Historical Site Assessment and Classification Summary

Survey Area Name: Furlon House Parking Lot Designator: **OOL-16**

Survey Area Description

Survey area OOL-16 consists of the land area that is located at the Furlon House, a structure currently used by YNPS as a visitor's center and as the shipping and receiving point of contact for materials shipped to the YNPS site. Survey area OOL-16 contains an estimated 1000 square meters of soil surface area.

Survey area OOL-16 is bounded entirely by non-impacted YAEC owned property.

Sub-surface systems that traverse or connect within OOL-16 include:

- The Furlon House sanitary sewer system.

Items of note located within or adjacent to OOL-16 include:

- The Lord Brook that passes adjacent to OOL-16
- Monroe Hill Road that passes by the Furlon House.

Survey Area Name: Furlon House Parking Lot Designator: **OOL-16**

Survey Area History

Survey area OOL-16 is not part of the RCA. There are no radioactive systems present in OOL-16.Survey area OOL-16 was not used for storing radioactive material or processing or packaging radioactive waste.

Surveys Area OOL-16 contains soil that was excavated during the construction activities performed at the YNPS site.

Survey area OOL-16 has the potential to be minimally impacted by low levels of radioactivity as a result of site excavated soils deposited within survey area OOL-16.

Scoping/Characterization

Soil samples were collected and analyzed as part of the previously performed FSS. (see below)

Decommissioning

No decommissioning activities have been performed for survey area OOL-16.

Survey Area Name: Furlon House Parking Lot Designator: **OOL-16**

Findings

Survey area OOL-16 is a land area that is located in the non-RCA portion of the site.

Survey area OOL-16 is minimally impacted by concentration low levels of radioactivity present in soil deposited in this area. Survey area OOL-16 is likely to contain residual radioactivity concentrations at a small fraction of DCGL.

The radionuclide mix likely to be present in OOL-16 includes all radionuclides identified in the radioactive systems of the plant (Ref 1). The primary radionuclides of concern for survey area OOL-16 are Co-60, Cs-137, Ag-108m, Sr-90, and tritium.

Current Status

It is unlikely that survey area OOL-16 will be further impacted by continued decommissioning activities.

One survey media was assessed in OOL-16, Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for OOL-16 is presented at the end of Table 1 for each survey medium. The results are summarized below.

Soil: Mean SOF is none detectable.
Maximum SOF for a single soil sample is none detectable.
Minimum SOF for a single soil sample is none detectable.

Classification Statement

Based upon the historical use and radiological conditions associated with this survey area OOL-16 is identified as a Class 3 Area.

Survey Area Name: Furlon House Parking Lot Designator: **OOL-16**

Drawings

Figure 7-1B

References

1.	"Radionuclides for Building Surfaces and Soil DCGL Determinations," YA-REPT-00-001-03

Table 2
Statistical Data Summary – OOL-16 -- Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	2	2	0.429	0.143	0.328	0.530	0.429
Ag-108m	pCi/g	0	2	0.000				
Ag-110m	pCi/g	0	2	0.000				
Am-241	pCi/g	0	2	0.000				
Bi-214	pCi/g	2	2	0.316	0.022	0.300	0.332	0.316
Ce-144	pCi/g	0	2	0.000				
Co-58	pCi/g	0	2	0.000				
Co-60	pCi/g	0	2	0.000				
Cs-134	pCi/g	0	2	0.000				
Cs-137	pCi/g	0	2	0.000				
Fe-59	pCi/g	0	2	0.000				
K-40	pCi/g	2	2	11.295	1.054	10.550	12.040	11.295
Mn-54	pCi/g	0	2	0.000				
Nb-95	pCi/g	0	2	0.000				
Pb-212	pCi/g	2	2	0.557	0.024	0.540	0.573	0.557
Pb-214	pCi/g	2	2	0.416	0.010	0.409	0.423	0.416
Ru-103	pCi/g	0	2	0.000				
Ru-106	pCi/g	0	2	0.000				
Sb-124	pCi/g	0	2	0.000				
Sb-125	pCi/g	0	2	0.000				
Tl-208	pCi/g	1	1	0.471		0.471	0.471	0.471
Zn-65	pCi/g	0	2	0.000				
Zr-95	pCi/g	0	2	0.000				

Table 3
Summary of Detected Results Above Criteria
OOL-16 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	2	2		pCi/g	0	0.53
Ag-108m	0	2	8.52	pCi/g	0	
Ag-110m	0	2		pCi/g	0	
Am-241	0	2	44.35	pCi/g	0	
Bi-214	2	2		pCi/g	0	0.33
Ce-144	0	2		pCi/g	0	
Co-58	0	2		pCi/g	0	
Co-60	0	2	4.84	pCi/g	0	
Cs-134	0	2	6.71	pCi/g	0	
Cs-137	0	2	12.24	pCi/g	0	
Fe-59	0	2		pCi/g	0	
K-40	2	2		pCi/g	0	12.04
Mn-54	0	2	21.66	pCi/g	0	
Nb-95	0	2		pCi/g	0	
Pb-212	2	2		pCi/g	0	0.57
Pb-214	2	2		pCi/g	0	0.42
Ru-103	0	2		pCi/g	0	
Ru-106	0	2	68.21	pCi/g	0	
Sb-124	0	2		pCi/g	0	
Sb-125	0	2	37.73	pCi/g	0	
Tl-208	1	1		pCi/g	0	0.47
Zn-65	0	2		pCi/g	0	
Zr-95	0	2		pCi/g	0	

Table 4
Rad
OOL-16 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS536 (3263)	TS538 (3264)
Sample ID	TS536	TS538
Date Sampled	8/17/1998	8/17/1998
Ac-228	0.3276	0.5303
Ag-108m	0.01426 U	-0.01939 U
Ag-110m	-0.01169 U	0.007566 U
Am-241	0 U	0 U
Bi-214	0.3004	0.3321
Ce-144	0.07706 U	-0.1016 U
Co-58	-0.002609 U	0.01227 U
Co-60	-0.0225 U	-0.02225 U
Cs-134	-0.0699 U	-0.04121 U
Cs-137	0.01811 U	0.02047 U
Fe-59	-0.02327 U	-0.01154 U
K-40	10.55	12.04
Mn-54	-0.008954 U	0.007816 U
Nb-95	0.01457 U	0.01376 U
Pb-212	0.5399	0.5732
Pb-214	0.4091	0.4228
Ru-103	0.009776 U	-0.02172 U
Ru-106	0 U	-0.1912 U
Sb-124	0.01043 U	0 U
Sb-125	0.002526 U	-0.03259 U
Tl-208		0.4711
Zn-65	0.02636 U	-0.07595 U
Zr-95	0.007129 U	0.002716 U

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Historical Site Assessment and Classification Summary

Survey Area Name: Asphalt Brick and Concrete Storage Area Designator: **OOL-17**

Survey Area Description

Survey area OOL-17 consists of the land area that is located adjacent to Yankee Road known as the Asphalt, Brick and Concrete Storage area.

Survey area OOL-17 contains an estimated 1000 square meters of soil surface area.

Survey area OOL-17 is bounded entirely by non-impacted YAEC owned property.

Items of note located within or adjacent to OOL-17 include:

- Yankee Road that connects OOL-17 to the YNPS site.

Survey Area Name: Asphalt Brick and Concrete Storage Area Designator: **OOL-17**

Survey Area History

Survey area OOL-17 is not part of the RCA. There are no radioactive systems present in OOL-17. Survey area OOL-17 was not used for processing or packaging radioactive wastes or intentionally used for storing radioactive material.

Surveys Area OOL-17 contains soil that was excavated during construction activities performed at the YNPS site. Additionally it received material and equipment that had previously been inside the YNPS site. Some of the material placed in this area originated in the RCA yard area but had passed the criteria applied for free release prior to being placed in OOL-17. These materials included shield blocks and other material. Some items were subsequently identified as radioactive material. This material was recovered and placed back inside the YNPS RCA.

Survey area OOL-17 has the potential to be minimally impacted by low levels of radioactivity as a result of site excavated soil deposition as well as low levels of activity that may have been weathered from the minimally contaminated items.

In preparation for major building demolition most of the items were removed from the ABC yard and disposed of as regular waste. Shield blocks present were relocated to form a bounding wall for a new parking lot. The area was graded and clean stone fill deposited upon the expanded surface.

Scoping/Characterization

None

Decommissioning

No decommissioning activities have been performed for survey area OOL-17.

Survey Area Name: Asphalt Brick and Concrete Storage Area Designator: **OOL-17**

Findings

Survey area OOL-17 is a land area that is located in the non-RCA portion of the site.

Survey area OOL-17 is minimally impacted by concentration low levels of radioactivity present in soil deposited in this area. Survey area OOL-17 is likely to contain residual radioactivity concentrations at a small fraction of DCGL.

The radionuclide mix likely to be present in OOL-17 includes all radionuclides identified in the radioactive systems of the plant (Ref 1). The primary radionuclides of concern for survey area OOL-17 are Co-60, Cs-137, Ag-108m, Sr-90, and tritium.

Current Status

It is unlikely that survey area OOL-17 will be further impacted by continued decommissioning activities. No sampling was conducted in this area.

Classification Statement

Based upon the historical use and radiological conditions associated with this survey area OOL-17 is identified as a Class 3 Area.

Survey Area Name: Asphalt Brick and Concrete Storage Area Designator: **OOL-17**

Drawings

Figure 7-1B

References

1.	"Radionuclides for Building Surfaces and Soil DCGL Determinations," YA-REPT-00-001-03

Historical Site Assessment and Classification Summary

Survey Area Name: East Lower RCA Yard Designator: **NOL-01**

Survey Area Description

Survey area NOL-01 consists of land area within the RCA and contains about 1364 square meters of surface area. The surface media of NOL-01 consists of asphalt.

Survey area NOL-01 is bounded by NOL-06, NSY-01 and SVC-02 on the north, OOL-12 on the east, NOL-02, SFP-01, SFP-02, NSY-09, NSY-02 and AUX-01 on the south and NOL-06 on the west. The boundary between NOL-01 and OOL-12 is the historical and relatively stable boundary of the RCA.

Surface items of note located within and to be evaluated as part of NOL-01 include:

- A portion of the onsite railroad spur line running from the east RCA access to under the VC
- East storm drain catch basins #s 3, 4 and 5

Other items located within NOL-01 that will be evaluated separately from survey area NOL-01 include:

- The Chem.-waste Transfer Pump Pit; liquid waste collection tanks and transfer pumps located in an under ground vault (NSY-11)
- The Spent Fuel Pool security wall located along the north and west walls of the SFP. (SFP-01)
- The reactor pressure vessel cask set-down pad located under the VC equipment hatch. (BRT-01)
- The Fuel Transfer Enclosure and the VCC transporter pad. (NSY-01)
- Fuel Transfer Chute personnel access hatch. (SFP-01)
- The Fuel Chute Pump-back System pump base. (SFP-01)
- The VC elevator and stairway access. (NSY-09)
- VC support bases (BRT-01)
- Reactor Support Structure (RSS) support bases (BRT-01)

Sub-surface systems that traverse or connect within NOL-01 include:

- The east storm drain system
- The Auxiliary Service Water System (ASWS) water and electrical
- The fuel oil supply to the auxiliary boilers
- Fire Protection System Water Lines
- Construction power, supply and distribution
- Electrical grounding cables.
- Radioactive drain lines and transfer lines
- Chem.-waste transfer vault vent.

Survey Area Name: East Lower RCA Yard Designator: **NOL-01**

Survey Area History

Survey area NOL-01 was posted and controlled as a RCA, from the beginning of plant operations. (Ref 1) The bounds of NOL-01 were established based on a common history of the travel of personnel and material within the lower (elevation 1022') east end of the RCA. NOL-01 is adjacent to the RP control point, contaminated machine shop, the PAB and spent fuel pool. Access to the upper RCA and waste disposal building is gained by crossing NOL-01. The area potentially impacted by migration of contamination resulting from typical personnel and material travel into and out of the RCA is captured within the bounds of survey area NOL-01 footprint.

The railroad service to the plant was terminated in the early 1970s. The railroad tracks within the YNPS site and two flat bed cars remained in service to support plant operations. The railroad cars were used as temporary radioactive material storage locations. The reactor head assembly was placed on one of the railroad cars for temporary storage during refueling activities. Other components that attached to the reactor head were also placed on the railroad car and the railroad car was than rolled down the track to clear the area under the equipment hatch.

Contamination of survey area NOL-01 resulted from transport of contaminated material and equipment and personnel traffic. Typical transport of contaminated material and equipment occurred from the PAB and SFP to the decon room and/or contaminated machine shop. Personnel who unknowingly became contaminated while working anywhere in the RCA would travel to the control point prior to identifying that contamination had occurred.

Significant operational events and activities that led to or describe contamination of survey area NOL-01 include:

- AOR 63-12, Shield Tank Cavity Shield Water Spill. (Ref 2)
- AOR 63-17, De-watering Pump Packing Leakage. (Ref 3)
- AOR 64-13, Leakage from the Ion Exchange Pit. (Ref 4)
- AOR 66-07, Spent Fuel Pit Water Spill (Ref 5)
- AOR 66-09, Hose Failure (Fuel Chute Pump-back System draining in progress) (Ref 6)
- PIR 75-07, Yard Area Contamination. (Ref 7)
- PIR 81-09, Contamination of Yard during Reactor Head Removal. (Ref 8)
- PIR 94-03, Leakage from Frozen Fuel Chute De-watering Line (Ref 9)
- PIR 94-09, Leakage from Frozen NST Telltale Lines (Ref 10)

Translocation Pathways

Modes and vectors of contamination transmigration from other survey areas include:

- Contaminated material transport within the NOL-01 typically involved moving contaminated equipment and tools from a contaminated work areas in

the RCA back to the hot side machine shop or the decon room. It also involved collection and transfer of radioactive waste material to the waste disposal building. In instances where contaminated radioactive material was not properly packaged for transport, spread of contamination during transport was likely to occur.

- Temporary contaminated radioactive material storage locations were set-up in the RCA. In instances where this material was improperly packaged, deposition of contamination within the storage location was likely to occur.
- Personnel involved in the above-described activities were also likely to cause spread of contamination.
- Transfer of large equipment and waste into and out of the VC through the equipment hatch.
- Routine trash collection and transfer from the VC.
- The movement of fuel casks and high-level waste out of the RCA by rail and by truck in accordance with established Radiation Protection program guidance.
- Once contamination had been deposited on the surface of the RCA personnel foot traffic was likely to further spread the contamination. This resulted in low-levels of radioactivity distributed generally within the RCA.
- Snow removal was necessary within the RCA in order to facilitate access to all areas. Snow removal likely moved contamination present on the surface of the RCA to the locations where snow was deposited. When these locations would not accept additional snow, the snow was loaded on to trucks and driven to remote storage locations. As the snow melted, the snow storage locations are likely to have a higher concentration of the radioactivity present due to deposition of additional radioactivity. Deposited snow locations within NOL-01 typically were outside the perimeter of the VC support up against the PAB and turbine building. Snow in the area along the railroad tracks and service building was pushed up on to the slope to the south, NOL-02 or out of the RCA to the east into survey area OOL-12.
- Surface water run-off resulting from rain and snowmelt is likely to have transported surface contamination into storm drains and/or into in low areas where it would collect. Surface water run-off collection locations in NOL-01 include 4 storm drain catch basins, one of which is closed due to its proximity to the fuel oil transfer house and the low area in front of the new fuel vault. Otherwise the surface water run-off pattern was east along the railroad tracks and into survey area OOL-12.
- Preparations and decontamination of spent fuel and high-level waste shipping containers were performed in the areas adjacent to the SFP and the current FTE. These evolutions were likely contributors of radioactive contamination to the surface of the RCA during the early years of plant operations. During the years when spent fuel was shipped (through 1972) there was no history of fuel failure or loss of integrity.

Modifications performed at the YNPS site during years of operation that changed the configuration of NOL-01 include:

- Paving of previously unpaved areas within the bounds of survey area NOL-01.
- Closing of east storm drain, catch basin #3.
- Installation of the permanent RCA perimeter fence.
- Seismic Upgrade of the RSS anchors

Modifications performed at the YNPS site in support of decommissioning that changed the configuration of NOL-01 include:

- Construction the SFP security wall and relocation of ECB #5 storm drain catch basin. (Ref 11)
- Construction of the SFP island power supply and distribution. (Ref 12)
- Installation of the decommissioning construction power supply and distribution network. (Ref 13)
- Closure/Isolation of the Fuel Transfer Chute. (Ref 14)
- Construction of the Reactor Pressure Vessel Cask landing pad under the VC equipment hatch. (Ref 15)
- Installation of the ASWS water piping and electrical supply. (Ref 16)
- Construction of the FTE. (Ref 17)

Scoping/Characterization Surveys

Scoping surveys were performed and the data collected used to develop the YNPS Decommissioning Plan. (Ref 17) Continuing characterization soil samples are also included in the NOL-01 soil sample data.

Additional scoping survey data was collected in support of the construction activities performed in NOL-01 in support of decommissioning. The progress of these efforts are documented via RP Memo 96-76 Protocol for Sampling of Soil and Asphalt from Excavations (Ref 18) and DP-8120 Collection of Site Characterization and FSS Samples (Ref 19). During these modifications some soils excavated contained radionuclide concentrations in excess of the current DCGL's for soil and are identified as remediated. Soil excavations with radionuclide concentrations less than the current DCGL's for soil are identified as mitigation.

Remediations

A soil remediation activity was conducted in NOL-01 during the construction of the security shield wall around the Spent Fuel Pit in 1992 (Ref 20). A summary of the results of "as found" soil sample data, results of samples taken during the progress of the remediation and results of "as left" soil sample data are included on the *remediated areas* sheet and accompanying diagrams attached to this section.

Decommissioning

No decommissioning activities have been performed for survey area NOL-01. Survey area NOL-01 has been impacted by decommissioning activities performed on systems and structures within and adjacent to it.

Survey Area Name: East Lower RCA Yard Designator: **NOL-01**

Findings

Survey area NOL-01 is a land area that is located within the current configuration of YNPS RCA.

Survey area NOL-01 is impacted and contains locations of leaks and spills of radioactive materials and is known to have contained radioactivity at levels greater the DCGL.

The radionuclide mix likely to be present in NOL-01 includes all radionuclides identified in the radioactive systems of the plant (Ref 21). The primary radionuclides of concern for survey area NOL-01 are Co-60, Cs-137, Ag-108m, Sr-90, Ni-63 and tritium.

Current Status

NOL-01 remains as part of the RCA and continues to be impacted by personnel traffic, radioactive material transportation, radioactive waste processing and by decommissioning activities.

A soil sample location map (Figure 17) has been prepared to show the distribution of sampling locations in NOL-01. Only samples representative of soils still present are included on the map (samples of soils representative of soils removed during remediation activities are not presented). Three survey media were assessed in NOL-01, Asphalt, Sod and Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL. There are separate sets of Tables 1-4 for each survey media. All are evaluated as fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for NOL-01 is presented at the end of Table 1 for each survey medium. The results are summarized below.

Asphalt: Mean SOF is 0.208.
Maximum SOF for a single asphalt sample is 0.882 (key# 544) outside the FTE doorway
Minimum SOF for a single asphalt sample is 0.017 (key# 429) under the VC

Sod: Mean SOF is 0.407.
Maximum SOF for a single sod sample is 0.608 (key# 610) near storm drain by IX Pit
Minimum SOF for a single sod sample is 0.240 (key# 614) at top of slope near IX Pit

Soil: Mean SOF is 0.153.
Maximum SOF for a single soil sample is 0.513 (key# 610) near storm drain by IX Pit
Minimum SOF for a single soil sample is 0.004 (key# 474) under the VC

Survey Area Name: East Lower RCA Yard Designator: **NOL-01**

Classification Statement

Based upon the historical use and radiological conditions associated with this survey area NOL-01 is identified as a Class 1 Area.

Survey Area Name: East Lower RCA Yard Designator: **NOL-01**

Drawings

E-1 ASWS Underground Plan
9699 FB-2 A
9699 FB-2 C
9699 FB-2 E
9699-FC-50 C
9699-FC-50 D
9699-FP-12 I

References

1.	Radiation Protection Memorandum RP-98-23, "Overview of the YNPS Historical Material Release Evaluation," dated March 5, 1998.
2.	Abnormal Occurrence Report (AOR) 63-12, "Shield Tank Cavity Shield Water Spill," dated October 1, 1963.
3.	AOR 63-17, "Dewatering Pump Packing Leakage," dated October 18, 1963.
4.	AOR 64-13, "High Level in IX Pit Resulting In Pit Leakage Coming Up Through the Blacktop," dated October 13, 1964.
5.	AOR 66-07, "Spent Fuel Pit Water Spill," dated September 27, 1966.
6.	AOR 66-09, "Plastic Garden Hose Failure," dated November 1, 1966.
7.	Plant Information Report (PIR 75-07), "Yard Area Contamination," dated August 12, 1975.
8.	PIR 81-09, "Contamination of Yard during Reactor Head Removal," June 12, 1981.
9.	PIR 94-03, "Leakage from Frozen Fuel Chute Dewatering Line," dated October 17, 1994.
10.	Special Order 94-09, "NST Tell-tales/Fuel Chute Dewatering Line," dated February 18, 1994.
11.	Engineering Design Change Request (EDCR) 92-303, "Reactor Internals Segmentation," dated August 12, 1993.
12.	Non-Nuclear Safety Modification (NNS) 95-004, "Construction Power Feed Installation, RCA," dated January 31, 1996.
13.	NNS 95-006, "Construction Power Feed Installation, SFP," dated February 1, 1996.
14.	EDCR 95-303, "Fuel Transfer Chute Isolation," dated June 22, 1995.
15.	EDCR 95-302, "Reactor Pressure Vessel Removal," issued May 11, 1995.
16.	EDCR 95-301, "Installation of Consolidated Spent Fuel Pool Cooling System," dated April 25, 1995.
17.	YNPS Decommissioning Plan, Rev. 0.0.
18.	Radiation Protection Memorandum RP-96-76, "Protocol for Sampling of Soil and Asphalt from Excavations," dated October 10, 1996.
19.	Department Procedure DP-8120, "Collection of Site Characterization and Site Release Samples."
20.	Memorandum, "Sampling and Analysis of the Soil Around the SFP Building," dated October 14, 1992.
21.	Remediated Areas progress and Status Table NOL-01 (see text)

NOL-01

Remediated Areas								
Location	Sample #	Date	GLV SOF	Disposition	Nuclide	Conc. (pCi/gm)	Fraction of DCGL	DCGL SOF
SFP / NFV east side trench 0"	A-1	9/28/1992			Co-60	2.160E+00	0.446	0.932
					Cs-134	2.327E-01	0.035	
					Cs-137	5.523E+00	0.451	
SFP / NFV east side trench 18"	A-2	9/29/1992	ND					
SFP / NFV east side trench 36"	A-3	9/28/1992			Cs-137	6.880E-02	0.006	0.006
SFP / NFV east side trench 48"	A-4	9/29/1992	ND	AL				
SFP / NFV east side trench 0"	B-1	9/28/1992			Co-60	3.869E+00	0.800	1.229
					Cs-134	2.862E-01	0.043	
					Cs-137	4.691E+00	0.383	
					Mn-54	7.010E-02	0.003	
SFP / NFV east side trench 18"	B-2	9/29/1992			Cs-137	9.150E-02	0.007	0.007
SFP / NFV east side trench 36"	B-3	9/28/1992			Cs-137	1.419E-01	0.012	0.012
SFP / NFV east side trench 48"	B-4	9/29/1992		AL	Co-60	5.970E-02	0.012	0.012
SFP / NFV east side trench 0"	C-1	9/29/1992			Co-60	2.610E+00	0.539	0.878
					Cs-134	2.335E-01	0.035	
					Cs-137	3.684E+00	0.301	
					Mn-54	6.700E-02	0.003	
SFP / NFV east side trench 18"	C-2	9/29/1992			Co-60	5.449E-01	0.113	0.479
					Cs-137	4.487E+00	0.367	
SFP / NFV east side trench 36"	C-3	9/29/1992			Cs-137	3.100E-02	0.003	0.003
SFP / NFV east side trench 48"	C-4	10/1/1992	ND	AL				
SFP / NFV east side trench 0"	D-1	9/29/1992			Co-60	3.658E+00	0.756	1.245
					Cs-134	2.691E-01	0.040	
					Cs-137	5.441E+00	0.445	
					Mn-54	8.950E-02	0.004	
SFP / NFV east side trench 18"	D-2	9/29/1992			Co-60	3.722E-01	0.077	0.183
					Cs-137	1.297E+00	0.106	
SFP / NFV east side trench 36"	D-3	9/29/1992			Cs-137	1.459E-01	0.012	0.012
SFP / NFV east side trench 48"	D-4	9/30/1992		AL	Co-60	9.721E-01	0.201	0.227
					Cs-137	3.186E-01	0.026	

NOL-01

Remediated Areas								
Location	Sample #	Date	GLV SOF	Disposition	Nuclide	Conc. (pCi/gm)	Fraction of DCGL	DCGL SOF
SFP / NFV east side trench 0"	E-1	9/30/1992			Co-60	1.807E-01	0.037	0.069
					Cs-137	3.934E-01	0.032	
SFP / NFV east side trench 18"	E-2	10/1/1992			Co-60	2.608E-01	0.054	0.153
					Cs-137	1.213E+00	0.099	
SFP / NFV east side trench 36"	E-3	10/1/1992			Co-60	8.830E-02	0.018	0.025
					Cs-137	7.730E-02	0.006	
SFP / NFV east side trench 48"	E-4	10/2/1992			Co-60	3.623E-01	0.075	13.433
					Cs-134	1.917E+00	0.286	
					Cs-137	1.600E+02	13.072	
SFP / NFV east side trench 48"	E-4 (2)	10/5/1992	ND	AL				
SFP / NFV east side trench 0"	F-1	9/30/1992			Co-60	1.356E+00	0.280	1.009
					Cs-134	1.734E-01	0.026	
					Cs-137	8.605E+00	0.703	
SFP / NFV east side trench 18"	F-2	10/2/1992	ND					
SFP / NFV east side trench 36"	F-3	10/2/1992	ND					
SFP / NFV east side trench 48"	F-4	10/2/1992		AL	Co-60	1.206E-01	0.025	0.149
					Cs-137	1.524E+00	0.125	
SFP / NFV west side trench 0"	G-1	10/19/1992			Co-60	5.629E-01	0.116	1.443
					Cs-134	1.312E-01	0.020	
					Cs-137	1.600E+01	1.307	
SFP / NFV west side trench 18"	G-2	10/21/1992			Co-60	4.800E-02	0.010	0.166
					Cs-137	1.912E+00	0.156	
SFP / NFV west side trench 60"	G-3	10/26/1992	ND	AL				
SFP / NFV west side trench 0"	H-1	10/26/1992			Co-60	5.820E-02	0.012	0.630
					Cs-134	5.160E-02	0.008	
					Cs-137	7.464E+00	0.610	
SFP / NFV west side trench 18"	H-2	10/26/1992			Co-60	3.178E-01	0.066	0.318
					Cs-137	3.089E+00	0.252	
SFP / NFV west side trench 60"	H-3	10/26/1992		AL	Co-60	1.859E-01	0.038	0.228
					Cs-137	2.320E+00	0.190	

NOL-01

Remediated Areas								
Location	Sample #	Date	GLV SOF	Disposition	Nuclide	Conc. (pCi/gm)	Fraction of DCGL	DCGL SOF
SFP / NFV west side trench 0"	I-1	10/27/1992			Co-60	4.454E-01	0.092	0.813
					Cs-134	7.360E-02	0.011	
					Cs-137	8.690E+00	0.710	
SFP / NFV west side trench 18"	I-2	10/27/1992	ND					
SFP / NFV west side trench 60"	I-3	10/27/1992		AL	Co-60	5.590E-02	0.012	0.029
					Cs-137	2.168E-01	0.018	

UNK - unknown
AB - as area backfill
ABC - ABC storage area
AL - as left
ALAR - as left after remediation
FR - further remediation
RD - rad disposal
TS - temporary storage tk

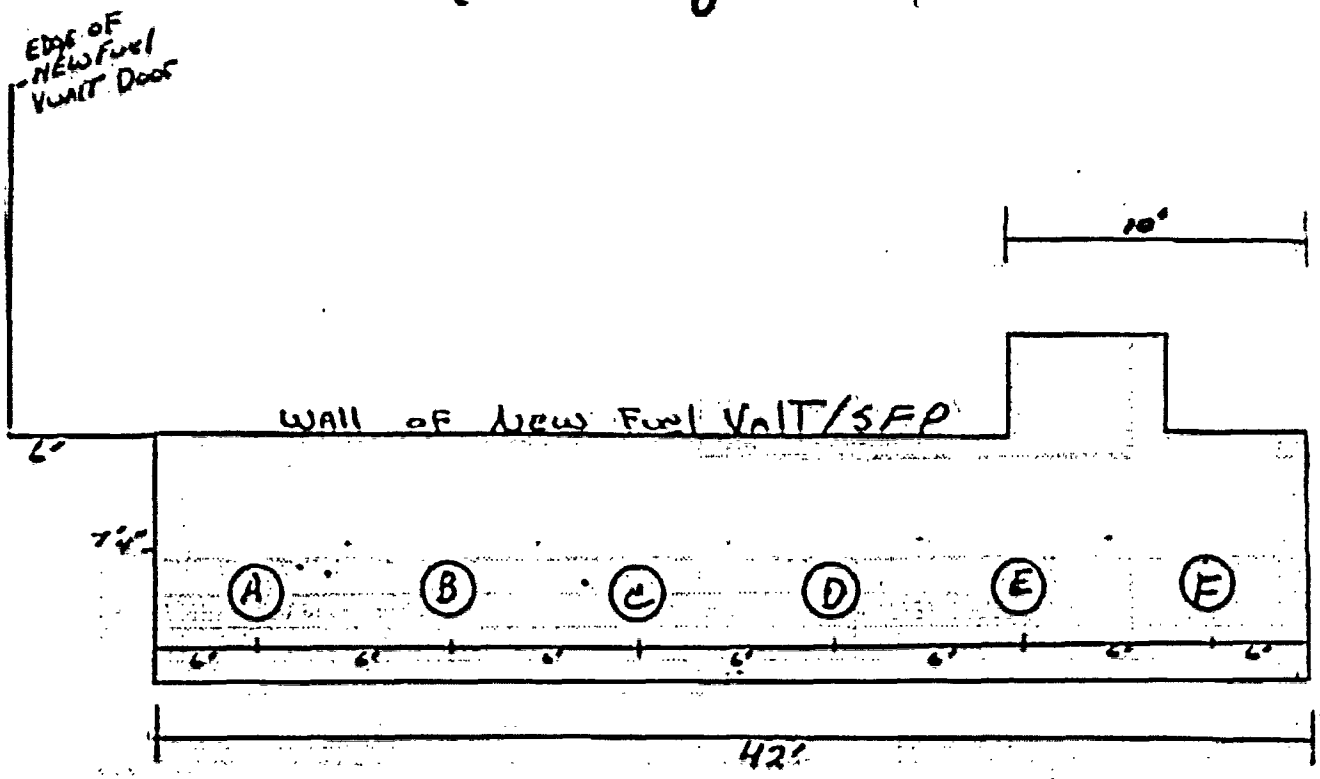
DCGL (pCi/gm)		
Nuclide	25 mrem/yr	10 mrem/yr
Ag-108m	8.521E+00	3.408E+00
Co-60	4.838E+00	1.935E+00
Cs-134	6.706E+00	2.682E+00
Cs-137	1.224E+01	4.896E+00
Mn-54	2.166E+01	8.664E+00

115 904

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

4 PA
~~3~~ Samples per Letter, AT Locations shown
#1 Top Soil
#2 - 18" Down
#3 - 36" Down
#4 - 48" DOWN (at bottom of trench) PA



SPECIAL SURVEY FORM LOCATION OF EQUIPMENT: Dirt Sample Locations in Front of NFV/SFP

8101.6 REV.18
INS # V02.09.03
RT # 10-811, 373

Start @ 1330
DATE 9-28-92 TIME 1330
SURVEYOR Pruitt/D. Hayes

INSTRUMENT HPGE # (RP)
CALIBRATION DUE DATE 1/94

KEY
- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- -x-x- BARRIER ⊢—⊣ MASSLINE

( ) DIRECT RADIATION
READINGS IN MR/HR EXCEPT AS NOTED.

(✓) CONTAMINATION
LESS THAN 1000 dpm/100 cm² BETA-GAMMA AND LESS THAN 50 dpm/100 cm² ALPHA UNLESS OTHERWISE NOTED.

( ) HOT PARTICLE SURVEY
NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

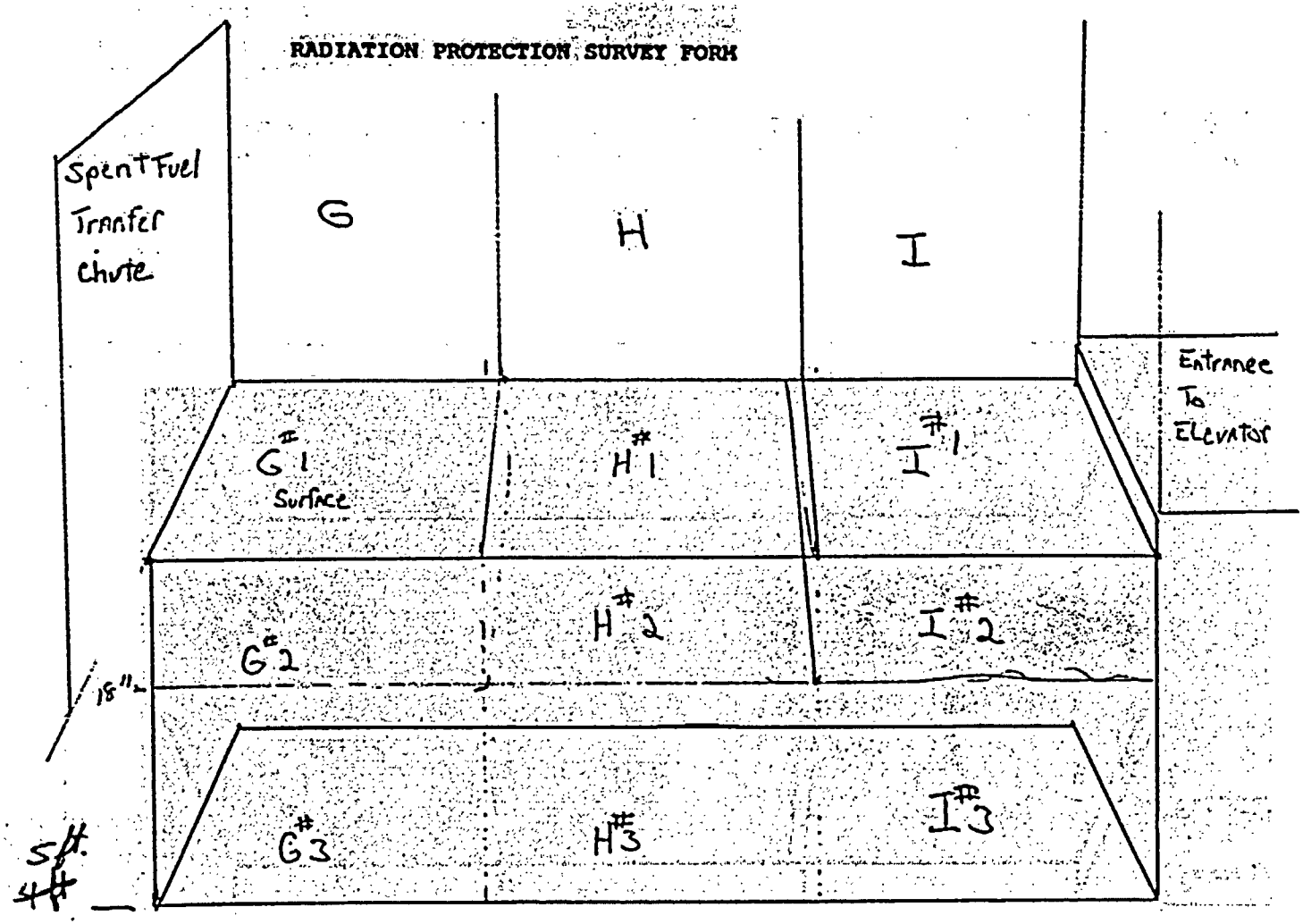
1	11	21
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

1 of 31

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM



DATE 10-20-92 TIME 1400

SURVEYOR R. Shippee/

INSTRUMENT HPGE (RP) ~~NAI~~ # ~~PA~~ ~~NA~~

CALIBRATION DUE DATE ~~NA~~ 1/94 ~~PA~~

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- ~~* *~~ BARRIER ⊢⌒⊣ MASSLINN
- ( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.
- ( ) CONTAMINATION LESS THAN 1000 dpm/100 cm^2 BETA-GAMMA AND LESS THAN 50 dpm/100 cm^2 ALPHA UNLESS OTHERWISE NOTED.
- ( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm^2

1	11	21
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: Soil samples / Site characterization

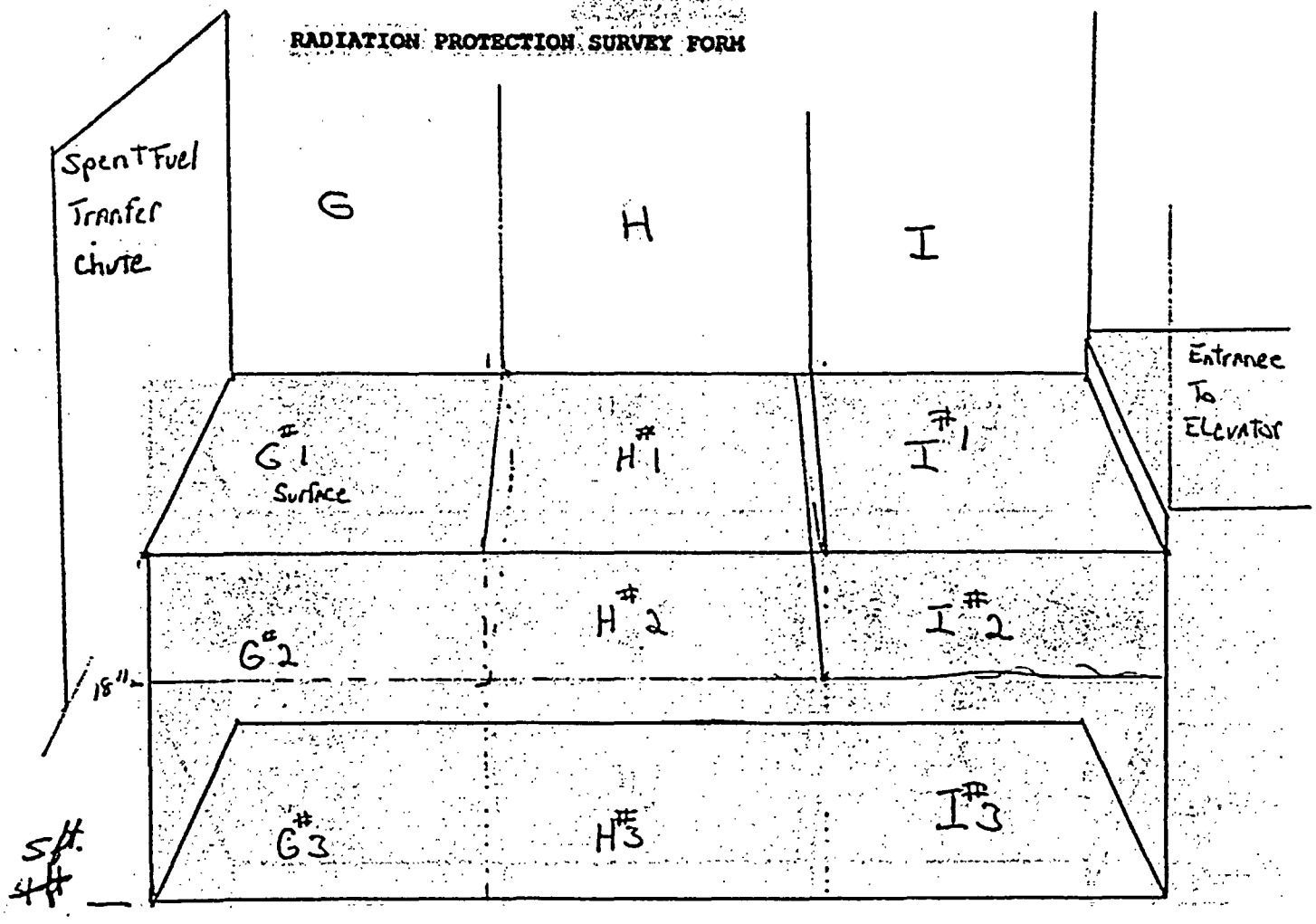
SPECIAL SURVEY FORM LOCATION or EQUIPMENT West wall of S.F.P. excavation for Blast Wall

8101.6 REV.18
IMS # V02.09.03
RT # 10.S11. 373

170

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM



DATE 10-20-92 TIME 1400

SURVEYOR R. Shippee/

INSTRUMENT HPGE (RP) ~~Lab~~ # ~~[illegible]~~

CALIBRATION DUE DATE ~~[illegible]~~ 1/94 ~~[illegible]~~

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SHEAR LOCATION
- ~~X X~~ BARRIER ⊢⌒⊣ MASSLINN
- ( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.
- ( ) CONTAMINATION LESS THAN 1000 dpm/100 cm² BETA-GAMMA AND LESS THAN 50 dpm/100 cm² ALPHA UNLESS OTHERWISE NOTED.
- ( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: Soil samples / Site characterization

SPECIAL SURVEY FORM LOCATION or EQUIPMENT West wall of S.F.P. excavation for Blast Wall

8101.6 REV.18
IMS # V02.09.03
RT # 10.S11. 373

170

115 904

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

4 ~~3~~ samples per Letter, AT Locations Shown

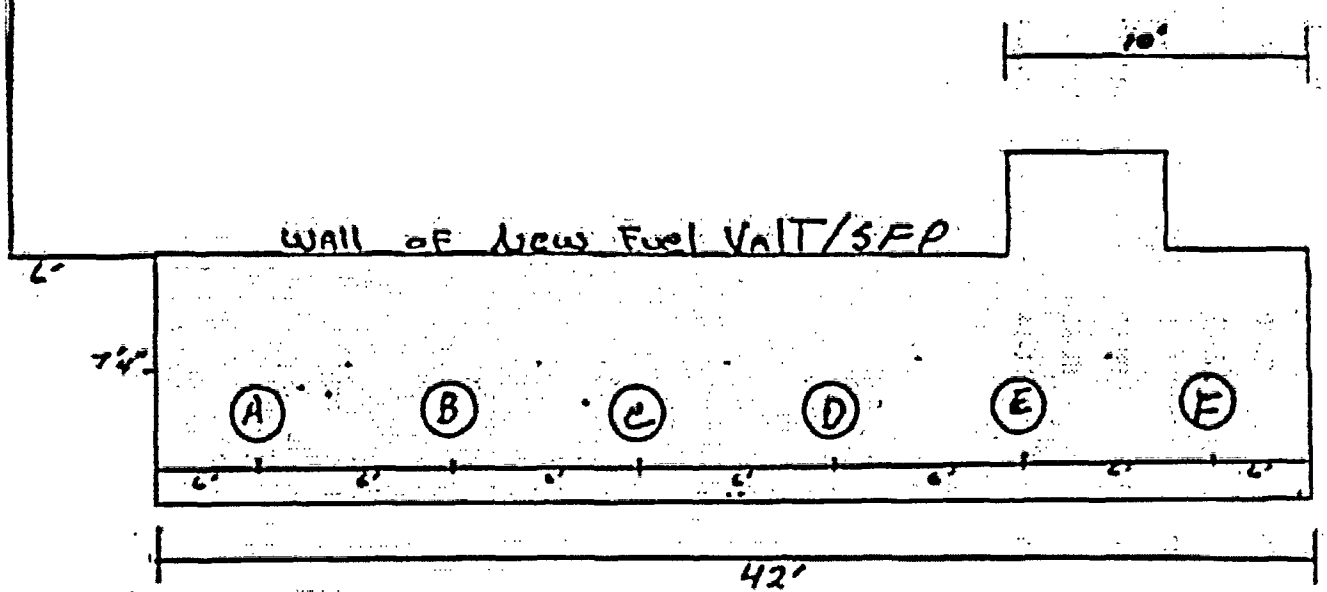
#1 Top Soil

#2 - 18" Down

#3 - 36" Down

#4 - 48" DOWN (at bottom of trench)

Edge of New Fuel Vault Door



SPECIAL SURVEY FORM LOCATION OF EQUIPMENT: Dirt Sample Locations in Front of NFV/SFP

8101.6 REV.18
INS # V02.09.03
RT # 10.811. 373

Started at 9-28-92 LWP

DATE 9-28-92 TIME 1330

SURVEYOR Pruitt/D. Hayes

INSTRUMENT HPGE # (RP)

CALIBRATION DUE DATE 1/94

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- -x-x- BARRIER |—| MASSLINE

( ) DIRECT RADIATION
READINGS IN MR/HR EXCEPT AS NOTED.

