochrane's Corral. An area was established across from the	RAD
		LLWETSB	LLWETSB for temp. storage of trailers containing rad material.	
122	Mar-17-1998	Wiscasset Landfill	Results of investigation into barrel filters from MY found at the	RAD
			Wiscasset landfill.	

4143.5

ATTACHMENT C
ATLAS DOCUMENT INPUT FORM

1. DOCUMENT TITLE* 1996 UOR LOG	
2. DOCUMENT TYPE* INDEXES	3. DOCUMENT FORM*
4. DOCUMENT LOCATION*	5. RETENTION PERIOD
6. TECHNICAL FILE NUMBER 1.8.4.2	
7. DOCUMENT NUMBER	
8. REVISION NUMBER	9. DATE: 1/1/96 - 12/31/96 1996 10. CLASSIFICATION TYPE 'D'
11. TOPICAL INDUSTRY ISSUE	
12. KEYWORDS	
13. SUBJECT	
14. REFERENCE DOCUMENT	
15. SYSTEM CODE	16. COMPONENT CODE
17. CYCLE NUMBER	
18. ORIGINATOR: **OPERATIONS**	
19. RECEIVER	
20. VENDOR CODE	
21. ACCESSION NUMBER	
ACTION: ADD/REPLACE/DELETE (CIRCLE ONE)	

NOTE: Required fields are identified by an asterisk (*).

1996 UOR LOG

UOR #	Date	Subject
96-001	1/1/96	Asbestos Spill in Containment "D"
96-002	1/5/96	Frozen AFW Pipe
96-003	1/4/96	RC-M-33 Thermal Overload Trip
96-004	1/8/96	Auto Trip of P-25A
96-005	1/10/96	HV-7 (Spray Pump Area) Inlet Plenum Ice Blockage "D"
96-006	1/16/96	Erratic Operation of SCC-T-227
96-007	1/19/96	Relay Failure on DG-1B
96-008	1/20/96	P-2C Recirc Flow Controller Discrepancy
96-009	2/2/96	Smoke in Control Room
96-010	2/3/96	"A" Boron Waste Storage Tank Heater (E-36A) Leak "D"
96-011	2/5/96	ECCS Valve in Secondary Component Cooling System Found not Locked Shut
96-012	2/6/96	Accidental Discharge of Security Officer Sidearm
96-013	2/7/96	Computer Database Generation Renders Incore Monitoring System Inoperable
96-014	2/8/96	Trash Rake Cable Failure
96-015	2/8/96	Failure of P-14B Breaker to Open from MCB
96-016	2/13/96	Plant Trip Caused by open Failure of Steam Generator #3 Feedwater Regulating Valve, FW-F-307
96-017	2/19/96	HD-A-188 Fails Open While Taking Manual Control of Valve
96-018	2/23/96	#3 Steam Generator Level Drifting Low
96-019	2/29/96	Inadvertent Gaseous Effluent Release "D"
96-020	3/4/96	HV-7 Inlet Plenum has Ice Blockage "D"
96-021	3/12/96	Failure of DG-1B Air Pressure Annunciator
96-022	3/15/96	PAB Masonry Wall Seismic Deficien y
96-023	3/29/96	Security Barrier Vulnerability
96-024	4/5/96	Maintenance Cut Puping at CH-99 with System Pressurized
96-025	4/5/96	P-25B Declared Inoperable Due to Oil Sample Results
96-026	4/19/96	Safeguards Information Found Uncontrolled