(✓) CONTAMINATION
LESS THAN 1000 dpm/100 cm² BETA-GAMMA AND LESS THAN 50 dpm/100 cm² ALPHA UNLESS OTHERWISE NOTED.

( ) HOT PARTICLE SURVEY
NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

1 of 3

Table 1
Sum of Fractions
NOL-01 -- Asphalt
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
616	IR-171	IRAS-171		0.133
546	IR-123	IRAS-123		0.143
544	IR-122	IRAS-122		0.882
542	IR-121	IRAS-121		0.061
538	IR-119	IRAS-119		0.266
502	IR-96	IRAS-96		0.173
500	IR-95	IRAS-95		0.196
498	IR-94	IRAS-94		0.307
492	IR-91	IRAS-91		0.102
490	IR-90	IRAS-90		0.017
484	IR-87	IRAS-87		0.256
482	IR-86	IRAS-86		0.489
476	IR-83	IRAS-83		0.038
474	IR-82	IRAS-82		0.047
429	IR-34	IRAS-34		0.017
			Min	0.017
			Max	0.882
			Mean	0.208

Table 2
Statistical Data Summary – NOL-01 – Asphalt
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ag-108m	pCi/g	1	14	0.094		0.094	0.094	0.094
Co-58	pCi/g	0	16	0.000				
Co-60	pCi/g	14	16	0.926	1.090	0.064	4.207	0.610
Cs-134	pCi/g	1	16	0.071		0.071	0.071	0.071
Cs-137	pCi/g	15	16	0.348	0.286	0.051	1.072	0.216

Table 3
Summary of Detected Results Above Criteria
NOL-01 -- Asphalt
Yankee Nuclear Power Station Rowe, MA
DCGL_Asphalt

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ag-108m	1	14	8.52	pCi/g	0	0.09
Co-58	0	16		pCi/g	0	
Co-60	14	16	4.84	pCi/g	0	4.21
Cs-134	1	16	6.71	pCi/g	0	0.07
Cs-137	15	16	12.24	pCi/g	0	1.07

Table 4
Rad
NOL-01 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key) Sample ID Date Sampled	IR-119 (538) IRAS-119 8/3/1994	IR-121 (542) IRAS-121 8/4/1994	IR-122 (544) IRAS-122 8/5/1994	IR-123 (546) IRAS-123 8/5/1994	IR-171 (616) IRAS-171 9/20/1994	IR-33 (427) IRAS-33 5/21/1993
Ag-108m	0.059 UM	0.059 UM	0.102 UM	0.046 UM	0.055 UM	
Co-58	0.076 UM	0.074 UM	0.151 UM	0.06 UM	0.053 UM	0.0616 UM
Co-60	1.093	0.261	4.207	0.606	0.414	0.0832 UM
Cs-134	0.061 UM	0.065 UM	0.123 UM	0.06 UM	0.079 UM	0.0616 UM
Cs-137	0.487	0.0858	0.154	0.216	0.582	0.0783 UM
SOF	0.266	0.061	0.882	0.143	0.133	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-01 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-34 (429)	IR-82 (474)	IR-83 (476)	IR-86 (482)	IR-87 (484)	IR-90 (490)	IR-91 (492)
Sample ID	IRAS-34	IRAS-82	IRAS-83	IRAS-86	IRAS-87	IRAS-90	IRAS-91
Date Sampled	5/21/1993	8/3/1994	6/21/1994	6/20/1994	6/16/1994	6/21/1994	6/20/1994
Ag-108m		0.048 UM	0.039 UM	0.078 UM	0.049 UM	0.044 UM	0.066 UM
Co-58	0.0674 UM	0.054 UM	0.041 UM	0.098 UM	0.071 UM	0.055 UM	0.083 UM
Co-60	0.0661 UM	0.166	0.129	2.126	1.124	0.0644	0.41
Cs-134	0.066 UM	0.059 UM	0.043 UM	0.091 UM	0.06 UM	0.051 UM	0.063 UM
Cs-137	0.209	0.16	0.143	0.608	0.29	0.0509	0.212
SOF	0.017	0.047	0.038	0.489	0.256	0.017	0.102

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-01 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-94 (498)	IR-95 (500)	IR-96 (502)
Sample ID	IRAS-94	IRAS-95	IRAS-96
Date Sampled	6/22/1994	6/22/1994	6/22/1994
Ag-108m	0.094 UM	0.0935	0.054 UM
Co-58	0.119 UM	0.086 UM	0.071 UM
Co-60	1.009	0.613	0.747
Cs-134	0.0708	0.059 UM	0.051 UM
Cs-137	1.072	0.714	0.231
SOF	0.307	0.196	0.173

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 1
Sum of Fractions
NOL-01 -- Sod
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
614	IR-168	IRTZ-168		0.240
612	IR-167	IRTZ-167		0.327
610	IR-166	IRTZ-166		0.608
608	IR-165	IRTZ-165		0.536
597	IR-156	IRTZ-156		0.325
			Min	0.240
			Max	0.608
			Mean	0.407

Table 2
Statistical Data Summary – NOL-01 – Sod
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ag-108m	pCi/g	1	5	0.584		0.584	0.584	0.584
Co-58	pCi/g	0	5	0.000				
Co-60	pCi/g	5	5	1.461	0.517	0.770	2.128	1.574
Cs-134	pCi/g	0	5	0.000				
Cs-137	pCi/g	4	5	1.403	0.492	0.984	2.058	1.286

Table 3
Summary of Detected Results Above Criteria
NOL-01 -- Sod
Yankee Nuclear Power Station Rowe, MA
DCGL_Sod

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ag-108m	1	5	8.52	pCi/g	0	0.58
Co-58	0	5		pCi/g	0	
Co-60	5	5	4.84	pCi/g	0	2.13
Cs-134	0	5	6.71	pCi/g	0	
Cs-137	4	5	12.24	pCi/g	0	2.06

Table 4
Rad
NOL-01 -- Sod (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key) Sample ID Date Sampled	IR-156 (597) IRTZ-156 9/14/1994	IR-165 (608) IRTZ-165 9/20/1994	IR-166 (610) IRTZ-166 9/20/1994	IR-167 (612) IRTZ-167 9/20/1994	IR-168 (614) IRTZ-168 9/20/1994
Ag-108m	0.108 UM	0.584	0.115 UM	0.088 UM	0.079 UM
Co-58	0.131 UM	0.096 UM	0.147 UM	0.106 UM	0.081 UM
Co-60	1.574	1.669	2.128	1.162	0.77
Cs-134	0.095 UM	0.088 UM	0.144 UM	0.082 UM	0.085 UM
Cs-137	1.399 U	1.503	2.058	1.068	0.984
SOF	0.325	0.536	0.608	0.327	0.24

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 1
Sum of Fractions
NOL-01 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID	Sum Of Fractions
610	IR-166	IRTS-166	0.513
482	IR-86	IRTS-86	0.151
484	IR-87	IRTS-87	0.101
492	IR-91	IRTS-91	0.035
498	IR-94	IRTS-94	0.110
500	IR-95	IRTS-95	0.087
502	IR-96	IRTS-96	0.367
538	IR-119	IRTS-119	0.080
542	IR-121	IRTS-121	0.037
544	IR-122	IRTS-122	0.206
546	IR-123	IRTS-123	0.094
597	IR-156	IRTS-156	0.320
474	IR-82	IRTS-82	0.004
608	IR-165	IRTS-165	0.394
3299	TS98.44	TS98.44C	0.012
612	IR-167	IRTS-167	0.456
614	IR-168	IRTS-168	0.294
616	IR-171	IRTS-171A	0.202
616	IR-171	IRTS-171B	0.014
616	IR-171	IRTS-171C	0.007
616	IR-171	IRTS-171D	0.036
616	IR-171	IRTS-171G	0.182
3296	TS98.40	TS98.40A1	0.005
3296	TS98.40	TS98.40C2	0.013
3297	TS98.41	TS98.41A	0.017
3299	TS98.44	TS98.44A	0.004
599	IR-157	IRTS-157	0.378

Table 1
Sum of Fractions
NOL-01 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID	Sum Of Fractions	
			Min	0.004
			Max	0.513
			Mean	0.153

Table 2
Statistical Data Summary – NOL-01 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	28	28	0.884	0.115	0.672	1.101	0.872
Ag-108m	pCi/g	1	54	0.095		0.095	0.095	0.095
Ag-110m	pCi/g	0	28	0.000				
Am-241	pCi/g	0	28	0.000				
Ba-133	pCi/g	1	1	0.099		0.099	0.099	0.099
Bi-212	pCi/g	24	26	3.852	14.320	0.508	71.070	0.878
Bi-214	pCi/g	28	28	0.489	0.055	0.340	0.638	0.491
Ce-144	pCi/g	0	28	0.000				
Co-58	pCi/g	0	56	0.000				
Co-60	pCi/g	20	56	0.749	0.583	0.062	1.767	0.562
Cs-134	pCi/g	2	56	0.128	0.063	0.083	0.173	0.128
Cs-136	pCi/g	2	2	0.371	0.081	0.314	0.429	0.371
Cs-137	pCi/g	22	56	0.526	0.576	0.050	1.803	0.211
Eu-152	pCi/g	1	1	0.205		0.205	0.205	0.205
Fe-59	pCi/g	2	28	0.089	0.011	0.082	0.097	0.089
I-132	pCi/g	1	3	3.474		3.474	3.474	3.474
K-40	pCi/g	28	28	16.015	1.198	13.400	18.830	15.910
Kr-85	pCi/g	0	1	0.000				
La-140	pCi/g	0	1	0.000				
Mn-54	pCi/g	0	28	0.000				
Nb-95	pCi/g	1	28	0.033		0.033	0.033	0.033
Np-239	pCi/g	0	6	0.000				
Pb-212	pCi/g	28	28	0.854	0.106	0.618	1.061	0.860
Pb-214	pCi/g	28	28	0.534	0.068	0.373	0.682	0.528
Ra-226	pCi/g	20	22	1.408	0.472	0.825	2.376	1.223
Ru-103	pCi/g	0	28	0.000				
Ru-106	pCi/g	2	28	0.299	0.011	0.291	0.307	0.299
Sb-124	pCi/g	1	28	0.061		0.061	0.061	0.061
Sb-125	pCi/g	0	3	0.000				
Tl-202	pCi/g	1	1	0.028		0.028	0.028	0.028
Tl-208	pCi/g	28	28	0.831	0.098	0.657	1.034	0.817
Zn-65	pCi/g	0	28	0.000				
Zr-95	pCi/g	3	28	0.069	0.010	0.057	0.076	0.074

Table 3
Summary of Detected Results Above Criteria
NOL-01 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	28	28		pCi/g	0	1.10
Ag-108m	1	54	8.52	pCi/g	0	0.09
Ag-110m	0	28		pCi/g	0	
Am-241	0	28	44.35	pCi/g	0	
Ba-133	1	1		pCi/g	0	0.10
Bi-212	24	26		pCi/g	0	71.07
Bi-214	28	28		pCi/g	0	0.64
Ce-144	0	28		pCi/g	0	
Co-58	0	56		pCi/g	0	
Co-60	20	56	4.84	pCi/g	0	1.77
Cs-134	2	56	6.71	pCi/g	0	0.17
Cs-136	2	2		pCi/g	0	0.43
Cs-137	22	56	12.24	pCi/g	0	1.80
Eu-152	1	1	12.06	pCi/g	0	0.20
Fe-59	2	28		pCi/g	0	0.10
I-132	1	3		pCi/g	0	3.47
K-40	28	28		pCi/g	0	18.83
Kr-85	0	1		pCi/g	0	
La-140	0	1		pCi/g	0	
Mn-54	0	28	21.66	pCi/g	0	
Nb-95	1	28		pCi/g	0	0.03
Np-239	0	6		pCi/g	0	
Pb-212	28	28		pCi/g	0	1.06
Pb-214	28	28		pCi/g	0	0.68
Ra-226	20	22		pCi/g	0	2.38
Ru-103	0	28		pCi/g	0	
Ru-106	2	28	68.21	pCi/g	0	0.31
Sb-124	1	28		pCi/g	0	0.06
Sb-125	0	3	37.73	pCi/g	0	
Tl-202	1	1		pCi/g	0	0.03
Tl-208	28	28		pCi/g	0	1.03
Zn-65	0	28		pCi/g	0	
Zr-95	3	28		pCi/g	0	0.08

Table 4
Rad
NOL-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-119 (538)	IR-121 (542)	IR-122 (544)	IR-123 (546)	IR-156 (597)	IR-157 (599)
Sample ID	IRTS-119	IRTS-121	IRTS-122	IRTS-123	IRTS-156	IRTS-157
Date Sampled	8/3/1994	8/4/1994	8/5/1994	8/5/1994	9/14/1994	9/13/1994
Ac-228						
Ag-108m	0.06 UM	0.059 UM	0.052 UM	0.056 UM	0.066 UM	0.08 UM
Ag-110m						
Am-241						
Ba-133						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.075 UM	0.065 UM	0.068 UM	0.073 UM	0.077 UM	0.085 UM
Co-60	0.307	0.14	0.91	0.406	1.043	1.385
Cs-134	0.062 UM	0.056 UM	0.052 UM	0.07 UM	0.061 UM	0.082 UM
Cs-136						
Cs-137	0.207	0.0962	0.214	0.126	1.282	1.117
Eu-152						
Fe-59						
I-132						
K-40						
Kr-85						
La-140						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Tl-202						
Tl-208						
Zn-65						
Zr-95						
SOF	0.08	0.037	0.206	0.094	0.32	0.378

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-165 (608)	IR-166 (610)	IR-167 (612)	IR-168 (614)	IR-171 (616)	IR-171 (616)
Sample ID	IRTS-165	IRTS-166	IRTS-167	IRTS-168	IRTS-171A	IRTS-171B
Date Sampled	9/19/1994	9/19/1994	9/19/1994	9/19/1994	9/20/1994	9/19/1994
Ac-228						
Ag-108m	0.094 UM	0.087 UM	0.081 UM	0.067 UM	0.067 UM	0.044 UM
Ag-110m						
Am-241						
Ba-133						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.103 UM	0.103 UM	0.105 UM	0.076 UM	0.066 UM	0.062 UM
Co-60	1.433	1.767	1.636	1.102	0.264	0.0993 UM
Cs-134	0.101 UM	0.097 UM	0.07 UM	0.064 UM	0.173	0.06 UM
Cs-136						
Cs-137	1.191	1.803	1.448	0.815	1.486	0.173
Eu-152						
Fe-59						
I-132						
K-40						
Kr-85						
La-140						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Tl-202						
Tl-208						
Zn-65						
Zr-95						
SOF	0.394	0.513	0.456	0.294	0.202	0.014

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-171 (616)	IR-171 (616)	IR-171 (616)	IR-171 (616)	IR-171 (616)	IR-33 (427)
Sample ID	IRTS-171C	IRTS-171D	IRTS-171E	IRTS-171F	IRTS-171G	IRTS-33
Date Sampled	9/19/1994	9/19/1994	9/19/1994	9/19/1994	9/19/1994	5/21/1993
Ac-228						
Ag-108m	0.051 UM	0.052 UM	0.051 UM	0.042 UM	0.053 UM	
Ag-110m						
Am-241						
Ba-133						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.068 UM	0.057 UM	0.064 UM	0.055 UM	0.078 UM	0.0998 UM
Co-60	0.093 UM	0.139	0.104 UM	0.0979 UM	0.781	0.11 UM
Cs-134	0.057 UM	0.058 UM	0.061 UM	0.045 UM	0.056 UM	0.08 UM
Cs-136						
Cs-137	0.0844	0.0874	0.0887 UM	0.0808 UM	0.251	0.116 UM
Eu-152						
Fe-59						
I-132						
K-40						
Kr-85						
La-140						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Tl-202						
Tl-208						
Zn-65						
Zr-95						
SOF	0.007	0.036			0.182	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-34 (429)	IR-82 (474)	IR-83 (476)	IR-86 (482)	IR-87 (484)	IR-90 (490)	IR-91 (492)
Sample ID	IRTS-34	IRTS-82	IRTS-83	IRTS-86	IRTS-87	IRTS-90	IRTS-91
Date Sampled	5/21/1993	8/3/1994	6/21/1994	6/20/1994	6/20/1994	6/21/1994	6/21/1994
Ac-228							
Ag-108m		0.042 UM	0.046 UM	0.055 UM	0.057 UM	0.045 UM	0.05 UM
Ag-110m							
Am-241							
Ba-133							
Bi-212							
Bi-214							
Ce-144							
Co-58	0.0731 UM	0.057 UM	0.047 UM	0.073 UM	0.07 UM	0.056 UM	0.059 UM
Co-60	0.0925 UM	0.0823 UM	0.0847 UM	0.671	0.452	0.0715 UM	0.139
Cs-134	0.078 UM	0.048 UM	0.042 UM	0.051 UM	0.058 UM	0.056 UM	0.063 UM
Cs-136							
Cs-137	0.0923 UM	0.0496	0.0796 UM	0.145	0.0882	0.0644 UM	0.074
Eu-152							
Fe-59							
I-132							
K-40							
Kr-85							
La-140							
Mn-54							
Nb-95							
Np-239							
Pb-212							
Pb-214							
Ra-226							
Ru-103							
Ru-106							
Sb-124							
Sb-125							
Tl-202							
Tl-208							
Zn-65							
Zr-95							
SOF		0.004		0.151	0.101		0.035

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-94 (498)	IR-95 (500)	IR-96 (502)	TS472 (3205)	TS98.40 (3296)	TS98.40 (3296)
Sample ID	IRTS-94	IRTS-95	IRTS-96	TS472	TS98.40A1	TS98.40A2
Date Sampled	6/22/1994	6/22/1994	6/22/1994	12/3/1997	9/23/1998	10/19/1998
Ac-228				0.721	0.9395	0.963
Ag-108m	0.058 UM	0.0947	0.067 UM	-0.00648 U	0.00908 U	0.0001211 U
Ag-110m				0.001725 U	-0.01438 U	0.02249 U
Am-241				0 U	0 U	0 U
Ba-133						
Bi-212				0.702	1.035	0.8633
Bi-214				0.3395	0.501	0.4339
Ce-144				0.06006 U	0.05825 U	-0.14 U
Co-58	0.066 UM	0.068 UM	0.108 UM	-0.003033 U	0.002702 U	0.0009844 U
Co-60	0.366	0.272	1.71	0.02413 U	0.02568 U	-0.03566 U
Cs-134	0.068 UM	0.071 UM	0.084 UM	0.011 U	-0.01308 U	-0.06835 U
Cs-136						
Cs-137	0.424	0.235	0.169	0.0172 U	0.01872 U	-0.003179 U
Eu-152						
Fe-59				-0.01318 U	-0.01206 U	0.007409 U
I-132						
K-40				13.4	15.81	14.19
Kr-85						
La-140						
Mn-54				0.02013 U	0.004357 U	-0.01645 U
Nb-95				-0.01167 U	-0.005434 U	0.01189 U
Np-239						
Pb-212				0.6183	0.8762	0.7126
Pb-214				0.3731	0.5306	0.5718
Ra-226					1.012	2.342
Ru-103				-0.02372 U	0.001472 U	-0.01444 U
Ru-106				-0.07138 U	0.3071	0.08159 U
Sb-124				-0.006514 U	-0.03483 U	0.001456 U
Sb-125						
Tl-202						
Tl-208				0.7807	0.7291	0.8947
Zn-65				-0.01583 U	-0.06357 U	0.02948 U
Zr-95				-0.001246 U	0.0007287 U	0.0382 U
SOF	0.11	0.087	0.367		0.005	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS98.40 (3296)	TS98.40 (3296)	TS98.40 (3296)	TS98.40 (3296)	TS98.41 (3297)
Sample ID	TS98.40B1	TS98.40B2	TS98.40C1	TS98.40C2	TS98.41A
Date Sampled	10/19/1998	9/24/1998	9/24/1998	10/19/1998	10/19/1998
Ac-228	0.7676	0.8659	0.8503	0.8716	1.071
Ag-108m	-0.009762 U	-0.000478 U	0.01516 U	0.002618 U	-0.0154 U
Ag-110m	-0.03039 U	-0.01454 U	-0.003353 U	-0.02348 U	-0.004248 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Bi-212		1.247	0.6988	1.483	1.08
Bi-214	0.4751	0.4614	0.4923	0.4439	0.5523
Ce-144	-0.1054 U	-0.09982 U	-0.1494 U	-0.1231 U	0.006552 U
Co-58	-0.01436 U	-0.01611 U	-0.02231 U	0.006261 U	-0.02373 U
Co-60	0.0146 U	0.01206 U	-0.01993 U	0.06166	-0.02587 U
Cs-134	-0.03114 U	-0.01059 U	0.001528 U	-0.00779 U	-0.001976 U
Cs-136					0.4286
Cs-137	0.01763 U	0.01943 U	0.03576 U	0.01251 U	0.002551 U
Eu-152					0.2048
Fe-59	-0.03437 U	-0.0334 U	0 U	0.03335 U	0 U
I-132	3.474				
K-40	15.59	15.48	18.83	18.12	15.94
Kr-85					
La-140				0.1341 U	
Mn-54	0 U	0.01689 U	0.01566 U	-0.004656 U	0.0197 U
Nb-95	-0.02383 U	-0.0007088 U	-0.005904 U	0.03069 U	0.02001 U
Np-239			-0.3852 U		
Pb-212	0.8972	0.9467	0.8996	0.718	0.9729
Pb-214	0.4265	0.5451	0.5248	0.5424	0.5032
Ra-226	1.078	2.376		1.473	1.419
Ru-103	0.01284 U	-0.003095 U	-0.01489 U	0.007314 U	0.01064 U
Ru-106	0.02088 U	0.04601 U	0.1825 U	-0.06224 U	-0.01269 U
Sb-124	0.01789 U	0.03164 U	-0.01711 U	0.01556 U	-0.02378 U
Sb-125					
Tl-202					
Tl-208	0.8009	0.9013	1.034	0.8201	0.9981
Zn-65	0.009185 U	-0.01714 U	-0.1431 U	0.03059 U	-0.1283 U
Zr-95	0.01227 U	0.05688 U	0.03398 U	0.003146 U	0.04789 U
SOF				0.013	0.017

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS98.41 (3297)	TS98.41 (3297)	TS98.42 (3298)	TS98.42 (3298)	TS98.42 (3298)
Sample ID	TS98.41B	TS98.41C	TS98.42A	TS98.42B	TS98.42C
Date Sampled	10/19/1998	10/19/1998	10/19/1998	10/19/1998	10/19/1998
Ac-228	0.9838	1.038	1.101	0.8982	0.979
Ag-108m	-0.01397 U	0.0159 U	-0.0006857 U	0.007278 U	-0.002312 U
Ag-110m	-0.01267 U	-0.02681 U	-0.01243 U	0.006808 U	-0.02417 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Bi-212	1.087	0.5199 U	0.6968	0.6865	1.063
Bi-214	0.4997	0.4885	0.572	0.4916	0.6376
Ce-144	-0.1935 U	0.1363 U	-0.1598 U	0.1789 U	-0.1053 U
Co-58	0.006342 U	-0.04463 U	-0.01668 U	-0.004069 U	-0.00992 U
Co-60	0.03393 U	0.01774 U	-0.02026 U	0.003679 U	0.003639 U
Cs-134	-0.06491 U	-0.1408 U	-0.07234 U	-0.003722 U	-0.003494 U
Cs-136					
Cs-137	-0.03537 U	-0.009763 U	0.008625 U	-0.01523 U	-0.01507 U
Eu-152					
Fe-59	-0.06756 U	-0.05619 U	0.03122 U	-0.02824 U	-0.04457 U
I-132					
K-40	17.68	16.87	15.47	16.05	16.93
Kr-85	1.41 U				
La-140					
Mn-54	0.01479 U	0.01311 U	0.0002528 U	-0.001806 U	0.02449 U
Nb-95	-0.01109 U	0.00254 U	-0.004889 U	0.02019 U	-0.04104 U
Np-239		0.16 U		0.3736 U	
Pb-212	0.8727	0.97	0.9571	0.8577	0.8362
Pb-214	0.5912	0.5755	0.5076	0.6006	0.6308
Ra-226	1.356	1.083	1.836	1.958	1.02
Ru-103	-0.001343 U	-0.009973 U	-0.003845 U	0.02613 U	0.01041 U
Ru-106	0.1067 U	0.00000003998 U	-0.198 U	0.08419 U	0.06245 U
Sb-124	0.01313 U	-0.01909 U	0 U	0.01016 U	-0.004456 U
Sb-125					
Tl-202					
Tl-208	0.884	0.853	0.8606	1.019	0.796
Zn-65	0.07003 U	0.09133 U	0.07566 U	-0.01496 U	-0.05309 U
Zr-95	-0.00779 U	-0.03023 U	0.004247 U	0.07637	-0.0004284 U
SOF					

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS98.44 (3299)	TS98.44 (3299)	TS98.44 (3299)	TS98.46 (3300)	TS98.46 (3300)
Sample ID	TS98.44A	TS98.44B	TS98.44C	TS98.46A	TS98.46B
Date Sampled	10/28/1998	10/28/1998	10/28/1998	10/29/1998	10/29/1998
Ac-228	0.7808	1.053	1.047	0.8821	0.8717
Ag-108m	-0.0108 U	0.01873 U	-0.01813 U	0.01876 U	-0.01011 U
Ag-110m	-0.02058 U	0.0009937 U	-0.003316 U	-0.02674 U	-0.03308 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Bi-212		1.518	1.218	1.347	0.7099
Bi-214	0.544	0.5109	0.5343	0.4894	0.4413
Ce-144	0.145 U	-0.09577 U	0.008989 U	-0.04885 U	0.006282 U
Co-58	0.01226 U	0.02159 U	0.001633 U	-0.02373 U	0.0208 U
Co-60	-0.009308 U	0.03063 U	0.03556 U	0.004309 U	-0.0005841 U
Cs-134	-0.02409 U	-0.07826 U	0.0834	0.04146 U	-0.06826 U
Cs-136					
Cs-137	-0.0278 U	-0.02175 U	0.008167 U	0.009548 U	-0.008465 U
Eu-152					
Fe-59	0.008865 U	0.04774 U	0.007305 U	0.02182 U	-0.05217 U
I-132					
K-40	16.23	17.86	17.13	15.86	16.24
Kr-85					
La-140					
Mn-54	0.01246 U	0.006077 U	-0.01903 U	-0.03 U	0.01367 U
Nb-95	0.03779 U	0.02878 U	0.0003195 U	0.009946 U	0.01309 U
Np-239				0.09877 U	
Pb-212	0.7529	1.046	1.061	0.8626	0.8365
Pb-214	0.5706	0.636	0.6823	0.5641	0.6078
Ra-226	1.223		1.513		
Ru-103	-0.002944 U	0.00929 U	0.01428 U	-0.009724 U	-0.007615 U
Ru-106	0.2909	-0.2479 U	-0.09024 U	0.02006 U	0.03243 U
Sb-124	-0.06648 U	-0.05485 U	0.01086 U	-0.009669 U	-0.03148 U
Sb-125	-0.1094 U				-0.1249 U
Tl-202					
Tl-208	0.9081	0.7988	0.8145	0.7596	0.6566
Zn-65	0.01627 U	-0.03321 U	-0.1181 U	-0.01835 U	0.02947 U
Zr-95	0.005578 U	-0.001854 U	-0.001392 U	0.07354	0.05636 U
SOF	0.004		0.012		

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

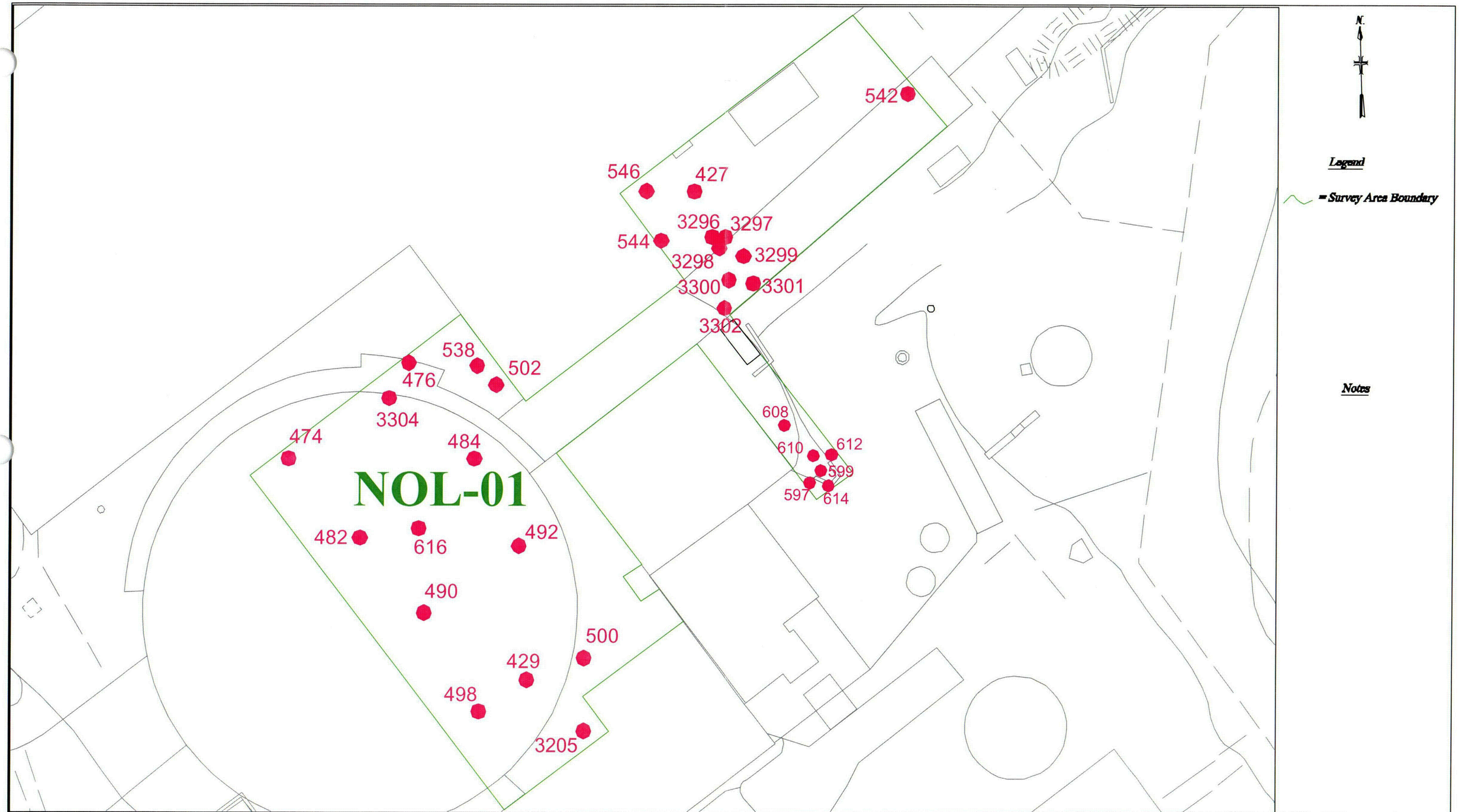
Station (Key)	TS98.46 (3300)	TS98.47 (3301)	TS98.47 (3301)	TS98.47 (3301)	TS98.48 (3302)
Sample ID	TS98.46C	TS98.47A	TS98.47B	TS98.47C	TS98.48A
Date Sampled	10/29/1998	10/29/1998	10/29/1998	10/29/1998	10/29/1998
Ac-228	0.6773	0.8456	0.8291	0.8897	0.8303
Ag-108m	0.006679 U	-0.01487 U	0.008698 U	-0.002827 U	0.003784 U
Ag-110m	0.004573 U	-0.00474 U	0.005182 U	-0.02356 U	0.02375 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Bi-212	0.5795	71.07	1.016 U	0.8236	0.8926
Bi-214	0.4574	0.443	0.4917	0.5206	0.5465
Ce-144	0.03856 U	0.02944 U	0.1209 U	-0.06345 U	0.05218 U
Co-58	-0.01352 U	-0.009243 U	-0.01676 U	0.003409 U	-0.03469 U
Co-60	0.01405 U	0.003523 U	0.01527 U	0.003795 U	0.03011 U
Cs-134	0.009103 U	-0.109 U	-0.00085 U	-0.1581 U	0.07228 U
Cs-136					
Cs-137	0.01501 U	0.001296 U	0.03189 U	-0.007857 U	0.01245 U
Eu-152					
Fe-59	-0.0278 U	-0.007621 U	-0.02361 U	0.0815	-0.02875 U
I-132					
K-40	15.3	14.76	15.25	16.17	14.87
Kr-85					
La-140					
Mn-54	0.0005084 U	0.01062 U	0.01926 U	0.01703 U	0.01786 U
Nb-95	0.008378 U	0.03346	0.01834 U	-0.007413 U	0.02624 U
Np-239		0.09786 U			
Pb-212	0.7892	0.7675	0.8512	0.96	0.9221
Pb-214	0.4865	0.4685	0.5667	0.4531	0.494
Ra-226	1.018 U	1.222	0.8246	2.131	1.19
Ru-103	-0.02844 U	-0.01597 U	0.008626 U	-0.0004052 U	-0.002201 U
Ru-106	-0.06221 U	0.0736 U	0.08813 U	-0.09182 U	-0.04286 U
Sb-124	0.01593 U	0.01223 U	0.02979 U	0 U	0.02872 U
Sb-125			-0.06869 U		
Tl-202					
Tl-208	0.8316	0.7456	0.8068	0.9109	0.8062
Zn-65	-0.06048 U	0.04866 U	-0.08394 U	0.05029 U	0.06648 U
Zr-95	-0.001282 U	0.02979 U	0.02178 U	0.05727	0.03784 U
SOF					

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS98.48 (3302)	TS98.48 (3302)	TS98.53 (3304)	TS98.53 (3304)	TS98.53 (3304)
Sample ID	TS98.48B	TS98.48C	TS98.53A	TS98.53B	TS98.53C
Date Sampled	10/29/1998	10/29/1998	11/17/1998	11/17/1998	11/17/1998
Ac-228	0.778	0.9181	0.6722	0.8107	0.8157
Ag-108m	-0.01606 U	-0.002769 U	-0.01788 U	0.01183 U	0.002678 U
Ag-110m	0.01276 U	0.02629 U	-0.0138 U	-0.03094 U	-0.004809 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133	0.09859				
Bi-212	0.9013	0.5084	0.6024	0.7635	0.8597
Bi-214	0.442	0.447	0.4659	0.4969	0.4773
Ce-144	-0.1106 U	0.06173 U	-0.0281 U	0.1299 U	-0.05299 U
Co-58	0.01413 U	-0.0114 U	-0.03401 U	-0.008193 U	-0.009119 U
Co-60	0.007401 U	0.003583 U	-0.02392 U	-0.01396 U	0.003219 U
Cs-134	-0.07394 U	-0.04187 U	0.02246 U	-0.0001598 U	-0.03264 U
Cs-136		0.314			
Cs-137	0 U	0.02225 U	0.007726 U	0 U	-0.02221 U
Eu-152					
Fe-59	0.09657	0.02914 U	-0.02516 U	-0.04813 U	-0.04444 U
I-132	2.892 U				9.704 U
K-40	15.88	16.1	16.38	15.29	14.75
Kr-85					
La-140					
Mn-54	0.008046 U	0.02161 U	-0.02061 U	-0.0002447 U	0.01851 U
Nb-95	-0.002201 U	-0.01351 U	-0.003386 U	0.02555 U	0.01625 U
Np-239					-0.4194 U
Pb-212	0.8748	0.8372	0.7575	0.7254	0.7357
Pb-214	0.5158	0.4674	0.515	0.5142	0.473
Ra-226	1.094	0.8743 U	0.9595	1.056	
Ru-103	-0.02389 U	-0.004598 U	-0.009937 U	0.003536 U	-0.008619 U
Ru-106	-0.1694 U	-0.0979 U	-0.03911 U	-0.3393 U	0.2105 U
Sb-124	0.01112 U	-0.0121 U	0.06065	0.009622 U	0.007895 U
Sb-125					
Tl-202			0.02776		
Tl-208	0.83	0.9296	0.6826	0.7524	0.6605
Zn-65	-0.1171 U	0.04479 U	0.00805 U	0.008021 U	-0.02807 U
Zr-95	0.03666 U	-0.01142 U	0.008718 U	0.02549 U	0.04385 U
SOF					

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed



	Yankee Atomic Power Company *Soil Sample Locations - NOL-01*	YANKEE	*Date: October 2003* *Revision: 4*	*Figure: 17*

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Historical Site Assessment and Classification Summary

Survey Area Name: Northeast Upper RCA Yard Designator: NOL-02

Survey Area Description

Survey area NOL-02 consists of land area within the RCA and contains about 1990 square meters of surface area. The surface of NOL-02 consists of asphalt, asphalt over concrete, soil, trap rock and rip-rap.

Survey area NOL-02 is bounded by AUX-01, NSY-02, SFP-02 and NOL-01 on the north, OOL-11 on the east, NOL-03 and NSY-07 on the south and WST-03, and NOL-05 on the west.

Surface items of note located within and to be evaluated as part of NOL-02 include:

- Berm around the Fuel Oil Storage Tank.
- Asphalt over concrete walk way next to the IX Pit
- Temporary waste evaporator and liquid waste storage tank locations
- Temporary test tanks locations
- The southeast most support for the yard area crane.
- Fuel Oil Transfer House.

Other items located within NOL-02, which will be evaluated separately from survey area NOL-02, include:

- TK-39 base. (NSY-13).
- The support structures for the waste gas surge drum, within the shield walls of the tank farm area. (NSY-07).

Sub-surface systems that traverse or connect within NOL-02 include:

- The east storm drain system
- The fuel oil supply to the auxiliary boilers
- Fire Protection System Water
- Construction power, supply and distribution
- Electrical grounding cables.
- Radioactive drain lines and transfer lines
- Abandoned street light cables.
- Security lighting conduits

Survey Area Name: Northeast Upper RCA Yard Designator: NOL-02

Survey Area History

Portions of survey area NOL-02 were posted and controlled as an RCA, from the beginning of plant operations. (Ref 1) the early bounds of the RCA were established based on a common history of the travel of personnel and material within the upper portion (elevation 1035') of the RCA. The RCA was expanded over time to accommodate the need for additional space in the RCA and when appropriate based upon identified contamination. NOL-02 provides access to the SFP, IX Pit, PAB and Waste Disposal Building. The area potentially impacted by migration of contamination resulting from typical personnel and material travel into and out of the upper level RCA is captured within the bounds of survey area NOL-02 footprint.

Contamination of survey area NOL-02 resulted from transport and storage of contaminated material and equipment and personnel foot traffic. Typical transport of contaminated material and equipment occurred from the PAB and SFP to the waste disposal building.

Significant operational events and activities that led to or describe contamination of survey area NOL-02 include:

- AOR-61-15, Radioactive Spill, chemistry sample container breakage (Ref 2)
- AOR 63-12, Shield Tank Cavity Shield Water Spill. (Ref 3)
- AOR 64-13, Leakage from the Ion Exchange Pit. (Ref 4)
- PIR 75-07, Yard Area Contamination. (Ref 5)
- PIR-77-16, Radioactive Liquid Transfer Line Puncture. (Ref 6)
- PIR 80-09, Resin Spill. (Ref 7)
- Test tank, sample collection practices. (Ref 8)

Translocation Pathways

Modes and vectors of contamination transmigration from other survey areas include:

- Contaminated material transport within the NOL-02 typically involved moving contaminated equipment and tools from a contaminated work areas in the waste disposal building back to the hot side machine shop or the decon room. It also involved collection and transfer of radioactive waste material to the waste disposal building. In instances where contaminated radioactive material was not properly packaged for transport, spread of contamination during transport was likely to occur. NOL-2 was also the preferred travel path for waste transfer from the VC to waste disposal.
- Temporary storage locations for packaged contaminated radioactive material were set-up in NOL-02. In instances where this material was improperly packaged, deposition of contamination within the storage location was likely to occur. The primary material storage location in NOL-02 was within the shield walls of the waste gas surge drum, area in the tank farm.

- Personnel involved in the above-described activities were also likely to cause spread of contamination.
- Once contamination had been deposited on the surface of the RCA personnel foot traffic was likely to further spread the contamination. This resulted in low-levels of radioactivity distributed generally within the RCA.
- Snow removal was necessary within the RCA in order to facilitate access to all areas. Snow removal likely moved contamination present on the surface of the RCA to the locations where snow was deposited. When these locations would not accept additional snow, the snow was loaded on to trucks and driven to remote storage locations. As the snow melted, the snow storage locations are likely to have a higher concentration of the radioactivity present due to deposition of additional radioactivity. Deposited snow locations in NOL-02 were the northeast corner toward the fuel oil storage tank berm and on to the rip-rap covered slope to the north toward the railroad tracks (NOL-01).
- Surface water run-off resulting from rain and snowmelt is likely to have transported surface contamination into storm drains and/or into in low areas where it would collect. Surface water collection locations in NOL-02 are under the south end of the yard area crane (asphalt), the slope to the north (rip-rap), the northeast corner toward the fuel oil storage tank (soil) and the area around TK-#39 and the former location of the test tanks (trap rock).
- Transfer of spent resin and preparation of shipping casks were performed in the area under the yard area crane and adjacent to the IX Pit. These evolutions are known contributors of radioactive contamination to the surface of NOL-02.
- For a period of time test tank sample collection practices resulted in spillage of an unknown volume of test tank liquid. The spillage entered the soil under the trap rock around the test tanks. The spillage resulted from purging of the sample line in order to collect a representative sample of the test tank liquid for analysis prior to its release via the monitored release pathway. A change was made to the sample collection process that eliminated the occurrence of such spillage.

Modifications performed at the YNPS site during years of operation that changed the configuration of NOL-02 include:

- Paving of previously unpaved areas within the bounds of survey area NOL-02. (Ref 9)
- Installation of the permanent RCA perimeter fence. (Ref 9)
- Installation of security lighting and fence line cameras. (Ref 10)
- Changes and repairs made to the Fire Protection Water System. (Ref 11)

Modifications performed at the YNPS site in support of decommissioning that changed the configuration of NOL-02 include:

- Installation of the decommissioning construction power supply and distribution network. (Ref 12)
- Construction of the SFP island power supply and distribution. (Ref 13)
- Installation of the ASWS water piping and electrical supply. (Ref 14)
- Set-up of the temporary liquid waste evaporator and temporary waste storage tank and test tanks. (Ref 15)

Additional scoping survey data was collected in support of the construction activities performed in NOL-02 in support of decommissioning. The progress of these efforts are documented via RP Memo 96-76 Protocol for Sampling of Soil and Asphalt from Excavations and DP-8120 Collection of Site Characterization and FSS Samples. During these modifications some soils excavated contained radionuclide concentrations in excess of the current DCGL's for soil and are identified as remediated. Soil excavations with radionuclide concentrations less than the current DCGL's for soil are identified as mitigation.