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1996 UOR LOG

UOR #	Date	Subject
96-027	4/19/96	Temp. Cable Found Running Between Cable Trays
96-028	4/22/96	P-5 Declared Inoperable During Surveillance Run
96-029	4/22/96	PS-A-17 and PS-A-23 Rendered Inoperable During VP Valve Pressure Switch Calibrations
96-030	4/23/96	DG-1A Coolant and Fuel Leaks
96-031	4/25/96	Missed RCP Seal Injection Check Valve IST Surveillance
96-032	4/26/96	Turbine Hall Flood Protection Design Deficiency - **Addendum 7/9/96**
96-033	4/28/96	RPS Channel 'C' Symmetric Offset Trip Signal Failure
96-034	5/2/96	Oil Spill at Fire Training Site "D"
96-035	5/14/96	Yard Crane (CR-3) Interlock Design Defect
96-036	5/16/96	Opening Capability of LSI-M-11, 21, 31
96-037	5/21/96	S/G #3 Feedwater Level Perturbation
96-038	5/21/96	Failure to Perform "System Integrity Inspections"
96-039	5/31/96	Incorrect Assumption used in EOP Verification Analysis
96-040	6/7/96	Inadequate Cooling Flow to P-29B & P-29C Cutless Bearings
96-041	6/7/96	P-2C Recirc Valve Solenoid SOV-1303 Piping Descrepancy
96-042	6/12/96	P-25B Declared Inoperable for Water in Lube Oil Sump
96-043	6/13/96	Seismic Qualification of PVS Rad Monitors Questioned
96-044	6/14/96	Loss of FN-43-1 When MCC-11E Feeder Breaker Tripped Open
96-045	6/15/96	345KV Sect. 377 (Surowiec) Anomaly Trips Open
96-046	6/16/96	P-25B Turbine Lube Oil Sump Full of Water
96-047	6/17/96	Plant Personnel Notification Systems Degraded
96-048	6/21/96	Uncompensated Vulnerability of a Controlled Access Area
96-049	6/25/96	Containment Personnel Hatch Interlock Control Conflict - Addendum 6/25/96
96-050	6/26/96	HSI-M-32 (Dual Function SIAS/Remotely Operated CI Valve) Determined Inoperable
96-051	6/27/96	Inadequate Fire Barrier Found in Reactor MCC Room - **Addendum 6/27/96**
96-052	6/28/96	Cold-Side Machine Shop Inner Roll-up Door Found Closed

1996 UOR LOG

UOR #	Date	Subject
96-053	7/1/96	345KV Sect. 377 (Surowiec) Anomaly Trips Open Breakers KG1 and K378-1
96-054	7/2/96	Fire Barrier Penetration Seal Discrepancy
96-055	7/2/96	Missed Communications Drill
96-056	7/8/96	Both EDGs Declared Inoperable Simultaneously for Inadequate Tornado-proof Design of Diesel Room Vent Dampers
96-057	7/9/96	PS-1701 Contact Rating Discrepancy
96-058	7/10/96	Vital Bus #2 Breaker #2 Inadvertently Opened
96-059	7/12/96	Failed Surveillance - SW Pump Gland Cooling Test
96-060	7/12/96	Design Basis Issue for PCC & SCC During HELB in Turbine Building - **Addendum 11/7/96**
96-061	7/13/96	Loss of Control Power for #1 RMS Cabinet
96-062	7/17/96	P-29B Service Water Pump Lube Water Flushing Line Pipe Support Inadequate
96-063	7/19/96	Containment PCC Piping Design Inadequacy
96-064	7/23/96	HELB Concerns in Unprotected Cable Tray Room
96-065	7/24/96	Environmental Qualification of Cables/Connectors Inside CTMT may not meet Requirements for Submergence During DBA - **Addendum 7/30/96**
96-066	7/25/96	RCS Emergency Vent System Valves Inoperable
96-067	8/1/96	Inadequate EFW Pump Check Valve Surveillance - **Addendum 8/4/96**
96-068	8/1/96	Main Feedwater Regulating Bypass Valve Leakby - **Addendum 8/7/96**
96-069	8/2/96	FN-44A & B Declared Inoperable Due to a Potential Failure of the Inlet Vanes (VP-A-56 & 57)
96-070	8/13/96	Dropped CEAs During Reactor Startup - **Addendum 9/2/96**
96-071	8/13/96	P-29Cs Lube Water Piping Seismic Support Removed by Mistake
96-072	8/17/96	P-14A Auto Start Wire Found Cut - **Addendum 8/23/96 (2)**
96-073	8/18/96	BD-T-12 Declared Inoperable
96-074	8/21/96	Excess Flow Check Valve Actuation Circuit (SIC 96-20)
96-075	8/22/96	Missed Tech. Spec. Surveillance
96-076	8/22/96	Stock Material Delivered to Plant with Rad. Levels above Background **Addendum 10/7/96**