Scoping/Characterization

Scoping surveys were performed and the data collected used to develop the YNPS Decommissioning Plan. (Ref 16)

Decommissioning

Decommissioning Work Plans (DWP) activities performed in survey area NOL-02 included the following:

- DWP Y-01, Yard Area Contaminated Underground Piping (Ref 17)
- DWP WG-01 Waste Gas System Removal (Ref 18)
- DWP WHT-01 Waste Hold-up Tank and Test Tank Removals (Ref 19)

Survey area NOL-02 has been impacted by decommissioning activities performed on systems and structures within and adjacent to it.

Survey Area Name: Northeast Upper RCA Yard Designator: NOL-02

Findings

Survey area NOL-02 is a land area that is located within the current configuration of YNPS RCA.

Survey area NOL-02 is impacted and contains locations of leaks and spills of radioactive materials and is known to have contained radioactivity at levels greater the DCGL.

The radionuclide mix likely to be present in NOL-02 includes all radionuclides identified in the radioactive systems of the plant (Ref 20). The primary radionuclides of concern for survey area NOL-02 are Co-60, Cs-137, Ag-108m, Sr-90, Ni-63 and tritium.

Current Status

NOL-02 remains as part of the RCA and continues to be potentially impacted by personnel traffic, radioactive material transportation, radioactive waste processing and by decommissioning activities.

A soil sample location map (Figure 18) has been prepared to show the distribution of sampling locations in NOL-02. Only samples representative of soils still present are included on the map (samples of soils representative of soils removed during remediation activities are not presented). Two survey media were assessed in NOL-02, Asphalt and Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL. There are separate sets of Tables 1-4 for each survey media. All are evaluated as fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for NOL-02 is presented at the end of Table 1 for each survey medium. The results are summarized below.

Asphalt: Mean SOF is 0.199.
Maximum SOF for a single asphalt sample is 0.546 (key# 528) SE of the yard area crane
Minimum SOF for a single asphalt sample is 0.009 (key# 459) top of slope near IX Pit

Soil: Mean SOF is 0.079.
Maximum SOF for a single soil sample is 0.422 (key# 536) near test tank area
Minimum SOF for a single soil sample is 0.002 (key# 3426) NE corner of WGST cubicle

Historical Site Assessment and Classification Summary

Survey Area Name: Northeast Upper RCA Yard Designator: NOL-02

Classification Statement

Based upon the historical use and radiological conditions associated with this survey area NOL-02 is identified as a Class 1 Area.

Survey Area Name: Northeast Upper RCA Yard Designator: NOL-02

Drawings

9699 FB-2 A
9699 FB-2 C
9699 FB-2 E
9699-FC-50 B
E-1 ASWS Underground Plan

References

1.	Radiation Protection Memorandum RP-98-23, "Overview of the YNPS Historical Material Release Evaluation." Dated March 5, 1998.
2.	Abnormal Occurrence Report (AOR) 61-15, "Radioactive Spill, Chemistry Sample Container Breakage," dated September 21, 1961.
3.	AOR 63-12, "Shield Tank Cavity Shield Water Spill," dated October 1, 1963.
4.	AOR 64-13, "High Level In IX Pit Resulting In Pit Leakage Coming Up Through the Blacktop," dated October 13, 1964.
5.	Plant Information Report (PIR) 75-07, "Yard Area Contamination," dated August 12, 1975.
6.	PIR-77-16,"Radioactive Liquid Transfer Line Puncture," dated December 21, 1977.
7.	PIR 80-09, "Resin Spill," dated September 19, 1980.
8.	Test tank, sample collection practices. Gedutis
9.	Plant Alteration (PA)-84-006, "Radiation Control Area Boundary Fence Installation," dated 1984.
10.	PA-78-018, "Replacement of Plant Perimeter Fence," dated June 9, 1978.
11.	Drawing 9699 FB-2 C, Water & Fire Protection Underground Sheet #1
12.	Non-Nuclear Safety Modification (NNS) 95-004, "Construction Power Feed Installation, RCA," dated January 31, 1996.
13.	NNS 95-006, "Construction Power Feed Installation, SFP," dated February 1, 1996.
14.	Engineering Design Change Request (EDCR) 95-301 Installation of Consolidated Spent Fuel Cooling
15.	EDCR 96-303, "Temporary Liquid Waste Processing System."
16.	YNPS Decommissioning Plan, Rev. 0.0.
17.	Decommissioning Work Plan (DWP) Y-01, "Yard Area Contaminated Removals," dated July 15, 1997.
18.	DWP WG-01, "Waste Gas System," dated November 29, 1994.
19.	DWP WHT-01, "Removal of Waste Holdup Tank (TK-31) and Test Tanks (TK-34-1 & TK-34-2)," dated November 19, 1996.
20.	"Radionuclides for Building Surfaces and Soil DCGLs Determination," YA-REPT-00-001-03

Underground Systems

NOL-02				
Structure / System	Component	Description	Location	Impacted?
Storm Drains	ECB-003	blanked on top	~82' E of NE corner of FSB	
	ECB-006	depth = 89"; dia. 4' at base, 2' at cover; ladder access; 8" corr pipe 66" from top going ~65' NE to ECB-004, 4" corr pipe 64" from top going ~28' NW to FBS, 4" corr pipe 64" from top going ~58' SW to blanked drain btwn IXP and WHUT; concrete bottom; good condition	~70' N of PWST C.L.	
	ECB-007	depth = 43"; 32"x32" at base, 16"x16" at cover; no ladder access; 8" corr pipe 31" from top going ~58' NW to ECB-004; concrete bottom; good condition	on NW corner of Fuel Oil tank pad	
	ECB-008 & 009	depth = 41"; 3'x3'; no ladder access; 4" drains exit the bottom going E to ECB-010; concrete bottom; good condition	along N edge of moat	
Aux. Service Water System	ASWS electric	see NOL-01		
Abandoned Street Lighting	electric cable	from NOL-05 continuing E ~50' then curving ~N ~100' and apparently ending		
Water		from tee W9 (NOL-01) S to tee W10; ~15' E to hose house; ~10' S then W ~140'	W10 - ~7' S and ~83' E of SE corner of PAB	
Security Lighting	underground cables	from HH11 (NOL-03) going N to light;from HH11 N to new HH then WNW ~40' to FSB, from HH11 going N to a point ~50' E of SE corner of FSB then E ~12' to camera pole; from HH11 N to camera pole		
Radioactive Waste	disposal piping depth=5'-8'	from SE corner of PAB south to NE corner of WDB then E to tanks 29-1&2, 34-1&2, 39		

Table 1
Sum of Fractions
NOL-02 -- Asphalt
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
459	IR-49	IRAS-49		0.009
562	IR-133	IRAS-133		0.100
560	IR-132	IRAS-132		0.364
558	IR-131	IRAS-131		0.013
528	IR-110	IRAS-110		0.546
526	IR-109	IRAS-109		0.163
			Min	0.009
			Max	0.546
			Mean	0.199

Table 2
Statistical Data Summary – NOL-02 – Asphalt
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ag-108m	pCi/g	0	5	0.000				
Co-58	pCi/g	0	8	0.000				
Co-60	pCi/g	4	8	1.099	0.751	0.352	1.841	1.102
Cs-134	pCi/g	0	8	0.000				
Cs-137	pCi/g	6	8	0.584	0.726	0.107	2.027	0.314

Table 3
Summary of Detected Results Above Criteria
NOL-02 -- Asphalt
Yankee Nuclear Power Station Rowe, MA
DCGL_Asphalt

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ag-108m	0	5	8.52	pCi/g	0	
Co-58	0	8		pCi/g	0	
Co-60	4	8	4.84	pCi/g	0	1.84
Cs-134	0	8	6.71	pCi/g	0	
Cs-137	6	8	12.24	pCi/g	0	2.03

Table 4
Rad
NOL-02 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-109 (526)	IR-110 (528)	IR-131 (558)	IR-132 (560)	IR-133 (562)	IR-47 (455)
Sample ID	IRAS-109	IRAS-110	IRAS-131	IRAS-132	IRAS-133	IRAS-47
Date Sampled	6/23/1994	6/24/1994	8/5/1994	8/5/1994	8/8/1994	5/20/1993
Ag-108m	0.059 UM	0.066 UM	0.047 UM	0.058 UM	0.044 UM	
Co-58	0.062 UM	0.079 UM	0.067 UM	0.079 UM	0.055 UM	0.103 UM
Co-60	0.562	1.841	0.112 UM	1.642	0.352	0.107 UM
Cs-134	0.054 UM	0.067 UM	0.056 UM	0.068 UM	0.05 UM	0.075 UM
Cs-137	0.576	2.027	0.164	0.297	0.33	0.127 UM
SOF	0.163	0.546	0.013	0.364	0.1	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-02 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-48 (457)	IR-49 (459)
Sample ID	IRAS-48	IRAS-49
Date Sampled	5/20/1993	5/20/1993
Ag-108m		
Co-58	0.0792 UM	0.072 UM
Co-60	0.103 UM	0.112 UM
Cs-134	0.07 UM	0.071 UM
Cs-137	0.143 UM	0.107
SOF		0.009

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 1
Sum of Fractions
NOL-02 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
3186	TS394	TS394F		0.013
457	IR-48	IRTS-48		0.024
526	IR-109	IRTS-109		0.041
528	IR-110	IRTS-110		0.228
536	IR-117	IRTS-117		0.422
537	IR-118	IRTS-118		0.193
560	IR-132	IRTS-132		0.024
562	IR-133	IRTS-133		0.066
588	IR-149	IRTS-149		0.064
589	IR-150	IRTS-150		0.295
590	IR-151	IRTS-151		0.160
591	IR-152	IRTS-152		0.066
455	IR-47	IRTS-47		0.178
3186	TS394	TS394E		0.009
3428	YS007.3	YS007.3B		0.004
3187	TS398	TS398		0.004
3189	TS400	TS400A		0.009
3189	TS400	TS400F		0.055
3189	TS400	TS400G		0.015
3192	TS403	TS403		0.028
3193	TS404	TS404A		0.128
3207	TS474	TS474		0.009
3426	YS007.1	YS007.1B		0.002
3427	YS007.2	YS007.2A		0.023
3427	YS007.2	YS007.2B		0.015
3428	YS007.3	YS007.3A		0.039
3186	TS394	TS394D		0.024
			Min	0.002
			Max	0.422
			Mean	0.079

Table 2
Statistical Data Summary – NOL-02 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	38	38	0.853	0.159	0.504	1.355	0.828
Ag-108m	pCi/g	2	49	0.295	0.341	0.054	0.536	0.295
Ag-110m	pCi/g	4	38	0.054	0.014	0.038	0.071	0.054
Am-241	pCi/g	0	38	0.000				
Ba-140	pCi/g	0	1	0.000				
Bi-212	pCi/g	30	34	0.982	0.262	0.482	1.658	0.959
Bi-214	pCi/g	38	38	0.470	0.070	0.337	0.646	0.467
Ce-141	pCi/g	0	1	0.000				
Ce-144	pCi/g	1	38	0.262		0.262	0.262	0.262
Co-58	pCi/g	0	53	0.000				
Co-60	pCi/g	21	53	0.362	0.414	0.041	1.738	0.207
Cr-51	pCi/g	0	1	0.000				
Cs-134	pCi/g	1	53	0.087		0.087	0.087	0.087
Cs-136	pCi/g	0	2	0.000				
Cs-137	pCi/g	21	53	0.280	0.264	0.046	0.999	0.167
Fe-59	pCi/g	0	38	0.000				
I-132	pCi/g	1	1	25.760		25.760	25.760	25.760
I-133	pCi/g	1	3	0.033		0.033	0.033	0.033
K-40	pCi/g	37	38	17.043	1.644	11.420	20.580	17.380
Mn-54	pCi/g	1	38	0.038		0.038	0.038	0.038
Nb-95	pCi/g	4	38	0.044	0.004	0.037	0.047	0.045
Np-239	pCi/g	0	3	0.000				
Pb-212	pCi/g	38	38	0.870	0.190	0.540	1.484	0.890
Pb-214	pCi/g	38	38	0.498	0.077	0.350	0.682	0.485
Ra-226	pCi/g	26	26	1.375	0.319	0.936	2.205	1.282
Ru-103	pCi/g	2	38	0.030	0.000	0.029	0.030	0.030
Ru-106	pCi/g	0	38	0.000				
Sb-124	pCi/g	1	38	0.053		0.053	0.053	0.053
Sb-125	pCi/g	0	1	0.000				
Tl-208	pCi/g	37	37	0.810	0.139	0.490	1.170	0.783
U-235	pCi/g	0	1	0.000				
Zn-65	pCi/g	1	38	0.161		0.161	0.161	0.161
Zr-95	pCi/g	3	38	0.085	0.004	0.082	0.089	0.084

Table 3
Summary of Detected Results Above Criteria
NOL-02 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	38	38		pCi/g	0	1.36
Ag-108m	2	49	8.52	pCi/g	0	0.54
Ag-110m	4	38		pCi/g	0	0.07
Am-241	0	38	44.35	pCi/g	0	
Ba-140	0	1		pCi/g	0	
Bi-212	30	34		pCi/g	0	1.66
Bi-214	38	38		pCi/g	0	0.65
Ce-141	0	1		pCi/g	0	
Ce-144	1	38		pCi/g	0	0.26
Co-58	0	53		pCi/g	0	
Co-60	21	53	4.84	pCi/g	0	1.74
Cr-51	0	1		pCi/g	0	
Cs-134	1	53	6.71	pCi/g	0	0.09
Cs-136	0	2		pCi/g	0	
Cs-137	21	53	12.24	pCi/g	0	1.00
Fe-59	0	38		pCi/g	0	
I-132	1	1		pCi/g	0	25.76
I-133	1	3		pCi/g	0	0.03
K-40	37	38		pCi/g	0	20.58
Mn-54	1	38	21.66	pCi/g	0	0.04
Nb-95	4	38		pCi/g	0	0.05
Np-239	0	3		pCi/g	0	
Pb-212	38	38		pCi/g	0	1.48
Pb-214	38	38		pCi/g	0	0.68
Ra-226	26	26		pCi/g	0	2.21
Ru-103	2	38		pCi/g	0	0.03
Ru-106	0	38	68.21	pCi/g	0	
Sb-124	1	38		pCi/g	0	0.05
Sb-125	0	1	37.73	pCi/g	0	
Tl-208	37	37		pCi/g	0	1.17
U-235	0	1		pCi/g	0	
Zn-65	1	38		pCi/g	0	0.16
Zr-95	3	38		pCi/g	0	0.09

Table 4
Rad
NOL-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-109 (526)	IR-110 (528)	IR-117 (536)	IR-118 (537)	IR-131 (558)	IR-132 (560)
Sample ID	IRTS-109	IRTS-110	IRTS-117	IRTS-118	IRTS-131	IRTS-132
Date Sampled	6/23/1994	6/24/1994	6/30/1994	6/30/1994	8/5/1994	8/5/1994
Ac-228						
Ag-108m	0.058 UM	0.068 UM	0.074 UM	0.068 UM	0.055 UM	0.044 UM
Ag-110m						
Am-241						
Ba-140						
Bi-212						
Bi-214						
Ce-141						
Ce-144						
Co-58	0.059 UM	0.076 UM	0.101 UM	0.081 UM	0.062 UM	0.054 UM
Co-60	0.147	0.707	1.738	0.763	0.0816 UM	0.0798
Cr-51						
Cs-134	0.054 UM	0.073 UM	0.07 UM	0.069 UM	0.058 UM	0.049 UM
Cs-136						
Cs-137	0.135	0.999	0.764	0.438	0.0902 UM	0.0963
Fe-59						
I-132						
I-133						
K-40						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Tl-208						
U-235						
Zn-65						
Zr-95						
SOF	0.041	0.228	0.422	0.193		0.024

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-133 (562)	IR-149 (588)	IR-150 (589)	IR-151 (590)	IR-152 (591)	IR-47 (455)
Sample ID	IRTS-133	IRTS-149	IRTS-150	IRTS-151	IRTS-152	IRTS-47
Date Sampled	8/8/1994	9/13/1994	9/13/1994	9/13/1994	9/14/1994	5/20/1993
Ac-228						
Ag-108m	0.044 UM	0.044 UM	0.536	0.065 UM	0.054 UM	
Ag-110m						
Am-241						
Ba-140						
Bi-212						
Bi-214						
Ce-141						
Ce-144						
Co-58	0.051 UM	0.053 UM	0.071 UM	0.072 UM	0.074 UM	0.107 UM
Co-60	0.207	0.244	0.852	0.602	0.244	0.692
Cr-51						
Cs-134	0.047 UM	0.048 UM	0.065 UM	0.068 UM	0.057 UM	0.085 UM
Cs-136						
Cs-137	0.283	0.167	0.684	0.44	0.189	0.431
Fe-59						
I-132						
I-133						
K-40						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Tl-208						
U-235						
Zn-65						
Zr-95						
SOF	0.066	0.064	0.295	0.16	0.066	0.178

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-48 (457)	IR-49 (459)	IR-51 (463)	TS394 (3186)	TS394 (3186)	TS394 (3186)
Sample ID	IRTS-48	IRTS-49	IRTS-51	TS394A	TS394B	TS394C
Date Sampled	5/20/1993	5/20/1993	5/19/1993	9/30/1997	9/30/1997	10/1/1997
Ac-228				0.8075	0.7895	0.8764
Ag-108m				0.02012 U	0.02266 U	-0.01035 U
Ag-110m				0.04754	0.01211 U	-0.02415 U
Am-241				0 U	0 U	0 U
Ba-140						
Bi-212				1.572	1.189	1.09
Bi-214				0.4331	0.3996	0.3374
Ce-141						0.04994 U
Ce-144				-0.07428 U	-0.03355 U	0.002204 U
Co-58	0.0745 UM	0.0707 UM	0.0891 UM	0.005897 U	-0.01161 U	-0.01351 U
Co-60	0.0857 UM	0.0828 UM	0.118 UM	0.02583 U	0.002123 U	0.003109 U
Cr-51						
Cs-134	0.063 UM	0.064 UM	0.075 UM	0.004901 U	0.01094 U	-0.07133 U
Cs-136						
Cs-137	0.288	0.0797 UM	0.107 UM	0.02405 U	-0.002629 U	-0.006007 U
Fe-59				0.0202 U	0.0001336 U	0.01331 U
I-132						
I-133						
K-40				20.58	17.52	16.62
Mn-54				-0.00581 U	-0.001093 U	0.03326 U
Nb-95				-0.01714 U	-0.008819 U	-0.008874 U
Np-239				-0.07143 U		
Pb-212				0.8247	0.9115	0.8001
Pb-214				0.4182	0.4135	0.5987
Ra-226				0.9703	1.213	1.187
Ru-103				-0.002815 U	-0.004137 U	0.01713 U
Ru-106				0.0007126 U	0 U	0.2489 U
Sb-124				-0.01679 U	0.001199 U	-0.03927 U
Sb-125						
Tl-208				0.8071	0.8309	0.6045
U-235						0.072 U
Zn-65				-0.08044 U	-0.1455 U	-0.06919 U
Zr-95				0 U	0.009221 U	-0.009727 U
SOF	0.024					

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS394 (3186)	TS394 (3186)	TS394 (3186)	TS398 (3187)	TS399 (3188)	TS400 (3189)
Sample ID	TS394D	TS394E	TS394F	TS398	TS399	TS400A
Date Sampled	10/7/1997	10/7/1997	10/7/1997	10/2/1997	10/2/1997	10/7/1997
Ac-228	0.819	1.285	0.9401	0.7156	1.014	0.7469
Ag-108m	-0.001287 U	-0.017 U	0.008767 U	-0.007945 U	0.01468 U	0.02216 U
Ag-110m	0.01369 U	0.01351 U	-0.004834 U	0.01959 U	0.003496 U	0.004327 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Ba-140						
Bi-212	0.7455	1.273	1.074	0.5927	1.056	1.038
Bi-214	0.4724	0.4976	0.4397	0.3887	0.5506	0.4239
Ce-141						
Ce-144	0.1617 U	-0.1646 U	0.03054 U	0.02562 U	-0.06692 U	-0.05863 U
Co-58	-0.01755 U	-0.02446 U	-0.01271 U	-0.03589 U	0.005624 U	-0.004149 U
Co-60	0.09487	0.04136	-0.01442 U	0 U	-0.03933 U	0.0167 U
Cr-51						
Cs-134	0.009139 U	-0.008585 U	0.08684	0 U	0.002462 U	-0.04889 U
Cs-136						
Cs-137	0.05044	-0.008459 U	0.01072 U	0.04613	0.008339 U	0.1065
Fe-59	0.04092 U	0.0356 U	-0.05943 U	0.00678 U	-0.002951 U	-0.006581 U
I-132						
I-133						
K-40	19.26	18.13	17.01	17.42	18.12	16.33
Mn-54	-0.01569 U	0.001072 U	0.01567 U	0.01742 U	-0.005554 U	-0.02375 U
Nb-95	0.004912 U	-0.00436 U	0.007042 U	0.01747 U	0.0449	-0.01049 U
Np-239						
Pb-212	0.9032	1.361	0.8777	0.6754	1.072	0.7112
Pb-214	0.5144	0.5912	0.4717	0.4786	0.5088	0.4751
Ra-226	1.181	1.109	1.013			
Ru-103	-0.01123 U	0.02726 U	-0.01258 U	-0.004993 U	-0.01242 U	-0.01924 U
Ru-106	-0.02327 U	-0.08583 U	-0.1557 U	-0.1323 U	-0.02514 U	-0.1226 U
Sb-124	0.002515 U	-0.01891 U	0.01082 U	0 U	-0.02651 U	0.00789 U
Sb-125						
Tl-208	1.003	1.17	0.7741	0.7987	0.9751	0.7606
U-235						
Zn-65	0.009349 U	-0.08561 U	-0.1079 U	0.05863 U	0.03038 U	-0.02679 U
Zr-95	0.037 U	0.03633 U	-0.02194 U	0.02049 U	0.04281 U	-0.01011 U
SOF	0.024	0.009	0.013	0.004		0.009

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed

Table 4
Rad
NOL-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS400 (3189)	TS400 (3189)	TS400 (3189)	TS400 (3189)	TS400 (3189)	TS400 (3189)
Sample ID	TS400B	TS400C	TS400D	TS400E	TS400F	TS400G
Date Sampled	10/7/1997	10/7/1997	10/8/1997	10/8/1997	10/9/1997	10/9/1997
Ac-228	0.788	0.7376	0.7026	0.9148	0.8583	0.8031
Ag-108m	0.002303 U	-0.008668 U	-0.007967 U	-0.008591 U	0.01 U	-0.03398 U
Ag-110m	-0.0289 U	0.0184 U	-0.009838 U	0.07067	-0.01397 U	-0.01553 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Ba-140						
Bi-212		1.065	0.573 U	0.8871	0.4573 U	0.8378
Bi-214	0.4476	0.6463	0.51	0.4943	0.4613	0.5641
Ce-141						
Ce-144	0.2621	-0.1097 U	0.04356 U	-0.006476 U	0.1371 U	-0.0909 U
Co-58	-0.009108 U	-0.04412 U	-0.01614 U	-0.03144 U	-0.03567 U	-0.04913 U
Co-60	0.009252 U	-0.008898 U	0.03832 U	-0.04253 U	0.2212	0.0712
Cr-51						
Cs-134	-0.1203 U	-0.09476 U	-0.0129 U	-0.016 U	-0.02637 U	0.0246 U
Cs-136				0.04344 U		
Cs-137	-0.0008149 U	0.03774 U	0.02961 U	0.02823 U	0.1134	-0.003079 U
Fe-59	-0.0238 U	0.035 U	-0.05999 U	-0.03312 U	-0.0255 U	0.05593 U
I-132						
I-133		0.03343		0.05856 U		
K-40	15.23	16.58	17.38	-0.2564 U	15.81	17.99
Mn-54	-0.00462 U	0.0006393 U	-0.001696 U	0.02002 U	0.03128 U	0.02956 U
Nb-95	-0.01742 U	0.03678 U	0.01094 U	0.002564 U	0.04744	-0.03399 U
Np-239						
Pb-212	0.9607	0.9256	0.9725	0.9852	0.6149	0.7715
Pb-214	0.3873	0.553	0.4809	0.4913	0.4886	0.6615
Ra-226	1.719		1.247	1.555		1.769
Ru-103	-0.02109 U	0.009962 U	0.005577 U	0.000462 U	-0.001163 U	0.01004 U
Ru-106	-0.133 U	-0.04023 U	0.03531 U	-0.268 U	-0.1128 U	-0.3133 U
Sb-124	-0.02496 U	0.002098 U	0.02434 U	0.05274	-0.04579 U	0 U
Sb-125						
Tl-208	0.8	0.7417	0.8407	0.8703	0.7613	0.62
U-235						
Zn-65	0.1609	-0.01269 U	-0.07406 U	-0.04405 U	-0.09694 U	-0.07717 U
Zr-95	-0.02966 U	-0.03303 U	0 U	-0.02378 U	0.08372	0.0457 U
SOF					0.055	0.015

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS400 (3189)	TS400 (3189)	TS400 (3189)	TS401 (3190)	TS402 (3191)	TS403 (3192)
Sample ID	TS400H	TS400I	TS400J	TS401	TS402	TS403
Date Sampled	10/15/1997	10/15/1997	10/15/1997	10/14/1997	10/14/1997	10/14/1997
Ac-228	0.6833	0.8321	0.8609	0.7623	0.823	0.9085
Ag-108m	-0.0164 U	0.008747 U	-0.003395 U	-0.007311 U	-0.009695 U	-0.02235 U
Ag-110m	0.02195 U	0.02279 U	-0.00189 U	0.01413 U	0.004352 U	0.01433 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Ba-140						0.533 U
Bi-212	0.8885		0.7799	1.266	1.016	0.7033
Bi-214	0.5099	0.5108	0.4537	0.5786	0.4983	0.5024
Ce-141						
Ce-144	0.1074 U	-0.01248 U	-0.0652 U	0.03018 U	0.02808 U	0.1926 U
Co-58	0.002431 U	0.0125 U	-0.00397 U	0.0009993 U	0.008981 U	0.005498 U
Co-60	0.02853 U	-0.0023 U	-0.01071 U	0.0123 U	0.01107 U	0.1003
Cr-51						0.1391 U
Cs-134	-0.1965 U	-0.01615 U	-0.01177 U	-0.09221 U	-0.1245 U	-0.006764 U
Cs-136						
Cs-137	0.005626 U	-0.02548 U	0 U	0.002767 U	-0.02056 U	0.09034
Fe-59	-0.006272 U	-0.004399 U	-0.01659 U	0.02547 U	-0.0286 U	-0.02643 U
I-132		25.76				
I-133						
K-40	15.94	18.35	17.87	15.78	17.13	17.76
Mn-54	0.001628 U	-0.01612 U	-0.004512 U	0.01918 U	0.01553 U	0.01377 U
Nb-95	0.006275 U	-0.01822 U	0.03742	0.01073 U	0.0363 U	-0.004229 U
Np-239			-0.5519 U			
Pb-212	0.7886	0.7478	0.7124	0.9772	0.9423	0.8513
Pb-214	0.4394	0.3969	0.4132	0.6816	0.5874	0.4887
Ra-226	1.056	1.124		1.558	1.07	
Ru-103	-0.0126 U	0.007953 U	0.01406 U	-0.02086 U	-0.01834 U	-0.002846 U
Ru-106	0.2099 U	-0.2583 U	-0.1636 U	-0.02349 U	0.169 U	0 U
Sb-124	0 U	0.01008 U	-0.007715 U	0.007188 U	-0.0114 U	-0.002692 U
Sb-125						
Tl-208	0.7768	0.8617	0.7749	0.7834	0.9439	0.8071
U-235						
Zn-65	-0.1677 U	0 U	0.03512 U	-0.002499 U	-0.06402 U	-0.125 U
Zr-95	0.08186	-0.005331 U	-0.01525 U	0.04485 U	0.01928 U	0.004629 U
SOF						0.028

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS404 (3193)	TS404 (3193)	TS404 (3193)	TS404 (3193)	TS404 (3193)	TS474 (3207)
Sample ID	TS404A	TS404B	TS404C	TS404E	TS404F	TS474
Date Sampled	10/16/1997	10/16/1997	10/16/1997	10/16/1997	10/16/1997	12/17/1997
Ac-228	0.7586	0.8425	0.7047	0.7728	0.6745	0.5038
Ag-108m	0.05365	0.005083 U	-0.008657 U	-0.01014 U	0.01608 U	0.0006742 U
Ag-110m	-0.0009429 U	-0.01706 U	0.01343 U	-0.01421 U	-0.009628 U	0.03766
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Ba-140						
Bi-212		0.9042	0.8957	0.8383	0.6446	1.139
Bi-214	0.3585	0.4515	0.4934	0.3935	0.4336	0.4164
Ce-141						
Ce-144	-0.0009454 U	-0.1112 U	-0.2321 U	-0.09136 U	0.01028 U	-0.1034 U
Co-58	0.01836 U	-0.0005324 U	-0.01481 U	-0.01305 U	-0.02591 U	-0.01506 U
Co-60	0.4636	0 U	0.0121 U	0.006558 U	0.01084 U	0.04253
Cr-51						
Cs-134	-0.08935 U	-0.004196 U	0.01057 U	-0.006363 U	-0.03524 U	-0.02073 U
Cs-136						
Cs-137	0.3218	-0.0077 U	-0.006238 U	0.005608 U	-0.00757 U	0.03348 U
Fe-59	-0.0108 U	-0.04145 U	0 U	0.04269 U	-0.0178 U	0.02602 U
I-132						
I-133						
K-40	14.21	18.05	14.71	17.07	16.75	16.56
Mn-54	0.01151 U	0.00347 U	-0.009319 U	0.01063 U	0.03024 U	-0.01293 U
Nb-95	0.01154 U	-0.01266 U	0.004889 U	0.009515 U	0.003512 U	-0.02015 U
Np-239					0.2315 U	
Pb-212	0.5894	0.9177	0.7393	0.7555	0.6581	0.5402
Pb-214	0.3503	0.522	0.4729	0.4408	0.4631	0.4059
Ra-226	0.9362	1.112	1.763	1.808	1.374	1.317
Ru-103	-0.0006311 U	0.005501 U	-0.009848 U	0.01688 U	-0.02018 U	-0.001961 U
Ru-106	0.1066 U	-0.14 U	-0.02207 U	-0.0234 U	-0.1263 U	-0.01917 U
Sb-124	0.004728 U	-0.01902 U	-0.00857 U	-0.007793 U	0.001169 U	0.0008674 U
Sb-125	0.06372 U					
Tl-208	0.5942	0.7284	0.8455		0.6838	0.4904
U-235						
Zn-65	-0.0582 U	-0.05516 U	-0.02655 U	0.01851 U	0.04101 U	-0.007818 U
Zr-95	0.004534 U	-0.009118 U	0.08923	0.02404 U	0.05192 U	-0.01954 U
SOF	0.128					0.009

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	YS007.1 (3426)	YS007.1 (3426)	YS007.2 (3427)	YS007.2 (3427)	YS007.2 (3427)
Sample ID	YS007.1B	YS007.1C	YS007.2A	YS007.2B	YS007.2C
Date Sampled	7/7/1998	7/7/1998	7/8/1998	7/8/1998	7/8/1998
Ac-228	0.9036	0.8903	0.7082	0.8932	0.9396
Ag-108m	-0.01988 U	-0.00445 U	0.006731 U	0.01343 U	0.005375 U
Ag-110m	0.002961 U	-0.006048 U	0.05987	-0.02198 U	0.02406 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-140					
Bi-212	0.4407 U	0.9644		1.169	1.147
Bi-214	0.4184	0.4938	0.4178	0.4584	0.4912
Ce-141					
Ce-144	0.1186 U	0.009107 U	-0.2564 U	0.03929 U	-0.05019 U
Co-58	0.003648 U	-0.03131 U	-0.005563 U	-0.005084 U	0.02649 U
Co-60	0.0176 U	0.0233 U	0.09238	0.07314	0.03625 U
Cr-51					
Cs-134	0.01188 U	0 U	-0.0718 U	-0.07007 U	-0.02863 U
Cs-136					
Cs-137	0.02873 U	0.007443 U	0.05211	0.007198 U	-0.01748 U
Fe-59	-0.005399 U	0.07173 U	0.000000006715 U	-0.05089 U	0.007165 U
I-132					
I-133					
K-40	16.24	19.58	11.42	18.13	16.4
Mn-54	0.03848	-0.004539 U	-0.0143 U	-0.004893 U	0.007505 U
Nb-95	-0.01813 U	0.0002376 U	0.01336 U	0.04608	-0.0427 U
Np-239					
Pb-212	0.9519	0.9958	0.6801	1.119	0.9085
Pb-214	0.52	0.4783	0.5777	0.4013	0.463
Ra-226	1.638	2.205		1.227	1.592
Ru-103	0.003758 U	0.01278 U	-0.01315 U	0.01048 U	-0.03387 U
Ru-106	0.2215 U	0.05911 U	-0.214 U	0.0201 U	0.1957 U
Sb-124	-0.007553 U	0.02352 U	0.01444 U	0.01025 U	0.0182 U
Sb-125					
Tl-208	0.7726	0.9017	0.7401	0.8097	0.7788
U-235					
Zn-65	0.0485 U	-0.1477 U	-0.01933 U	-0.04605 U	0.03558 U
Zr-95	-0.002905 U	0.008259 U	0.02633 U	-0.02182 U	0.02728 U
SOF	0.002		0.023	0.015	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	YS007.3 (3428)	YS007.3 (3428)	YS007.3 (3428)	YS007.4 (3429)	YS007.4 (3429)
Sample ID	YS007.3A	YS007.3B	YS007.3C	YS007.4B	YS007.4C
Date Sampled	7/8/1998	7/8/1998	7/8/1998	7/13/1998	7/13/1998
Ac-228	0.808	0.853	1.027	1.068	1.028
Ag-108m	-0.002201 U	0.01725 U	-0.00419 U	-0.008829 U	-0.02806 U
Ag-110m	0.001825 U	-0.004278 U	0.03266 U	-0.007167 U	-0.002144 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-140					
Bi-212	0.8968	0.6975	0.4819	0.9537	0.4849 U
Bi-214	0.4731	0.5271	0.3571	0.4848	0.4096
Ce-141					
Ce-144	-0.1518 U	0.05236 U	0.034 U	-0.01934 U	-0.05901 U
Co-58	-0.02459 U	0.007026 U	0.0125 U	-0.01079 U	0.0114 U
Co-60	0.1345	0.01771 U	0 U	-0.003024 U	0.02543 U
Cr-51					
Cs-134	-0.02516 U	-0.0389 U	-0.0746 U	-0.01579 U	0.07029 U
Cs-136					0.2784 U
Cs-137	0.1378	0.04698	-0.01731 U	0.0095 U	-0.005012 U
Fe-59	-0.02965 U	-0.09519 U	0.03121 U	-0.01781 U	-0.02735 U
I-132					
I-133	160.8 U				
K-40	14.94	18.61	17.78	18.41	17.55
Mn-54	0.01998 U	-0.0094 U	-0.02871 U	0.03556 U	-0.02322 U
Nb-95	-0.0188 U	-0.008638 U	0.008929 U	-0.01155 U	0.01715 U
Np-239					
Pb-212	0.7887	0.7256	0.9061	1.003	0.9138
Pb-214	0.5066	0.4747	0.5678	0.5352	0.6023
Ra-226		1.451			
Ru-103	0.02966	0.009571 U	-0.01433 U	0.009319 U	0.0009865 U
Ru-106	0.08239 U	-0.05777 U	0.02069 U	-0.03019 U	0.1323 U
Sb-124	-0.007544 U	-0.05474 U	0.01982 U	0.007091 U	-0.005068 U
Sb-125					
Tl-208	0.7781	0.7554	0.7965	1.069	0.7754
U-235					
Zn-65	0.05626 U	0.07616 U	-0.01535 U	0.09412 U	0.04208 U
Zr-95	-0.01779 U	0.01637 U	0.0402 U	-0.04087 U	-0.008438 U
SOF	0.039	0.004			

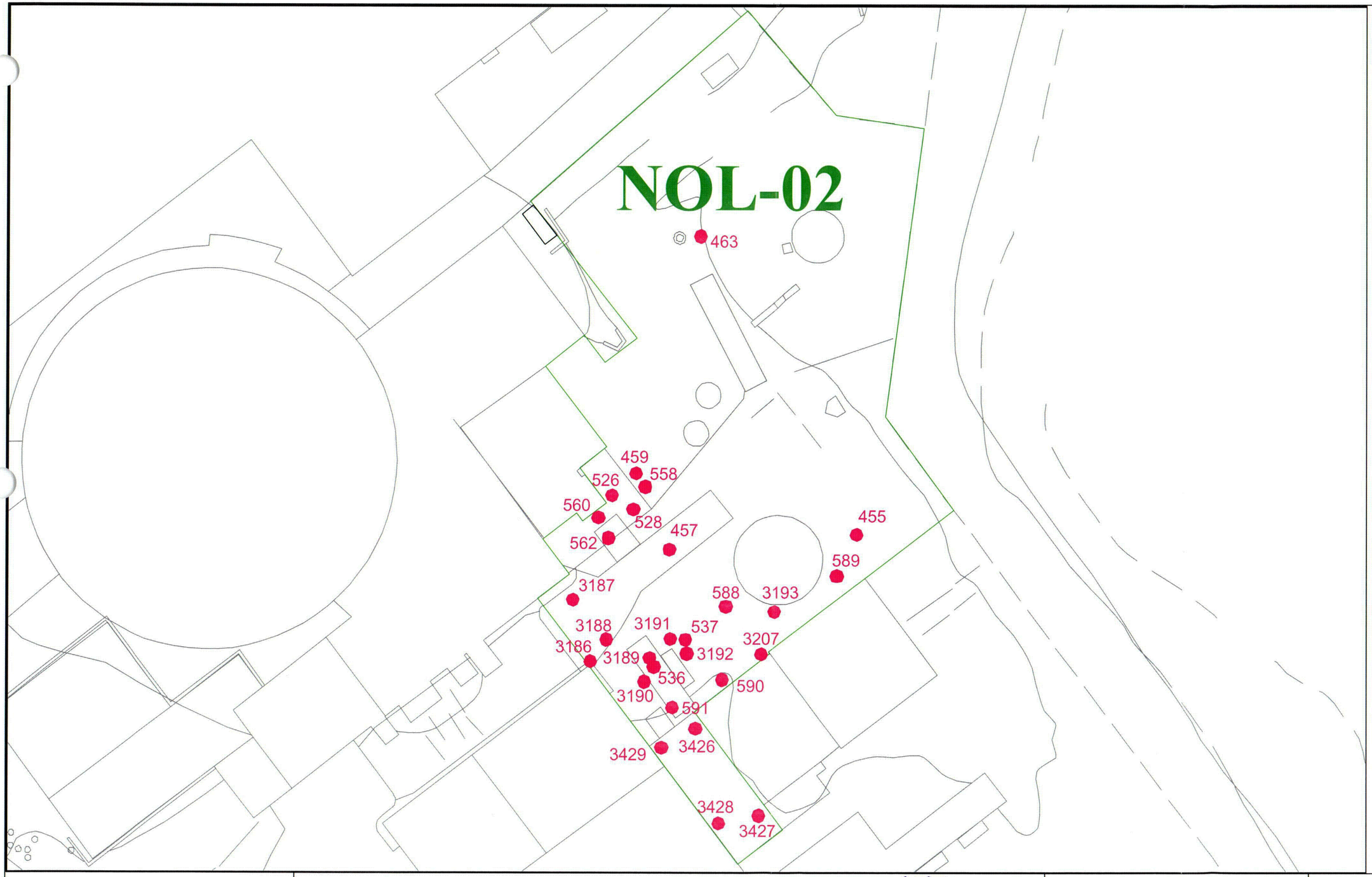
U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	YS007.5 (3430)
Sample ID	YS007.5B
Date Sampled	7/13/1998
Ac-228	1.355
Ag-108m	-0.02058 U
Ag-110m	0.02453 U
Am-241	0 U
Ba-140	
Bi-212	1.658
Bi-214	0.643
Ce-141	
Ce-144	-0.1016 U
Co-58	-0.01042 U
Co-60	0.00293 U
Cr-51	
Cs-134	0.002098 U
Cs-136	
Cs-137	0.000686 U
Fe-59	-0.02394 U
I-132	
I-133	
K-40	17.38
Mn-54	-0.007993 U
Nb-95	-0.002016 U
Np-239	
Pb-212	1.484
Pb-214	0.6029
Ra-226	1.561
Ru-103	0.02936
Ru-106	-0.1554 U
Sb-124	-0.03012 U
Sb-125	
Tl-208	1.156
U-235	
Zn-65	-0.08264 U
Zr-95	0.0178 U
SOF	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed



N

Legend

= Survey Area Boundary

Notes

	Yankee Atomic Power Company Soil Sample Locations - NOL-02	YANKEE	Date: October 2003 Revision: 4	Figure: 18

C22

Survey Area Name: Southeast Upper RCA Yard Designator: **NOL-03**

Survey Area Description

Survey area NOL-03 consists of land area within the RCA and contains about 1575 square meters of surface area. The surface of NOL-03 consists of asphalt, soil and trap rock.

Survey area NOL-03 is bounded by NOL-02 on the north, OOL-11 on the east, OOL-10 on the south and NOL-04, WST-01, WST-03, and NSY-07 on the west.

Surface items of note located within and to be evaluated as part of NOL-03 include:

- Security fence gate at the original access road to the property south of the YNPS site.
- Security camera bases.
- Security light pole bases.

Other items located within NOL-03, which will be evaluated separately from survey area NOL-03, include:

- Access point to the waste gas decay tanks located within the shield walls of the tank farm area, NSY-07
- The Old PCA Storage Building (WST-01)
- The New PCA Storage Building and addition. (NSY-06)

Sub-surface systems that traverse or connect within NOL-03 include:

- Electrical duct trays
- Electrical grounding cables.
- Security lighting conduits
- Radioactive drain lines and transfer lines
- Potable water lines

Survey Area Name: Southeast Upper RCA Yard Designator: **NOL-03**

Survey Area History

Portions of survey area NOL-03 were posted and controlled as a RCA from the beginning of plant operations. (Ref 1) The early bounds of the RCA were established based on a common history of the travel of personnel and material within the upper portion (elevation 1035') of the RCA. The RCA was expanded over time to accommodate the need for additional space in the RCA and when appropriate based upon identified contamination. NOL-03 provides access to the New PCA Storage Building and addition, NSY-06 and to the Waste Gas Decay Cubicle, and portion of NSY-07. The NOL-03 portion of the RCA was primarily used for material storage and was not typically used for personnel and material travel into and out of the RCA.

Contamination of survey area NOL-03 resulted from transport and storage of contaminated, material and equipment. Typical transport of contaminated material and equipment occurred from the decon rooms and VC to the storage area typically located adjacent to the tank farm. Over time this out of doors material storage option was replaced following construction of the WST-01, WST-02 and NSY-06.

Significant operational events and activities that led to or describe contamination of survey area NOL-03 include:

- PIR 75-07, Yard Area Contamination. (Ref 2)
- Storage of radioactive contaminated material.

Translocation Pathways

Modes and vectors of contamination transmigration from other survey areas include:

- Contaminated material transport within the NOL-03 typically involved moving contaminated equipment and tools from contaminated work areas elsewhere in the RCA to the area south of NSY-07. In instances where contaminated radioactive material was not properly packaged for transport, spread of contamination during transport was likely to occur.
- Temporary storage locations for packaged contaminated radioactive material were set-up in NOL-03. In instances where this material was improperly packaged, deposition of contamination within the storage location was likely to occur. The primary material storage location in NOL-03 was the area to the south the tank farm. Early in the plant history when this area was the primary material storage location for radioactive equipment and was unpaved.
- Personnel involved in the above-described activities were also likely to cause spread of contamination.
- Once contamination had been deposited on the surface of the RCA personnel foot traffic was likely to further spread the contamination. This resulted in low-levels of radioactivity distributed generally within the RCA.

- Snow removal was necessary within the RCA in order to facilitate access to all areas. Snow removal likely moved contamination present on the surface of the RCA to the locations where snow was deposited. When these locations would not accept additional snow, the snow was loaded on to trucks and driven to remote storage locations. As the snow melted the snow accumulation locations are likely to have a higher concentration of radioactivity present due to deposition of additional radioactivity in the snow. Deposited snow locations in NOL-03 were located along the east and south edges of the RCA. These locations were also locations to which snow was trucked from other areas.
- Surface water run-off resulting from rain and snowmelt is likely to have transported surface contamination into storm drains and/or into in low areas where it would collect. There are no storm drain system inputs located in NOL-03. Surface water collection locations in NOL-03 are at the east and south perimeters of the asphalt-covered area. Due to the flatness of NOL-03 and the lack of installed drainage NOL-03 tends to hold much of the surface water allowing for very little run-off to occur.

Modifications performed at the YNPS site during years of operation that changed the configuration of NOL-03 include:

- Paving of previously unpaved areas within the bounds of survey area NOL-03. (Ref 3)
- Installation of the permanent RCA perimeter fence. (Ref 3)
- Installation of security lighting and fence line cameras. (Ref 4)

Modifications performed at the YNPS site in support of decommissioning that changed the configuration of NOL-03 include:

- Set-up of a temporary soil sample preparation facility.
- Establishment of a storage location for excavated soils associated with decommissioning activities.
- Soil removal associated with DWP Y-02. (Ref 5)

Scoping/Characterization

Scoping surveys were performed and the resulting data collected was used to develop the YNPS Decommissioning Plan. (Ref 6)

Additional scoping survey data was collected in support of the construction activities performed in NOL-03 in support of decommissioning. The progress of these efforts are documented via RP Memo 96-76 Protocol for Sampling of Soil and Asphalt from Excavations and DP-8120 Collection of Site Characterization and FSS Samples. During these modifications some soils excavated contained radionuclide concentrations in excess of the current DCGL's for soil and are identified as remediated. Soil excavations with radionuclide concentrations less than the current DCGL's for soil are identified as mitigation.

Survey Area Name: Southeast Upper RCA Yard Designator: **NOL-03**

Remediations

Soil remediation activities were conducted in NOL-03. This series of remediations were initiated following the scoping survey conducted for the Decommissioning Plan. The remediations spanned the area between the east end of the Waste Tank Moat and extended to the east end of the Old PCA building. A summary of the results of "as found" soil sample data, results of samples taken during the progress of the remediation and results of "as left" soil sample data are included on the *remediated areas* sheet and accompanying diagrams attached to this section.

Decommissioning

Decommissioning activities have been performed for NOL-03 in accordance with DWP Y-02, Removal of Contaminated Soil and Sub-surface Concrete (Ref 5). Survey area NOL-03 has also been impacted by decommissioning activities performed on systems and structures within and adjacent to it.

Survey Area Name: Southeast Upper RCA Yard Designator: **NOL-03**

Findings

Survey area NOL-03 is a land area that is located within the current configuration of YNPS RCA.

Survey area NOL-03 is impacted and contains locations of leaks and spills of radioactive materials and is known to have contained radioactivity at levels greater the DCGL.

The radionuclide mix likely to be present in NOL-03 includes all radionuclides identified in the radioactive systems of the plant (Ref 7). The primary radionuclides of concern for survey area NOL-03 are Co-60, Cs-137, Ag-108m, Sr-90, Ni-63 and tritium.

Current Status

Soil known to contain radioactivity at concentrations in excess of DCGL has been remediated from NOL-03. NOL-03 remains as part of the RCA and continues to be potentially impacted by personnel traffic, radioactive material transportation, radioactive waste processing and by decommissioning activities.

A soil sample location map (Figure 19) has been prepared to show the distribution of sampling locations in NOL-03. Only samples representative of soils still present are included on the map (samples of soils representative of soils removed during remediation activities are not presented). Two survey media were assessed in NOL-03, Asphalt and Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL. There are separate sets of Tables 1-4 for each survey media. All are evaluated as fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for NOL-03 is presented at the end of Table 1 for each survey medium. The results are summarized below.

Asphalt: Mean SOF is 0.344.
Maximum SOF for a single asphalt sample is 1.782 (key# 510) just outside the SE corner of tank farm moat.
Minimum SOF for a single asphalt sample is 0.007 (key# 518) about halfway between the Old PCA and east RCA boundary.

Soil: Mean SOF is 4.302.
Maximum SOF for a single soil sample is 224.5 (key# 568) just outside the SE corner of tank farm moat.
Minimum SOF for a single soil sample is 0.003 (key# 3223) about halfway between the Old PCA and east RCA boundary.

Historical Site Assessment and Classification Summary

Survey Area Name: Southeast Upper RCA Yard Designator: **NOL-03**

Classification Statement

Based upon the historical use and radiological conditions associated with this survey area NOL-03 is identified as a Class 1 Area.

Survey Area Name: Southeast Upper RCA Yard Designator: **NOL-03**

Drawings

9699 FB-2 A
9699 FB-2 C
9699 FB-2 E
E-1 ASWS Underground Plan
YC-H-2-3

References

1.	Radiation Protection Memorandum RP-98-23, "Overview of the YNPS Historical Material Release Evaluation," dated March 5, 1998.
2.	Plant Information Report (PIR) 75-07, "Yard Area Contamination," dated August 12, 1975.
3.	Plant Alteration (PA) 84-006, "Radiation Control Area Boundary Fence Installation," dated 1984.
4.	PA 78-018, "Replace security perimeter fence," dated June 9, 1978.
5.	Decommissioning Work Package (DWP) Y-02, "Removal of Contaminated Soil and Sub-surface Concrete," dated October 20, 1997.
6.	YNPS Decommissioning Plan, Rev. 0.0.
7.	"Radionuclides for Building Surfaces and Soil DCGL Determination" YA-REPT-00-001-03.

NOL-03

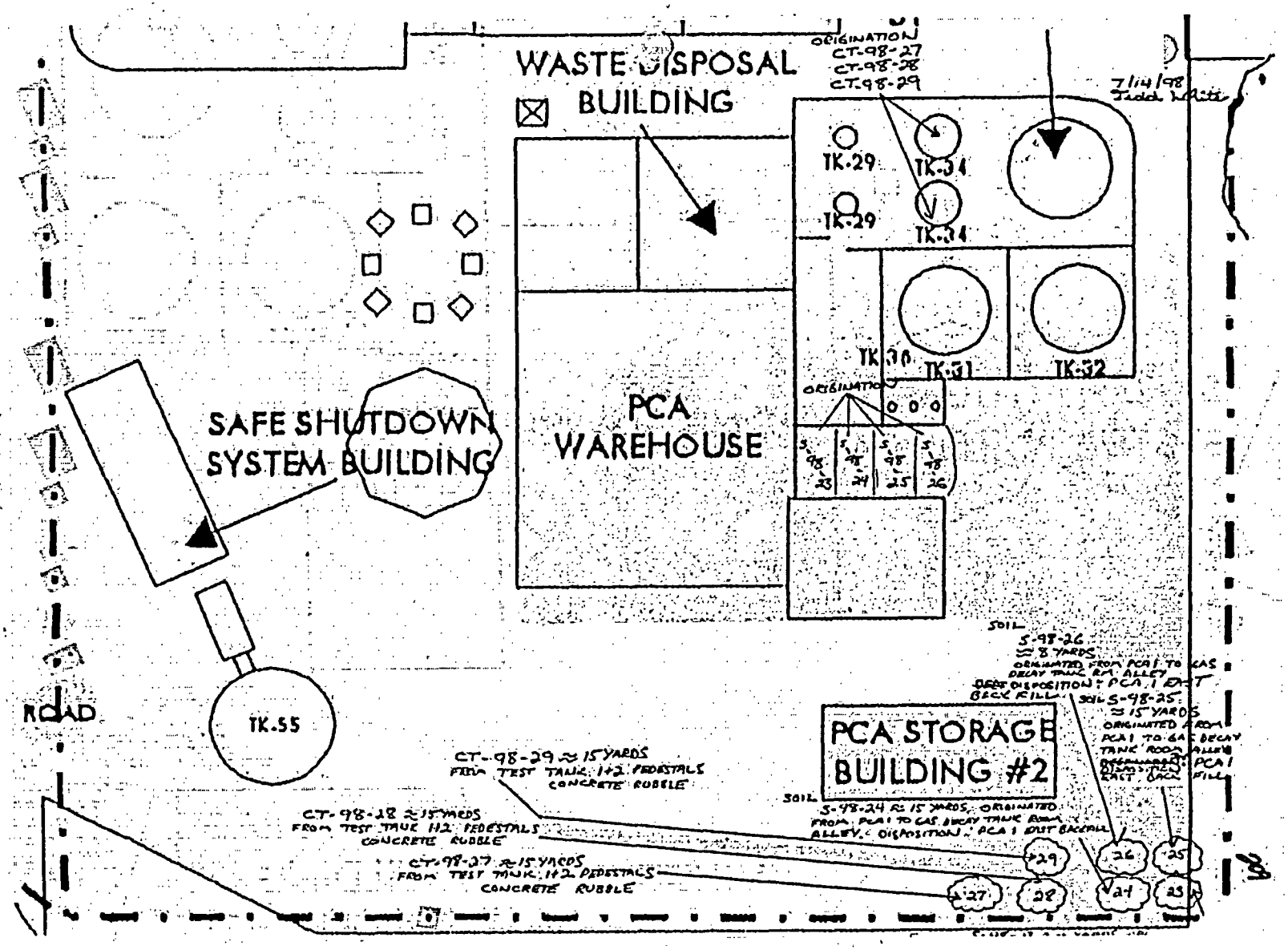
Remediated Areas								
Location	Sample #	Date	GLV SOF	Disposition	Nuclide	Conc. (pCi/gm)	Fraction of DCGL	DCGL SOF
Alley E of PCA Whse - 1'-5' composite	S-98-23A	8-Jul-98	0.340	UNK				
Alley E of PCA Whse - 1'-5' composite	S-98-23B	8-Jul-98	0.262	UNK				
Alley E of PCA Whse - 1'-5' composite	S-98-23C	8-Jul-98	1.680	UNK	Co-60	3.970E+00	0.821	0.837
					Cs-137	1.980E-01	0.016	
Alley E of PCA Whse - 1'-5' composite	S-98-24A	8-Jul-98	0.178	AB				
Alley E of PCA Whse - 1'-5' composite	S-98-24B	9-Jul-98	0.240	AB				
Alley E of PCA Whse - 1'-5' composite	S-98-24C	9-Jul-98	0.105	AB				
Alley E of PCA Whse - 1'-5' composite	S-98-25A	9-Jul-98	0.144	AB				
Alley E of PCA Whse - 1'-5' composite	S-98-25B	9-Jul-98	0.080	AB				
Alley E of PCA Whse - 1'-5' composite	S-98-25C	9-Jul-98	0.070	AB				
Alley E of PCA Whse - 1'-5' composite	S-98-26A	9-Jul-98	ND	AB				
Alley E of PCA Whse - 1'-5' composite	S-98-26B	16-Jul-98	ND	AB				
Alley E of PCA Whse - 1'-5' composite	S-98-26C	16-Jul-98	0.014	AB				
Alley E of PCA Whse - 60"-66" composite	TS-505	13-Jul-98	ND	ALAR				
Alley E of PCA Whse - 60"-66" composite	TS-506	13-Jul-98	0.060	ALAR				
Alley E of PCA Whse - 60"-66" composite	TS-502	9-Jul-98	11.720	FR	Ag-108m	7.060E-02	0.008	5.882
					Co-60	2.690E+01	5.560	
					Cs-137	3.840E+00	0.314	
Alley E of PCA Whse - 60"-66" composite	TS-503	9-Jul-98	1.080	FR	Co-60	2.520E+00	0.521	0.537
					Cs-137	1.970E-01	0.016	
Alley E of PCA Whse - 60"-66" composite	TS-504	9-Jul-98	2.040	FR	Co-60	4.780E+00	0.988	1.019
					Cs-137	3.790E-01	0.031	
Alley E of PCA Whse - 80"-86" composite	TS-527	4-Aug-98	0.400	AL	Co-60	9.304E-01	0.192	0.200
					Cs-137	9.439E-02	0.008	
Alley E of PCA Whse - 80"-86" composite	TS-528	4-Aug-98	0.100	ALAR	Co-60	2.366E-01	0.049	0.049
1st Rem. Area E of PCA1 @12"-18"	TS-478A	10-Jun-98	0.020	AL	Cs-137	1.243E-01	0.010	0.010
1st Rem. Area E of PCA1 @18"-24"	TS-478B	10-Jun-98	0.020	ALAR	Cs-137	1.327E-01	0.011	0.011
1st Rem. Area E of PCA1 @12"-18" composite	TS-479A	10-Jun-98	0.073	ALAR	Ag-108m	7.201E-02	0.008	0.017
					Cs-137	1.035E-01	0.008	
1st Rem. Area E of PCA1 @12"-18" composite	TS-480A	10-Jun-98	0.836	FR	Ag-108m	5.700E-01	0.067	0.514
					Co-60	1.370E+00	0.283	
					Cs-137	2.010E+00	0.164	

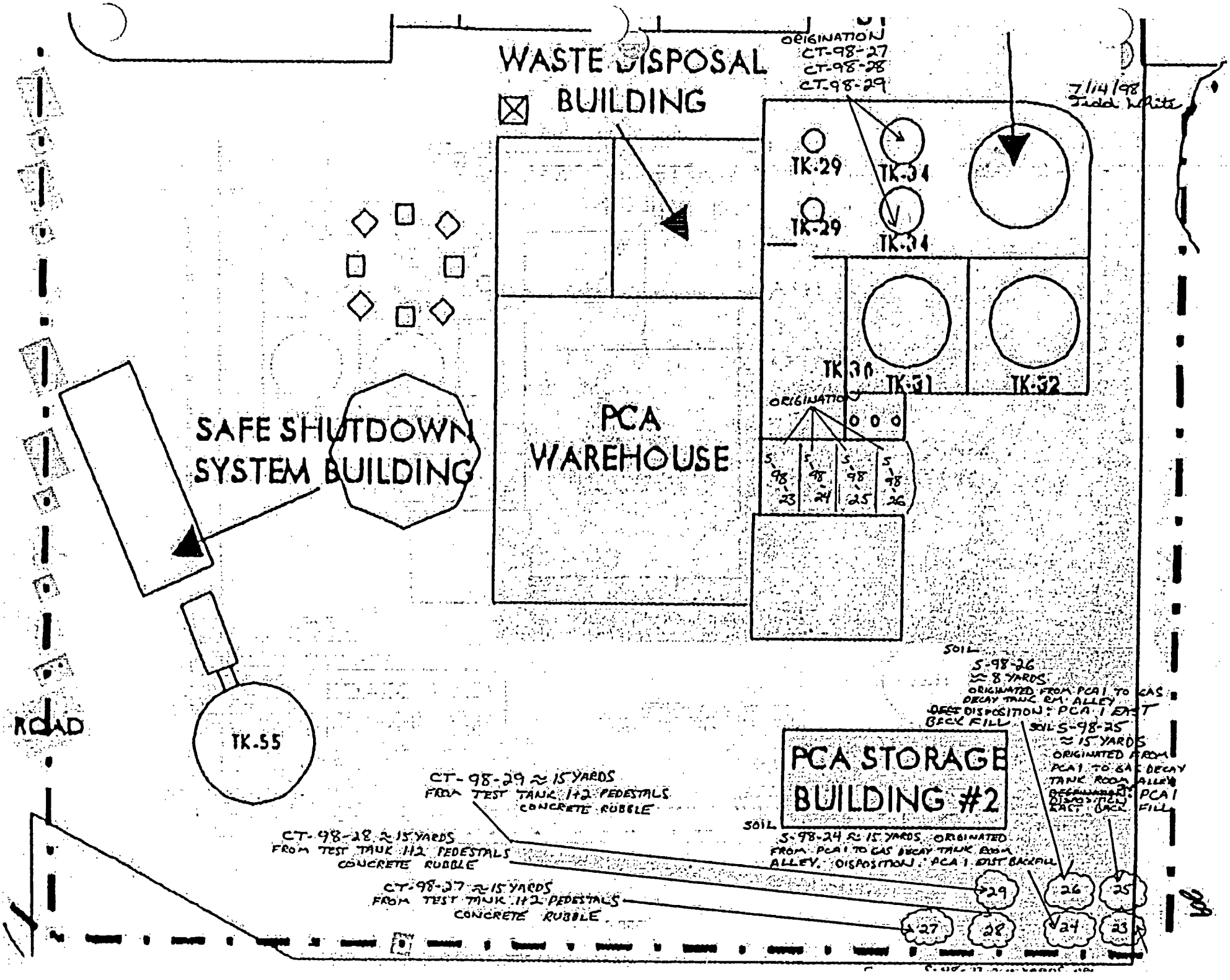
1st Rem. Area E of PCA1 @48"-54" soil	TS-481	10-Jun-98	ND	ALAR				
1st Rem. Area E of PCA1 @30"-36" clay	TS-482	10-Jun-98	ND	ALAR				
1st Rem. Area E of PCA1 @18"-24" composite	TS-483	10-Jun-98	0.170	ALAR	Ag-108m	1.250E-01	0.015	0.083
					Co-60	2.355E-01	0.049	
					Cs-137	2.427E-01	0.020	
1st Rem. Area E of PCA1 @18"-24" composite	TS-484	10-Jun-98	ND	ALAR				
1st Rem. Area E of PCA1 @18"-24" composite	TS-493	30-Jun-98	0.230	ALAR	Ag-108m	6.280E-02	0.007	0.062
					Co-60	1.763E-01	0.036	
					Cs-137	2.243E-01	0.018	
1st Rem. Area E of PCA1 @18"-24" composite	TS-494	30-Jun-98	0.121	ALAR	Co-60	1.208E-01	0.025	0.034
					Cs-137	1.166E-01	0.010	
1st Rem. Area E of PCA1 @30" sediment from	SE-495	30-Jun-98	10.004	RD	Ag-108m	1.212E+01	1.422	4.789
east side roof drain					Co-60	1.463E+01	3.024	
					Cs-137	4.200E+00	0.343	
1st Rem. Area E of PCA1 @30"-36" roof dr. area	TS-496	2-Jul-98	0.540	ALAR	Ag-108m	3.087E-01	0.036	0.117
					Co-60	2.849E-01	0.059	
					Cs-137	2.701E-01	0.022	
2nd Rem. Area E of PCA1 @12"-18" composite	TS-485	10-Jun-98	0.220	ALAR	Ag-108m	6.080E-02	0.007	0.109
					Co-60	3.800E-01	0.079	
					Cs-137	2.853E-01	0.023	
2nd Rem. Area E of PCA1 @12"-18" composite	TS-486	10-Jun-98	0.400	ALAR	Co-60	4.124E-01	0.085	0.108
					Cs-137	2.755E-01	0.023	
2nd Rem. Area E of PCA1 @18"-24" composite	TS-487	10-Jun-98	0.260	ALAR	Co-60	2.778E-01	0.057	0.075
					Cs-137	2.194E-01	0.018	
2nd Rem. Area E of PCA1 @18"-24" composite	TS-488	10-Jun-98	ND	ALAR				
2nd Rem. Area E of PCA1 @12"-18" composite	TS-489A	23-Jun-98	ND	ALAR				
2nd Rem. Area E of PCA1 @18"-24" composite	TS-489B	23-Jun-98	ND	ALAR				
2nd Rem. Area E of PCA1 @12"-18" composite	TS-490A	23-Jun-98	ND	ALAR				
2nd Rem. Area E of PCA1 @18"-24" composite	TS-490B	23-Jun-98	ND	ALAR				
2nd Rem. Area E of PCA1 @12"-18" composite	TS-491A	23-Jun-98	ND	ALAR				
2nd Rem. Area E of PCA1 @18"-24" composite	TS-491B	23-Jun-98	ND	ALAR				
2nd Rem. Area E of PCA1 @12"-18" composite	TS-492A		ND	ALAR				
2nd Rem. Area E of PCA1 @18"-24" composite	TS-492B		ND	ALAR				

UNK - unknown
AB - as area backfill
ABC - ABC storage area
AL - as left
ALAR - as left after remediation
FR - further remediation
RD - rad disposal
TS - temporary storage tank

NOL-03

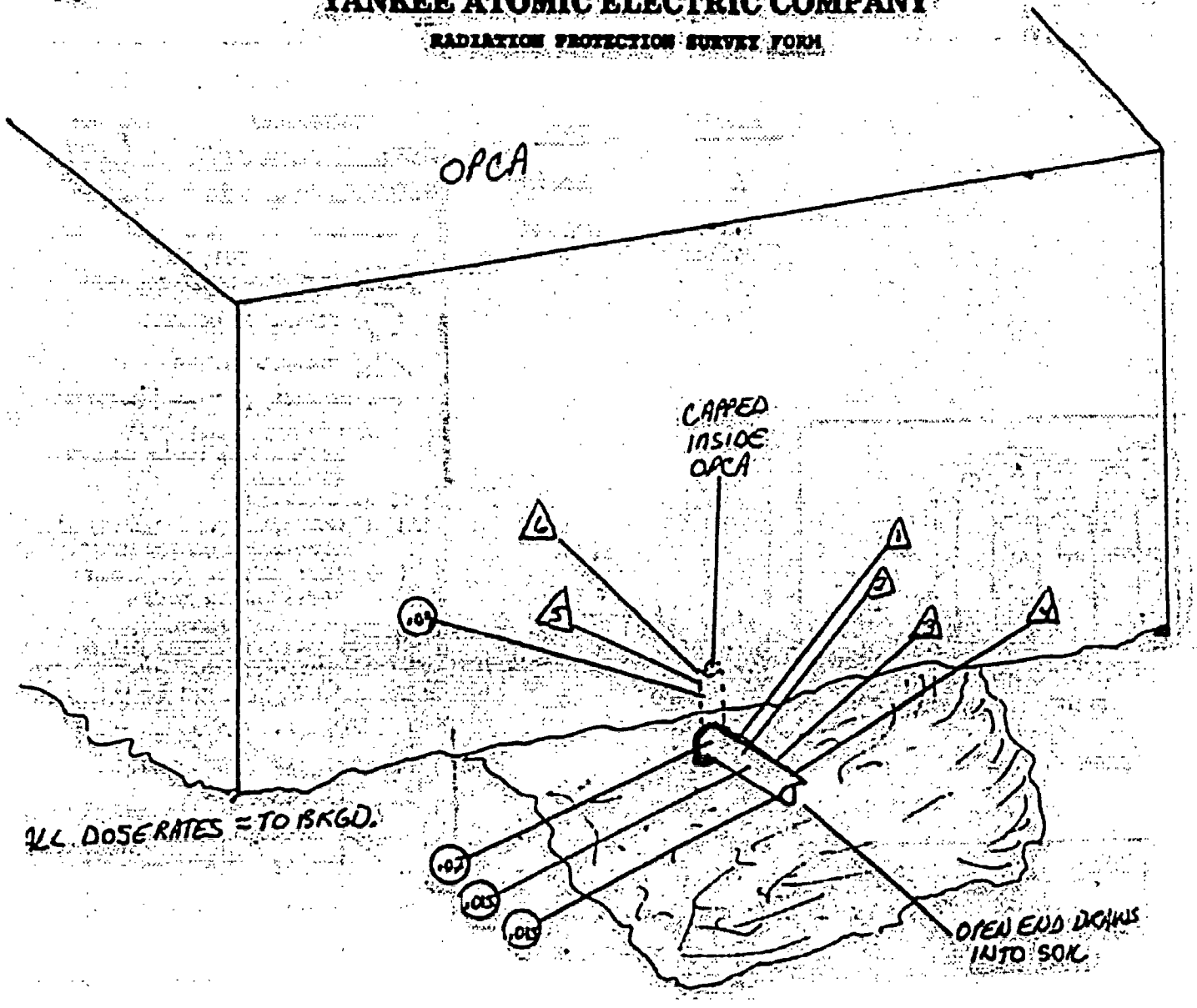
Rem. Area E of alley@12"-18" composite	TS-507	14-Jul-98	ND	AL				
Rem. Area E of alley@12"-18" composite	TS-508	14-Jul-98	ND	AL		DCGL (pCi/gm)		
						Nuclide	25 mrem/yr	10 mrem/yr
Remediated Area S of ADD tank@12"-18" compos	TS-509A	21-Jul-98	ND	AL		Ag-108m	8.521E+00	3.408E+00
Remediated Area S of ADD tank@12"-18" compos	TS-509B	21-Jul-98	ND	AL		Co-60	4.838E+00	1.935E+00
Remediated Area S of ADD tank@12"-18" compos	TS-509C	21-Jul-98	ND	AL		Cs-134	6.706E+00	2.682E+00
Remediated Area S of ADD tank@12"-18" compos	TS-524	4-Aug-98	ND	ALAR		Cs-137	1.224E+01	4.896E+00
Remediated Area S of ADD tank@12"-18" compos	TS-525	4-Aug-98	ND	ALAR				
Remediated Area S of ADD tank@12"-18" compos	TS-526	4-Aug-98	0.010	ALAR	Cs-137	7.269E-02	0.006	0.006


WASTE DISPOSAL BUILDING
ORIGINATION CT-98-27 CT-98-28 CT-98-29
7/14/98
TK-29
TK-29
TK-34
TK-34
TK-30
TK-31
TK-32
ORIGINATION
S-98-23
S-98-24
S-98-25
S-98-26
SAFE SHUTDOWN SYSTEM BUILDING
PCA WAREHOUSE
ROAD
TK-55
SOIL S-98-26 ≈ 8 YARDS ORIGINATED FROM PCA1 TO GAS DECAY TANK RM. ALLEY DEST. DISPOSITION: PCA1 EAST BACK FILL
SOIL S-98-25 ≈ 15 YARDS ORIGINATED FROM PCA1 TO GAS DECAY TANK ROOM ALLEY DESTINATION: PCA1 EAST BACK FILL
PCA STORAGE BUILDING #2
CT-98-29 ≈ 15 YARDS FROM TEST TANK 1+2 PEDESTALS CONCRETE RUBBLE
SOIL S-98-24 ≈ 15 YARDS, ORIGINATED FROM PCA1 TO GAS DECAY TANK ROOM ALLEY. DISPOSITION: PCA1 EAST BACKFILL
CT-98-28 ≈ 15 YARDS FROM TEST TANK 1+2 PEDESTALS CONCRETE RUBBLE
CT-98-27 ≈ 15 YARDS FROM TEST TANK 1+2 PEDESTALS CONCRETE RUBBLE
29
26
25
27
28
24
23


WASTE DISPOSAL BUILDING
ORIGINATION
CT-98-27
CT-98-28
CT-98-29
7/14/98
Todd White
TK-29
TK-29
TK-34
TK-34
TK-30
TK-31
TK-32
ORIGINATION
S-98-23
S-98-24
S-98-25
S-98-26
PCA WAREHOUSE
SAFE SHUTDOWN SYSTEM BUILDING
ROAD
TK-55
SOIL
S-98-26
≈ 8 YARDS
ORIGINATED FROM PCA1 TO GAS DECAY TANK RM. ALLEY
DEST DISPOSITION: PCA 1 EAST BACK FILL
SOIL S-98-25
≈ 15 YARDS
ORIGINATED FROM PCA1 TO GAS DECAY TANK ROOM ALLEY
DEST DISPOSITION: PCA 1 EAST BACK FILL
PCA STORAGE BUILDING #2
SOIL
S-98-24 ≈ 15 YARDS ORIGINATED FROM PCA1 TO GAS DECAY TANK ROOM ALLEY. DISPOSITION: PCA 1 EAST BACKFILL
CT-98-29 ≈ 15 YARDS
FROM TEST TANK 1+2 PEDESTALS
CONCRETE RUBBLE
CT-98-28 ≈ 15 YARDS
FROM TEST TANK 1+2 PEDESTALS
CONCRETE RUBBLE
CT-98-27 ≈ 15 YARDS
FROM TEST TANK 1+2 PEDESTALS
CONCRETE RUBBLE
29
26
25
27
28
24
23

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM



DATE 5 JUL 98 TIME 1045

SURVEYOR KELLY

INSTRUMENT/I		CAL DUE
BICRON	5549	10·14·98
L-177	4674	4·21·99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER — MASSLINE

(X) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION
- (X) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED
- ( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	<1K	11	N/A	21	N/A
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7	N/A	17		27	
8		18		28	
9		19		29	
10		20		30	

COMMENTS: SMEAR #'s 1,2 TAKEN INSIDE DRAINLINE, SMEAR #'s 3-6 TAKEN OUTSIDE DRAIN LINE.
L-177 BKGD = 40 CPM

SPECIAL SURVEY FORM LOCATION or EQUIPMENT ROOF DRAIN FROM OPCA

B101.6 REV.26
INS 0 V02.09.03
RT 0.811.373

YANKEE ATOMIC ELECTRIC COMPANY

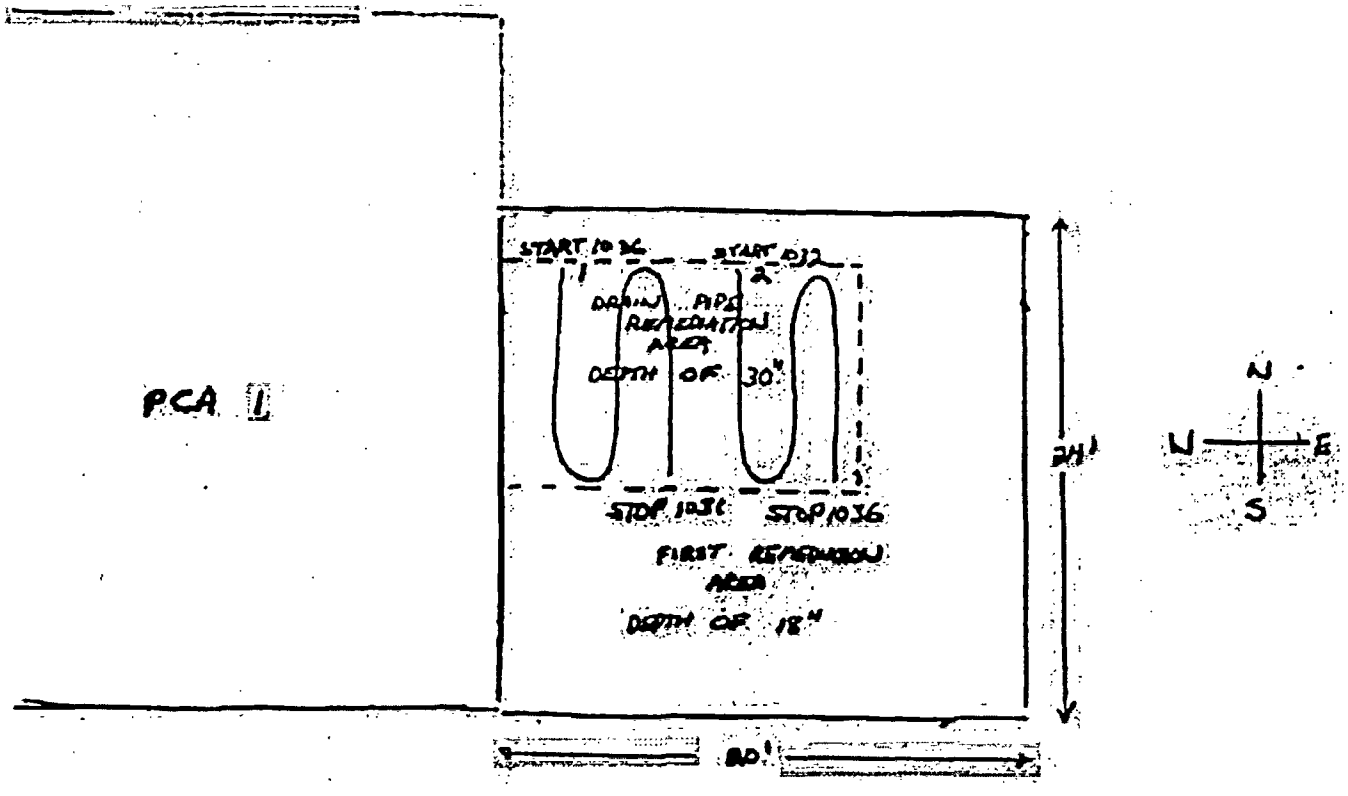
RADIATION PROTECTION SURVEY FORM

DATE 7/2/98 TIME 1010

SURVEYOR Todd Wilde

INSTRUMENT/#	CAL DUE
FERLINE E600 5155	11/1/98
FERLINE SPA3 59051	10/1/98

LOC#	CPM
1.	20.1K
2.	25.6K



KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SWEAR LOCATION
- BARRIER
- BASELINE
- ( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.
- (<) CONTAMINATION
  - ( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED
  - ( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.
- ( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SWEAR LOCATION & REV dpm/100 cm²

1	N/A	11	N/A	21	N/A
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

COMMENTS:

SPECIAL SURVEY FORM

LOCATION OF EQUIPMENT: LAND SCAN OF PCA 1 EAST EXCAVATION AREA
AREA OF PCA 1 DRAIN PIPE REMEDIATION DEPTH OF 30"
SITE CHARACTERIZATION SURVEY
SCANNED WITH COLLIMATER

S101.6	REV.24
IMS #	V02.09.03
RT #	10.811.373

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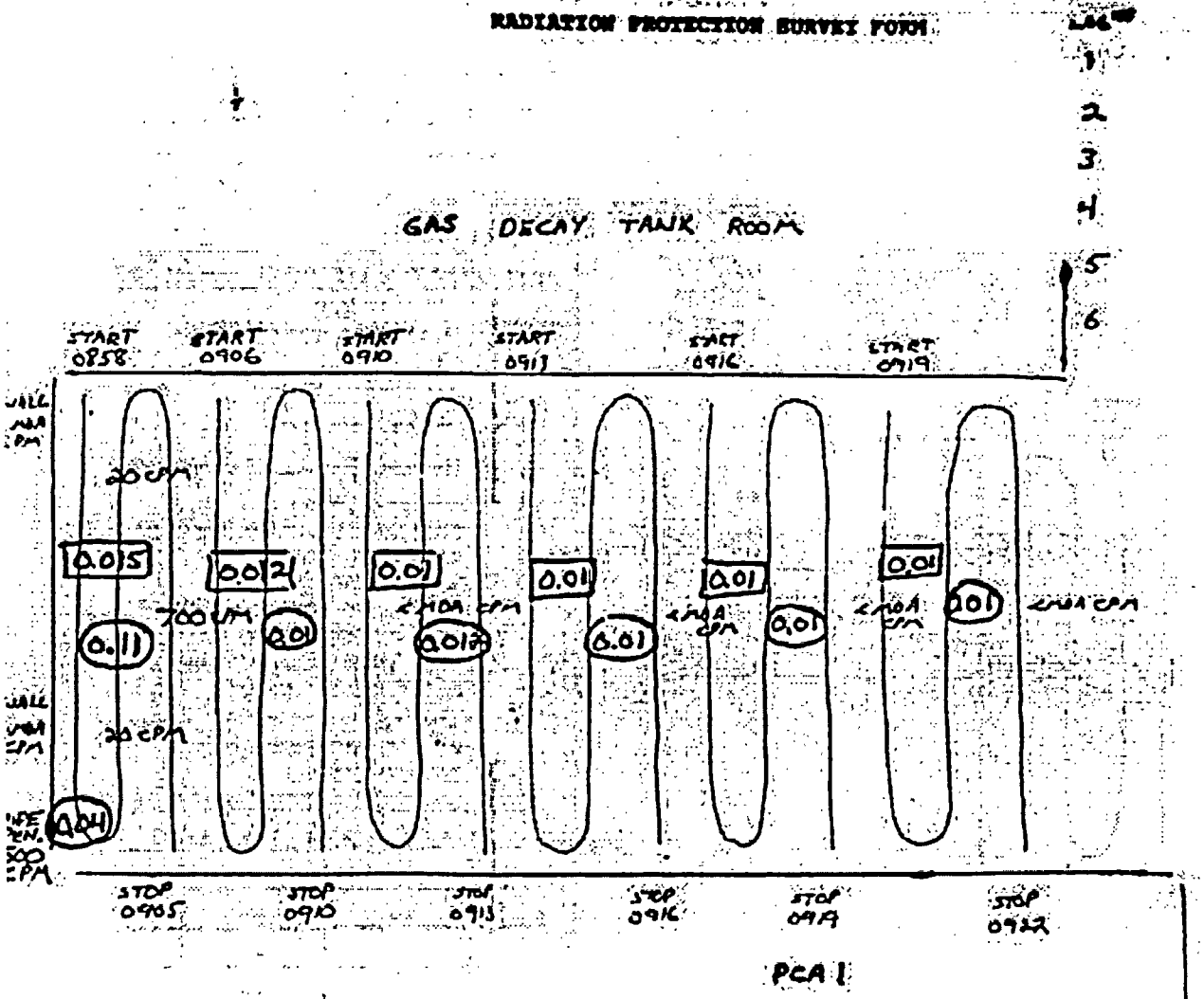
YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

LAG #	CPM
1	930K
2	15.23K
3	22.3K
4	13.81K
5	11.95K
6	10.98K



DATE 7/15/98 TIME 1010

SURVEYOR Todd Willits

INSTRUMENT/#	CAL DUE
EBERLINE E600 5156	11/20/98
RICHARD JUREK 5723	8/3/98
EBERLINE RM-14 4239	10/12/98

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- ⊹⊹ BARRIER ⊢⌒⊣ MASSLINE
- (✓) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.
- ( ) CONTAMINATION
  - ( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED
  - ( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.
- ( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	N/A	11	N/A	21	N/A
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

COMMENTS: CPM READINGS ARE DIRECT FRISK WITH EBERLINE RM-14 BACKGROUND 100 CPM

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT LAND SCAN OF ALLEY AREA BETWEEN PCA 1 AND GAS DECAY TANK ROOM SCANNED AT DEPTH OF 60" SCANNED WITH COLLIMATER SITE CHARACTERIZATION SURVEY

8101.6 REV. 24
INS # V02.09.03
RT # 10.811.373

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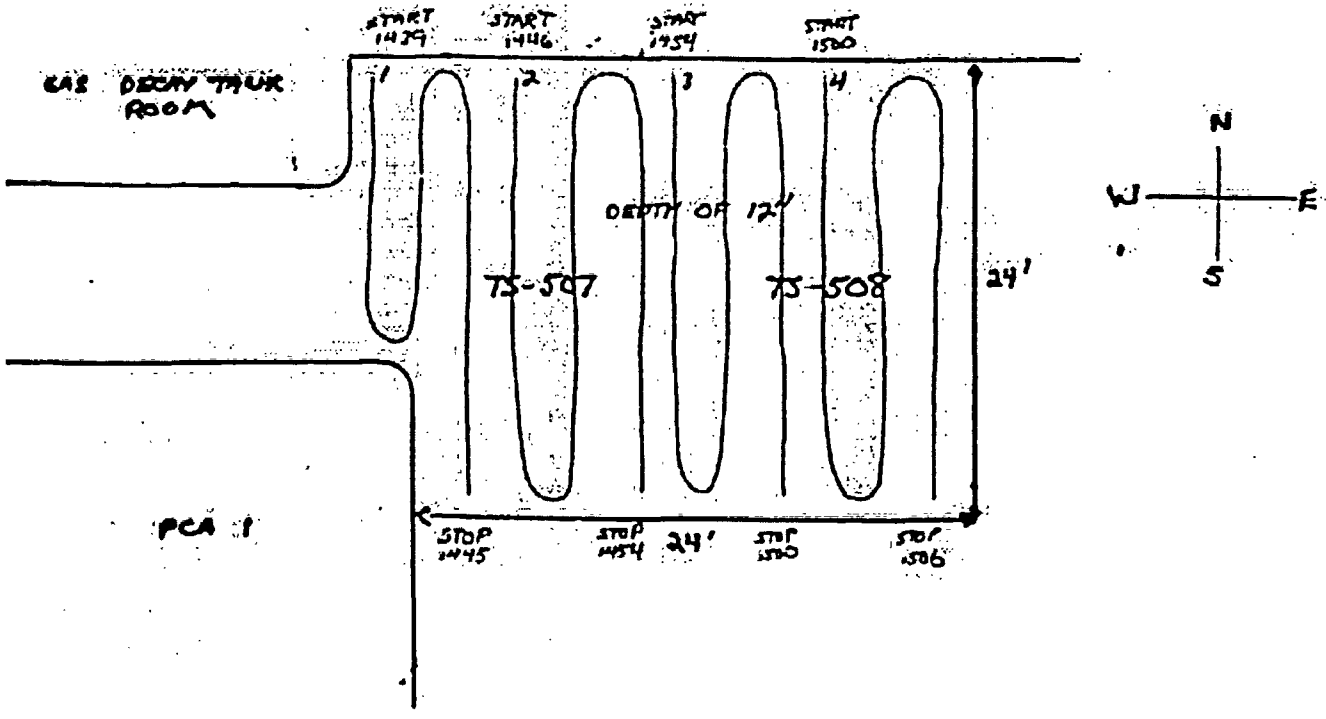
YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

LOG #	CPM
1	10.09K
2	11.29K ~~10.04K~~
3	12.44K
4	13.71K



DATE 7/15/98 TIME 1600

SURVEYOR Todd Wilbur

INSTRUMENT/#	CAL DUE
EBERLINE E600 5156	11/20/98
NEXTON UDRM 5723	8/3/98
EBERLINE RM 14 4259	10/13/98

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER — MASSLINE

(X) DIRECT RADIATION
READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION
( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY
NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & RDG dpm/100 cm²

1	N/A	11	N/A	21	N/A
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

COMMENTS:

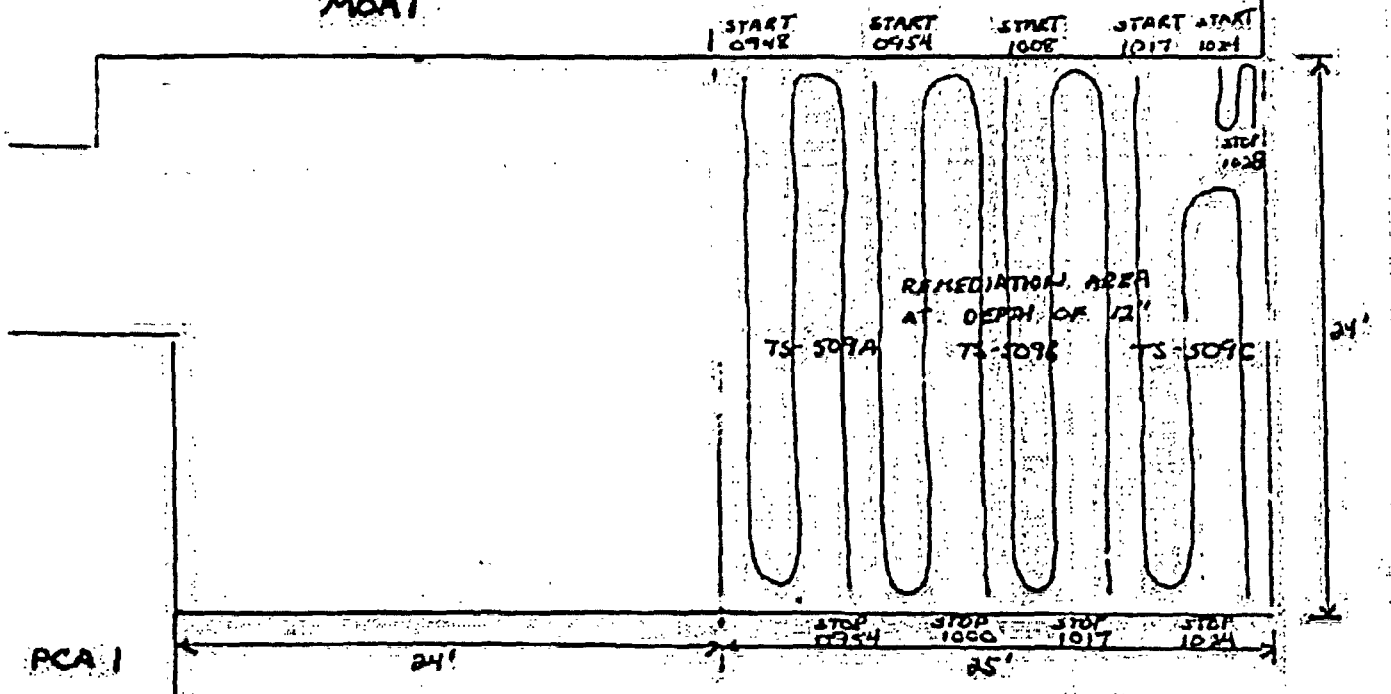
SPECIAL SURVEY FORM
LOCATION or EQUIPMENT: LAND SCAN OF AREA EAST OF PCA 1 AND SOUTH OF WHERE HOLD UP TANK AT DEPTH OF 12" SCANNED WITH COLLIMATOR SITE CHARACTERIZATION SURVEY

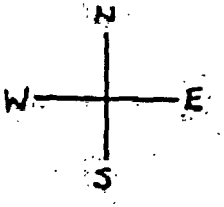
S101.6 REV.24
INS # V02.09.03
RT # 10.811.373

7E1

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM TK-31 TK 32





LOG #	CPM
1.	14.28K
2.	13.03K
3.	12.67K
4.	15.89K
5.	27.0 K

DATE 7/21/98 TIME 1030

SURVEYOR Todd White

INSTRUMENT/#	CAL DUE
EBERLINE E600 5156	11/20/98
EBERLINE SPA3 5183	10/1/98

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SWEAR LOCATION
- BARRIER
- MASELINE

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION
- ( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED
- ( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SWEAR LOCATION & NET dpm/100 cm²

1	N/A	11	N/A	21	N/A
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

COMMENTS:

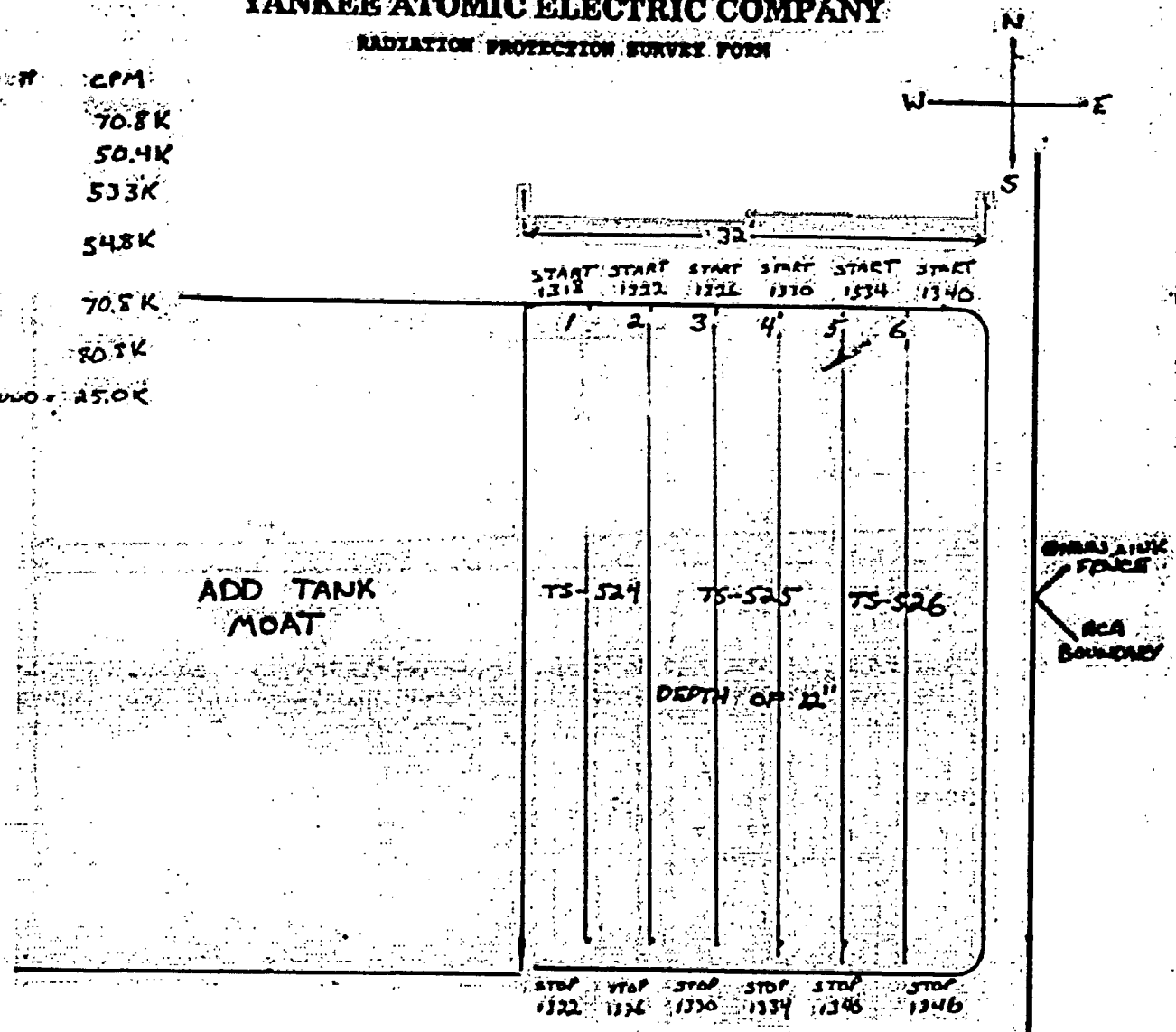
SPECIAL SURVEY FORM
LOCATION or EQUIPMENT LAND SCAN OF REMEDIATION AREA SOUTH OF ACTIVITY DELUTION AND DECAY TANK (TK 32)
· SCANNED AT DEPTH OF 12"
· SCANNED WITH COLLIMATOR
SITE CHARACTERIZATION SURVEY

8101.6 REV.26
INS # V02.09.03
RX # 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

LOG #	CPM
1.	70.8K
2	50.4K
3	53.3K
4	54.8K
5.	70.5K
6.	80.5K
BACKGROUND =	25.0K



DATE 8/4/98 TIME 1530

SURVEYOR Todd L. Allen

INSTRUMENT/#	CAL DUE
RESPONSE F400 5156	11/20/98
RESPONSE SPA-3 51841	9/21/98

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SWIPE LOCATION
- BARRIER
- MASSLINE

( ) DIRECT RADIATION
READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION
( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY
NO HOT PARTICLES FOUND UNLESS NOTED.