1996 UOR LOG

UOR #	Date	Subject
96-077	8/28/96	Apparent Non-Compliance with 10CFR70.24 new Fuel Vault Rad Mon. Requirment
96-078	8/29/96	P-14S Wiring Discrepancy
96-079	8/31/96	Contractor Fire Watch Experiences Heart Attack
96-080	9/7/96	Low Gland Cooling Flow to P-26D - **Addendum 9/10/96**
96-081	9/9/96	Degraded Condenser Vacuum
96-082	9/10/96	Loss of Control Power for #1 RMS Cabinet
96-083	9/23/96	Pipe Break in Water Treatment due to Water Hammer
96-084	9/23/96	Power Increased to 2457 MWth During I-2B Delithiation
96-085	9/20/96	Near Miss Between CR-3 and Man-lift
96-086	9/26/96	Erratic Operation of RM-6113A
96-087	9/26/96	Broken Handwheel Spokes on LSI-M-11
96-088	9/27/96	Spurious trip of Reactor Protective Channel C; High Power, Symmetric Offset, Thermal Margin Low Pressure trip bins
96-089	9/26/96	Deficient Surveillance of Containment Purge Filters
96-090	9/26/96	Emergency Center Ventilation Damper Stuck - **Addendum 10/12/96**
96-091	10/4/96	PVS Sampling Filters Not Installed
96-092	10/6/96	Unintentional Entry Into T.S. 3.9.C Due to PVS APD Tripping Off
96-093	10/9/96	Plant Trip/Automatic RPS Actuation During RPS Surveillance - **Addendum 11/6/96**
96-094	10/10/96	CEA Misalignment During Critical Approach
96-095	10/11/96	Uncontrolled Jumper Found in Turning Gear Motor Control Circuit
96-096	10/14/96	Gaseous Release Exceeds PIL Tape Value D
96-097	10/15/96	Containment Service Air Valve Found Out of Position
96-098	10/17/96	Potential Compromise of Safeguards Information
96-099	10/18/96	Both Pressurizer Proportional Heater Trains Inoperable - **Addendum 11/6/96**
96-100	10/18/96	Potential Non-compliance with a Condition of the Facility Operating License Regarding Post-accident Iodine Sampling
96-101	10/22/96	Loss of Plant Computer
96-102	10/24/96	Both A-Train Service Water Pumps Declared Inoperable - **Addendum 10/28/96**

1996 UOR LOG

UOR #	Date	Subject
96-103	10/25/96	Inadequate Cable Separation - **Addendum 12/10/96**
96-104	10/25/96	Unexplained Trip of Service Water Pump P-29B
96-105	10/30/96	Unscheduled Gaseous Release "D"
96-106	11/4/96	Inadequate Check Valve Surveillance on VP-67 & VP-68 - **Addendum 11/7/96**
96-107	11/5/96	DG-1A Declared Inop (Loose Governor Speed Setting Motor)
96-108	11/9/96	Loss of Incoming 115KV Lines
96-109	11/12/96	Leaking P-29C Gland Cooling Check Valve - **Addendum 11/14/96 & 11/15/96**
96-110	11/18/96	Unscheduled Release from PVS "D"
96-111	11/27/96	P-25B Pump Outboard Bearing Packing Overheated
96-112	12/3/96	Potential Unmonitored Release Path "D"
96-113	12/4/96	Fuel Handling Crane Power Cable Broken
96-114	12/5/96	Plant Shutdown - Manual Rx Trip Buttons Declared Inoperable - **Addendum 12/6/96**
96-115	12/5/96	Comsip Hydrogen Analyzer Inoperable
96-116	12/7/96	Both Diesel Generators Declared Inoperable
96-117	12/8/96	Inadequate Surveillance Procedure
96-118	12/11/96	Unscheduled Gaseous Release "D"
96-119	12/13/96	Pressurizer Pressure Input to SMM and Pits Systems are not Adequate for Accuracy Due to its Instrument Range - **Amended 12/16/96**
96-120	12/19/96	Heat Exchangers Outside Design Basis
96-121	12/19/96	Dead Ended Cable in Cable Tray Found Energized
96-122	12/24/96	HPD-A-96 Inoperable
96-123	12/27/96	Inadequate RPS Surveillances
96-124	12/31/96	Plant Shutdown Required by Technical Specifications

PLAN FOR CONTAMINATED SAND

~~1- Move Sandpile #2 To LLWSB. Majority of samples show low levels of CS-137.~~

2- Have YNSD apply for 10 CFR 20.302 permission To bury all similar owner property.

3. According To Pete Littlefield at YNSD, NRC will rule on below regulatory concern at the end of this year. This would allow us To on-site bury our sand.

5- Sample outside the restricted area fence by the RWST To determine if any samples are above MPC. If actually above MPC is found, the sand will be removed To the ~~LLWSB~~ To be disposed of by 20.302 permission or NRC ruling on below regulatory concern.

To sand #2 Pi 6

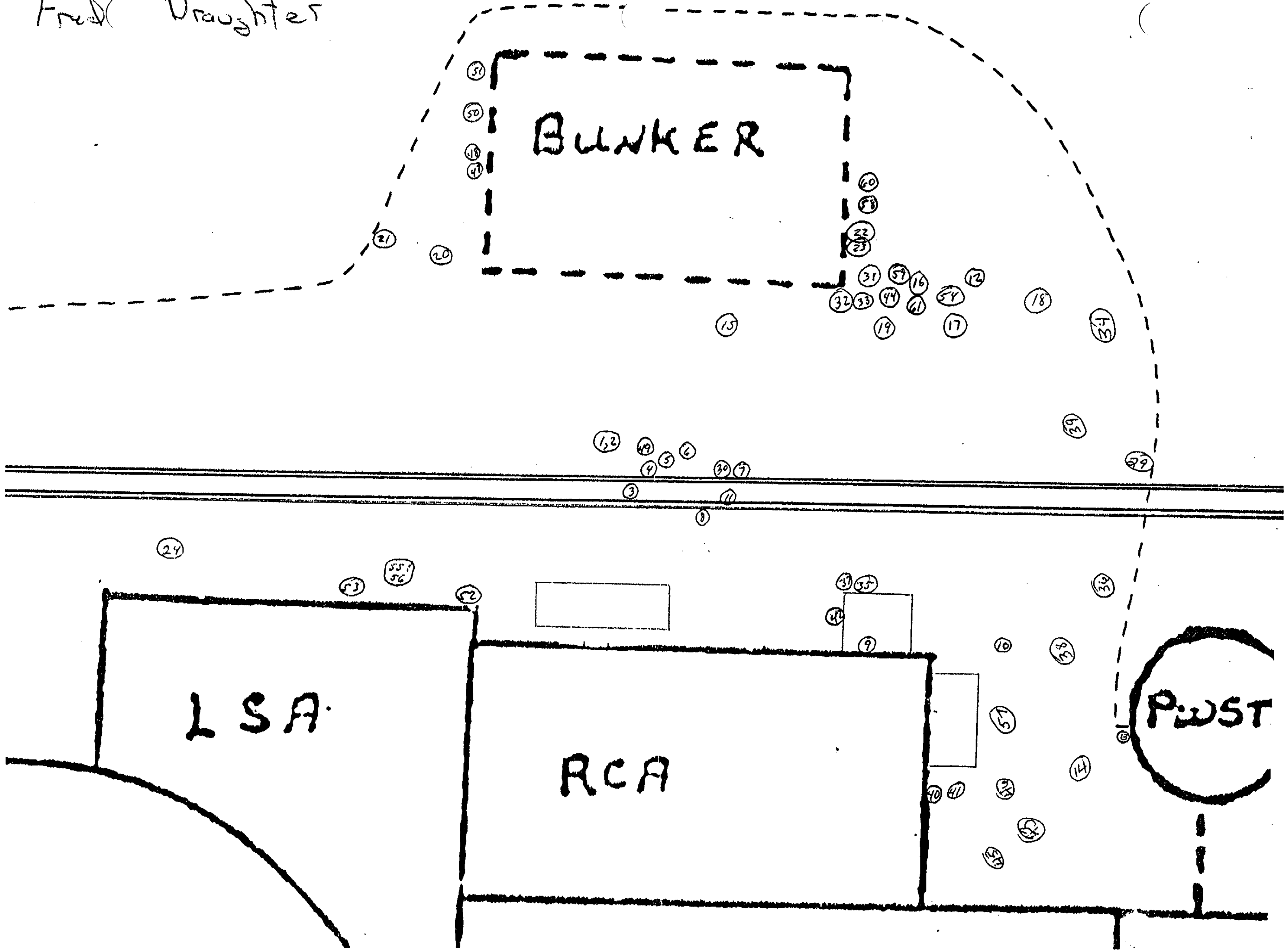
TABLE 2 H2O

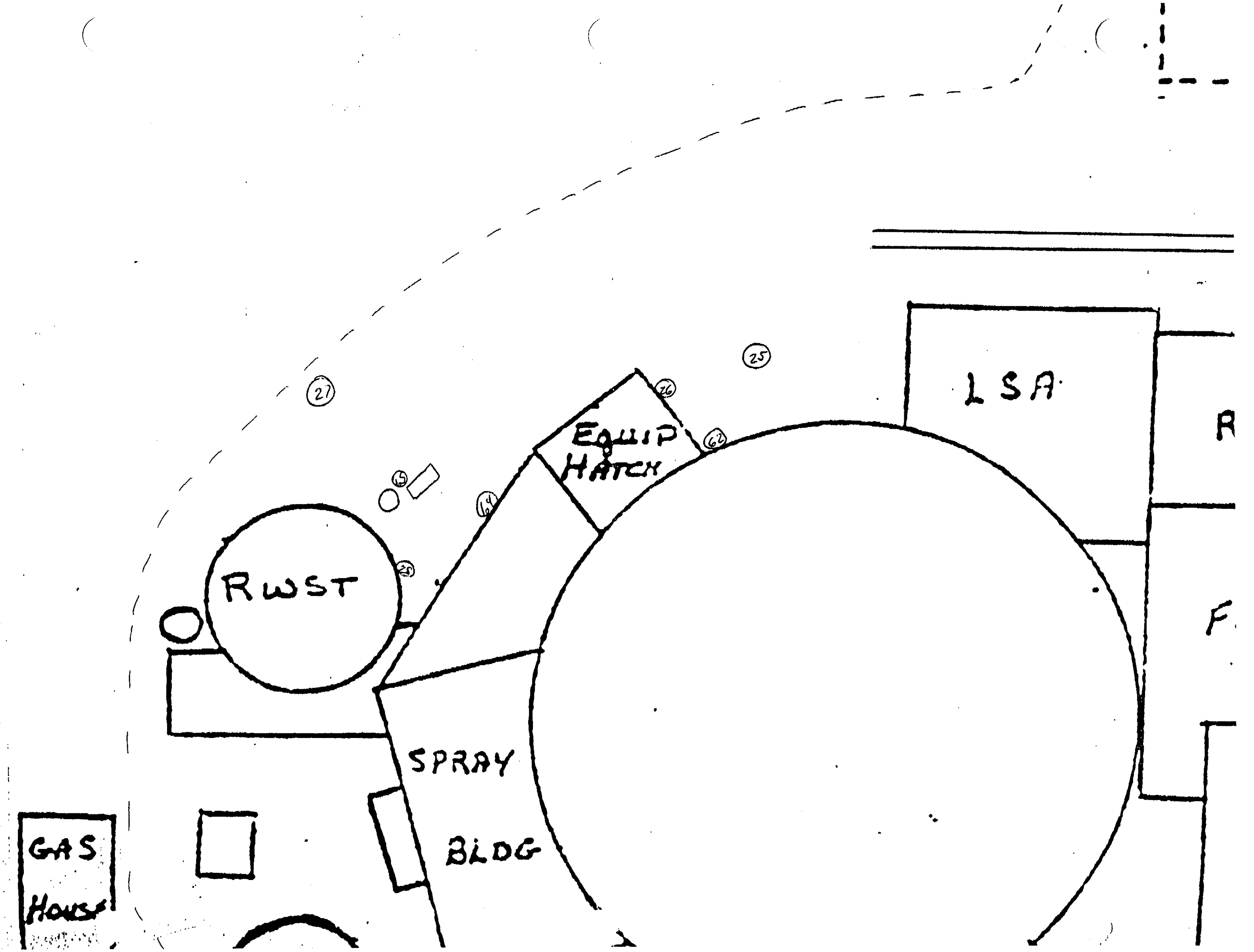
6- Inside the plant restricted area (outside radiation control Area), sand will be surveyed with an HP-210 probe. Sand readings greater than 100 CPM above Bkg will be disposed of as radioactive Material.

IDENTIFIED RADIOLOGICAL ISSUES FOR FURTHER CHARACTERIZATION

Issue Description	Date	Status
Leak in RWST siphon return line to ground	1988	~600 ft3 of soil removed and disposed as LLW ~NRC approves residual under 10 CFR § 20.302(a) on 8/31/89
Residual slightly contaminated soil under LLW storage area in vicinity of yard crane	1992	~Area evaluated and characterized by YNSD 10/92 (MYP #92-1173) and 1/93 (MYP # 93-0054) ~IAW 10 ~~CFR § 50.75(g)~~ placed in decommissioning plan file 4/12/93 (JHA-93-27) 1.8.
Spreading of slightly contaminated silt from base of intake racks in unused area under transmission lines	1992-97	~MDEP issued Dredge Spoil Utilization Permit S-20814-SS-A-N ~MDHE accepted practice 5/24/95 (R.J. Schell Ltr to MDEP)
Tk 40 drain pipe erosion	1995	– 50.75(g)