SWIPE LOCATION & NET dpm/100 cm²

1	N/A	11	N/A	21	N/A
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

COMMENTS:

SPECIAL SURVEY FORM
LOCATION OF EQUIPMENT REMEDIATION AREA EAST OF ADD TANK MOAT.
LAND SCAN OF YO2 EXCAVATION AREA AT DEPTH OF 12"
SITE CHARACTERIZATION SURVEY
SCANNED WITH COLLIMATER

B101.6 REV.24
INS # V02.09.03
RT # 10.811.373

Table 1
Sum of Fractions
NOL-03 -- Asphalt
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
514	IR-103	IRAS-103		0.094
464	IR-59	IRAS-59		0.785
466	IR-60	IRAS-60		1.175
468	IR-61	IRAS-61		0.080
506	IR-99	IRAS-99		0.274
508	IR-100	IRAS-100		0.649
453	IR-46	IRAS-46		0.114
512	IR-102	IRAS-102		0.017
2995	AS98.49	AS98.49C		0.031
516	IR-104	IRAS-104		0.052
518	IR-105	IRAS-105		0.007
520	IR-106	IRAS-106		0.055
522	IR-107	IRAS-107		0.135
524	IR-108	IRAS-108		0.181
600	IR-158	IRAS-158		0.073
510	IR-101	IRAS-101		1.782
			Min	0.007
			Max	1.782
			Mean	0.344

Table 2
Statistical Data Summary – NOL-03 – Asphalt
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	3	3	0.439	0.092	0.346	0.531	0.438
Ag-108m	pCi/g	6	28	2.152	2.470	0.110	6.048	1.353
Ag-110m	pCi/g	0	3	0.000				
Am-241	pCi/g	0	3	0.000				
Bi-212	pCi/g	1	2	0.693		0.693	0.693	0.693
Bi-214	pCi/g	3	3	0.389	0.047	0.335	0.421	0.410
Ce-144	pCi/g	0	3	0.000				
Co-58	pCi/g	0	33	0.000				
Co-60	pCi/g	14	33	1.071	1.285	0.148	4.080	0.392
Cs-134	pCi/g	0	33	0.000				
Cs-137	pCi/g	15	33	0.724	0.765	0.084	2.803	0.428
Fe-59	pCi/g	0	3	0.000				
K-40	pCi/g	3	3	9.805	1.502	8.328	11.330	9.758
Mn-54	pCi/g	0	3	0.000				
Nb-95	pCi/g	0	3	0.000				
Pb-212	pCi/g	3	3	0.430	0.097	0.331	0.525	0.434
Pb-214	pCi/g	3	3	0.420	0.088	0.330	0.507	0.422
Ra-226	pCi/g	2	2	0.906	0.032	0.884	0.929	0.906
Ru-103	pCi/g	0	3	0.000				
Ru-106	pCi/g	0	3	0.000				
Sb-124	pCi/g	0	3	0.000				
Sb-125	pCi/g	0	1	0.000				
Tl-208	pCi/g	2	2	0.452	0.070	0.403	0.502	0.452
Zn-65	pCi/g	0	3	0.000				
Zr-95	pCi/g	0	3	0.000				

Table 3
Summary of Detected Results Above Criteria
NOL-03 -- Asphalt
Yankee Nuclear Power Station Rowe, MA
DCGL_Asphalt

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	3	3		pCi/g	0	0.53
Ag-108m	6	28	8.52	pCi/g	0	6.05
Ag-110m	0	3		pCi/g	0	
Am-241	0	3	44.35	pCi/g	0	
Bi-212	1	2		pCi/g	0	0.69
Bi-214	3	3		pCi/g	0	0.42
Ce-144	0	3		pCi/g	0	
Co-58	0	33		pCi/g	0	
Co-60	14	33	4.84	pCi/g	0	4.08
Cs-134	0	33	6.71	pCi/g	0	
Cs-137	15	33	12.24	pCi/g	0	2.80
Fe-59	0	3		pCi/g	0	
K-40	3	3		pCi/g	0	11.33
Mn-54	0	3	21.66	pCi/g	0	
Nb-95	0	3		pCi/g	0	
Pb-212	3	3		pCi/g	0	0.53
Pb-214	3	3		pCi/g	0	0.51
Ra-226	2	2		pCi/g	0	0.93
Ru-103	0	3		pCi/g	0	
Ru-106	0	3	68.21	pCi/g	0	
Sb-124	0	3		pCi/g	0	
Sb-125	0	1	37.73	pCi/g	0	
Tl-208	2	2		pCi/g	0	0.50
Zn-65	0	3		pCi/g	0	
Zr-95	0	3		pCi/g	0	

Table 4
Rad
NOL-03 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	AS98.49 (2995)	AS98.49 (2995)	AS98.49 (2995)	IR-100 (508)	IR-101 (510)	IR-102 (512)
Sample ID	AS98.49A	AS98.49B	AS98.49C	IRAS-100	IRAS-101	IRAS-102
Date Sampled	10/29/1998	10/29/1998	10/29/1998	6/22/1994	6/23/1994	6/23/1994
Ac-228	0.5311	0.4381	0.3464			
Ag-108m	-0.01939 U	0.008413 U	-0.005179 U	0.087 UM	6.048	0.04 UM
Ag-110m	0.00823 U	0.007742 U	-0.04431 U			
Am-241	0 U	0 U	0 U			
Bi-212	0.5057 U		0.6926			
Bi-214	0.4102	0.4205	0.3352			
Ce-144	-0.09206 U	0.1842 U	-0.04834 U			
Co-58	-0.008776 U	-0.01303 U	-0.003223 U	0.107 UM	0.132 UM	0.051 UM
Co-60	0.00466 U	0.03683 U	0.1481	2.594	4.08	0.0917 UM
Cs-134	-0.04835 U	0.0092 U	0.04485 U	0.078 UM	0.13 UM	0.047 UM
Cs-137	0.01588 U	0.0001121 U	0.02577 U	1.377	2.803	0.203
Fe-59	0.02187 U	-0.04704 U	-0.02544 U			
K-40	11.33	8.328	9.758			
Mn-54	0.02287 U	0.02265 U	-0.02347 U			
Nb-95	0.01537 U	0.004252 U	0.02463 U			
Pb-212	0.5252	0.3313	0.4339			
Pb-214	0.5072	0.422	0.3304			
Ra-226	0.9289	0.8838				
Ru-103	0.01168 U	-0.01817 U	0.01195 U			
Ru-106	-0.03926 U	0.1053 U	0 U			
Sb-124	0 U	-0.02045 U	0 U			
Sb-125	-0.04705 U					
Tl-208	0.5017		0.4027			
Zn-65	-0.01841 U	-0.04975 U	-0.0304 U			
Zr-95	0.03953 U	0.05424 U	0.0044 U			
SOF			0.031	0.649	1.782	0.017

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 – Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-103 (514)	IR-104 (516)	IR-105 (518)	IR-106 (520)	IR-107 (522)	IR-108 (524)
Sample ID	IRAS-103	IRAS-104	IRAS-105	IRAS-106	IRAS-107	IRAS-108
Date Sampled	6/23/1994	6/23/1994	6/23/1994	6/23/1994	6/23/1994	6/23/1994
Ac-228						
Ag-108m	0.048 UM	0.057 UM	0.053 UM	0.048 UM	0.204	0.125
Ag-110m						
Am-241						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.069 UM	0.056 UM	0.055 UM	0.061 UM	0.062 UM	0.073 UM
Co-60	0.37	0.192	0.0616 UM	0.171	0.419	0.414
Cs-134	0.048 UM	0.057 UM	0.046 UM	0.059 UM	0.051 UM	0.061 UM
Cs-137	0.21	0.155	0.0835	0.246	0.298	0.985
Fe-59						
K-40						
Mn-54						
Nb-95						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Tl-208						
Zn-65						
Zr-95						
SOF	0.094	0.052	0.007	0.055	0.135	0.181

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-112 (531)	IR-113 (533)	IR-124 (548)	IR-125 (550)	IR-126 (552)	IR-134 (564)
Sample ID	IRAS-112	IRAS-113	IRAS-124	IRAS-125	IRAS-126	IRAS-134
Date Sampled	6/30/1994	6/30/1994	8/3/1994	8/3/1994	8/3/1994	8/8/1994
Ac-228						
Ag-108m	0.075 UM	0.063 UM	0.048 UM	0.044 UM	0.048 UM	0.047 UM
Ag-110m						
Am-241						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.064 UM	0.064 UM	0.053 UM	0.058 UM	0.065 UM	0.047 UM
Co-60	0.0845 UM	0.0632 UM	0.0926 UM	0.083 UM	0.0721 UM	0.0735 UM
Cs-134	0.065 UM	0.052 UM	0.059 UM	0.049 UM	0.052 UM	0.049 UM
Cs-137	0.0909 UM	0.0759 UM	0.0668 UM	0.0733 UM	0.0603 UM	0.0554 UM
Fe-59						
K-40						
Mn-54						
Nb-95						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Tl-208						
Zn-65						
Zr-95						
SOF						

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-135 (566)	IR-143 (579)	IR-144 (581)	IR-145 (583)	IR-153 (592)	IR-154 (594)
Sample ID	IRAS-135	IRAS-143	IRAS-144	IRAS-145	IRAS-153	IRAS-154
Date Sampled	8/8/1994	8/10/1994	8/10/1994	8/10/1994	9/14/1994	9/15/1994
Ac-228						
Ag-108m	0.052 UM	0.055 UM	0.055 UM	0.053 UM	0.048 UM	0.042 UM
Ag-110m						
Am-241						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.059 UM	0.061 UM	0.066 UM	0.073 UM	0.052 UM	0.057 UM
Co-60	0.092 UM	0.0853 UM	0.0763 UM	0.0806 UM	0.0861 UM	0.0776 UM
Cs-134	0.054 UM	0.053 UM	0.056 UM	0.061 UM	0.043 UM	0.04 UM
Cs-137	0.069 UM	0.0674 UM	0.081 UM	0.0805 UM	0.0682 UM	0.0621 UM
Fe-59						
K-40						
Mn-54						
Nb-95						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Tl-208						
Zn-65						
Zr-95						
SOF						

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-158 (600)	IR-43 (447)	IR-44 (449)	IR-45 (451)	IR-46 (453)	IR-59 (464)	IR-60 (466)
Sample ID	IRAS-158	IRAS-43	IRAS-44	IRAS-45	IRAS-46	IRAS-59	IRAS-60
Date Sampled	9/14/1994	5/20/1993	5/18/1993	5/18/1993	5/19/1993	6/3/1993	6/3/1993
Ac-228							
Ag-108m	0.056 UM					2.502	3.923
Ag-110m							
Am-241							
Bi-212							
Bi-214							
Ce-144							
Co-58	0.06 UM	0.0474 UM	0.0838 UM	0.0584 UM	0.0698 UM	0.134 UM	0.112 UM
Co-60	0.183	0.0832 UM	0.0939 UM	0.0901 UM	0.356	1.65	3.092
Cs-134	0.073 UM	0.063 UM	0.073 UM	0.071 UM	0.075 UM	0.133 UM	0.111 UM
Cs-137	0.428	0.059 UM	0.104 UM	0.0758 UM	0.499	1.841	0.923
Fe-59							
K-40							
Mn-54							
Nb-95							
Pb-212							
Pb-214							
Ra-226							
Ru-103							
Ru-106							
Sb-124							
Sb-125							
Tl-208							
Zn-65							
Zr-95							
SOF	0.073				0.114	0.785	1.175

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-61 (468)	IR-99 (506)
Sample ID	IRAS-61	IRAS-99
Date Sampled	6/3/1993	6/22/1994
Ac-228		
Ag-108m		0.11
Ag-110m		
Am-241		
Bi-212		
Bi-214		
Ce-144		
Co-58	0.0727 UM	0.072 UM
Co-60	0.296	1.032
Cs-134	0.072 UM	0.06 UM
Cs-137	0.234	0.581
Fe-59		
K-40		
Mn-54		
Nb-95		
Pb-212		
Pb-214		
Ra-226		
Ru-103		
Ru-106		
Sb-124		
Sb-125		
Tl-208		
Zn-65		
Zr-95		
SOF	0.08	0.274

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 1
Sum of Fractions
NOL-03 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID	Sum Of Fractions
587	IR-148	IRTS-148	0.066
566	IR-135	IRTS-135	0.226
568	IR-136	IRTS-136	224.524
569	IR-137	IRTS-137	40.225
570	IR-138	IRTS-138	1.541
579	IR-143	IRTS-143	0.114
581	IR-144	IRTS-144	0.139
583	IR-145	IRTS-145	0.069
596	IR-155	IRTS-155F	0.063
586	IR-147	IRTS-147	0.142
533	IR-113	IRTS-113	0.083
592	IR-153	IRTS-153	0.015
594	IR-154	IRTS-154	0.049
596	IR-155	IRTS-155A	9.744
596	IR-155	IRTS-155B	2.180
596	IR-155	IRTS-155C	0.489
596	IR-155	IRTS-155D	0.113
449	IR-44	IRTS-44	0.026
585	IR-146	IRTS-146	0.068
512	IR-102	IRTS-102	0.844
453	IR-46	IRTS-46	4.732
464	IR-59	IRTS-59	0.716
466	IR-60	IRTS-60	4.610
468	IR-61	IRTS-61	0.853
504	IR-97	IRTS-97	3.881
505	IR-98	IRTS-98	10.106
506	IR-99	IRTS-99	0.395

Table 1
Sum of Fractions
NOL-03 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID	Sum Of Fractions
564	IR-134	IRTS-134	0.352
510	IR-101	IRTS-101	0.417
550	IR-125	IRTS-125	0.034
514	IR-103	IRTS-103	0.407
516	IR-104	IRTS-104	4.978
518	IR-105	IRTS-105	2.483
520	IR-106	IRTS-106	0.680
522	IR-107	IRTS-107	5.264
524	IR-108	IRTS-108	2.431
531	IR-112	IRTS-112	0.309
600	IR-158	IRTS-158A	5.094
508	IR-100	IRTS-100	0.780
3232	TS503	TS503	0.275
3220	TS488	TS488	0.009
3221	TS489	TS489A	0.004
3222	TS490	TS490A	0.004
3223	TS491	TS491A	0.016
3223	TS491	TS491B	0.003
3224	TS492	TS492A	0.009
3225	TS493	TS493	0.064
596	IR-155	IRTS-155E	0.051
3227	TS496	TS496	0.117
3217	TS485	TS485	0.109
3233	TS504	TS504	0.525
3234	TS505	TS505	0.003
3235	TS506	TS506	0.014
3236	TS507	TS507	0.010

Table 1
Sum of Fractions
NOL-03 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
3253	TS525	TS525		0.004
3254	TS526	TS526		0.006
3255	TS527	TS527		0.200
3226	TS494	TS494		0.039
3202	TS413	TS413		0.159
600	IR-158	IRTS-158B		3.112
600	IR-158	IRTS-158C		0.332
600	IR-158	IRTS-158D		0.078
600	IR-158	IRTS-158E		0.069
600	IR-158	IRTS-158F		0.066
600	IR-158	IRTS-158G		0.012
602	IR-159	IRTS-159		0.075
3219	TS487	TS487		0.075
3201	TS412	TS412		0.021
3218	TS486	TS486		0.113
3210	TS478	TS478A		0.010
3210	TS478	TS478B		0.011
3211	TS479	TS479A		0.017
3212	TS480	TS480A		0.515
3213	TS481	TS481		0.006
3215	TS483	TS483		0.083
3216	TS484	TS484		0.023
3256	TS528	TS528		0.049
606	IR-163	IRTS-163		0.007
			Min	0.003
			Max	224.524
			Mean	4.302

Table 2
Statistical Data Summary – NOL-03 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	38	38	0.938	0.727	0.595	5.238	0.794
Ag-108m	pCi/g	44	92	8.990	23.273	0.041	99.714	0.315
Ag-110m	pCi/g	1	38	0.056		0.056	0.056	0.056
Am-241	pCi/g	0	38	0.000				
Ba-140	pCi/g	0	2	0.000				
Bi-212	pCi/g	20	26	0.785	0.181	0.546	1.108	0.782
Bi-214	pCi/g	31	31	0.541	0.530	0.367	3.385	0.440
Ce-144	pCi/g	1	38	0.256		0.256	0.256	0.256
Co-58	pCi/g	1	95	0.212		0.212	0.212	0.212
Co-60	pCi/g	61	95	21.358	129.420	0.047	1008.800	0.866
Cs-134	pCi/g	3	95	0.298	0.399	0.027	0.756	0.110
Cs-136	pCi/g	1	2	0.332		0.332	0.332	0.332
Cs-137	pCi/g	72	95	3.343	9.759	0.041	61.209	0.287
Eu-152	pCi/g	0	2	0.000				
Fe-59	pCi/g	0	38	0.000				
I-132	pCi/g	1	2	1.650		1.650	1.650	1.650
K-40	pCi/g	32	38	19.013	16.994	1.656	109.400	17.100
La-140	pCi/g	1	1	0.167		0.167	0.167	0.167
Mn-54	pCi/g	3	38	0.124	0.146	0.040	0.292	0.040
Nb-95	pCi/g	7	38	0.042	0.008	0.029	0.052	0.044
Np-239	pCi/g	0	3	0.000				
Pb-212	pCi/g	38	38	0.922	0.720	0.606	5.202	0.821
Pb-214	pCi/g	38	38	0.560	0.534	0.358	3.744	0.472
Ra-226	pCi/g	18	25	1.288	0.257	0.870	1.779	1.327
Ru-103	pCi/g	2	38	0.039	0.012	0.031	0.048	0.039
Ru-106	pCi/g	1	38	0.299		0.299	0.299	0.299
Sb-124	pCi/g	0	38	0.000				
Sb-125	pCi/g	0	3	0.000				
Se-75	pCi/g	0	1	0.000				
Tl-208	pCi/g	37	37	0.848	0.652	0.558	4.652	0.740
Zn-65	pCi/g	0	38	0.000				
Zr-95	pCi/g	5	38	0.063	0.007	0.059	0.075	0.059

Table 3
Summary of Detected Results Above Criteria
NOL-03 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	38	38		pCi/g	0	5.24
Ag-108m	44	92	8.52	pCi/g	7	99.71
Ag-110m	1	38		pCi/g	0	0.06
Am-241	0	38	44.35	pCi/g	0	
Ba-140	0	2		pCi/g	0	
Bi-212	20	26		pCi/g	0	1.11
Bi-214	31	31		pCi/g	0	3.39
Ce-144	1	38		pCi/g	0	0.26
Co-58	1	95		pCi/g	0	0.21
Co-60	61	95	4.84	pCi/g	14	1008.80
Cs-134	3	95	6.71	pCi/g	0	0.76
Cs-136	1	2		pCi/g	0	0.33
Cs-137	72	95	12.24	pCi/g	3	61.21
Eu-152	0	2	12.06	pCi/g	0	
Fe-59	0	38		pCi/g	0	
I-132	1	2		pCi/g	0	1.65
K-40	32	38		pCi/g	0	109.40
La-140	1	1		pCi/g	0	0.17
Mn-54	3	38	21.66	pCi/g	0	0.29
Nb-95	7	38		pCi/g	0	0.05
Np-239	0	3		pCi/g	0	
Pb-212	38	38		pCi/g	0	5.20
Pb-214	38	38		pCi/g	0	3.74
Ra-226	18	25		pCi/g	0	1.78
Ru-103	2	38		pCi/g	0	0.05
Ru-106	1	38	68.21	pCi/g	0	0.30
Sb-124	0	38		pCi/g	0	
Sb-125	0	3	37.73	pCi/g	0	
Se-75	0	1		pCi/g	0	
Tl-208	37	37		pCi/g	0	4.65
Zn-65	0	38		pCi/g	0	
Zr-95	5	38		pCi/g	0	0.07

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-100 (508)	IR-101 (510)	IR-102 (512)	IR-103 (514)	IR-104 (516)	IR-105 (518)
Sample ID	IRTS-100	IRTS-101	IRTS-102	IRTS-103	IRTS-104	IRTS-105
Date Sampled	6/22/1994	6/23/1994	6/23/1994	6/23/1994	6/23/1994	6/23/1994
Ac-228						
Ag-108m	0.192	0.796	0.15	0.086 UM	0.156 UM	6.362
Ag-110m						
Am-241						
Ba-140						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.135 UM	0.088 UM	0.132 UM	0.105 UM	0.239 UM	0.148 UM
Co-60	2.56	1.155	3.31	1.565	23.909	6.375
Cs-134	0.118 UM	0.075 UM	0.109 UM	0.085 UM	0.202 UM	0.158 UM
Cs-136						
Cs-137	2.795	1.034	1.742	1.022	0.445	5.12
Eu-152						
Fe-59						
I-132						
K-40						
La-140						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Se-75						
Tl-208						
Zn-65						
Zr-95						
SOF	0.78	0.417	0.844	0.407	4.978	2.483

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key) Sample ID Date Sampled	IR-106 (520) IRTS-106 6/23/1994	IR-107 (522) IRTS-107 6/23/1994	IR-108 (524) IRTS-108 6/23/1994	IR-112 (531) IRTS-112 6/30/1994	IR-113 (533) IRTS-113 6/30/1994	IR-124 (548) IRTS-124 8/3/1994
Ac-228						
Ag-108m	0.555	25.948	0.496	0.321	0.138	0.05 UM
Ag-110m						
Am-241						
Ba-140						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.102 UM	0.229 UM	0.161 UM	0.082 UM	0.066 UM	0.072 UM
Co-60	2.476	7.661	8.124	1.171	0.231	0.0811 UM
Cs-134	0.082 UM	0.235 UM	0.124 UM	0.071 UM	0.055 UM	0.051 UM
Cs-136						
Cs-137	1.262	7.782	8.494	0.357	0.232	0.0815 UM
Eu-152						
Fe-59						
I-132						
K-40						
La-140						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Se-75						
Tl-208						
Zn-65						
Zr-95						
SOF	0.68	5.264	2.431	0.309	0.083	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-125 (550)	IR-126 (552)	IR-134 (564)	IR-135 (566)	IR-136 (568)	IR-137 (569)
Sample ID	IRTS-125	IRTS-126	IRTS-134	IRTS-135	IRTS-136	IRTS-137
Date Sampled	8/3/1994	8/4/1994	8/8/1994	8/8/1994	8/8/1994	8/8/1994
Ac-228						
Ag-108m	0.08 UM	0.041 UM	1.103	0.278	99.714	98.174
Ag-110m						
Am-241						
Ba-140						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.077 UM	0.043 UM	0.092 UM	0.082 UM	2.826 UM	0.862 UM
Co-60	0.0818	0.0696 UM	1.015	0.834	1008.8	114.13
Cs-134	0.063 UM	0.047 UM	0.086 UM	0.08 UM	2.16 UM	0.756
Cs-136						
Cs-137	0.206	0.0712 UM	0.153	0.258	52.701	61.209
Eu-152						
Fe-59						
I-132						
K-40						
La-140						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Se-75						
Tl-208						
Zn-65						
Zr-95						
SOF	0.034		0.352	0.226	224.524	40.225

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-138 (570)	IR-143 (579)	IR-144 (581)	IR-145 (583)	IR-146 (585)	IR-147 (586)
Sample ID	IRTS-138	IRTS-143	IRTS-144	IRTS-145	IRTS-146	IRTS-147
Date Sampled	8/8/1994	8/10/1994	8/10/1994	8/10/1994	9/12/1994	9/13/1994
Ac-228						
Ag-108m	2.833	0.144	0.197	0.062 UM	0.074 UM	0.117
Ag-110m						
Am-241						
Ba-140						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.129 UM	0.066 UM	0.074 UM	0.053 UM	0.055 UM	0.092 UM
Co-60	4.683	0.249	0.393	0.226	0.245	0.454
Cs-134	0.119 UM	0.046 UM	0.062 UM	0.057 UM	0.056 UM	0.09 UM
Cs-136						
Cs-137	2.943	0.554	0.425	0.277	0.207	0.417
Eu-152						
Fe-59						
I-132						
K-40						
La-140						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Se-75						
Tl-208						
Zn-65						
Zr-95						
SOF	1.541	0.114	0.139	0.069	0.068	0.142

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-148 (587)	IR-153 (592)	IR-154 (594)	IR-155 (596)	IR-155 (596)	IR-155 (596)
Sample ID	IRTS-148	IRTS-153	IRTS-154	IRTS-155A	IRTS-155B	IRTS-155C
Date Sampled	9/13/1994	9/14/1994	9/14/1994	9/12/1994	9/12/1994	9/13/1994
Ac-228						
Ag-108m	0.16	0.131	0.074 UM	37.352	5.026	1.096
Ag-110m						
Am-241						
Ba-140						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.078 UM	0.065 UM	0.065 UM	0.288 UM	0.155 UM	0.078 UM
Co-60	0.154	0.0867 UM	0.181	18.657	5.293	1.266
Cs-134	0.067 UM	0.061 UM	0.054 UM	0.332 UM	0.156 UM	0.072 UM
Cs-136						
Cs-137	0.191	0.0969 UM	0.136	18.412	6.068	1.203
Eu-152						
Fe-59						
I-132						
K-40						
La-140						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Se-75						
Tl-208						
Zn-65						
Zr-95						
SOF	0.066	0.015	0.049	9.744	2.18	0.489

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key) Sample ID Date Sampled	IR-155 (596) IRTS-155D 9/13/1994	IR-155 (596) IRTS-155E 9/12/1994	IR-155 (596) IRTS-155F 9/14/1994	IR-158 (600) IRTS-158A 9/13/1994	IR-158 (600) IRTS-158B 9/13/1994	IR-158 (600) IRTS-158C 9/13/1994
Ac-228						
Ag-108m	0.425	0.187	0.157	20.594	3.944	0.149
Ag-110m						
Am-241						
Ba-140						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.059 UM	0.052 UM	0.088 UM	0.2 UM	0.181 UM	0.08 UM
Co-60	0.201	0.095	0.215	9.876	8.877	0.866
Cs-134	0.054 UM	0.047 UM	0.074 UM	0.201 UM	0.165 UM	0.075 UM
Cs-136						
Cs-137	0.263	0.115	0.105 UM	7.778	9.965	1.659
Eu-152						
Fe-59						
I-132						
K-40						
La-140						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Se-75						
Tl-208						
Zn-65						
Zr-95						
SOF	0.113	0.051	0.063	5.094	3.112	0.332

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-158 (600)	IR-158 (600)	IR-158 (600)	IR-158 (600)	IR-158 (600)	IR-159 (602)
Sample ID	IRTS-158D	IRTS-158E	IRTS-158F	IRTS-158G	IRTS-158H	IRTS-159
Date Sampled	9/13/1994	9/12/1994	9/13/1994	9/15/1994	9/15/1994	9/13/1994
Ac-228						
Ag-108m	0.061 UM	0.059 UM	0.226	0.061 UM	0.06 UM	0.073 UM
Ag-110m						
Am-241						
Ba-140						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.077 UM	0.076 UM	0.076 UM	0.065 UM	0.072 UM	0.07 UM
Co-60	0.175	0.201	0.124	0.0962 UM	0.045 UM	0.251
Cs-134	0.054 UM	0.061 UM	0.059 UM	0.062 UM	0.059 UM	0.064 UM
Cs-136						
Cs-137	0.515	0.336	0.167	0.145	0.0791 UM	0.289
Eu-152						
Fe-59						
I-132						
K-40						
La-140						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Se-75						
Tl-208						
Zn-65						
Zr-95						
SOF	0.078	0.069	0.066	0.012		0.075

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-160 (603)	IR-161 (604)	IR-162 (605)	IR-163 (606)	IR-164 (607)	IR-43 (447)
Sample ID	IRTS-160	IRTS-161	IRTS-162	IRTS-163	IRTS-164	IRTS-43
Date Sampled	9/13/1994	9/20/1994	9/20/1994	9/20/1994	9/20/1994	5/19/1993
Ac-228						
Ag-108m	0.061 UM	0.05 UM	0.053 UM	0.05 UM	0.069 UM	
Ag-110m						
Am-241						
Ba-140						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.074 UM	0.067 UM	0.075 UM	0.075 UM	0.078 UM	0.0752 UM
Co-60	0.104 UM	0.093 UM	0.0966 UM	0.121 UM	0.0982 UM	0.089 UM
Cs-134	0.073 UM	0.053 UM	0.056 UM	0.057 UM	0.069 UM	0.064 UM
Cs-136						
Cs-137	0.0871 UM	0.0755 UM	0.0932 UM	0.0828	0.135 UM	0.0825 UM
Eu-152						
Fe-59						
I-132						
K-40						
La-140						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Se-75						
Tl-208						
Zn-65						
Zr-95						
SOF				0.007		

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-44 (449)	IR-45 (451)	IR-46 (453)	IR-59 (464)	IR-60 (466)	IR-61 (468)	IR-97 (504)
Sample ID	IRTS-44	IRTS-45	IRTS-46	IRTS-59	IRTS-60	IRTS-61	IRTS-97
Date Sampled	5/20/1993	5/18/1993	5/18/1993	6/3/1993	6/4/1993	6/3/1993	6/22/1994
Ac-228							
Ag-108m			0.503	2.281	7.587	0.234	9.348
Ag-110m							
Am-241							
Ba-140							
Bi-212							
Bi-214							
Ce-144							
Co-58	0.111 UM	0.0683 UM	0.212	0.122 UM	0.166 UM	0.167 UM	0.2 UM
Co-60	0.0972 UM	0.0863 UM	19.267	1.504	13.54	3.633	10.064
Cs-134	0.09 UM	0.061 UM	0.286 UM	0.121 UM	0.138 UM	0.121 UM	0.177 UM
Cs-136							
Cs-137	0.324	0.0764 UM	8.447	1.678	11.27	0.916	8.61
Eu-152							
Fe-59							
I-132							
K-40							
La-140							
Mn-54							
Nb-95							
Np-239							
Pb-212							
Pb-214							
Ra-226							
Ru-103							
Ru-106							
Sb-124							
Sb-125							
Se-75							
Tl-208							
Zn-65							
Zr-95							
SOF	0.026		4.732	0.716	4.61	0.853	3.881

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-98 (505)	IR-99 (506)	TS412 (3201)	TS413 (3202)	TS478 (3210)	TS478 (3210)
Sample ID	IRTS-98	IRTS-99	TS412	TS413	TS478A	TS478B
Date Sampled	6/22/1994	6/22/1994	10/30/1997	10/30/1997	6/10/1998	6/10/1998
Ac-228			0.6457	5.238	0.818	0.9299
Ag-108m	67.296	0.085 UM	0.004483 U	-0.01096 U	-0.02098 U	0.02306 U
Ag-110m			0.01846 U	-0.1119 U	0.0204 U	-0.002394 U
Am-241			0 U	0 U	0 U	0 U
Ba-140				2.249 U		
Bi-212			0.6396		0.9255	0.5942
Bi-214			0.3665	3.385	0.5007	0.4477
Ce-144			-0.06972 U	-1.691 U	-0.01397 U	-0.156 U
Co-58	0.276 UM	0.091 UM	0.005783 U	0.1303 U	-0.002255 U	-0.007123 U
Co-60	8.257	1.656	0.07206	0.5154	0.03902 U	-0.0178 U
Cs-134	0.305 UM	0.085 UM	0.001959 U	0.4351 U	-0.001769 U	-0.06362 U
Cs-136						
Cs-137	6.142	0.648	0.07932	0.4811	0.1243	0.1327
Eu-152					-0.01579 U	
Fe-59			0.01606 U	0.1274 U	0.03377 U	-0.07629 U
I-132						
K-40			13.83	109.4	16.11	17.75
La-140						
Mn-54			0.004887 U	0.2921	0.000000004917 U	-0.004243 U
Nb-95			-0.0196 U	0.05522 U	0.01719 U	-0.01098 U
Np-239						
Pb-212			0.7419	5.202	0.8717	0.8245
Pb-214			0.4329	3.744	0.3582	0.4647
Ra-226				5.628 U	1.139	
Ru-103			-0.005777 U	0.003006 U	0.008224 U	-0.02734 U
Ru-106			0.01993 U	0.6631 U	0.0631 U	-0.04072 U
Sb-124			0.002139 U	-0.1824 U	0.01913 U	0 U
Sb-125						
Se-75						
Tl-208			0.5937	4.652	0.7852	0.9587
Zn-65			0.08745 U	-0.1166 U	-0.06035 U	-0.02031 U
Zr-95			0.01686 U	0.1622 U	-0.00661 U	0.03771 U
SOF	10.106	0.395	0.021	0.159	0.01	0.011

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS479 (3211)	TS480 (3212)	TS481 (3213)	TS482 (3214)	TS483 (3215)	TS484 (3216)
Sample ID	TS479A	TS480A	TS481	TS482	TS483	TS484
Date Sampled	6/10/1998	6/10/1998	6/10/1998	6/10/1998	6/10/1998	6/10/1998
Ac-228	0.9708	0.7493	0.752	0.9285	0.6879	0.9243
Ag-108m	0.07201	0.5699	0.01793 U	-0.01291 U	0.125	0.04925
Ag-110m	-0.001231 U	0.0149 U	-0.002753 U	-0.01207 U	-0.01086 U	0.02082 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Ba-140						
Bi-212	0.2444 U		0.4392 U	0.38 U	0.7787	0.6362
Bi-214	0.44	0.3958	0.4255	0.4691	0.395	0.455
Ce-144	-0.2131 U	0.3092 U	-0.1936 U	0.01863 U	-0.03908 U	-0.0432 U
Co-58	0.002308 U	-0.006828 U	0.003908 U	-0.002177 U	0.008178 U	-0.003259 U
Co-60	0.0183 U	1.373	0.02806 U	-0.01065 U	0.2355	0.06432
Cs-134	0.01392 U	0.03503 U	-0.08258 U	-0.005908 U	0.02421 U	-0.008163 U
Cs-136						
Cs-137	0.1035	2.006	0.046	-0.01692 U	0.2427	0.0501
Eu-152						
Fe-59	0.0168 U	0.01256 U	-0.005369 U	0 U	-0.06436 U	0.02226 U
I-132		1.65				
K-40	17.36	17.06	17.81	18.69	17.02	17.69
La-140						
Mn-54	0.0002566 U	0.003476 U	0.03984	0.02407 U	-0.0307 U	0.002291 U
Nb-95	0.01283 U	0.01276 U	-0.003465 U	0.005719 U	-0.008522 U	0.01006 U
Np-239						
Pb-212	0.9036	0.8409	0.8218	0.8311	0.7418	1.008
Pb-214	0.5105	0.4307	0.4637	0.4245	0.5121	0.5681
Ra-226	1.323		1.242		0.9803 U	1.072 U
Ru-103	0.01169 U	0.01623 U	-0.01345 U	-0.00859 U	-0.00689 U	-0.0151 U
Ru-106	0.1071 U	0.04193 U	0.04244 U	-0.1917 U	-0.04105 U	0.1038 U
Sb-124	-0.0056 U	0.001122 U	0.02004 U	0.002146 U	0 U	0.02892 U
Sb-125						
Se-75						
Tl-208	0.9042	0.6404	0.6936	0.742	0.7663	0.829
Zn-65	-0.05842 U	-0.1213 U	0.01515 U	0.01499 U	-0.0103 U	-0.0526 U
Zr-95	-0.008614 U	0.004314 U	-0.03716 U	0.02475 U	0.05919	0.01283 U
SOF	0.017	0.515	0.006		0.083	0.023

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS485 (3217)	TS486 (3218)	TS487 (3219)	TS488 (3220)	TS489 (3221)	TS489 (3221)
Sample ID	TS485	TS486	TS487	TS488	TS489A	TS489B
Date Sampled	6/10/1998	6/10/1998	6/10/1998	6/10/1998	6/23/1998	6/23/1998
Ac-228	1.169	0.8053	0.774	0.9907	1.047	1.055
Ag-108m	0.0608	0.04676	0 U	0.01035 U	0.006146 U	-0.01947 U
Ag-110m	0.05571	0.006313 U	-0.03446 U	0.03898 U	0.01091 U	0.0003485 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Ba-140						
Bi-212	0.666			0.7852		
Bi-214	0.4694	0.5029	0.4275	0.4186		
Ce-144	-0.002756 U	0.07519 U	0.05458 U	-0.2595 U	0.123 U	-0.02052 U
Co-58	0.02229 U	-0.005618 U	-0.00969 U	0.0009633 U	-0.0009513 U	0.003403 U
Co-60	0.38	0.4124	0.2778	0.03375 U	0.01034 U	-0.02466 U
Cs-134	0.002039 U	-0.003837 U	-0.003972 U	0.02743	-0.02713 U	0.03565 U
Cs-136					0.3317	
Cs-137	0.2853	0.2755	0.2194	0.05771	0.04992	0.01945 U
Eu-152						
Fe-59	-0.07228 U	0.06806 U	0.02673 U	-0.01604 U	0.02002 U	0 U
I-132				8.14 U		
K-40	18.63	16.84	16.26	16.35	-0.06928 U	-0.1416 U
La-140		0.1666				
Mn-54	0.00356 U	0.005264 U	0.0241 U	-0.002932 U	-0.001933 U	0.01556 U
Nb-95	-0.004308 U	-0.008565 U	0.02824 U	-0.02118 U	-0.02179 U	0.0374
Np-239						
Pb-212	0.9122	0.6782	0.7696	0.8835	0.7272	0.7059
Pb-214	0.5972	0.4096	0.4529	0.5139	0.4731	0.5061
Ra-226		1.059 U				1.585
Ru-103	-0.02186 U	0.006924 U	0.006379 U	0 U	-0.0007342 U	-0.01294 U
Ru-106	0.03708 U	-0.1366 U	-0.1819 U	0.03987 U	0.07885 U	-0.0806 U
Sb-124	0.022 U	0.01779 U	0.01137 U	0.009618 U	-0.02321 U	-0.009705 U
Sb-125						
Se-75						
Tl-208	0.826	0.6444	0.773	0.7898	0.8151	0.9575
Zn-65	-0.04996 U	-0.07039 U	0.003526 U	-0.02292 U	-0.0356 U	0.01213 U
Zr-95	0.03846 U	-0.05841 U	0.01481 U	0.05897	-0.02177 U	-0.0282 U
SOF	0.109	0.113	0.075	0.009	0.004	