Fred Draughter




RWST
EQUIP HATCH
LSA
SPRAY BLDG
GAS House
27
25
26
62
64
65
28

LOCATION	PRIOR TO REMOVAL			WHEN REMOVED		LOOSE (L) OR FIXED (F)	DATE REMOVED
	CORRECTED CPM	MR/HR	MRAD/HR	MR/HR	MRAD/HR		
1	—	10	300	10	300	F	4-19-9
2	—	—	—	3	74	F	4-19-9
3	22,000	<1	6				
4	35,000	3	12				
5	24,000	1.5	9				
6	28,000	1.5	10				
7	31,000	4	8				
8	—	42	26	70	2500	L	4-23-
9	50,000	1	20				
10	3500	<1	<1	10K CCPM	2	L	6-6-
11	22,000	1	4	2	22	L	4-24-
12	2,000	<1	—	<1	<1	L	4-24-9
13	50,000	<1	2	12 MR	260	L	4-25-9
14	100,000	4	32	6	108	L	4-26-
15	40,000	1.5	6	Removed By Vacuum	Removed By Vacuum	L	4-29-9
16	32,000	3	6	N/A	N/A	L	4-29-9
17	30,000	1	5	↓	↓	L	4-29-91
18	11,000	.5	—	↓	↓	L	4-29-9
19	500	<.1	—	↓	↓	L	4-29-9
20	35,000	3	3	↓	↓	L	4-29-91
21	20,000	<1	—	↓	↓	L	4-29-91
22	8,000	<1	—	↓	↓	L	
23	9,000	<1	—	↓	↓	L	4-29-9
24	6,000	<1	—	↓	↓	L	4-29-91

Location	Prior to Removal			When Removed		Loose (L) or Fixed (F)	Date Removed
	Corrected CPM	MR/HR	MRAD/HR	MR/HR	MRAD/HR		
25	110,000	1.5	48	1.5	48	L	4-29-9,
26	7000 ~~2000~~	<1	<1	—	—	L	4-30-91
27	2500	<1	<1	<1	<1	L	5-1-91
28	60,000	~~<1~~ 1.5	14	1.5	14	L	5-2-91
29	10,000	<1	<1	1	16	L	6-3-9
30	5,000	<1	<1	.5	10	F	6-6-91
31	20,000	<1	2	1	9	L	6-6-9.
32	50,000	1	5	1	24	L	6-6-91
33	5,000	<1	<1	1	20	L	6-10-91
34	10,000	<1	<1	<1	20,000 ccpm	L	6-20-9
35	65,000	1.0	22	1	22	L	6-25-9
36	5,000	<1	<1			L	6-25-9
37	2500	<1	<1	<1	<1	L	6-25-9
38	2000	<1	<1	~~5~~ <1	<1 ~~50,000 cpm~~	F	
39	10,000	<1	<1	<1	50,000 cpm	L	6-26-9
40	800	<1	<1	1500 ccpm	—	L	6-27-9.
41	7500	<1	<1	<1	<1	L	6-27-91
42	10,000	<1	<1	<	2	L	6-27-91
43	50,000	<1	<1	2	16	L	6-28-9
44	8500	<1	<1	.5	9	L	7-1-91
45	10,000	<1	<1	<1	2	L	7-2-9,
46	30,000	<1	6	<1	6	L	7-2-9
47	50,000	<1	13	<1	13	L	7-2-91
48	39000	<1	7	<1	7	L	7-2-91

Location	Prior to Removal			When Removed		Loose (L) or Fixed (F)	Date Removed
	Corrected CPM	MR/HR	MRAD/HR	MR/HR	MRAD/HR		
49	28,000	<1	<1	<1	8	L	7-3-91
50	7500	<1	<1	<1	<1	L	7-3-91
51	3000	<1	<1	<1	<1	L	7-3-91
52	4000	<1	<1	<1	1	L	7-9-91
53	110,000	1.5	54	1.5	54	L	7-9-91
54	30,000	<1	8	<1	8	L	7-12-91
55	40,000	<1	13	.5	13	F	7-12-91
56	18,000	<1	5	<.5	5	F	7-12-91
57	20,00	<1	2	—	2	L	7-15-
58	100,000	1	38	1	38	L	7-18-91
59	40,000	.5	7	.5	7	L	7-18-91
60	12,000	<.5	2	<.5	2	L	7-18-91
61	8000	<.5	1	<.5	1	L	7-18-91
62	150,000	2	220	2	220	L	7-18-91

UNAFFECTED SYSTEMS

Compressed Air

Cause - back leakage from CTMT leak testing
Direct/total - 19 out of 62 >MDA; up to 112,307 dpm/100cm^2.
Removable - 15 out of 62 >MDA; up to 685 dpm/100cm^2.

Component Cooling Water System

Cause - heat exchanger leakage
Direct/total - 10 out of 41 >MDA; up to 21,644 dpm/100cm^2.
Removable - 1 out of 43 >MDA; up to 38 dpm/100cm^2.

Service Building HVAC

Cause - exhaust hoods where contaminated equipment was worked on (e.g., MOV room)
Direct/total - 39 out of 79 >MDA; up to 87,566 dpm/100cm^2.
Removable - 33 out of 79 >MDA; up to 1,445 dpm/100cm^2.

Service Water

Cause - at batch tank mix point
Direct/total - 0 out of 39 >MDA
Removable - 9 out of 88 >MDA; up to 3,134 dpm/100cm^2.

Hydrogen & Nitrogen System

Cause - back leakage from N_2 sparging/blanketing
Direct/total - 3 out of 20 >MDA; up to 125,317 dpm/100cm^2.
Removable - 8 out of 24 >MDA; up to 829 dpm/100cm^2.

Auxiliary Steam System

Cause - system leaks/background glitches
Direct/total - 19 out of 70 >MDA; up to 11,787 dpm/100cm^2.
Removable - 0 out of 70 >MDA.

UNAFFECTED SYSTEMS (Continued)

Sanitary Sewer System

Cause - decon shower drain
Direct/total - 7 out of 37 >MDA; up to 5,657 dpm/100cm^2.
Removable - 0 out of 37 >MDA.

Secondary Sampling & Chemical Addition

Cause - steam generator tube leaks
Direct/total - 0 out of 29 >MDA.
Removable - 4 out of 33 >MDA; up to 4,861 dpm/100cm^2.

Turbine Building Sumps and Drains

Cause - system leaks
Direct/total - 4 out of 40 >MDA; up to 5,801 dpm/100cm^2.
Removable - 1 out of 40 >MDA; up to 34 dpm/100cm^2.

UNAFFECTED STRUCTURES

Turbine Building 21'

Cause - on floor below system filter leak CCW
Direct/total - 5 out of 213 >1000 dpm/100cm^2; up to 8,613 dpm/100cm^2.
Removable - 1 out of 213 >100 dpm/100cm^2; up to 204 dpm/100cm^2.

Control Room & Computer Room

Cause - unknown
Direct/total - 2 out of 49 >1000 dpm/100cm^2; up to 1,054 dpm/100cm^2.
Removable - 0 out of 40 >100 dpm/100cm^2.

Service Building Cold Side 21'

Cause - unknown
Direct/total - 4 out of 134 >1000 dpm/100cm^2; up to 1,622 dpm/100cm^2.
Removable - 0 out of 134 >100 dpm/100cm^2.

Axiliary Boiler Room

Cause - unknown
Direct/total - 3 out of 26 >1000 dpm/100cm^2; up to 1,310 dpm/100cm^2.
Removable - 0 out of 26 >100 dpm/100cm^2.

Administration Building (front Office)

Cause - unknown
Direct/total - 4 out of 37 >1000 dpm/100cm^2; up to 1,628 dpm/100cm^2.
Removable - 0 out of 37 >100 dpm/100cm^2.

Wart Building

Cause - unknown
Direct/total - 1 out of 72 >1000 dpm/100cm^2; up to 1,164 dpm/100cm^2.
Removable - 0 out of 72 >100 dpm/100cm^2.

Visitor Center

Cause - unknown
Direct/total - 1 out of 60 >1000 dpm/100cm^2; up to 1,929 dpm/100cm^2.
Removable - 0 out of 60 >100 dpm/100cm^2.

Environmental Services Building

Cause - on stone foundation walls - granit suspected
Direct/total - 3 out of 28 >1000 dpm/100cm^2; up to 6,524 dpm/100cm^2.
Removable - 0 out of 26 >100 dpm/100cm^2.

CORE ACTIVATION RESULTS

Item	Weight (lb)	Activity (Ci)	Class (10CFR61)
Reactor Vessel with Internals*	1,294,571	3,570,000	C
Fuel Assembly Alignment Plate	8,717	18,300	C
Thermal Shield	64,461	71,700	C
Center Core Support Barrel	39,576	481,000	GTCC
Core Shroud	40,124	2,700,000	GTCC
Lower Core Plate	6,751	130,000	GTCC
Reactor Vessel	231,008	4,840	A

*Added 5% activity (170,000 Ci) and 903,935 lb to account for top & bottom of reactor.