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Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS490 (3222)	TS490 (3222)	TS491 (3223)	TS491 (3223)	TS492 (3224)	TS492 (3224)
Sample ID	TS490A	TS490B	TS491A	TS491B	TS492A	TS492B
Date Sampled	6/23/1998	6/23/1998	6/23/1998	6/23/1998	6/23/1998	6/23/1998
Ac-228	0.7209	0.8112	0.8702	0.8144	0.74	0.7341
Ag-108m	-0.01889 U	0.01465 U	0.0002047 U	0.009358 U	0.005174 U	0.01036 U
Ag-110m	-0.03874 U	-0.02978 U	-0.004923 U	0.002638 U	-0.02811 U	-0.003554 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Ba-140						
Bi-212		0.5666	0.5462	0.7313	0.8429	0.9322
Bi-214		0.4076	0.4189		0.4319	0.4681
Ce-144	0.3292 U	-0.2552 U	-0.05495 U	0.0009932 U	0.08819 U	0.1565 U
Co-58	-0.03036 U	0.01209 U	-0.009746 U	0.02856 U	-0.003006 U	0.007114 U
Co-60	0.02079 U	0.001531 U	-0.007986 U	-0.01177 U	0.008928 U	-0.01075 U
Cs-134	0 U	-0.01773 U	0.1101	-0.004411 U	-0.02847 U	-0.08627 U
Cs-136						
Cs-137	0.04543	0.002466 U	-0.002377 U	0.0406	0.05287	0.02734 U
Eu-152						
Fe-59	-0.05914 U	0.03285 U	-0.02637 U	-0.06278 U	-0.02597 U	0.01214 U
I-132						
K-40	0.2786 U	0.3591 U	1.662	1.656	14.59	19.03
La-140						
Mn-54	0.03401 U	-0.005511 U	0.003139 U	-0.02887 U	-0.01416 U	-0.0215 U
Nb-95	0.03011 U	0.04433	0.004473 U	0.04676	0.0294	0.04678
Np-239			-0.4423 U			
Pb-212	0.8208	0.7256	0.7949	0.9112	0.7659	0.8562
Pb-214	0.4079	0.4958	0.5307	0.5709	0.4745	0.5035
Ra-226		0.8703	1.779	1.331	1.517	
Ru-103	-0.00332 U	0.002449 U	-0.001101 U	0.00679 U	0.03069	-0.01268 U
Ru-106	0.05945 U	-0.1022 U	0 U	-0.02244 U	0.2988	-0.02266 U
Sb-124	0.01378 U	-0.009302 U	0.02741 U	-0.009606 U	0.01493 U	-0.02731 U
Sb-125						-0.05447 U
Se-75						
Tl-208	0.692	0.8449	0.7202	0.9047	0.7124	0.6153
Zn-65	0.001988 U	0.03774 U	-0.06904 U	0 U	-0.03598 U	0.05056 U
Zr-95	0.01167 U	0.06088	0.01257 U	0.00977 U	-0.006153 U	0.02567 U
SOF	0.004		0.016	0.003	0.009	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS493 (3225)	TS494 (3226)	TS496 (3227)	TS503 (3232)	TS504 (3233)	TS505 (3234)
Sample ID	TS493	TS494	TS496	TS503	TS504	TS505
Date Sampled	6/30/1998	6/30/1998	7/2/1998	7/9/1998	7/9/1998	7/13/1998
Ac-228	0.7226	0.7832	0.6926	0.7716	0.5952	0.7546
Ag-108m	0.0628	0.04098	0.3087	-0.00202 U	-0.003415 U	-0.005079 U
Ag-110m	-0.01116 U	0.01507 U	0.00664 U	0.03874 U	0.02687 U	-0.007804 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Ba-140						
Bi-212	0.8581	0.5642	0.6019	0.7376 U		1.102
Bi-214	0.4215	0.3912	0.5194	0.3935		0.5609
Ce-144	0.02436 U	0.256	-0.07477 U	-0.1558 U	0.2619 U	-0.03254 U
Co-58	-0.007328 U	-0.05631 U	-0.01398 U	0.0372 U	-0.00248 U	-0.03228 U
Co-60	0.1763	0.1208	0.2849	1.253	2.39	0.03213 U
Cs-134	-0.06429 U	-0.01547 U	-0.05623 U	-0.09239 U	-0.004038 U	-0.1598 U
Cs-136						
Cs-137	0.2243	0.1166	0.2701	0.197	0.3791	0.04188
Eu-152						
Fe-59	-0.04185 U	-0.01038 U	0.0349 U	0 U	0.07154 U	-0.0656 U
I-132						
K-40	17.57	16.51	17.39	15.3	14.54	17.33
La-140						
Mn-54	0.04005	0.004504 U	0.02937 U	0.004767 U	-0.006798 U	0.002503 U
Nb-95	0.005469 U	0.02368 U	0.01764 U	0.02153 U	0.001895 U	0.01525 U
Np-239		-0.2795 U				
Pb-212	0.6057	0.7802	0.8325	0.8521	0.7104	0.6776
Pb-214	0.4713	0.3964	0.459	0.3717	0.4533	0.5157
Ra-226		1.124	1.494		1.06	
Ru-103	-0.004156 U	-0.000903 U	0.04783	-0.0009065 U	-0.0134 U	-0.01598 U
Ru-106	-0.3984 U	-0.06461 U	-0.01964 U	0 U	-0.08216 U	0.04083 U
Sb-124	0.0315 U	-0.00311 U	-0.006306 U	0.006249 U	0.01183 U	0 U
Sb-125			-0.0265 U			-0.1088 U
Se-75						
Tl-208	0.7396	0.8478	0.8416	0.6419	0.6793	0.5757
Zn-65	0.005645 U	0.07223 U	-0.07045 U	-0.05853 U	-0.06508 U	0.1648 U
Zr-95	0 U	0 U	0.01617 U	-0.04005 U	0.03807 U	0.05884
SOF	0.064	0.039	0.117	0.275	0.525	0.003

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

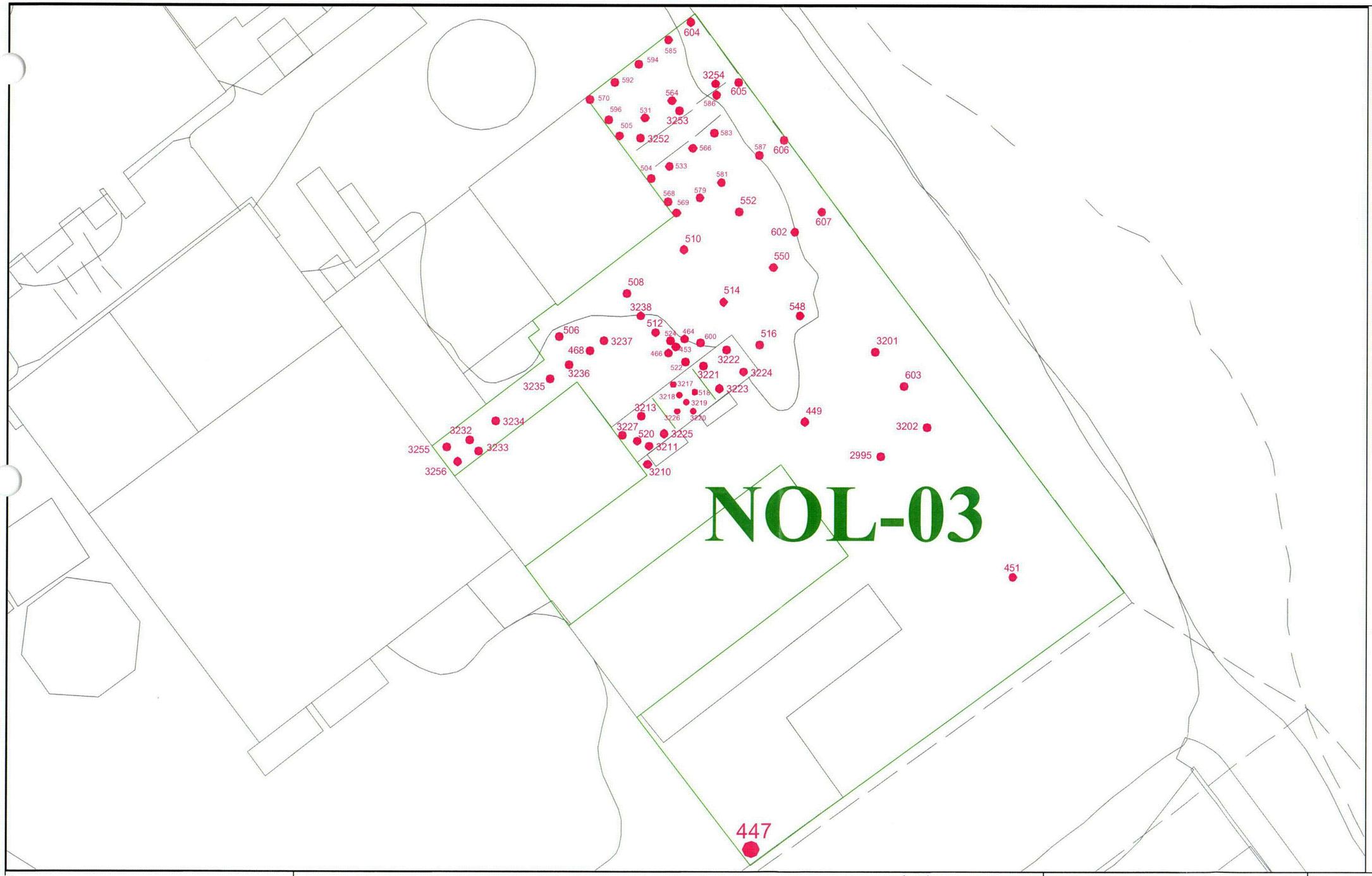
Station (Key)	TS506 (3235)	TS507 (3236)	TS508 (3237)	TS509 (3238)	TS509 (3238)	TS524 (3252)
Sample ID	TS506	TS507	TS508	TS509A	TS509B	TS524
Date Sampled	7/13/1998	7/15/1998	7/15/1998	7/21/1998	7/21/1998	8/4/1998
Ac-228	0.8693	0.7089	0.8596	0.7621	0.8399	0.7218
Ag-108m	0.004168 U	0.01504 U	-0.0182 U	-0.01042 U	-0.004856 U	0.01732 U
Ag-110m	0.006781 U	-0.01005 U	-0.003593 U	-0.004357 U	-0.007347 U	-0.00143 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Ba-140						
Bi-212	1.024	0.852	0.9363		0.4774 U	
Bi-214	0.4781	0.4044	0.5392			0.4267
Ce-144	-0.01154 U	-0.01887 U	-0.03504 U	0.229 U	0.1058 U	-0.04983 U
Co-58	0.01816 U	-0.00699 U	-0.02685 U	0.002281 U	-0.004438 U	0.00932 U
Co-60	0.06987	0.04698	-0.03853 U	0.003725 U	-0.02569 U	0.005828 U
Cs-134	-0.05634 U	0.004239 U	-0.103 U	-0.009028 U	0.01379 U	-0.03688 U
Cs-136				0.2229 U		
Cs-137	-0.003353 U	0.01855 U	-0.007741 U	-0.01384 U	-0.008097 U	-0.01759 U
Eu-152						0.09077 U
Fe-59	0.01612 U	0.02217 U	0.00573 U	0.04233 U	-0.06435 U	0.01057 U
I-132						
K-40	14.73	17.14	16.72	-0.4031 U	0 U	18.78
La-140						
Mn-54	0.01459 U	0.01521 U	0.01547 U	0.02536 U	0.01062 U	0.01073 U
Nb-95	0.02209 U	0.03268 U	0.01057 U	0.02349 U	-0.01809 U	0.03756
Np-239						0.05733 U
Pb-212	0.8818	0.7829	0.9974	0.84	0.7319	0.614
Pb-214	0.5543	0.3962	0.533	0.4579	0.494	0.4383
Ra-226	1.346	0.8541 U	1.021	0.8962 U	0.8216 U	1.347
Ru-103	-0.006542 U	-0.01389 U	-0.01296 U	0.01481 U	0.009921 U	-0.002337 U
Ru-106	0 U	-0.04135 U	-0.1818 U	0.2068 U	-0.07223 U	0.1042 U
Sb-124	0.03587 U	0.01052 U	-0.008018 U	-0.01737 U	0.01264 U	-0.01006 U
Sb-125						
Se-75				0.02208 U		
Tl-208	0.7505	0.581	0.7211		0.62	0.637
Zn-65	-0.08176 U	0.04274 U	-0.008241 U	0.08307 U	-0.05641 U	-0.07529 U
Zr-95	0.04956 U	0.02527 U	-0.01008 U	0 U	-0.05343 U	-0.001264 U
SOF	0.014	0.01				

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS525 (3253)	TS526 (3254)	TS527 (3255)	TS528 (3256)
Sample ID	TS525	TS526	TS527	TS528
Date Sampled	8/4/1998	8/4/1998	8/4/1998	8/4/1998
Ac-228	0.7833	0.7449	0.9733	0.8683
Ag-108m	0.02825 U	0.01921 U	-0.0009291 U	-0.006761 U
Ag-110m	-0.02251 U	-0.02017 U	-0.01644 U	-0.01482 U
Am-241	0 U	0 U	0 U	0 U
Ba-140			0.3198 U	
Bi-212		0.4851 U		1.108
Bi-214	0.4045	0.4504	0.5107	0.4545
Ce-144	0.0969 U	0.04615 U	0.2099 U	0.1218 U
Co-58	0.006572 U	0.01257 U	-0.02566 U	-0.01852 U
Co-60	0.02803 U	0.02024 U	0.9304	0.2366
Cs-134	0.005588 U	0.01226 U	-0.09878 U	-0.06343 U
Cs-136				
Cs-137	0.04616	0.07269	0.09439	-0.03798 U
Eu-152				
Fe-59	0.0382 U	0.03353 U	0 U	-0.04507 U
I-132				
K-40	15.5	18.73	19.72	20.73
La-140				
Mn-54	0.01653 U	0.01937 U	0.0148 U	-0.007978 U
Nb-95	0.02887 U	0.006259 U	0.003874 U	0.05226
Np-239				
Pb-212	0.7485	0.7423	0.8768	1.041
Pb-214	0.4076	0.4242	0.5616	0.5106
Ra-226	0.9109	1.613	1.444	1.031
Ru-103	-0.00991 U	0.006225 U	-0.006681 U	-0.02588 U
Ru-106	-0.1123 U	-0.291 U	0.1565 U	-0.03544 U
Sb-124	0 U	-0.01451 U	0.02997 U	0.006003 U
Sb-125				
Se-75				
Tl-208	0.6369	0.5577	0.7379	0.9325
Zn-65	0.0103 U	0.1036 U	0.1229 U	0.0134 U
Zr-95	0.07476	0.004591 U	-0.02765 U	0.004328 U
SOF	0.004	0.006	0.2	0.049

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed



NOL-03

N.

Legend

= Survey Area Boundary

Notes

Yankee Atomic Power Company *Soil Sample Locations - NOL-03*	YANKEE	*Date: October 2003* *Revision: 4*	*Figure: 19*

C23

Historical Site Assessment and Classification Summary

Survey Area Name: Southwest Upper RCA Yard Designator: **NOL-04**

Survey Area Description

Survey area NOL-04 consists of land area within the RCA and contains about 1753 square meters of surface area. The surface of NOL-04 consists of asphalt and soil.

Survey area NOL-04 is bounded by NOL-05 and WST-02 on the north, NOL-03 on the east, OOL-10 on the south and OOL-10 on the west.

Items of note located within NOL- Surface items of note located within and to be evaluated as part of NOL-04 include:

- Other Security support items
- Light pole #1

Other items located within NOL-04, which will be evaluated separately from survey area NOL-04, include:

- Personnel access point to the Old PCA Storage Building. (WST-01)
- Access to the RCA Warehouse southeast equipment and personnel doors. (WST-02)
- Access to the New PCA Storage Building and addition east equipment and personnel doors. (NSY-06)
- The Fire Protection Water Storage Tank, TK #55, and Fire Water Pump house survey area (NSY-05)

Sub-surface systems that traverse or connect within NOL-04 include:

- Potable water
- Storm Drain System
- Fire Protection Water System
- Electrical duct trays
- Electrical grounding cables.
- Security lighting conduits

Survey Area Name: Southwest Upper RCA Yard Designator: **NOL-04**

Survey Area History

Portions of survey area NOL-04 were posted and controlled as a RCA from the beginning of plant operations (Ref 1). The early bounds of the RCA were established based on a common history of the travel of personnel and material within the upper portion (elevation 1035') of the RCA. The RCA was expanded over time to accommodate the need for additional space in the RCA and when appropriate based upon identified contamination. NOL-04 provides access to the New PCA Storage Building and addition (NSY-06), and to the Fire Protection Water Storage Tank and pump house (NSY-05), the Old PCA Storage Building (WST-01) and the RCA Warehouse (WST-02). The NOL-04 portion of the RCA was primarily used for material transfer storage within the RCA and was not typically used for personnel and material transport into and/or out of the RCA.

Contamination of survey area NOL-04 resulted from transport and storage of contaminated, material and equipment. Recently transportation of contaminated material and equipment occurred from all location in the RCA to the storage areas WST-01, WST-02 and NSY-06. NOL-04 is used for preparing radioactive waste for shipment. Previously NOL-04 was used for storage of packaged radioactive waste awaiting shipment. Storage of package radioactive waste was relocated to WST-02 to reduce the potential for spread of contamination to the RCA yard surface.

Significant operational events and activities that led to or describe contamination of survey area NOL-04 include:

- PIR 75-07, Yard Area Contamination. (Ref 2)
- Storage of radioactive waste packages. (Ref 3)

Translocation Pathways

Modes and vectors of contamination transmigration include:

- Contaminated material transport within the NOL-04 typically involved moving contaminated equipment, tools and radioactive waste from contaminated work areas elsewhere in the RCA to WST-01, WST-02 and NSY-06. In instances where contaminated radioactive material was not properly packaged for transport, spread of contamination during transport was likely to occur.
- Temporary storage locations for packaged contaminated radioactive material were set-up in NOL-04. In instances where this material was improperly packaged, deposition of contamination within the storage location was likely to occur. The primary material storage location in NOL-04 was the area known as the drum storage area. Early in the plant history when this area was the primary radioactive waste storage location this area was unpaved.
- Personnel involved in the above-described activities were also likely to cause spread of contamination.

Survey Area Name: Southwest Upper RCA Yard Designator: **NOL-04**

- Once contamination had been deposited on the surface of the RCA personnel foot traffic was likely to further spread the contamination. This resulted in low-levels of radioactivity distributed generally within the RCA.
- Snow removal was necessary within the RCA in order to facilitate access to all areas. Snow removal likely moved contamination present on the surface of the RCA to the locations where snow was deposited. When these locations would not accept additional snow, the snow was loaded on to trucks and driven to remote storage locations. As the snow melted the snow storage locations are likely to have a higher concentration of radioactivity present due to deposition of additional radioactivity in the snow. Deposited snow locations in NOL-04 were located along the south edge of the RCA adjacent to TK-55. This area was also a location to which snow was trucked from other areas.
- Surface water run-off resulting from rain and snowmelt is likely to have transported surface contamination into storm drains and/or into in low areas where it would collect. There is only one storm drain system input located in NOL-04. Surface water tends not to collect in NOL-04. Due to the slope of NOL-04 surface water run-off occurs in the direction of OOL-10 and NOL-05.

Modifications performed at the YNPS site during years of operation that changed the configuration of NOL-04 include:

- Paving of previously unpaved areas within the bounds of survey area NOL-04. (Ref 3)
- Installation of the permanent RCA perimeter fence. (Ref 4)
- Installation of security lighting and fence line cameras. (Ref 5)
- Construction of the Diesel Fire Pump House and TK-55.

Modifications performed at the YNPS site in support of decommissioning that changed the configuration of NOL-04 include:

- Construction of the ISFSI and ISFSI haul road. (Ref 6)

Scoping/Characterization

Scoping surveys were performed and the resulting data collected was used to develop the YNPS Decommissioning Plan. (Ref 7)

Remediations

No remediations have been performed in this area.

Survey Area Name: Southwest Upper RCA Yard Designator: **NOL-04**

Decommissioning

No decommissioning activities have been performed for NOL-04. Survey area NOL-04 has been impacted by decommissioning activities performed on systems and structures within and adjacent to it.

Survey Area Name: Southwest Upper RCA Yard Designator: **NOL-04**

Findings

Survey area NOL-04 is a land area that is located within the current configuration of YNPS RCA.

Survey area NOL-04 is impacted and contains locations where radioactive contamination may be present at levels greater the DCGL.

The radionuclide mix likely to be present in NOL-04 includes all radionuclides identified in the radioactive systems of the plant (Ref 8). The primary radionuclides of concern for survey area NOL-04 are Co-60, Cs-137, Ag-108m, Sr-90, Ni-63 and tritium.

Current Status

NOL-04 remains as part of the RCA and continues to be potentially impacted by personnel traffic, radioactive material transportation, radioactive waste processing and by decommissioning activities.

A soil sample location map (Figure 20) has been prepared to show the distribution of sampling locations in NOL-04. Only samples representative of soils still present are included on the map. Two survey media were assessed in NOL-04, Asphalt and Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL. There are separate sets of Tables 1-4 for each survey media. All are evaluated as fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for NOL-04 is presented at the end of Table 1 for each survey medium. The results are summarized below.

Asphalt: Mean SOF is 0.033.
Maximum SOF for a single asphalt sample is 0.161 (key# 445) one third of the distance across the NOL-04 from the eastern boundary.
Minimum SOF for a single asphalt sample is 0.003 (key# 2979) center of survey area surface sample.

Soil: Mean SOF is 0.099.
Maximum SOF for a single soil sample is 0.676 (key# 571) near northern boundary third of the distance across the NOL-04 from the eastern boundary.
Minimum SOF for a single soil sample is 0.005 (key# 3149) center of survey area.

Historical Site Assessment and Classification Summary

Survey Area Name: Southwest Upper RCA Yard Designator: **NOL-04**

Classification Statement

Based upon the historical use and radiological conditions associated with this survey area NOL-04 is identified as a Class 1 Area.

Survey Area Name: Southwest Upper RCA Yard Designator: **NOL-04**

Drawings

9699 FB-2 A
9699 FB-2 C
9699 FB-2 E
E-1 ASWS Underground Plan
YC-H-2-3

References

1.	Radiation Protection Memorandum (RP)-98-23, "Overview of the YNPS Historical Material Release Evaluation," dated March 5, 1998.
2.	Plant Information Report (PIR) 75-07, "Yard Area Contamination," dated August 12, 1975.
3.	"Plan of Clean and Potentially Contaminated Areas," Radiation Protection Manual Revised January 2, 1961.
4.	Plant Alteration (PA) 84-006, Installation permanent RCA fence."
5.	PA-78-18, "Replace security perimeter fence."
6.	Engineering Design Change Request (EDCR) 99-302, "ISFSI Construction," dated September 12, 2000.
7.	YNPS Decommissioning Plan, Rev. 0.0.
8.	"Radionuclides for Building Surfaces and Soil DCGLs Determination," YA-REPT-00-001-03

Underground Systems

NOL-04				
Structure / System	Component	Description	Location	Impacted?
Water		from NOL-05 to a point ~40' E of the fire tank then E ~107' (and under the new PCA storage) then S ~240' to an abandoned well		
Security Lighting	underground cables	from OOL-10 going ESE to HH10; from HH10 N ~90' to a light on PCA warehouse, from HH10 SSE ~10' to a light on NW corner of new PCA storage, from HH10 E ~105' to HH11	HH10 - ~10' NNW of NW corner of new PCA storage	
Electrical	duct trays			

Table 1
Sum of Fractions
NOL-04 -- Asphalt
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
2984	AS360	AS360A		0.009
2981	AS357	AS357		0.005
2979	AS355	AS355B		0.025
2979	AS355	AS355A		0.003
573	IR-140	IRAS-140		0.008
571	IR-139	IRAS-139		0.017
445	IR-42	IRAS-42		0.161
			Min	0.003
			Max	0.161
			Mean	0.033

Table 2
Statistical Data Summary – NOL-04 – Asphalt
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	9	9	0.401	0.175	0.187	0.807	0.368
Ag-108m	pCi/g	0	12	0.000				
Ag-110m	pCi/g	0	10	0.000				
Am-241	pCi/g	0	1	0.000				
Bi-212	pCi/g	2	6	0.590	0.177	0.465	0.716	0.590
Bi-214	pCi/g	7	7	0.419	0.073	0.264	0.483	0.433
Ce-144	pCi/g	0	10	0.000				
Co-58	pCi/g	0	16	0.000				
Co-60	pCi/g	3	16	0.235	0.288	0.043	0.566	0.097
Cs-134	pCi/g	0	16	0.000				
Cs-136	pCi/g	0	1	0.000				
Cs-137	pCi/g	6	16	0.166	0.190	0.036	0.534	0.080
Fe-59	pCi/g	1	10	0.078		0.078	0.078	0.078
I-132	pCi/g	0	1	0.000				
K-40	pCi/g	8	10	7.399	2.039	4.322	10.990	7.236
Mn-54	pCi/g	0	10	0.000				
Nb-94	pCi/g	0	1	0.000				
Nb-95	pCi/g	0	10	0.000				
Np-239	pCi/g	0	4	0.000				
Pb-212	pCi/g	10	10	0.358	0.222	0.172	0.860	0.252
Pb-214	pCi/g	10	10	0.403	0.093	0.211	0.520	0.428
Ra-226	pCi/g	6	6	1.137	0.232	0.794	1.408	1.212
Ru-103	pCi/g	0	10	0.000				
Ru-106	pCi/g	0	10	0.000				
Sb-124	pCi/g	1	10	0.052		0.052	0.052	0.052
Tl-208	pCi/g	3	3	0.482	0.092	0.414	0.587	0.445
Zn-65	pCi/g	0	10	0.000				
Zr-95	pCi/g	0	10	0.000				

Table 3
Summary of Detected Results Above Criteria
NOL-04 -- Asphalt
Yankee Nuclear Power Station Rowe, MA
DCGL_Asphalt

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	9	9		pCi/g	0	0.81
Ag-108m	0	12	8.52	pCi/g	0	
Ag-110m	0	10		pCi/g	0	
Am-241	0	1	44.35	pCi/g	0	
Bi-212	2	6		pCi/g	0	0.72
Bi-214	7	7		pCi/g	0	0.48
Ce-144	0	10		pCi/g	0	
Co-58	0	16		pCi/g	0	
Co-60	3	16	4.84	pCi/g	0	0.57
Cs-134	0	16	6.71	pCi/g	0	
Cs-136	0	1		pCi/g	0	
Cs-137	6	16	12.24	pCi/g	0	0.53
Fe-59	1	10		pCi/g	0	0.08
I-132	0	1		pCi/g	0	
K-40	8	10		pCi/g	0	10.99
Mn-54	0	10	21.66	pCi/g	0	
Nb-94	0	1	8.53	pCi/g	0	
Nb-95	0	10		pCi/g	0	
Np-239	0	4		pCi/g	0	
Pb-212	10	10		pCi/g	0	0.86
Pb-214	10	10		pCi/g	0	0.52
Ra-226	6	6		pCi/g	0	1.41
Ru-103	0	10		pCi/g	0	
Ru-106	0	10	68.21	pCi/g	0	
Sb-124	1	10		pCi/g	0	0.05
Tl-208	3	3		pCi/g	0	0.59
Zn-65	0	10		pCi/g	0	
Zr-95	0	10		pCi/g	0	

Table 4
Rad
NOL-04 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	AS355 (2979)	AS355 (2979)	AS356 (2980)	AS357 (2981)	AS358 (2982)
Sample ID	AS355A	AS355B	AS356	AS357	AS358
Date Sampled	7/8/1997	7/8/1997	7/8/1997	7/9/1997	7/9/1997
Ac-228	0.2608	0.4159	0.4373	0.1873	
Ag-108m	-0.007115 U	-0.001558 U	0.008238 U	0.008859 U	-0.003842 U
Ag-110m	0.001677 U	-0.007869 U	0.01906 U	-0.02018 U	0.009509 U
Am-241					
Bi-212			0.00000003343 U		6.407 U
Bi-214	0.4133	0.4826	0.4183		
Ce-144	0.003031 U	-0.04645 U	0.002127 U	0.1175 U	-0.08489 U
Co-58	0.003852 U	0.01077 U	-0.01332 U	0.0005518 U	0.01003 U
Co-60	0.03127 U	0.0968	0.02092 U	0.02464 U	0.01212 U
Cs-134	-0.03075 U	0.04745 U	0.002361 U	0 U	0.01888 U
Cs-136				0.03245 U	
Cs-137	0.0358	0.0646	-0.00541 U	0.06351	-0.008364 U
Fe-59	0.0122 U	-0.01717 U	0.07765	-0.01224 U	0.02471 U
I-132			0.7127 U		
K-40	5.896	6.737	7.894	0.08043 U	-0.08121 U
Mn-54	0.01007 U	0.004725 U	0.01501 U	0.009817 U	0.005324 U
Nb-94					
Nb-95	-0.005773 U	0.004925 U	-0.01795 U	0.01665 U	0.01647 U
Np-239	0.6944 U	-0.02904 U	0.07825 U		
Pb-212	0.1724	0.2462	0.5669	0.308	0.1923
Pb-214	0.4778	0.4712	0.4162	0.4391	0.2957
Ra-226	0.7942	1.408			
Ru-103	-0.006452 U	0.002191 U	0.01787 U	-0.01575 U	-0.0006446 U
Ru-106	-0.06846 U	0.01986 U	-0.1468 U	-0.176 U	-0.06932 U
Sb-124	-0.01708 U	0.001145 U	-0.006422 U	-0.01591 U	-0.008649 U
Tl-208			0.4447		
Zn-65	-0.0003615 U	-0.09276 U	-0.02551 U	0.02755 U	-0.02782 U
Zr-95	0.01661 U	0.01453 U	0.000988 U	-0.02604 U	-0.01235 U
SOF	0.003	0.025		0.005	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-04 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	AS359 (2983)	AS360 (2984)	AS360 (2984)	AS361 (2985)	AS362 (2986)	IR-139 (571)
Sample ID	AS359	AS360A	AS360B	AS361	AS362.2	IRAS-139
Date Sampled	7/9/1997	7/9/1997	7/9/1997	7/10/1997	7/10/1997	8/8/1994
Ac-228	0.3249	0.3545	0.368	0.4556	0.8072	
Ag-108m	-0.008047 U	0.001409 U	0.01164 U	0.003966 U	0.01098 U	0.066 UM
Ag-110m	-0.02778 U	0.01819 U	0.01318 U	0.01748 U	-0.03791 U	
Am-241				0 U		
Bi-212	0.4653		0.3154 U	0.4388 U	0.7155	
Bi-214		0.4674	0.2639	0.4521	0.4333	
Ce-144	0.01714 U	-0.005063 U	0.02465 U	0.08172 U	-0.1294 U	
Co-58	0.006276 U	0.0005722 U	-0.0209 U	-0.006105 U	-0.01324 U	0.08 UM
Co-60	0.004361 U	0.04343	0.02409 U	0.02835 U	0.004047 U	0.109 UM
Cs-134	0.002239 U	-0.03719 U	-0.1868 U	0.03143 U	0.002419 U	0.083 UM
Cs-136						
Cs-137	-0.01649 U	0.01091 U	0.02609 U	0.008374 U	0.0269 U	0.204
Fe-59	0.01826 U	0.02154 U	-0.02838 U	-0.02983 U	0.02098 U	
I-132						
K-40	4.322	6.513	7.735	9.104	10.99	
Mn-54	-0.005024 U	0.005881 U	-0.01071 U	-0.005723 U	-0.005458 U	
Nb-94	0.01441 U					
Nb-95	0.009665 U	0.006883 U	0.003589 U	-0.01389 U	-0.006902 U	
Np-239					0.6894 U	
Pb-212	0.2176	0.235	0.2581	0.5216	0.8598	
Pb-214	0.2112	0.4484	0.3533	0.3984	0.5201	
Ra-226	1.203	0.9203		1.278	1.221	
Ru-103	0.006918 U	-0.01469 U	-0.005387 U	-0.009969 U	-0.01178 U	
Ru-106	-0.02277 U	-0.09466 U	0.1428 U	-0.02331 U	-0.1976 U	
Sb-124	0.02923 U	0.01472 U	0 U	0.05196	0.001375 U	
Tl-208				0.4139	0.587	
Zn-65	-0.05825 U	-0.01733 U	-0.07557 U	-0.1697 U	-0.08958 U	
Zr-95	0.01171 U	0.004906 U	0.005012 U	-0.02536 U	-0.05116 U	
SOF		0.009				0.017

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-04 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-140 (573)	IR-39 (439)	IR-40 (441)	IR-41 (443)	IR-42 (445)
Sample ID	IRAS-140	IRAS-39	IRAS-40	IRAS-41	IRAS-42
Date Sampled	8/9/1994	5/17/1993	5/17/1993	5/17/1993	5/18/1993
Ac-228					
Ag-108m	0.049 UM				
Ag-110m					
Am-241					
Bi-212					
Bi-214					
Ce-144					
Co-58	0.059 UM	0.062 UM	0.0571 UM	0.0478 UM	0.0863 UM
Co-60	0.0958 UM	0.0771 UM	0.0811 UM	0.0746 UM	0.566
Cs-134	0.043 UM	0.055 UM	0.04 UM	0.071 UM	0.063 UM
Cs-136					
Cs-137	0.0944	0.0656 UM	0.0599 UM	0.111 UM	0.534
Fe-59					
I-132					
K-40					
Mn-54					
Nb-94					
Nb-95					
Np-239					
Pb-212					
Pb-214					
Ra-226					
Ru-103					
Ru-106					
Sb-124					
Tl-208					
Zn-65					
Zr-95					
SOF	0.008				0.161

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 1
Sum of Fractions
NOL-04 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
3148	TS355	TS355A		0.006
445	IR-42	IRTS-42		0.009
571	IR-139	IRTS-139		0.676
573	IR-140	IRTS-140		0.593
990	TS 352 A	TS 352 A		0.014
3145	TS352	TS352B		0.011
3146	TS353	TS353A		0.022
439	IR-39	IRTS-39		0.011
3147	TS354	TS354A		0.268
3200	TS411	TS411B		0.008
3149	TS356	TS356A		0.005
3150	TS357	TS357A		0.021
3153	TS360	TS360A		0.005
3154	TS361	TS361A		0.070
3155	TS362	TS362A		0.014
3156	TS363	TS363A		0.031
3200	TS411	TS411A		0.014
3146	TS353	TS353B		0.006
			Min	0.005
			Max	0.676
			Mean	0.099

Table 2
Statistical Data Summary – NOL-04 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	34	34	0.701	0.123	0.421	0.937	0.704
Ag-108m	pCi/g	3	36	0.188	0.074	0.105	0.247	0.212
Ag-110m	pCi/g	2	34	0.040	0.014	0.031	0.050	0.040
Am-241	pCi/g	0	16	0.000				
Bi-212	pCi/g	24	28	0.741	0.192	0.482	1.186	0.700
Bi-214	pCi/g	31	31	0.417	0.063	0.269	0.540	0.420
Ce-144	pCi/g	0	34	0.000				
Co-58	pCi/g	0	40	0.000				
Co-60	pCi/g	11	40	0.567	0.932	0.030	2.635	0.064
Cs-134	pCi/g	1	40	0.034		0.034	0.034	0.034
Cs-137	pCi/g	16	40	0.322	0.484	0.055	1.717	0.106
Eu-152	pCi/g	0	1	0.000				
Fe-59	pCi/g	0	34	0.000				
I-131	pCi/g	0	1	0.000				
I-132	pCi/g	0	1	0.000				
I-133	pCi/g	0	1	0.000				
K-40	pCi/g	30	34	14.731	2.127	9.876	20.100	14.715
Mn-54	pCi/g	1	34	0.038		0.038	0.038	0.038
Nb-95	pCi/g	3	34	0.040	0.001	0.039	0.040	0.040
Np-239	pCi/g	0	5	0.000				
Pb-212	pCi/g	34	34	0.700	0.115	0.405	0.927	0.706
Pb-214	pCi/g	34	34	0.440	0.058	0.316	0.571	0.448
Ra-226	pCi/g	17	23	1.293	0.299	0.883	1.866	1.159
Ru-103	pCi/g	1	34	0.045		0.045	0.045	0.045
Ru-106	pCi/g	0	34	0.000				
Sb-124	pCi/g	0	34	0.000				
Sb-125	pCi/g	0	4	0.000				
Sc-75	pCi/g	0	1	0.000				
Tl-208	pCi/g	32	32	0.678	0.117	0.429	0.929	0.663
Zn-65	pCi/g	0	34	0.000				
Zr-95	pCi/g	3	34	0.063	0.006	0.056	0.069	0.065

Table 3
Summary of Detected Results Above Criteria
NOL-04 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	34	34		pCi/g	0	0.94
Ag-108m	3	36	8.52	pCi/g	0	0.25
Ag-110m	2	34		pCi/g	0	0.05
Am-241	0	16	44.35	pCi/g	0	
Bi-212	24	28		pCi/g	0	1.19
Bi-214	31	31		pCi/g	0	0.54
Ce-144	0	34		pCi/g	0	
Co-58	0	40		pCi/g	0	
Co-60	11	40	4.84	pCi/g	0	2.64
Cs-134	1	40	6.71	pCi/g	0	0.03
Cs-137	16	40	12.24	pCi/g	0	1.72
Eu-152	0	1	12.06	pCi/g	0	
Fe-59	0	34		pCi/g	0	
I-131	0	1		pCi/g	0	
I-132	0	1		pCi/g	0	
I-133	0	1		pCi/g	0	
K-40	30	34		pCi/g	0	20.10
Mn-54	1	34	21.66	pCi/g	0	0.04
Nb-95	3	34		pCi/g	0	0.04
Np-239	0	5		pCi/g	0	
Pb-212	34	34		pCi/g	0	0.93
Pb-214	34	34		pCi/g	0	0.57
Ra-226	17	23		pCi/g	0	1.87
Ru-103	1	34		pCi/g	0	0.05
Ru-106	0	34	68.21	pCi/g	0	
Sb-124	0	34		pCi/g	0	
Sb-125	0	4	37.73	pCi/g	0	
Se-75	0	1		pCi/g	0	
Tl-208	32	32		pCi/g	0	0.93
Zn-65	0	34		pCi/g	0	
Zr-95	3	34		pCi/g	0	0.07

Table 4
Rad
NOL-04 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-139 (571)	IR-140 (573)	IR-39 (439)	IR-40 (441)	IR-41 (443)	IR-42 (445)
Sample ID	IRTS-139	IRTS-140	IRTS-39	IRTS-40	IRTS-41	IRTS-42
Date Sampled	8/9/1994	8/9/1994	5/17/1993	5/17/1993	5/17/1993	5/19/1993
Ac-228						
Ag-108m	0.247	0.212				
Ag-110m						
Am-241						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.095 UM	0.1 UM	0.0683 UM	0.0716 UM	0.0719 UM	0.0856 UM
Co-60	2.635	2.071	0.134 UM	0.0886 UM	0.0701 UM	0.104 UM
Cs-134	0.069 UM	0.076 UM	0.079 UM	0.056 UM	0.052 UM	0.068 UM
Cs-137	1.248	1.717	0.133	0.0975 UM	0.0654 UM	0.105
Eu-152						
Fe-59						
I-131						
I-132						
I-133						
K-40						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Se-75						
Tl-208						
Zn-65						
Zr-95						
SOF	0.676	0.593	0.011			0.009