ENVIRONS

BACKGROUND

LOCATION	SURVEYOR/DATE	MINIMUM	MAXIMUM	AVERAGE
Sediment Cs-137	GTS / 1998	0.04 pCi/g	0.11 pCi/g	0.07 pCi/g
Sediment Cs-137	Hess / 1972	0.35 pCi/g	0.45 pCi/g	0.4 pCi/g
Soil Cs-137	GTS / 1998	0.09 pCi/g	1.4 pCi/g	0.44 pCi/g
Soil Cs-137	Hess / 1972	0.8 pCi/g	4.96 pCi/g	2.04 pCi/g
Water H-3	GTS / 1998	685 pCi/L	1220 pCi/L	955 pCi/L
Open Land Exposure (NaI_2)	GTS / 1998	5.9 μR/hr	13.6 μR/hr	11.4 μR/hr
Open Land Exposure (PIC)	GTS / 1998	7.18 μR/hr	9.34 μR/hr	8.22 μR/hr

ENVIRONS(Continued)

RCA

58 samples collected
28 had detectable activity Cs-137 up to 156 pCi/g & Co-60 up to 3.29 pCi/g.

Area North Of Forebay

Up to 145 pCi/g Cs-137 for about 4000 uCi total. Area will require remediation.

Forebay

In Bay
- 2 samples collected
- All showed Cs-137 at about 0.5 pCi/g (Bkgd Cs-137 ~ 0.05 pCi/g)
- All showed Co-60 at 5.08 and 11.2 pCi/g

Shore Line
- 27 samples collected
- All showed Cs-137 at about 0.5 pCi/g (Bkgd Cs-137 ~ 1.0 pCi/g)
- 2 Showed Co-60 at 0.05 and 0.08 pCi/g

Bailey Cove

14 samples collected
All showed Cs-137 at about 0.2 pCi/g (Bkgd Cs-137 ~ 0.05 pCi/g)
1 Showed Co-60 at 0.04 pCi/g

Diffuser

5 samples collected
All showed Cs-137 at about 0.1 pCi/g (Bkgd Cs-137 ~ 0.05 pCi/g)
2 Showed Co-60 at 0.08 and 0.12 pCi/g

Outfall 6 (R0300)

2 samples collected
All showed Cs-137 at about 0.5 pCi/g (Bkgd Cs-137 ~ 1.0 pCi/g)
All showed Co-60 at 0.05 and 0.04 pCi/g

ENVIRONS (Continued)

Shorelines

30 samples collected
All showed Cs-137 at about 0.5 pCi/g (Bkgd Cs-137 ~ 1.0 pCi/g)
2 showed Co-60 at 0.05 and 0.07 pCi/g

Foxbird Island

73 samples collected
All showed Cs-137 at about 0.5 pCi/g (Bkgd Cs-137 ~ 1.0 pCi/g)
1 showed Co-60 at 0.06 pCi/g

Protected Area

35 samples collected
12 had detectable activity Cs-137 up to 0.64 pCi/g & Co-60 up to 0.09 pCi/g.

Contractor Lot

Was 0.4 pCi/g Co-60, appears to be remediated.
Needs to be classified as Impacted-Class 1 for Final Survey.

Bailey Point

Was 33,000 pCi/g Co-60, appears to be remediated.
Needs to be classified as Impacted-Class 1 for Final Survey.

Tritium Results

Location	GTS 1998 H-3 pCi/L	MYAP 1992 H-3 pCi/L
Well B-201		950
Well B-202	622	50
Well B-203	1198	-10
Well B-204	441	-80
Well B-205	928	730
Well B-206	541	1230
Well BK-1	4023	2560
CTMT Sump		2470
MW-100	788	-20
Cr-1	914	

GTS H-3 bkgd 700-1200 pCi/L

Location	GTS 1998 H-3 pCi/L	GTS 1998 γ pCi/g
Catch Basin 6A	2005	N/D
Catch Basin 7A	3266	N/D
Catch Basin 7B	978	N/D
Catch Basin 7E	2712	N/D
Outfall 006	716	Co-60 at 0.05 and 0.04 pCi/g
Outfall 008		N/D

GTS H-3 bkgd 700-1200 pCi/L
N/D = None Detected