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed

Table 4
Rad
NOL-04 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS 352 A (990)	TS352 (3145)	TS353 (3146)	TS353 (3146)	TS354 (3147)	TS354 (3147)
Sample ID	TS 352 A	TS352B	TS353A	TS353B	TS354A	TS354B
Date Sampled	7/3/1997	7/3/1997	7/3/1997	7/3/1997	7/8/1997	7/8/1997
Ac-228	0.7836	0.7198	0.6326	0.7724	0.628	0.6059
Ag-108m	-0.006122 U	0.004152 U	-0.01255 U	0.02223 U	0.1048	-0.01481 U
Ag-110m	0.002399 U	0.01444 U	-0.01007 U	-0.02045 U	0.02947 U	-0.00429 U
Am-241						0 U
Bi-212	0.5102		0.0711 U	0.879		0.4828 U
Bi-214	0.3463	0.4123	0.4985	0.4236	0.3156	0.3701
Ce-144	0.0566 U	0.003368 U	0.03352 U	-0.1756 U	0.1207 U	-0.2343 U
Co-58	0.000881 U	0.01191 U	0.002865 U	-0.001753 U	-0.004226 U	-0.006412 U
Co-60	0.03723	0.03029	0.06423	0.03268 U	0.9596	0.006804 U
Cs-134	-0.09597 U	-0.04148 U	-0.169 U	-0.033 U	0.03446	0.005738 U
Cs-137	0.07935	0.05509	0.1066	0.07768	0.6344	0.02215 U
Eu-152				0.04051 U		
Fe-59	-0.01465 U	0.01526 U	0.009036 U	0.06107 U	0.06583 U	-0.01561 U
I-131						
I-132			0.8855 U			
I-133						
K-40	15.47	15.34	13.53	16.53	13	15.39
Mn-54	-0.01612 U	0.003497 U	-0.01237 U	-0.005727 U	-0.0315 U	0.02782 U
Nb-95	0.02899 U	-0.01278 U	0.01436 U	0.02267 U	0.02127 U	0.01351 U
Np-239					-0.01383 U	
Pb-212	0.666	0.6762	0.6976	0.6743	0.6843	0.5792
Pb-214	0.3589	0.4046	0.4753	0.3402	0.4429	0.3858
Ra-226	0.8476 U	0.8826		1.526	1.405	
Ru-103	-0.0008494 U	-0.004422 U	-0.008382 U	-0.02124 U	0.008229 U	-0.01086 U
Ru-106	0 U	-0.09592 U	0.2343 U	-0.144 U	-0.02872 U	-0.003335 U
Sb-124	0.002931 U	0 U	-0.01446 U	0.02804 U	-0.02916 U	-0.03017 U
Sb-125						
Se-75						
Tl-208	0.5637	0.5793	0.6016	0.8844	0.6242	0.6605
Zn-65	-0.001857 U	-0.06984 U	-0.1003 U	-0.06875 U	-0.01377 U	-0.04099 U
Zr-95	0.01052 U	0.005477 U	-0.02818 U	0.02691 U	0.0367 U	0.03343 U
SOF	0.014	0.011	0.022	0.006	0.268	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-04 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS355 (3148)	TS355 (3148)	TS356 (3149)	TS356 (3149)	TS357 (3150)	TS358 (3151)
Sample ID	TS355A	TS355B	TS356A	TS356B	TS357A	TS358A
Date Sampled	7/8/1997	7/8/1997	7/8/1997	7/9/1997	7/9/1997	7/9/1997
Ac-228	0.7255	0.6668	0.8731	0.8224	0.6039	0.7252
Ag-108m	-0.01057 U	0.01579 U	-0.001004 U	-0.008849 U	0.007219 U	0.002529 U
Ag-110m	0.005726 U	-0.003965 U	0.008521 U	-0.04582 U	0.001572 U	0.03066
Am-241		0 U		0 U		
Bi-212	0.745	1.186	0.6116	0.7675	0.7025	
Bi-214	0.4219	0.4651	0.433	0.4584		
Ce-144	0.03449 U	-0.1757 U	-0.005988 U	-0.133 U	-0.1768 U	0.04176 U
Co-58	0.007749 U	-0.007202 U	-0.02074 U	-0.002771 U	-0.01444 U	-0.01531 U
Co-60	0.03406 U	0.02022 U	0.03379 U	0.003284 U	0.07169	0.009516 U
Cs-134	-0.005215 U	-0.003789 U	-0.02276 U	0.04726 U	-0.3435 U	-0.01783 U
Cs-137	0.07521	0.01412 U	0.06063	-0.009065 U	0.07314	-0.0001703 U
Eu-152						
Fe-59	-0.04166 U	-0.03091 U	-0.005166 U	-0.01506 U	-0.04962 U	0.0194 U
I-131						
I-132						
I-133						
K-40	14.65	17.34	15.35	0.132 U	0.06266 U	-0.1275 U
Mn-54	-0.009022 U	-0.007447 U	-0.008424 U	0.008517 U	0.02666 U	-0.009561 U
Nb-95	0.006719 U	0.002889 U	0.01326 U	0.01058 U	0.006994 U	0.03963
Np-239	-0.3363 U					
Pb-212	0.7656	0.7342	0.9013	0.7636	0.5948	0.7309
Pb-214	0.427	0.4848	0.4652	0.4834	0.3162	0.4619
Ra-226	1.13		1.096	1.816	1.126	
Ru-103	0.001449 U	0.01039 U	0.02246 U	0.01275 U	0.003647 U	0.0006748 U
Ru-106	-0.1169 U	0.212 U	0.1546 U	-0.02392 U	0.08042 U	-0.05442 U
Sb-124	0.01666 U	-0.01546 U	0.0341 U	0.01707 U	0.006197 U	0.0009701 U
Sb-125						
Se-75						
Tl-208	0.7107	0.8147	0.823	0.6653		0.6606
Zn-65	0.0124 U	0.101 U	-0.08369 U	-0.0588 U	-0.0161 U	-0.04368 U
Zr-95	-0.02484 U	0.02409 U	0.06866	0.02549 U	-0.04693 U	-0.06478 U
SOF	0.006		0.005		0.021	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-04 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS358 (3151)	TS359 (3152)	TS359 (3152)	TS360 (3153)	TS360 (3153)	TS361 (3154)
Sample ID	TS358B	TS359A	TS359B	TS360A	TS360B	TS361A
Date Sampled	7/9/1997	7/9/1997	7/9/1997	7/10/1997	7/10/1997	7/10/1997
Ac-228	0.6217	0.763	0.6118	0.6679	0.6878	0.4205
Ag-108m	-0.00947 U	-0.01283 U	0.009945 U	0.01172 U	-0.002864 U	0.01144 U
Ag-110m	0.01314 U	-0.004823 U	0.02344 U	0.01645 U	-0.02227 U	-0.006747 U
Am-241	0 U		0 U			
Bi-212	0.8951	0.9185	0.9066		0.6476	
Bi-214	0.3419	0.4195	0.3538	0.4523	0.5404	0.269
Ce-144	-0.2673 U	-0.06578 U	-0.0602 U	0.07056 U	-0.1956 U	-0.058 U
Co-58	-0.01911 U	-0.002911 U	-0.0144 U	-0.01543 U	-0.02891 U	-0.004589 U
Co-60	-0.01414 U	-0.02882 U	0.0005591 U	0.01481 U	-0.0037 U	0.2111
Cs-134	-0.05254 U	-0.01255 U	0.008571 U	-0.009221 U	-0.1217 U	0 U
Cs-137	0.008458 U	0.01121 U	-0.01428 U	0.0569	0.009563 U	0.3273
Eu-152						
Fe-59	-0.01405 U	-0.01986 U	-0.004488 U	0.02335 U	0.02408 U	-0.02804 U
I-131						
I-132						
I-133						
K-40	0.1232 U	12.4	12.69	14.98	18.38	9.876
Mn-54	0.009236 U	0.01685 U	0.01461 U	-0.004235 U	0.01202 U	0.01398 U
Nb-95	0.0129 U	-0.0097 U	0.009787 U	-0.01175 U	0.005271 U	0.004174 U
Np-239						
Pb-212	0.8094	0.7138	0.6917	0.8056	0.7325	0.5371
Pb-214	0.4578	0.4368	0.3908	0.5154	0.4524	0.3387
Ra-226		0.6464 U	0.9954	0.7994 U	1.421	0.8202 U
Ru-103	-0.003259 U	-0.0209 U	-0.002186 U	0.009627 U	0.01352 U	0.04526
Ru-106	0.1909 U	0.09287 U	0.08394 U	-0.08262 U	0.02129 U	-0.003169 U
Sb-124	-0.01124 U	0 U	0.001796 U	0.01494 U	-0.007108 U	-0.01029 U
Sb-125						0.08964 U
Se-75						
Tl-208	0.5191	0.619	0.6401	0.8251	0.7538	
Zn-65	0.03328 U	-0.04084 U	0.02424 U	0.1121 U	0.1143 U	-0.121 U
Zr-95	-0.03928 U	-0.04331 U	0.01726 U	0.02291 U	-0.0268 U	-0.0203 U
SOF				0.005		0.07

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-04 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS361 (3154)	TS362 (3155)	TS362 (3155)	TS363 (3156)	TS363 (3156)	TS409 (3198)
Sample ID	TS361B	TS362A	TS362B	TS363A	TS363B	TS409A
Date Sampled	7/10/1997	7/10/1997	7/10/1997	7/10/1997	7/10/1997	10/22/1997
Ac-228	0.6674	0.822	0.9374	0.8096	0.4836	0.8296
Ag-108m	-0.01243 U	0.02572 U	-0.002595 U	0.01071 U	0.01435 U	-0.001274 U
Ag-110m	0.01265 U	-0.03805 U	0.00651 U	-0.001769 U	0.02757 U	0.04976
Am-241						0 U
Bi-212	0.6984	0.536	0.9663	0.5207 U	0.4817	0.5019
Bi-214	0.4167	0.3933	0.5236	0.4009	0.3936	0.5084
Ce-144	-0.03924 U	-0.1496 U	0.07309 U	-0.2101 U	-0.1392 U	0.04152 U
Co-58	0.01077 U	-0.01525 U	-0.03167 U	-0.03015 U	-0.02099 U	-0.01952 U
Co-60	0.01047 U	-0.01354 U	-0.01192 U	0.05901	0.02077 U	0.02081 U
Cs-134	-0.005903 U	-0.01335 U	0.0112 U	0.01174 U	-0.01396 U	-0.0185 U
Cs-137	0.01203 U	0.1703	0.006643 U	0.2249	-0.002846 U	0.005738 U
Eu-152						
Fe-59	-0.005691 U	0.004828 U	0.02594 U	0.03397 U	0.0136 U	0.01498 U
I-131						
I-132						
I-133						
K-40	16.22	13.96	20.1	16.79	17.44	16.16
Mn-54	0.004934 U	-0.005036 U	0.0264 U	0.02133 U	0.014 U	-0.01417 U
Nb-95	0.01495 U	-0.0203 U	0.04006	-0.02496 U	-0.005016 U	0.0009731 U
Np-239			-1.36 U		0.3152 U	
Pb-212	0.6732	0.6839	0.9274	0.7935	0.4724	0.8145
Pb-214	0.4629	0.4719	0.5711	0.4841	0.382	0.4755
Ra-226		1.067	1.438	0.9614	0.826 U	
Ru-103	0.01278 U	0.01379 U	0.01115 U	0.02373 U	0.006935 U	0.01684 U
Ru-106	-0.2412 U	0.09742 U	-0.1489 U	0.1598 U	0.09412 U	0.09593 U
Sb-124	0.03917 U	0.01845 U	-0.003188 U	0.003711 U	0.0106 U	-0.009403 U
Sb-125						-0.06467 U
Se-75			0.01592 U			
Tl-208	0.7189	0.6562	0.929	0.7258	0.4293	0.7957
Zn-65	-0.04854 U	-0.05888 U	0.08282 U	-0.03025 U	-0.1077 U	0.05906 U
Zr-95	0.01888 U	0.05648	0.05094 U	-0.02391 U	0.03606 U	0.06857 U
SOF		0.014		0.031		

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed

Table 4
Rad
NOL-04 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS409 (3198)	TS409 (3198)	TS409 (3198)	TS409 (3198)	TS410 (3199)	TS411 (3200)
Sample ID	TS409B	TS409C	TS409D	TS409E	TS410	TS411A
Date Sampled	10/22/1997	10/22/1997	10/22/1997	10/22/1997	10/22/1997	10/23/1997
Ac-228	0.9046	0.8288	0.7452	0.6656	0.6287	0.7608
Ag-108m	0.003981 U	0.01636 U	-0.01311 U	0.02348 U	-0.01329 U	0.0007019 U
Ag-110m	-0.01733 U	-0.007179 U	-0.004072 U	0.007694 U	0.006063 U	0.02024 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Bi-212	1.155	0.831	0.6442	0.6779	0.6208	0.6243
Bi-214	0.4651	0.4806	0.4674		0.3307	0.4279
Ce-144	-0.02379 U	0.07162 U	-0.06121 U	-0.09149 U	0.09201 U	-0.04086 U
Co-58	0.004197 U	-0.01103 U	-0.004256 U	0.01778 U	0.001169 U	0.01671 U
Co-60	0.02751 U	0.0123 U	0.006522 U	0.009951 U	0.02412 U	0.05917
Cs-134	0.01067 U	-0.192 U	-0.06901 U	0.01366 U	-0.01227 U	-0.06369 U
Cs-137	-0.01633 U	0.006417 U	0.01522 U	0.005566 U	-0.002413 U	0.0462 U
Eu-152						
Fe-59	-0.005914 U	-0.0948 U	-0.06067 U	0.002518 U	-0.005161 U	0.01323 U
I-131						0.6566 U
I-132						
I-133	76.27 U					
K-40	14.16	14.78	13.3	11.51	12.56	15.19
Mn-54	-0.003549 U	0.02714 U	0.009898 U	-0.01371 U	0.006482 U	0.03831
Nb-95	-0.01143 U	0.01693 U	0.002868 U	-0.01489 U	0.02603 U	0.01576 U
Np-239			-1.333 U			
Pb-212	0.7529	0.844	0.7793	0.6033	0.5768	0.769
Pb-214	0.5201	0.4392	0.4228	0.3525	0.4064	0.5059
Ra-226	1.38	1.159	1.654		1.866	0.9273 U
Ru-103	-0.008808 U	-0.006409 U	0.005117 U	0.00257 U	-0.004912 U	-0.01561 U
Ru-106	-0.04467 U	-0.04421 U	-0.1061 U	0.02172 U	0.01956 U	-0.06404 U
Sb-124	-0.0388 U	-0.001239 U	0 U	-0.01043 U	0.006579 U	0.01851 U
Sb-125			-0.08889 U			
Se-75						
Tl-208	0.6962	0.8434	0.6671	0.5621	0.6048	0.7433
Zn-65	-0.03968 U	-0.06487 U	0.005052 U	-0.1055 U	0.04977 U	-0.05046 U
Zr-95	-0.008498 U	0.06461	-0.03283 U	-0.007997 U	0.02438 U	0.0539 U
SOF						0.014

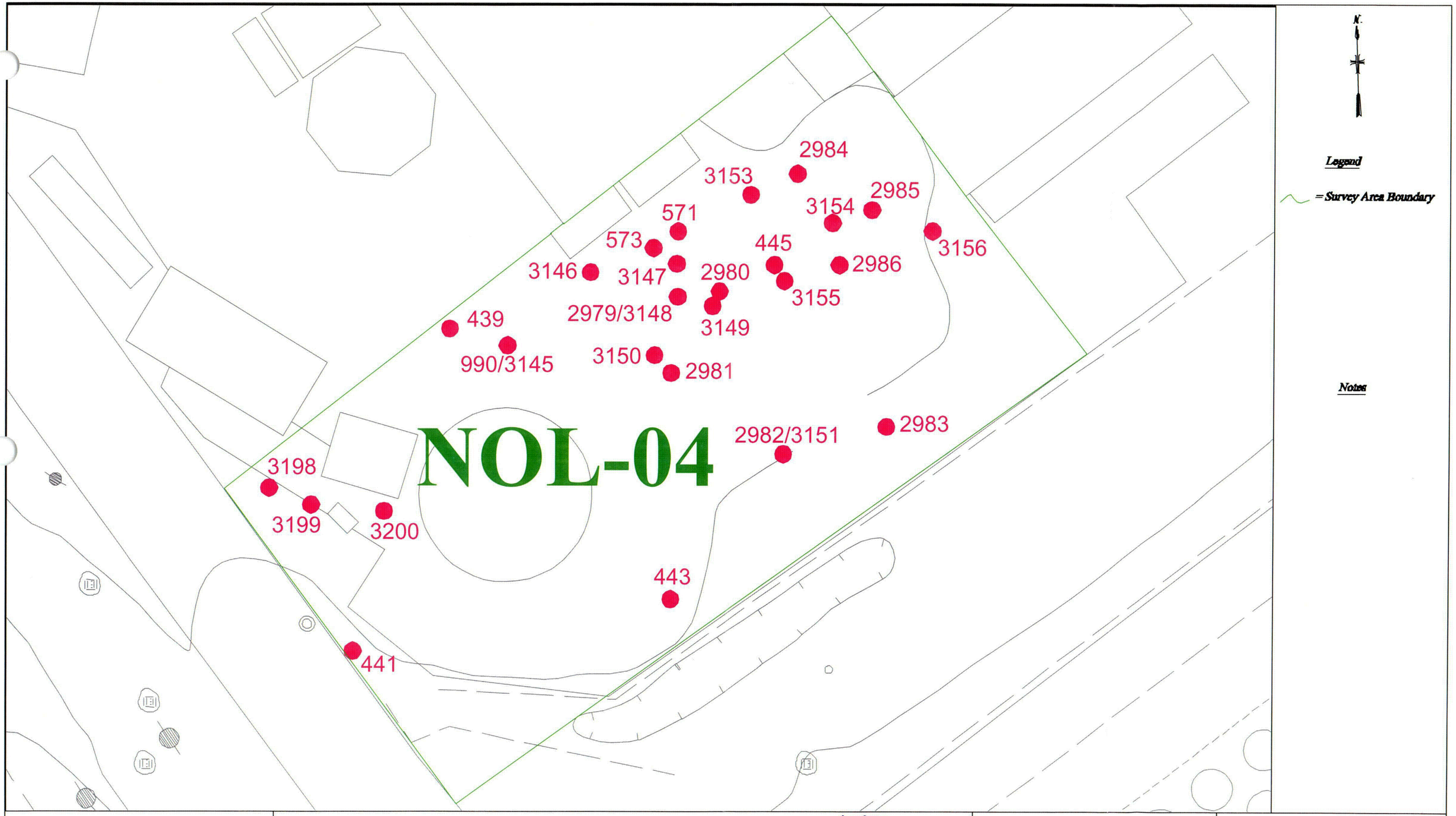
U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-04 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS411 (3200)	TS411 (3200)	TS411 (3200)	TS411 (3200)
Sample ID	TS411B	TS411C	TS411D	TS411E
Date Sampled	10/23/1997	10/23/1997	10/23/1997	10/23/1997
Ac-228	0.7572	0.4414	0.6678	0.5436
Ag-108m	0.01376 U	-0.003605 U	-0.01828 U	0.002488 U
Ag-110m	-0.02367 U	0.01238 U	-0.006811 U	-0.0111 U
Am-241	0 U	0 U	0 U	0 U
Bi-212		17.84 U	0.711	0.5777
Bi-214	0.3587	0.4078	0.4356	0.3998
Ce-144	-0.1189 U	0.04884 U	0.04543 U	0.06227 U
Co-58	-0.001283 U	-0.00681 U	0.008156 U	0.009315 U
Co-60	0.03863	-0.004052 U	0.03181 U	0.01532 U
Cs-134	-0.04911 U	-0.01063 U	0.03175 U	0.002528 U
Cs-137	0.0121 U	0.01667 U	-0.002578 U	-0.007913 U
Eu-152				
Fe-59	0.002488 U	-0.0272 U	0.03381 U	-0.008108 U
I-131				
I-132				
I-133				
K-40	13.31	14.1	14.41	13.02
Mn-54	-0.007387 U	0.01178 U	0.01857 U	0.0008143 U
Nb-95	0.03902	-0.004804 U	0.00627 U	0.005494 U
Np-239				
Pb-212	0.7499	0.5233	0.689	0.4047
Pb-214	0.4714	0.419	0.4423	0.4909
Ra-226			1.056	
Ru-103	-0.002699 U	-0.009927 U	-0.01388 U	0.0004519 U
Ru-106	-0.2189 U	0.09357 U	0.2223 U	-0.0442 U
Sb-124	-0.02262 U	-0.02522 U	-0.02773 U	0.001252 U
Sb-125				-0.01582 U
Se-75				
Tl-208	0.7112	0.4689	0.6076	0.5799
Zn-65	0.006711 U	0.03406 U	0.03127 U	0.005911 U
Zr-95	0.03964 U	-0.02135 U	-0.03717 U	-0.01025 U
SOF	0.008			

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed



	Yankee Atomic Power Company *Soil Sample Locations - NOL-04*	YANKEE	*Date: October 2003* *Revision: 4*	*Figure: 20*

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Historical Site Assessment and Classification Summary

Survey Area Name: Northwest Upper RCA Yard Designator: NOL-05

Survey Area Description

Survey area NOL-05 consists of land area within the RCA and contains about 1586 square meters of surface area. The surface of NOL-05 consists of asphalt and soil.

Survey area NOL-05 is bounded by NOL-06 and AUX-01on the north, NOL-02 on the east, WST-03, WST-04 and NOL-04 on the south and OOL-10 on the west.

Surface items of note located within and to be evaluated as part of NOL-05 include:

- The location of the Old Safety Injection Tank. (Ref 1)
- Radioactive material storage container locations.

Other items located within NOL-05 that will be evaluated separately from survey area NOL-05 include:

- New Safety Injection Tank Pad, TK-28. (NSY-08).
- Diesel Fire Pump House. (NSY-05)
- Safe Shutdown System Building. (NSY-04)

Sub-surface systems that traverse or connect within NOL-05 include:

- The west storm drain system
- Fire Protection System Water
- Potable water lines
- Construction power, supply and distribution
- Electrical duct trays
- Electrical grounding cables.
- Radioactive drain lines and transfer lines
- Abandoned street light cables.
- Security lighting conduits

Survey Area Name: Northwest Upper RCA Yard Designator: NOL-05

Survey Area History

Portions of survey area NOL-05 was posted and controlled as a RCA from the beginning of plant operations (Ref 1). The early bounds of the RCA were established based on a common history of the travel of personnel and material into and out of the west end of the upper portion (elevation 1035') of the RCA. The RCA was expanded over time to accommodate the need for additional space in the RCA and when appropriate based upon identified contamination. NOL-05 provides access to the SSS Building, PAB, Waste Disposal Building, Compactor Building and RCA Warehouse. The area potentially impacted by migration of contamination resulting from typical personnel and material travel into and out of the upper level RCA is captured within the bounds of survey area NOL-05.

Contamination of survey area NOL-05 resulted from transport and storage of contaminated, material and equipment and personnel foot traffic. Typical transport of contaminated material and equipment occurred from contaminated area accessible from the lower portion of the RCA to the waste disposal building and radioactive material storage areas.

Significant operational events and activities that led to or describe contamination of survey area NOL-05 include:

- AOR-61-15, Radioactive Spill chemistry sample container breakage. (Ref 2)
- PIR 75-07, Yard Area Contamination. (Ref 3)
- Leaks from welded seam defects in the Old Safety Injection Tank.

Translocation Pathways

Modes and vectors of contamination transmigration include:

- Contaminated material transport within the NOL-05 typically involved moving contaminated equipment and tools by vehicle from a contaminated work areas in the waste disposal building and upper level PAB back to the hot side machine shop or the decon room. It also involved collection and transfer of radioactive waste material to the waste disposal building. In instances where contaminated radioactive material was not properly packaged for transport, spread of contamination during transport was likely to occur. NOL-05 was also used as a travel path for waste transfer from the VC to waste disposal.
- Temporary storage locations for packaged contaminated radioactive material were set-up in NOL-05. In instances where this material was improperly packaged, deposition of contamination within the storage location was likely to occur. The primary material storage location in NOL-05 was adjacent to the west exterior wall of the RCA warehouse.
- Personnel involved in the above-described activities were also likely to cause spread of contamination.

- Once contamination had been deposited on the surface of the RCA personnel foot traffic was likely to further spread the contamination. This resulted in low-levels of radioactivity distributed generally within the RCA.
- Snow removal was necessary within the RCA in order to facilitate access to all areas. Snow removal likely moved contamination present on the surface of the RCA to the locations where snow was deposited. When these locations would not accept additional snow, the snow was loaded on to trucks and driven to remote storage locations. As the snow melted the snow storage locations are likely to have a higher concentration of radioactivity present due to deposition of additional radioactivity in the snow. Deposited snow locations in NOL-05 were located north of the SSS building and adjacent to the old Safety Injection Tank. This area was also a location to which snow was trucked from other areas.
- Surface water run-off resulting from rain and snowmelt is likely to have transported surface contamination into storm drains and/or into in low areas where it would collect. There is only one storm drain system input located in NOL-05. Surface water tends not to collect in NOL-05. Due to the slope of NOL-05 surface water run-off occurs in the direction of OOL-10 and NOL-06.

Modifications performed at the YNPS site during years of operation that changed the configuration of NOL-05 include:

- Paving of previously unpaved areas within the bounds of survey area NOL-05. (Ref 4)
- Installation of the permanent RCA perimeter fence. (Ref 5)
- Installation of security lighting and fence line cameras. (Ref 5)
- Construction of the SSS Building. (Ref 6)
- Changes and repairs made to the Fire Protection Water System. (Ref 7)

Modifications performed at the YNPS site in support of decommissioning that changed the configuration of NOL-05 include:

- Removal of buried conduits/piping associated with the SSS building. (Ref 8)
- Removal of the Old Safety Injection Tank. (Ref 9)
- Removal of the New Safety Injection Tank. (Ref 10)

Scoping/Characterization

Scoping surveys were performed and the resulting data collected was used to develop the YNPS Decommissioning Plan (Ref 11).

Additional scoping survey data was collected in support of the construction activities performed in NOL-05 in support of decommissioning. The progress of these efforts are documented via RP Memo 96-76 Protocol for Sampling of Soil and Asphalt from

excavations and DP-8120 Collection of Site Characterization and FSS Samples. During these modifications some soils excavated contained radionuclide concentrations in excess of the current DCGL's for soil and are identified as remediated. Soil excavations with radionuclide concentrations less than the current DCGL's for soil are identified as mitigation.

Decommissioning

Decommissioning Work Plans (DWP) activities performed in survey area NOL-05 included the following:

- DWP Y-01, Yard Area Contaminated Underground Piping. (Ref 8)

Survey area NOL-05 has been impacted by decommissioning activities performed on systems and structures within and adjacent to it.

Survey Area Name: Northwest Upper RCA Yard Designator: NOL-05

Findings

Survey area NOL-05 is a land area that is located within the current configuration of YNPS RCA.

Survey area NOL-05 is impacted and contains locations where radioactive contamination may be present at levels greater the DCGL.

The radionuclide mix likely to be present in NOL-05 includes all radionuclides identified in the radioactive systems of the plant (Ref 12). The primary radionuclides of concern for survey area NOL-05 are Co-60, Cs-137, Ag-108m, Sr-90, Ni-63 and tritium.

Current Status

NOL-05 remains as part of the RCA and continues to be potentially impacted by personnel traffic, radioactive material transportation, radioactive waste processing and by decommissioning activities.

A soil sample location map (Figure 21) has been prepared to show the distribution of sampling locations in NOL-05. Only samples representative of soils still present are included on the map (samples of soils representative of soils removed during remediation activities are not presented). Two survey media were assessed in NOL-05, Asphalt and Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL. There are separate sets of Tables 1-4 for each survey media. All are evaluated as fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for NOL-05 is presented at the end of Table 1 for each survey medium. The results are summarized below.

Asphalt: Mean SOF is 0.109.
Maximum SOF for a single asphalt sample is 0.496 (key#2988) at the SI pipe location under center of Old SI Tank.
Minimum SOF for a single asphalt sample is 0.006 (key#575) to the south the former location of the Old SI Tank.

Soil: Mean SOF is 0.021.
Maximum SOF for a single soil sample is 0.133 (key#3160) at the SI pipe location under center of Old SI Tank, depth = 5'.
Minimum SOF for a single soil sample is 0.003 (key#3160) at the SI pipe location under center of Old SI Tank, depth = 3'.

Historical Site Assessment and Classification Summary

Survey Area Name: Northwest Upper RCA Yard Designator: NOL-05

Classification Statement

Based upon the historical use and radiological conditions associated with this survey area NOL-05 is identified as a Class 1 Area.

Survey Area Name: Northwest Upper RCA Yard | Designator: NOL-05

Drawings

9699 FB-2 A
9699 FB-2 C
9699 FB-2 E
9699-FC-50 B
9699-FC-50 E
E-1 ASWS Underground Plan

References

1.	Radiation Protection Memorandum (RP) 98-23, "Overview of the YNPS Historical Material Release Evaluation," dated March 5, 1998.
2.	Abnormal Occurrence Report (AOR) 61-15, "Radioactive Spill Chemistry Sample Container Breakage," dated September 21, 1961.
3.	Plant Information Report (PIR) 75-07, "Yard Area Contamination," dated August 12, 1975.
4.	Plant Alteration (PA) 84-006, "Radiation Control Area Boundary Fence Installation," dated 1984.
5.	PA-78-018, "Replacement of Plant Perimeter Fence," dated June 9, 1978.
6.	Engineering Design Change Request (EDCR) 84-310, "Safe Shutdown System Building," dated 1984.
7.	Drawing 9699 FB-2 C, Water & Fire Protection Underground Sheet #1, See Notes
8.	Decommissioning Work Plan (DWP) Y-01, "Yard area Contaminated Removals," dated July 15, 1997.
9.	DWP SIT-01, "Old Safety Injection Tank (SIT) Removal," dated April 13, 1995.
10.	DWP SIT-02, "New Safety Injection Tank (TK-28) Removal," July 11, 1995.
11.	YNPS Decommissioning Plan, Rev. 0.0.
12.	"Radionuclides for Building Surfaces and Soil DCGLs Determination," YA-REPT-00-001-03.

Underground Systems

NOL-05				
Structure / System	Component	Description	Location	Impacted?
Storm Drains	WCB-009	depth = 24'; 4' dia. at base, 2' at top; ladder access; 10" corr pipe 22' from top going ~125' NW to WCB-010, 4" cast iron pipe 15'4" from top going NNW to ???, 4" cast iron pipe 14'11" from top going N to ???, 6" cast iron pipe 10'8" from top going NNE to ???, 8" corr pipe 15'5" from top going NE to ???, 8" corr pipe 20' from top going SSE to ???, 8" corr pipe 16'7" from top going SSE to ???; concrete bottom; good condition	at SW corner of PAB	
Abandoned Street Lighting	electric cable	from OOL-10 continuing E along a line ~even with the N wall of WDB to lightpole L1, then branching with one line curving S ~80' to lightpole L2 then going E under warehouse ~80' then S to the OPCA, the other branch going NE ~50' then E	L1 - ~15' W of NW corner of Compactor bldg; L2 - on west wall of PCA Warehouse ~25' N of SW corner	
Water		from OOL-10 continuing E to tee W0 just north of the middle of the north side of the SSS bldg, then going around the NE corner and halfway down the east wall then going SE ~118' to a point ~40' E of the fire tank; also from tee W0 going generally N ~170' to a point west of the NW corner of the SI bldg,	W0 - ~10' from center of N wall of SSS bldg	
		also from NOL-02 W to a point ~5' E and ~10' N of NE corner of compactor bldg, then SW ~35' under compactor bldg then WNW ~15' to tee W11; from tee W11 SSW ~15' to hose house; from tee W11 WNW ~45' then NW ~25'	W11 - ~10' S of NW corner of WCB	
Electrical	duct trays depth=3' 8'	from the NW corner of WDB going NW ~70' and from old SI tank pad going N ~45' both meeting then N to NOL-06		

Table 1
Sum of Fractions
NOL-05 -- Asphalt
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
2989	AS368	AS368		0.011
2988	AS367	AS367		0.496
2987	AS364	AS364		0.012
577	IR-142	IRAS-142		0.021
575	IR-141	IRAS-141		0.006
			Min	0.006
			Max	0.496
			Mean	0.109

Table 2
Statistical Data Summary – NOL-05 – Asphalt
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	3	3	0.444	0.195	0.327	0.669	0.335
Ag-108m	pCi/g	0	5	0.000				
Ag-110m	pCi/g	0	3	0.000				
Am-241	pCi/g	0	2	0.000				
Ba-140	pCi/g	0	1	0.000				
Bi-214	pCi/g	3	3	0.431	0.098	0.366	0.544	0.382
Ce-144	pCi/g	0	3	0.000				
Co-58	pCi/g	0	7	0.000				
Co-60	pCi/g	4	7	0.214	0.303	0.039	0.666	0.075
Cs-134	pCi/g	1	7	0.065		0.065	0.065	0.065
Cs-137	pCi/g	3	7	1.464	2.429	0.044	4.269	0.079
Fe-59	pCi/g	0	3	0.000				
K-40	pCi/g	3	3	8.031	1.214	6.959	9.349	7.784
Mn-54	pCi/g	0	3	0.000				
Nb-95	pCi/g	1	3	0.037		0.037	0.037	0.037
Pb-212	pCi/g	3	3	0.375	0.244	0.112	0.595	0.417
Pb-214	pCi/g	3	3	0.397	0.042	0.349	0.425	0.417
Ra-226	pCi/g	0	2	0.000				
Ru-103	pCi/g	0	3	0.000				
Ru-106	pCi/g	0	3	0.000				
Sb-124	pCi/g	0	3	0.000				
Tl-208	pCi/g	2	2	0.372	0.171	0.251	0.493	0.372
Zn-65	pCi/g	0	3	0.000				
Zr-95	pCi/g	0	3	0.000				

Table 3
Summary of Detected Results Above Criteria
NOL-05 -- Asphalt
Yankee Nuclear Power Station Rowe, MA
DCGL_Asphalt

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	3	3		pCi/g	0	0.67
Ag-108m	0	5	8.52	pCi/g	0	
Ag-110m	0	3		pCi/g	0	
Am-241	0	2	44.35	pCi/g	0	
Ba-140	0	1		pCi/g	0	
Bi-214	3	3		pCi/g	0	0.54
Ce-144	0	3		pCi/g	0	
Co-58	0	7		pCi/g	0	
Co-60	4	7	4.84	pCi/g	0	0.67
Cs-134	1	7	6.71	pCi/g	0	0.06
Cs-137	3	7	12.24	pCi/g	0	4.27
Fe-59	0	3		pCi/g	0	
K-40	3	3		pCi/g	0	9.35
Mn-54	0	3	21.66	pCi/g	0	
Nb-95	1	3		pCi/g	0	0.04
Pb-212	3	3		pCi/g	0	0.59
Pb-214	3	3		pCi/g	0	0.42
Ra-226	0	2		pCi/g	0	
Ru-103	0	3		pCi/g	0	
Ru-106	0	3	68.21	pCi/g	0	
Sb-124	0	3		pCi/g	0	
Tl-208	2	2		pCi/g	0	0.49
Zn-65	0	3		pCi/g	0	
Zr-95	0	3		pCi/g	0	

Table 4
Rad
NOL-05 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	AS364 (2987)	AS367 (2988)	AS368 (2989)	IR-141 (575)	IR-142 (577)	IR-37 (435)
Sample ID	AS364	AS367	AS368	IRAS-141	IRAS-142	IRAS-37
Date Sampled	8/27/1997	9/3/1997	9/3/1997	8/9/1994	8/9/1994	5/17/1993
Ac-228	0.3274	0.3347	0.6694			
Ag-108m	-0.01117 U	-0.00002683 U	0.0155 U	0.038 UM	0.044 UM	
Ag-110m	-0.01545 U	-0.04632 U	0.005059 U			
Am-241		0 U	0 U			
Ba-140	0.07724 U					
Bi-214	0.3663	0.3822	0.5435			
Ce-144	0.1384 U	-0.1681 U	-0.02865 U			
Co-58	-0.0287 U	-0.005719 U	-0.01493 U	0.045 UM	0.056 UM	0.0771 UM
Co-60	0.0387	0.6659	0.05082	0.0932 UM	0.0994	0.0934 UM
Cs-134	-0.01079 U	0.06459	0.01214 U	0.041 UM	0.052 UM	0.049 UM
Cs-137	0.0443	4.269	0.04388 U	0.0789	0.0752 UM	0.0717 UM
Fe-59	-0.01184 U	0.01712 U	-0.02321 U			
K-40	6.959	7.784	9.349			
Mn-54	-0.008695 U	-0.003537 U	-0.01462 U			
Nb-95	0.03743	-0.003429 U	0.01583 U			
Pb-212	0.112	0.4171	0.5947			
Pb-214	0.3485	0.4168	0.4249			
Ra-226	0.7163 U		0.7747 U			
Ru-103	0.008208 U	-0.01181 U	0.01595 U			
Ru-106	0 U	-0.2488 U	0.1687 U			
Sb-124	-0.009915 U	0.01358 U	0.01227 U			
Tl-208	0.2509		0.4925			
Zn-65	0.009525 U	0.01566 U	0.0697 U			
Zr-95	0.002178 U	-0.04823 U	-0.01852 U			
SOF	0.012	0.496	0.011	0.006	0.021	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-05 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-50 (461)
Sample ID	IRAS-50
Date Sampled	5/20/1993
Ac-228	
Ag-108m	
Ag-110m	
Am-241	
Ba-140	
Bi-214	
Ce-144	
Co-58	0.0671 UM
Co-60	0.0848 UM
Cs-134	0.06 UM
Cs-137	0.0784 UM
Fe-59	
K-40	
Mn-54	
Nb-95	
Pb-212	
Pb-214	
Ra-226	
Ru-103	
Ru-106	
Sb-124	
Tl-208	
Zn-65	
Zr-95	
SOF	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 1
Sum of Fractions
NOL-05 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
3165	TS373	TS373A		0.029
577	IR-142	IRTS-142		0.035
3157	TS364	TS364C		0.005
3158	TS365	TS365A		0.006
3160	TS367	TS367A		0.008
3160	TS367	TS367C		0.003
3160	TS367	TS367D		0.133
575	IR-141	IRTS-141		0.008
3164	TS372	TS372		0.022
3195	TS406	TS406		0.010
3166	TS374	TS374A		0.006
3171	TS379	TS379A		0.038
3173	TS381	TS381		0.005
3174	TS382	TS382		0.015
3176	TS384	TS384		0.019
3177	TS385	TS385		0.012
3178	TS386	TS386		0.014
3162	TS369	TS369		0.014
			Min	0.003
			Max	0.133
			Mean	0.021

Table 2
Statistical Data Summary – NOL-05 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	53	53	0.798	0.151	0.442	1.082	0.807
Ag-108m	pCi/g	2	55	0.038	0.004	0.035	0.041	0.038
Ag-110m	pCi/g	1	53	0.052		0.052	0.052	0.052
Am-241	pCi/g	0	47	0.000				
Bi-212	pCi/g	44	51	1.407	3.132	0.513	21.640	0.944
Bi-214	pCi/g	53	53	0.436	0.069	0.280	0.617	0.435
Ce-139	pCi/g	0	1	0.000				
Ce-144	pCi/g	0	53	0.000				
Co-57	pCi/g	0	1	0.000				
Co-58	pCi/g	0	57	0.000				
Co-60	pCi/g	10	57	0.110	0.107	0.029	0.383	0.068
Cr-51	pCi/g	0	1	0.000				
Cs-134	pCi/g	1	57	0.096		0.096	0.096	0.096
Cs-137	pCi/g	9	57	0.143	0.176	0.033	0.605	0.094
Eu-152	pCi/g	1	3	0.230		0.230	0.230	0.230
Fe-59	pCi/g	1	53	0.065		0.065	0.065	0.065
I-131	pCi/g	0	1	0.000				
I-132	pCi/g	1	4	0.282		0.282	0.282	0.282
I-133	pCi/g	0	2	0.000				
K-40	pCi/g	53	53	15.660	2.490	10.640	20.520	16.530
Mn-54	pCi/g	0	53	0.000				
Mo-99	pCi/g	0	1	0.000				
Nb-94	pCi/g	0	2	0.000				
Nb-95	pCi/g	1	53	0.042		0.042	0.042	0.042
Np-239	pCi/g	0	7	0.000				
Pb-212	pCi/g	53	53	0.800	0.136	0.419	1.032	0.813
Pb-214	pCi/g	53	53	0.464	0.072	0.307	0.632	0.464
Ra-226	pCi/g	28	35	1.310	0.361	0.737	2.717	1.237
Ru-103	pCi/g	3	53	0.028	0.005	0.023	0.031	0.031
Ru-106	pCi/g	1	53	0.358		0.358	0.358	0.358
Sb-124	pCi/g	1	53	0.050		0.050	0.050	0.050
Sb-125	pCi/g	0	9	0.000				
Tl-202	pCi/g	0	1	0.000				
Tl-208	pCi/g	50	50	0.734	0.138	0.285	0.967	0.749
Zn-65	pCi/g	0	53	0.000				
Zr-95	pCi/g	3	53	0.068	0.009	0.062	0.078	0.064

Table 3
Summary of Detected Results Above Criteria
NOL-05 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	53	53		pCi/g	0	1.08
Ag-108m	2	55	8.52	pCi/g	0	0.04
Ag-110m	1	53		pCi/g	0	0.05
Am-241	0	47	44.35	pCi/g	0	
Bi-212	44	51		pCi/g	0	21.64
Bi-214	53	53		pCi/g	0	0.62
Ce-139	0	1		pCi/g	0	
Ce-144	0	53		pCi/g	0	
Co-57	0	1		pCi/g	0	
Co-58	0	57		pCi/g	0	
Co-60	10	57	4.84	pCi/g	0	0.38
Cr-51	0	1		pCi/g	0	
Cs-134	1	57	6.71	pCi/g	0	0.10
Cs-137	9	57	12.24	pCi/g	0	0.60
Eu-152	1	3	12.06	pCi/g	0	0.23
Fe-59	1	53		pCi/g	0	0.07
I-131	0	1		pCi/g	0	
I-132	1	4		pCi/g	0	0.28
I-133	0	2		pCi/g	0	
K-40	53	53		pCi/g	0	20.52
Mn-54	0	53	21.66	pCi/g	0	
Mo-99	0	1		pCi/g	0	
Nb-94	0	2	8.53	pCi/g	0	
Nb-95	1	53		pCi/g	0	0.04
Np-239	0	7		pCi/g	0	
Pb-212	53	53		pCi/g	0	1.03
Pb-214	53	53		pCi/g	0	0.63
Ra-226	28	35		pCi/g	0	2.72
Ru-103	3	53		pCi/g	0	0.03
Ru-106	1	53	68.21	pCi/g	0	0.36
Sb-124	1	53		pCi/g	0	0.05
Sb-125	0	9	37.73	pCi/g	0	
Tl-202	0	1		pCi/g	0	
Tl-208	50	50		pCi/g	0	0.97
Zn-65	0	53		pCi/g	0	
Zr-95	3	53		pCi/g	0	0.08

Table 4
Rad
NOL-05 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-141 (575)	IR-142 (577)	IR-37 (435)	IR-50 (461)	TS364 (3157)	TS364 (3157)
Sample ID	IRTS-141	IRTS-142	IRTS-37	IRTS-50	TS364A	TS364B
Date Sampled	8/9/1994	8/9/1994	5/17/1993	5/20/1993	8/27/1997	8/27/1997
Ac-228					0.7044	0.6703
Ag-108m	0.045 UM	0.043 UM			-0.002731 U	0.01439 U
Ag-110m					-0.01548 U	-0.003737 U
Am-241						
Bi-212					1.29	1.01
Bi-214					0.4919	0.5225
Ce-139						
Ce-144					0.0339 U	0.1422 U
Co-57						
Co-58	0.05 UM	0.059 UM	0.0589 UM	0.0786 UM	-0.02146 U	-0.02745 U
Co-60	0.0871 UM	0.139	0.0919 UM	0.11 UM	0.02925 U	0.008331 U
Cr-51						
Cs-134	0.042 UM	0.053 UM	0.065 UM	0.067 UM	0.02211 U	-0.02073 U
Cs-137	0.0944	0.0827	0.0688 UM	0.0812 UM	0.009202 U	0.04176 U
Eu-152						
Fe-59					-0.02583 U	-0.04366 U
I-131						
I-132						
I-133						
K-40					15.79	16.58
Mn-54					-0.02669 U	0.009346 U
Mo-99						
Nb-94						
Nb-95					-0.005573 U	0.01472 U
Np-239						
Pb-212					0.8089	0.7097
Pb-214					0.4499	0.5625
Ra-226					1.055 U	
Ru-103					-0.0036 U	-0.003911 U
Ru-106					0.2203 U	-0.1155 U
Sb-124					0.02995 U	0.0199 U
Sb-125						
Tl-202						
Tl-208					0.8477	0.6621
Zn-65					0.07454 U	-0.004763 U
Zr-95					-0.0406 U	0.0153 U
SOF	0.008	0.035				

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-05 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS364 (3157)	TS364 (3157)	TS365 (3158)	TS365 (3158)	TS366 (3159)	TS367 (3160)
Sample ID	TS364C	TS364D	TS365A	TS365B	TS366X	TS367A
Date Sampled	8/27/1997	8/27/1997	8/28/1997	8/28/1997	9/2/1997	9/3/1997
Ac-228	0.7275	0.4914	0.4701	0.5757	0.7764	0.8952
Ag-108m	-0.006673 U	-0.003712 U	-0.003373 U	0.01766 U	-0.04472 U	-0.004602 U
Ag-110m	-0.01576 U	0.00334 U	0.0005612 U	-0.00604 U	0.02241 U	0.01923 U
Am-241					0 U	0 U
Bi-212	0.5717	1.129	0.1487 U	36.69 U	0.5627	0.6144
Bi-214	0.439	0.392	0.3646	0.4988	0.447	0.4636
Ce-139						
Ce-144	-0.132 U	-0.008799 U	-0.04901 U	-0.09763 U	0.02283 U	-0.004668 U
Co-57						
Co-58	0.0141 U	-0.0234 U	0.01314 U	-0.03546 U	-0.006228 U	-0.002637 U
Co-60	0.008945 U	-0.01388 U	0.02938	0.006592 U	0.02839 U	0.02209 U
Cr-51						
Cs-134	0.04789 U	-0.02775 U	-0.06084 U	-0.05387 U	0.01685 U	-0.0446 U
Cs-137	0.01878 U	0.01674 U	-0.0001024 U	-0.009098 U	0.01352 U	0.09653
Eu-152						
Fe-59	0.05156 U	-0.04829 U	0.01021 U	-0.002688 U	-0.01658 U	-0.0684 U
I-131						
I-132			0.2823			
I-133		1.939 U				
K-40	13.13	10.64	10.67	10.97	13.75	14.06
Mn-54	-0.003105 U	-0.0005758 U	-0.007955 U	0.003452 U	0.007695 U	0.02972 U
Mo-99						
Nb-94						
Nb-95	0.009247 U	0.01305 U	-0.0008785 U	-0.01212 U	0.02047 U	-0.01082 U
Np-239		0.06189 U				
Pb-212	0.6906	0.6135	0.4188	0.6212	0.8131	0.7836
Pb-214	0.434	0.422	0.3163	0.3588	0.4917	0.5176
Ra-226	1.415	1.031	0.7137 U		1.216	
Ru-103	0.03123	-0.007289 U	0.01243 U	0.008018 U	-0.004157 U	-0.01271 U
Ru-106	0.3576	-0.04616 U	0.05727 U	0.02047 U	-0.1345 U	0.02108 U
Sb-124	-0.01416 U	0.00856 U	-0.0143 U	-0.0252 U	-0.007209 U	0.001515 U
Sb-125			-0.01174 U			-0.0615 U
Tl-202					0.02809 U	
Tl-208	0.6842	0.4757	0.4789	0.6171	0.7884	0.8119
Zn-65	-0.05064 U	-0.01777 U	0.01005 U	-0.09583 U	-0.01384 U	-0.09886 U
Zr-95	-0.0117 U	-0.05368 U	0.006676 U	-0.005234 U	0.003812 U	0.01048 U
SOF	0.005		0.006			0.008

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-05 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS367 (3160)	TS367 (3160)	TS367 (3160)	TS367 (3160)	TS368 (3161)	TS368 (3161)
Sample ID	TS367B	TS367C	TS367D	TS367E	TS368A	TS368B
Date Sampled	9/3/1997	9/3/1997	9/9/1997	9/10/1997	9/8/1997	9/8/1997
Ac-228	0.8032	0.9476	0.8025	0.7263	0.952	0.9882
Ag-108m	0.002937 U	0.007043 U	0.03519	-0.003583 U	0.007417 U	0.01459 U
Ag-110m	-0.03889 U	0.01119 U	0.0283 U	-0.03902 U	-0.0003937 U	0.02703 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Bi-212	1.077	1.439	0.593	1.522	1.267	1.304
Bi-214	0.4352	0.4225	0.2802	0.6171	0.4767	0.4364
Ce-139						
Ce-144	-0.09739 U	-0.04828 U	-0.08825 U	0.1794 U	-0.1393 U	0.1414 U
Co-57						
Co-58	-0.0177 U	0.02519 U	-0.04296 U	-0.004573 U	-0.03425 U	0.02006 U
Co-60	-0.007604 U	-0.003438 U	0.3829	-0.004144 U	-0.0156 U	0 U
Cr-51						
Cs-134	-0.009022 U	0.01811 U	-0.01329 U	-0.1062 U	-0.01096 U	-0.01464 U
Cs-137	-0.0242 U	0.03965	0.6047	-0.00286 U	0.005382 U	0.001074 U
Eu-152						
Fe-59	-0.05887 U	-0.003538 U	-0.04666 U	0.02762 U	0.01797 U	-0.02496 U
I-131						
I-132						
I-133						
K-40	17.96	17.47	15.61	18.16	17.05	17.01
Mn-54	-0.01415 U	-0.002774 U	-0.005456 U	0.005229 U	-0.009613 U	0.02457 U
Mo-99						
Nb-94		0.01545 U				
Nb-95	0.02782 U	0.0216 U	-0.03592 U	0.01445 U	0.01471 U	-0.002215 U
Np-239			0.1501 U			
Pb-212	0.9658	0.8836	0.7266	0.7536	0.8474	1.011
Pb-214	0.4713	0.4322	0.4915	0.632	0.4893	0.4949
Ra-226	0.8761 U	1.415			1.269	
Ru-103	-0.01169 U	0.007943 U	-0.001443 U	0.01279 U	0.01209 U	0.005569 U
Ru-106	-0.2177 U	0.1645 U	-0.05806 U	-0.1422 U	-0.1785 U	0 U
Sb-124	0.03239 U	0.02771 U	-0.01209 U	0.05198 U	0.0395 U	0.005708 U
Sb-125				-0.1103 U		
Tl-202						
Tl-208	0.6646	0.7717	0.8474	0.879	0.6538	0.8863
Zn-65	-0.1461 U	-0.0202 U	-0.105 U	0.08214 U	0.1107 U	-0.1205 U
Zr-95	-0.01817 U	0.007669 U	-0.00279 U	0.0009751 U	0.03359 U	-0.02195 U
SOF		0.003	0.133			

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-05 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS368 (3161)	TS369 (3162)	TS371 (3163)	TS372 (3164)	TS373 (3165)	TS373 (3165)
Sample ID	TS368C	TS369	TS371	TS372	TS373A	TS373B
Date Sampled	9/4/1997	9/4/1997	9/9/1997	9/9/1997	9/9/1997	9/9/1997
Ac-228	0.6844	0.7214	0.6581	0.4418	1.06	0.9134
Ag-108m	0.0002239 U	-0.009854 U	-0.01605 U	-0.01907 U	0.008299 U	0.01022 U
Ag-110m	-0.002859 U	-0.03745 U	0.01654 U	-0.0002853 U	0.03083 U	-0.02049 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Bi-212	0.5974	0.9328	1.332 U	0.3426 U	1.134	
Bi-214	0.3977	0.5177	0.3662	0.2955	0.4022	0.5182
Ce-139						0.03128 U
Ce-144	0.1263 U	0.1475 U	0.05102 U	0.02464 U	-0.02201 U	-0.1766 U
Co-57						
Co-58	0.001608 U	0.003357 U	-0.01292 U	-0.01546 U	0.002883 U	0.008155 U
Co-60	0.02645 U	0.01851 U	0.01405 U	0.05223	0.08847	0.04693 U
Cr-51						
Cs-134	-0.01433 U	0.09607	-0.08364 U	-0.05804 U	0.02258 U	0.02593 U
Cs-137	0.0312 U	0.007662 U	0.01709 U	0.1339	0.1276	0.03473 U
Eu-152						
Fe-59	-0.02348 U	-0.004878 U	0 U	0.065	0.009515 U	-0.01297 U
I-131						
I-132						
I-133					2.008 U	
K-40	12.19	13.17	15.95	13.24	19.12	16.78
Mn-54	0.01774 U	0.02341 U	-0.01379 U	-0.01439 U	0.009009 U	0.009982 U
Mo-99						
Nb-94						
Nb-95	0.02933 U	0.007478 U	0.000508 U	0.01379 U	0.02403 U	0.01595 U
Np-239		-0.2657 U				
Pb-212	0.7272	0.7453	0.5315	0.542	0.8314	0.7555
Pb-214	0.4661	0.4091	0.3848	0.3498	0.3755	0.5325
Ra-226	1.069	0.8287 U	0.9917		1.71	0.9967
Ru-103	0.01424 U	-0.008207 U	0.01075 U	0.02289 U	0.003783 U	0.0314
Ru-106	-0.0904 U	-0.001885 U	0.2469 U	0.02134 U	-0.1513 U	-0.09974 U
Sb-124	-0.01519 U	0.01033 U	-0.01764 U	-0.03488 U	0.04656 U	0.01164 U
Sb-125			-0.009495 U			
Tl-202						
Tl-208	0.6581	0.7118	0.5417	0.2846	0.8239	0.8364
Zn-65	-0.03251 U	-0.1463 U	-0.02118 U	-0.02875 U	0.007728 U	0.01078 U
Zr-95	0.04849 U	0.02646 U	0.05256 U	0.0343 U	0.07785	0.06159
SOF		0.014		0.022	0.029	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-05 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS374 (3166)	TS374 (3166)	TS375 (3167)	TS375 (3167)	TS376 (3168)	TS376 (3168)
Sample ID	TS374A	TS374B	TS375A	TS375B	TS376A	TS376B
Date Sampled	9/9/1997	9/9/1997	9/9/1997	9/9/1997	9/9/1997	9/9/1997
Ac-228	0.9932	0.9127	0.8071	0.9038	0.8548	0.9313
Ag-108m	0.01494 U	-0.01286 U	-0.005504 U	0.006235 U	-0.01443 U	-0.00004349 U
Ag-110m	-0.01179 U	0.006513 U	0.004749 U	0.0284 U	-0.03538 U	0.02819 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Bi-212	1.234	1.267	0.6423	0.5685 U	0.9368	1.161
Bi-214	0.4958	0.3828	0.4192	0.364	0.3893	0.4007
Ce-139						
Ce-144	-0.01002 U	0.05853 U	0.06434 U	-0.08004 U	0.2138 U	0.1559 U
Co-57						
Co-58	-0.001996 U	0.01534 U	-0.005876 U	-0.004239 U	0.01761 U	0.02262 U
Co-60	-0.005689 U	0.007084 U	0.03107 U	0.02869 U	0.008089 U	0.01053 U
Cr-51						
Cs-134	0.01569 U	-0.0342 U	-0.1177 U	-0.04349 U	-0.06913 U	0.03502 U
Cs-137	0.0768	0.007465 U	-0.02598 U	-0.01484 U	-0.03998 U	0.01768 U
Eu-152						-0.0978 U
Fe-59	-0.02779 U	0.04183 U	-0.06176 U	0 U	-0.0168 U	-0.05662 U
I-131						0.2642 U
I-132						
I-133						
K-40	17.68	17.76	20.52	18.45	17.98	19.05
Mn-54	0.01637 U	0.006076 U	-0.01272 U	-0.004029 U	0.002007 U	0.001541 U
Mo-99						
Nb-94						
Nb-95	0.004317 U	-0.01131 U	0.01883 U	-0.007788 U	-0.002175 U	0.01173 U
Np-239	-0.4804 U		0.1502 U			
Pb-212	1.009	0.7961	0.8143	0.8126	0.8655	0.9706
Pb-214	0.434	0.4319	0.4255	0.3073	0.4736	0.3631
Ra-226	1.094		1.616			1.468
Ru-103	0.0005886 U	-0.002526 U	0.006602 U	-0.002517 U	-0.01771 U	-0.00713 U
Ru-106	-0.1309 U	-0.1239 U	0.1813 U	-0.1438 U	-0.1592 U	0.2077 U
Sb-124	-0.004801 U	0.001668 U	0.02113 U	0.01883 U	0.04617 U	0 U
Sb-125		-0.1537 U	-0.1353 U			
Tl-202						
Tl-208	0.763	0.8057	0.9667	0.8857	0.8753	0.8057
Zn-65	0.04808 U	0.1393 U	-0.06946 U	0.01229 U	-0.02786 U	0.0489 U
Zr-95	0.05664 U	0.01785 U	0.06688 U	0.01405 U	0.01116 U	0.02647 U
SOF	0.006					

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-05 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS377 (3169)	TS378 (3170)	TS379 (3171)	TS379 (3171)	TS379 (3171)	TS379 (3171)
Sample ID	TS377X	TS378	TS379A	TS379C	TS379D	TS379E
Date Sampled	9/10/1997	9/10/1997	9/16/1997	9/16/1997	9/16/1997	9/16/1997
Ac-228	0.815	1.082	0.7284	0.8425	0.8283	0.7369
Ag-108m	0.00531 U	-0.0132 U	-0.0007766 U	0.02193 U	-0.02584 U	-0.005143 U
Ag-110m	-0.05029 U	0.005722 U	0.02289 U	-0.0195 U	0.01208 U	0.004908 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Bi-212	0.7992	1.106	1.212	0.7105	0.8488	0.52
Bi-214	0.4499	0.4353	0.3845	0.3876	0.4926	0.435
Ce-139						
Ce-144	-0.07834 U	-0.1097 U	-0.09099 U	-0.113 U	-0.004137 U	0.01315 U
Co-57						
Co-58	-0.006102 U	-0.01236 U	-0.009519 U	0.004367 U	0.02397 U	-0.01648 U
Co-60	0.02694 U	0.0003838 U	0.1819	0.01079 U	0.003458 U	0.02434 U
Cr-51						
Cs-134	0.03005 U	-0.1394 U	-0.04769 U	0.03378 U	0.003278 U	-0.04561 U
Cs-137	0.002542 U	-0.02225 U	-0.004566 U	0.009701 U	-0.01525 U	0.01194 U
Eu-152						
Fe-59	-0.01138 U	-0.01097 U	-0.0005474 U	-0.02064 U	-0.03482 U	-0.02612 U
I-131						
I-132						
I-133						
K-40	17.32	17.53	15.9	16.53	16.99	16.24
Mn-54	-0.01023 U	0.02235 U	0.005089 U	-0.02095 U	0.0172 U	0.00825 U
Mo-99						
Nb-94						0.01064 U
Nb-95	0.001864 U	0.01416 U	0.01794 U	-0.02364 U	0.001361 U	-0.008211 U
Np-239						
Pb-212	0.8832	0.8891	0.8879	0.864	1.032	0.9491
Pb-214	0.3684	0.49	0.5136	0.4939	0.5995	0.4472
Ra-226	1.441	1.639			1.333	1.251
Ru-103	0.01451 U	-0.00248 U	0.005994 U	0.02286	-0.004127 U	-0.007746 U
Ru-106	-0.2356 U	0 U	-0.08917 U	0.04021 U	0.008429 U	-0.05939 U
Sb-124	-0.007895 U	-0.03235 U	0 U	0.01363 U	-0.007901 U	-0.01615 U
Sb-125						
Tl-202						
Tl-208		0.7741	0.7366	0.7055	0.8845	0.7615
Zn-65	-0.0999 U	-0.08017 U	-0.06249 U	-0.0356 U	-0.1683 U	-0.06644 U
Zr-95	0.0109 U	-0.0004217 U	0.04231 U	0.01366 U	0.06424	-0.03709 U
SOF			0.038			

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-05 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS380 (3172)	TS381 (3173)	TS382 (3174)	TS383 (3175)	TS384 (3176)	TS385 (3177)
Sample ID	TS380	TS381	TS382	TS383	TS384	TS385
Date Sampled	9/16/1997	9/16/1997	9/16/1997	9/17/1997	9/17/1997	9/18/1997
Ac-228	0.9422	0.9595	0.6814	0.8494	1.003	0.9968
Ag-108m	-0.009598 U	0.04102	0.0161 U	-0.01528 U	0.0112 U	0.01794 U
Ag-110m	0.02749 U	-0.02204 U	-0.04238 U	0.0284 U	-0.02301 U	0.001586 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Bi-212	0.7233	0.9086	0.4499 U	0.7457	0.9512	
Bi-214	0.435	0.3269	0.3254	0.428	0.3274	0.3869
Ce-139						
Ce-144	-0.1147 U	-0.08679 U	0.09362 U	-0.08831 U	0.07028 U	-0.01911 U
Co-57						
Co-58	0.004894 U	-0.0245 U	-0.02294 U	-0.02215 U	-0.03021 U	-0.009769 U
Co-60	0.01597 U	-0.009446 U	0.07062	0.03622 U	0.006696 U	0.04426
Cr-51						
Cs-134	-0.05326 U	0.05177 U	-0.1474 U	-0.08582 U	-0.0548 U	-0.07621 U
Cs-137	0.008698 U	0.01391 U	0.01783 U	0.04203 U	0.01349 U	0.03255
Eu-152					0.2296	
Fe-59	-0.0362 U	0.06177 U	-0.01272 U	0.03112 U	0.04785 U	0 U
I-131						
I-132					1.882 U	0.8389 U
I-133						
K-40	16.74	16.25	13.74	17.02	18	13.21
Mn-54	0.003314 U	0.02611 U	0.00932 U	0.004271 U	-0.003289 U	-0.0377 U
Mo-99						
Nb-94						
Nb-95	0.03233 U	0.02449 U	-0.00219 U	0.01023 U	-0.01724 U	-0.009121 U
Np-239						
Pb-212	0.9593	0.9503	0.553	0.8432	0.9572	0.9191
Pb-214	0.439	0.5321	0.3995	0.4923	0.5891	0.4198
Ra-226	1.134			1.649		
Ru-103	-0.009302 U	-0.01323 U	-0.01527 U	-0.01335 U	-0.008948 U	-0.01693 U
Ru-106	0.0766 U	-0.1401 U	-0.08396 U	-0.206 U	0.02236 U	-0.01799 U
Sb-124	-0.008443 U	-0.008027 U	0.008903 U	0.001244 U	0.01874 U	-0.008908 U
Sb-125						
Tl-202						
Tl-208	0.8167	0.712	0.4738	0.7381	0.9384	0.8363
Zn-65	0.05472 U	-0.02753 U	0.04111 U	-0.1398 U	-0.1383 U	-0.01267 U
Zr-95	0.03618 U	0.02517 U	0.01913 U	0.0311 U	-0.01564 U	0.005925 U
SOF		0.005	0.015		0.019	0.012

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-05 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS386 (3178)	TS387 (3179)	TS388 (3180)	TS389 (3181)	TS390 (3182)	TS391 (3183)
Sample ID	TS386	TS387	TS388	TS389	TS390	TS391
Date Sampled	9/22/1997	9/22/1997	9/23/1997	9/23/1997	9/23/1997	9/29/1997
Ac-228	0.8708	0.8178	0.6061	0.7403	0.8797	0.7737
Ag-108m	0.005017 U	0.002786 U	-0.01884 U	-0.005078 U	0.01037 U	-0.01855 U
Ag-110m	0.05221	-0.009346 U	0.0241 U	-0.01455 U	-0.01129 U	-0.003749 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Bi-212	0.765	0.8179	0.7734	0.513	21.64	0.9793
Bi-214	0.4616	0.4271	0.4458	0.3927	0.4688	0.4687
Ce-139						
Ce-144	-0.05972 U	-0.06493 U	0.07363 U	-0.1072 U	-0.2133 U	-0.1447 U
Co-57			0.02709 U			
Co-58	0.004498 U	-0.02262 U	-0.003497 U	-0.02105 U	-0.01043 U	-0.009785 U
Co-60	0.06556	-0.004262 U	-0.004212 U	-0.03732 U	0.005975 U	0.01622 U
Cr-51						
Cs-134	-0.008062 U	-0.004589 U	0.009474 U	0.006864 U	-0.01698 U	-0.04988 U
Cs-137	0.03222 U	-0.01176 U	0.00636 U	-0.007019 U	0.02315 U	0.008393 U
Eu-152						
Fe-59	0.05029 U	0.01995 U	0.01295 U	0.03436 U	0.04633 U	-0.0124 U
I-131						
I-132					2.801 U	
I-133						
K-40	18.3	13.57	12.11	17.11	14.47	17.44
Mn-54	0.001413 U	-0.01498 U	0.002955 U	0.01926 U	0.02071 U	-0.001705 U
Mo-99						0.2034 U
Nb-94						
Nb-95	0.00524 U	-0.02042 U	0.002567 U	0.008424 U	0.01766 U	-0.01307 U
Np-239						
Pb-212	0.8959	0.6872	0.683	0.7796	0.8302	0.7926
Pb-214	0.4403	0.4234	0.4754	0.4348	0.4299	0.5422
Ra-226	1.173	0.987	0.9038 U	0.7368	1.066	1.405
Ru-103	0.01886 U	0.01474 U	-0.009018 U	-0.004648 U	0.01255 U	0.009591 U
Ru-106	-0.02906 U	-0.3786 U	-0.1205 U	0 U	0.1344 U	0.1855 U
Sb-124	0.05	0.01191 U	0 U	-0.003745 U	-0.02263 U	0.0031 U
Sb-125	-0.05664 U					-0.1182 U
Tl-202						
Tl-208	0.7597	0.6165	0.6318	0.8212	0.6572	0.7114
Zn-65	-0.02084 U	0.0241 U	0.0003283 U	-0.02697 U	-0.09624 U	0.1307 U
Zr-95	0.02183 U	0.006608 U	0.02922 U	0.008159 U	0.02927 U	0.01144 U
SOF	0.014					

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-05 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS392 (3184)	TS393 (3185)	TS406 (3195)	TS407 (3196)	TS408 (3197)	TS408 (3197)
Sample ID	TS392	TS393	TS406	TS407	TS408A	TS408B
Date Sampled	9/24/1997	9/30/1997	10/22/1997	10/22/1997	10/22/1997	10/22/1997
Ac-228	0.9478	0.8831	0.73	0.5712	0.7278	0.8399
Ag-108m	-0.02596 U	-0.002714 U	0.01502 U	-0.0009 U	-0.01964 U	-0.01339 U
Ag-110m	-0.01051 U	0.01983 U	0.007206 U	-0.01792 U	0.01767 U	0.007698 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Bi-212	1.262	1.081	1.059	0.4484 U	0.994	0.9568
Bi-214	0.4991	0.5755	0.4353	0.456	0.5574	0.5039
Ce-139						
Ce-144	0.0897 U	-0.03845 U	-0.1516 U	-0.06999 U	-0.08758 U	-0.3169 U
Co-57						
Co-58	0.01888 U	0.01201 U	-0.007574 U	-0.0136 U	-0.03444 U	-0.001429 U
Co-60	0.03188 U	0.01212 U	0.04657	0.02271 U	0.03067 U	0.004687 U
Cr-51					0.1508 U	
Cs-134	-0.1424 U	-0.0173 U	-0.0431 U	-0.01339 U	0.002772 U	-0.06624 U
Cs-137	0.004462 U	-0.01626 U	-0.008324 U	-0.0202 U	0.01123 U	0.03002 U
Eu-152		0.08073 U				
Fe-59	0.03942 U	0.01438 U	-0.02588 U	-0.03482 U	-0.0015 U	-0.01303 U
I-131						
I-132						
I-133						
K-40	17.67	17.96	13.51	10.69	17.34	14.9
Mn-54	0.01353 U	0.00501 U	0.002364 U	0.0007808 U	0.0264 U	-0.009923 U
Mo-99						
Nb-94						
Nb-95	-0.004818 U	0.01851 U	0.02201 U	0.03578 U	0.03357 U	0.04177
Np-239					0.4063 U	-0.8423 U
Pb-212	0.9387	0.8567	0.7722	0.5523	0.849	0.8911
Pb-214	0.5209	0.613	0.4636	0.4511	0.5846	0.4894
Ra-226	2.717	1.219	0.9032 U		0.804 U	1.226
Ru-103	0.02771 U	-0.003564 U	0.006337 U	-0.01333 U	0.01682 U	0.002518 U
Ru-106	0.2462 U	-0.07377 U	0.07232 U	0.02166 U	0.04286 U	-0.06844 U
Sb-124	0 U	-0.01161 U	-0.0181 U	-0.008121 U	-0.04596 U	0.02727 U
Sb-125						
Tl-202						
Tl-208	0.9184	0.7267	0.6394		0.6034	0.9507
Zn-65	-0.04924 U	-0.01196 U	-0.09434 U	-0.04285 U	-0.03921 U	-0.02316 U
Zr-95	0.03259 U	0.005255 U	0.009941 U	0.04395 U	-0.005714 U	0.01029 U
SOF			0.01			

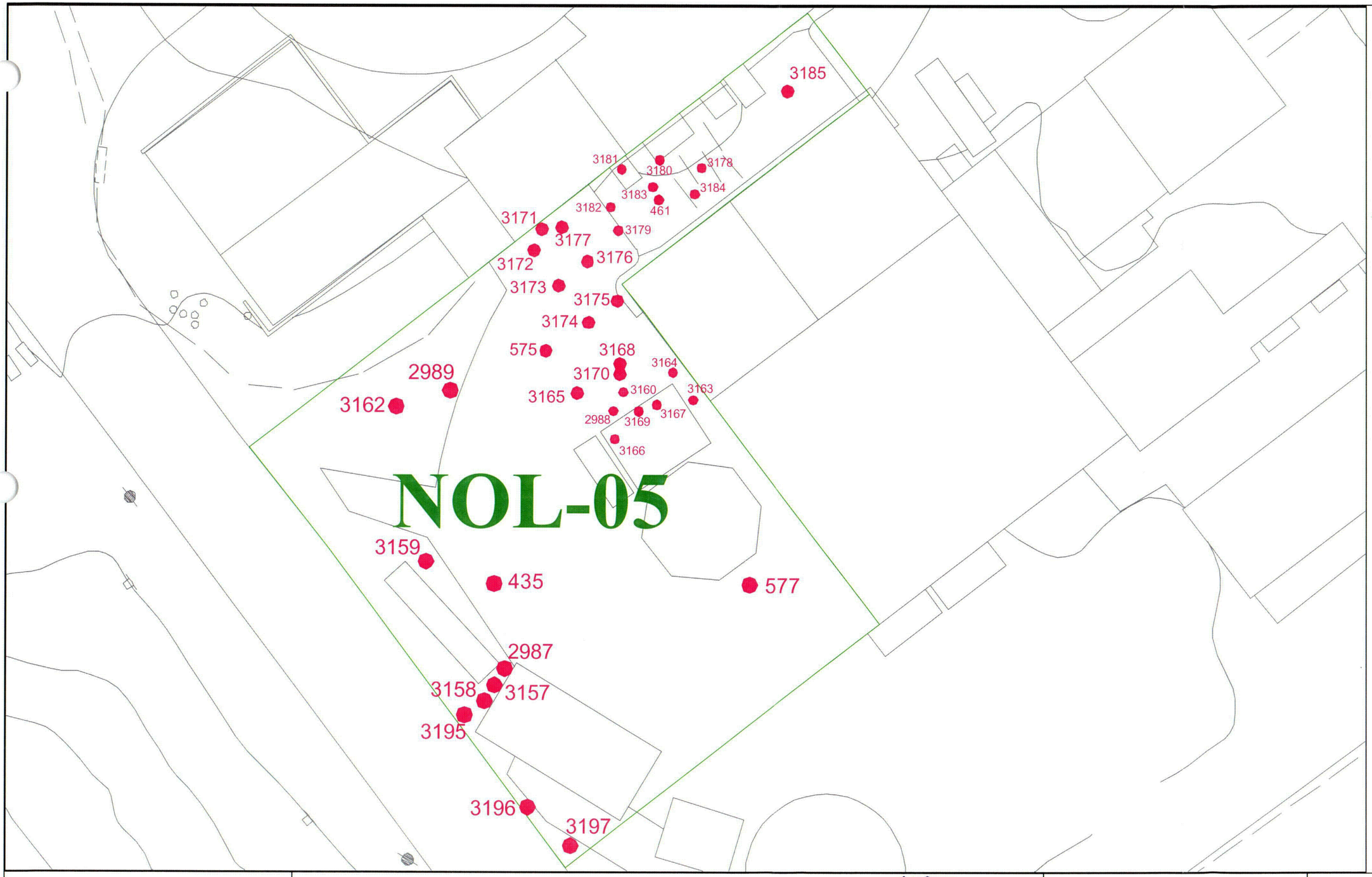
U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-05 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key) Sample ID Date Sampled	TS408 (3197) TS408C 10/22/1997	TS408 (3197) TS408D 10/22/1997	TS408 (3197) TS408E 10/22/1997
Ac-228	0.8061	0.5208	0.7011
Ag-108m	0.005973 U	-0.006425 U	-0.005846 U
Ag-110m	0.01438 U	-0.01336 U	-0.007489 U
Am-241	0 U	0 U	0 U
Bi-212	0.8388	0.6448	0.7685
Bi-214	0.3769	0.4496	0.5421
Ce-139			
Ce-144	0.01957 U	-0.06846 U	-0.2927 U
Co-57			
Co-58	0.01146 U	-0.005817 U	-0.01968 U
Co-60	0.004026 U	0.02763 U	0.004192 U
Cr-51			
Cs-134	-0.0789 U	0.04016 U	-0.03142 U
Cs-137	-0.01823 U	-0.005553 U	0.02889 U
Eu-152			
Fe-59	0 U	0.02556 U	0.03452 U
I-131			
I-132			
I-133			
K-40	13.33	12.17	13.21
Mn-54	-0.0008545 U	0.01746 U	0.02313 U
Mo-99			
Nb-94			
Nb-95	0.01281 U	0.004078 U	-0.0006063 U
Np-239			
Pb-212	0.7782	0.6612	0.7015
Pb-214	0.4967	0.4228	0.5007
Ra-226	1.247	1.154	
Ru-103	0.01234 U	0.006968 U	0.02062 U
Ru-106	-0.2784 U	-0.04642 U	-0.2998 U
Sb-124	0.02275 U	-0.008456 U	-0.01692 U
Sb-125	-0.1166 U		
Tl-202			
Tl-208	0.6074	0.653	
Zn-65	0.004764 U	-0.09881 U	0.01732 U
Zr-95	0.01196 U	-0.005984 U	0.01505 U
SOF			

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed



N

Legend

= Survey Area Boundary

Notes

Yankee Atomic Power Company Soil Sample Locations - NOL-05	YANKEE	Date: October 2003 Revision: 4	Figure: 21

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Historical Site Assessment and Classification Summary

Survey Area Name: West Lower RCA Yard Designator: **NOL-06**

Survey Area Description

Survey area NOL-06 consists of land area within the RCA and contains about 1339 square meters of surface area. The surface of NOL-06 consists of asphalt and soil.

Survey area NOL-06 is bounded by OOL-10 and TBN-01 on the north, NSY-01 and NOL-01 on the east, AUX-01, NSY-003 and NOL-05 on the south and OOL-10 on the west.

Surface items of note located within and to be evaluated as part of NOL-06 include:

- The secondary vent stack foundation.
- Waste liquid collection tank for the diesel generators.

Other items located within NOL-06 that will be evaluated separately from survey area NOL-06 include:

- VC support bases (BRT-01)
- RSS support bases (BRT-01)
- TK-1 base and pipe chase (NSY-12)
- Foundations for the PAB block wall modifications (AUX-02).

Sub-surface systems that traverse or connect within NOL-06 include:

- The west storm drain system
- The fuel oil supply to the auxiliary boilers
- Fire Protection System Water
- Electrical grounding cables.
- Electrical duct trays
- Security lighting conduits

Survey Area Name: West Lower RCA Yard Designator: **NOL-06**

Survey Area History

Survey area NOL-06 was posted and controlled as a RCA from the beginning of plant operation (Ref 1). The bounds of NOL-06 were established based on a history of travel of personnel and material within the lower (elevation 1022') west end of the RCA. The RCA was expanded over time to accommodate the need for additional space in the RCA and when appropriate based upon identified contamination. NOL-06 is adjacent to the PAB and safety injection and diesel building. Access to the upper RCA and waste disposal building is gained by crossing NOL-06. The area potentially impacted by migration of contamination resulting from typical personnel and material travel into and out of the west end of the RCA is captured within the bounds of survey area NOL-06.

Contamination of survey area NOL-06 resulted from transport of contaminated, material and equipment and personnel traffic. Typical transport of contaminated material and equipment occurred between NOL-01 to the NOL-06. Personnel who unknowingly became contaminated while working in the RCA might have traveled across NOL-06 in order to get to the control point prior to identifying that contamination had occurred.

Significant operational events and activities that led to or describe contamination of survey area NOL-06 include:

- PIR 75-07, Yard Area Contamination. (Ref 2)
- PIR 81-09, Contamination of Yard during Reactor Head Removal. (Ref 3)

Translocation Pathways

Modes and vectors of contamination transmigration include:

- Contaminated material transport within the NOL-06 typically involved moving contaminated equipment and tools by vehicles back and forth between the upper and lower elevations of the RCA. In instances where contaminated radioactive material was not properly packaged for transport, spread of contamination during transport was likely to occur.
- Temporary storage locations for packaged contaminated radioactive material were set-up in NOL-06. In instances where this material was improperly packaged, deposition of contamination within the storage location was likely to occur.
- Personnel involved in the above-described activities were also likely to cause spread of contamination.
- Once contamination had been deposited on the surface of the RCA personnel foot traffic was likely to further spread the contamination. This resulted in low-levels of radioactivity distributed generally within the RCA.
- Snow removal was necessary within the RCA in order to facilitate access to all areas. Snow removal likely moved contamination present on the surface of the RCA to the locations where snow was deposited. When these locations would not accept additional snow, the snow was loaded on to trucks and

driven to remote storage locations. As the snow melted the snow, storage locations are likely to have a higher concentration of the radioactivity present due to deposition of additional radioactivity. Deposited snow locations within NOL-06 typically were outside the perimeter of the VC supports, against the north exterior wall of the PAB and the south exterior wall of the turbine building.

- Surface water run-off resulting from rain and snowmelt is likely to have transported surface contamination into storm drains and/or into in low areas where it would collect. Surface water run-off and collection locations in NOL-06 include two storm drain catch basins inputs that are located in ditches on both sides of the paved area west of the VC and collection in a low area in the asphalt under the west side of the VC.

Modifications performed at the YNPS site during years of operation that changed the configuration of NOL-06 include:

- Paving of previously unpaved areas within the bounds of survey area NOL-06. (Ref 3)
- Installation of the permanent RCA perimeter fence. (Ref 4)
- Seismic Upgrade of the RSS anchors
- Installation of underground electrical conduits connecting the SIDG building and the Turbine Building

Modifications performed at the YNPS site in support of decommissioning that changed the configuration of NOL-06 include:

- Construction of the Reactor Pressure Vessel Cask landing pad under the VC equipment hatch.
- Construction of the ISFSI haul road.
- Clean up of oil contaminated soil resulting from an oil leak from a portable air compressor.

Additional scoping survey data was collected in support of the construction activities performed in NOL-06 in support of decommissioning. The progress of these efforts are documented via RP Memo 96-76 Protocol for Sampling of Soil and Asphalt from Excavations and DP-8120 Collection of Site Characterization and FSS Samples. During these modifications some soils excavated contained radionuclide concentrations in excess of the current DCGL's for soil and are identified as remediated. Soil excavations with radionuclide concentrations less than the current DCGL's for soil are identified as mitigation.

Scoping/Characterization

Scoping surveys were performed and data collected used to develop the YNPS Decommissioning Plan. (Ref 5)

Decommissioning

No decommissioning activities have been performed for survey area NOL-06. Survey area NOL-06 has been impacted by decommissioning activities performed on systems and structures within and adjacent to it.

Survey Area Name: West Lower RCA Yard Designator: **NOL-06**

Findings

Survey area NOL-06 is a land area that is located within the current configuration of YNPS RCA.

Survey area NOL-06 is impacted and contains locations where radioactive contamination may be present at levels greater the DCGL.

The radionuclide mix likely to be present in NOL-06 includes all radionuclides identified in the radioactive systems of the plant (Ref 6). The primary radionuclides of concern for survey area NOL-06 are Co-60, Cs-137, Ag-108m, Sr-90, Ni-63 and tritium.

Current Status

NOL-06 remains as part of the RCA and continues to be potentially impacted by personnel traffic, radioactive material transportation, radioactive waste processing and by decommissioning activities.

A soil sample location map (Figure 22) has been prepared to show the distribution of sampling locations in NOL-06. Only samples representative of soils still present are included on the map (samples of soils representative of soils removed during remediation activities are not presented). Two survey media were assessed in NOL-06, Asphalt and Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL. There are separate sets of Tables 1-4 for each survey media. All are evaluated as fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for NOL-06 is presented at the end of Table 1 for each survey medium. The results are summarized below.

Asphalt: Mean SOF is 0.219.
Maximum SOF for a single asphalt sample is 1.534 (key#540) at the northeast corner adjacent to the auxiliary boiler room.
Minimum SOF for a single asphalt sample is 0.008 (key#494) at the southwest corner adjacent to the SI accumulator tank room.

Soil: Mean SOF is 0.003.
Maximum SOF for a single soil sample is 0.402 (key#530) at the north of the SIDG building. .
Minimum SOF for a single soil sample is 0.074 (key#494) at the southwest corner adjacent to the SI accumulator tank room.

Historical Site Assessment and Classification Summary

Survey Area Name: West Lower RCA Yard Designator: **NOL-06**

Classification Statement

Based upon the historical use and radiological conditions associated with this survey area NOL-06 is identified as a Class 1 Area.

Survey Area Name: West Lower RCA Yard Designator: **NOL-06**

Drawings

9699 FB-2 A
9699 FB-2 C
9699 FB-2 E
9699-FC-50 A
9699-FC-50 D
9699-FP-12 I
E-1 ASWS Underground Plan

References

1.	Radiation Protection Memorandum RP 98-23,"Overview of the YNPS Historical Material Release Evaluation," March 5, 1998.
2.	Plant Information Report (PIR) 75-07, "Yard Area Contamination," dated August 12, 1975,
3.	PIR 81-09, "Contamination of Yard during Reactor Head Removal," dated July 12, 1981
4.	Plant Alteration (PA) 84-006, "Radiation Control Area Boundary Fence Installation," dated 1984.
5.	YNPS Decommissioning Plan, Rev. 0.0.
6.	"Radionuclides for Building Surfaces and Soil DCGL Determinations," YA-REPT-00-001-03.

Underground Systems

NOL-06				
Structure / System	Component	Description	Location	Impacted?
Water		from NOL-05 going generally N to a point west of the NW corner of the SI bldg, then a jog NE to a point north of the NW corner of the SI bldg then continuing N ~192' to tee W1 6' south of line of south wall of Office bldg; also from NOL-05 N of old SI tank pad going NW to a point ~10' N and ~15' W of SW corner of PAB, then going W ~45' then NW ~10' then N ~50' to tee W12; from tee W12 W ~50' to hose house; from tee W12 N ~5' then NE ~10' then N ~227' to tee W13	W12 - ~15' S and ~15' W of NW corner of SI bldg	
Security Lighting	underground cables	from OOL-10 going E to a point ~55' S of SW corner of TB then N ~55' to SW corner of TB		
Electrical	duct trays depth=2'6"-3'8"	from NOL-05 going N ~30' to manhole E3		

Table 1
Sum of Fractions
NOL-06 -- Asphalt
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
2999	AS99.57	AS99.57		0.121
540	IR-120	IRAS-120		1.534
496	IR-93	IRAS-93		0.023
494	IR-92	IRAS-92		0.008
488	IR-89	IRAS-89		0.034
480	IR-85	IRAS-85		0.138
472	IR-81	IRAS-81		0.010
470	IR-80	IRAS-80		0.010
431	IR-35	IRAS-35		0.097
			Min	0.008
			Max	1.534
			Mean	0.219

Table 2
Statistical Data Summary – NOL-06 – Asphalt
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	1	1	0.344		0.344	0.344	0.344
Ag-108m	pCi/g	1	10	0.172		0.172	0.172	0.172
Ag-110m	pCi/g	1	1	0.048		0.048	0.048	0.048
Am-241	pCi/g	0	1	0.000				
Ce-144	pCi/g	0	1	0.000				
Co-58	pCi/g	0	12	0.000				
Co-60	pCi/g	6	12	1.433	2.835	0.112	7.206	0.275
Cs-134	pCi/g	0	12	0.000				
Cs-137	pCi/g	8	12	0.273	0.344	0.082	1.109	0.150
Fe-59	pCi/g	0	1	0.000				
K-40	pCi/g	1	1	8.306		8.306	8.306	8.306
Mn-54	pCi/g	0	1	0.000				
Nb-95	pCi/g	0	1	0.000				
Pb-212	pCi/g	1	1	0.318		0.318	0.318	0.318
Pb-214	pCi/g	1	1	0.378		0.378	0.378	0.378
Ru-103	pCi/g	0	1	0.000				
Ru-106	pCi/g	0	1	0.000				
Sb-124	pCi/g	0	1	0.000				
Zn-65	pCi/g	0	1	0.000				
Zr-95	pCi/g	0	1	0.000				

Table 3
Summary of Detected Results Above Criteria
NOL-06 -- Asphalt
Yankee Nuclear Power Station Rowe, MA
DCGL_Asphalt

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	1	1		pCi/g	0	0.34
Ag-108m	1	10	8.52	pCi/g	0	0.17
Ag-110m	1	1		pCi/g	0	0.05
Am-241	0	1	44.35	pCi/g	0	
Ce-144	0	1		pCi/g	0	
Co-58	0	12		pCi/g	0	
Co-60	6	12	4.84	pCi/g	1	7.21
Cs-134	0	12	6.71	pCi/g	0	
Cs-137	8	12	12.24	pCi/g	0	1.11
Fe-59	0	1		pCi/g	0	
K-40	1	1		pCi/g	0	8.31
Mn-54	0	1	21.66	pCi/g	0	
Nb-95	0	1		pCi/g	0	
Pb-212	1	1		pCi/g	0	0.32
Pb-214	1	1		pCi/g	0	0.38
Ru-103	0	1		pCi/g	0	
Ru-106	0	1	68.21	pCi/g	0	
Sb-124	0	1		pCi/g	0	
Zn-65	0	1		pCi/g	0	
Zr-95	0	1		pCi/g	0	

Table 4
Rad
NOL-06 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	AS99.57 (2999)	IR-120 (540)	IR-35 (431)	IR-38 (437)	IR-80 (470)	IR-81 (472)
Sample ID	AS99.57	IRAS-120	IRAS-35	IRAS-38	IRAS-80	IRAS-81
Date Sampled	7/6/1999	8/3/1994	5/20/1993	5/17/1993	6/20/1994	6/20/1994
Ac-228	0.3435					
Ag-108m	0.007368 U	0.172			0.038 UM	0.039 UM
Ag-110m	0.04805					
Am-241	0 U					
Ce-144	0.01258 U					
Co-58	0.000862 U	0.169 UM	0.0903 UM	0.0769 UM	0.056 UM	0.049 UM
Co-60	0.1492	7.206	0.4	0.0836 UM	0.0885 UM	0.0698 UM
Cs-134	0.0186 U	0.109 UM	0.086 UM	0.072 UM	0.04 UM	0.039 UM
Cs-137	1.109	0.299	0.178	0.111 UM	0.122	0.125
Fe-59	-0.03521 U					
K-40	8.306					
Mn-54	0.002322 U					
Nb-95	0.01727 U					
Pb-212	0.3182					
Pb-214	0.3775					
Ru-103	-0.005578 U					
Ru-106	-0.142 U					
Sb-124	0.007658 U					
Zn-65	-0.06416 U					
Zr-95	-0.000000002339 U					
SOF	0.121	1.534	0.097		0.01	0.01

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-06 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-84 (478)	IR-85 (480)	IR-88 (486)	IR-89 (488)	IR-92 (494)	IR-93 (496)
Sample ID	IRAS-84	IRAS-85	IRAS-88	IRAS-89	IRAS-92	IRAS-93
Date Sampled	6/20/1994	6/20/1994	6/21/1994	6/21/1994	6/21/1994	6/22/1994
Ac-228						
Ag-108m	0.047 UM	0.046 UM	0.037 UM	0.041 UM	0.045 UM	0.047 UM
Ag-110m						
Am-241						
Ce-144						
Co-58	0.051 UM	0.065 UM	0.058 UM	0.061 UM	0.047 UM	0.068 UM
Co-60	0.105 UM	0.597	0.0731 UM	0.132	0.121 UM	0.112
Cs-134	0.046 UM	0.055 UM	0.039 UM	0.051 UM	0.045 UM	0.065 UM
Cs-137	0.0683 UM	0.174	0.0599 UM	0.0822	0.0966	0.0836 UM
Fe-59						
K-40						
Mn-54						
Nb-95						
Pb-212						
Pb-214						
Ru-103						
Ru-106						
Sb-124						
Zn-65						
Zr-95						
SOF		0.138		0.034	0.008	0.023

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 1
Sum of Fractions
NOL-06 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
3102	SI001.15	SI001.15C		0.024
494	IR-92	IRTS-92		0.003
530	IR-111	IRTS-111		0.402
535	IR-116	IRTS-116		0.057
540	IR-120	IRTS-120		0.358
554	IR-127	IRTS-127		0.055
555	IR-128	IRTS-128		0.087
556	IR-129	IRTS-129		0.021
557	IR-130	IRTS-130		0.269
3101	SI001.14	SI001.14A		0.168
3101	SI001.14	SI001.14B		0.027
3101	SI001.14	SI001.14C		0.044
480	IR-85	IRTS-85		0.038
3102	SI001.15	SI001.15B		0.008
3208	TS476	TS476		0.011
3103	SI001.16	SI001.16A		0.049
3103	SI001.16	SI001.16B		0.004
3103	SI001.16	SI001.16C		0.032
3104	SI001.18	SI001.18		0.018
3107	SI001.20	SI001.20		0.095
3108	SI001.21	SI001.21		0.043
3109	SI001.22	SI001.22		0.033
3110	SI001.23	SI001.23		0.037
3111	SI001.24	SI001.24		0.022
3112	SI001.25	SI001.25		0.029
3113	SI001.26	SI001.26		0.019
3102	SI001.15	SI001.15A		0.043
			Min	0.003
			Max	0.402
			Mean	0.074

Table 2
Statistical Data Summary – NOL-06 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	22	22	0.609	0.235	0.156	1.088	0.614
Ag-108m	pCi/g	1	38	0.031		0.031	0.031	0.031
Ag-110m	pCi/g	0	23	0.000				
Am-241	pCi/g	0	23	0.000				
Bi-212	pCi/g	13	17	0.662	0.234	0.350	1.146	0.597
Bi-214	pCi/g	21	21	0.370	0.112	0.190	0.576	0.386
Ce-144	pCi/g	1	23	0.167		0.167	0.167	0.167
Co-58	pCi/g	0	40	0.000				
Co-60	pCi/g	23	40	0.347	0.525	0.035	1.816	0.127
Cs-134	pCi/g	1	40	0.076		0.076	0.076	0.076
Cs-137	pCi/g	23	40	0.176	0.120	0.034	0.535	0.142
Eu-152	pCi/g	0	2	0.000				
Fe-59	pCi/g	0	23	0.000				
I-132	pCi/g	0	1	0.000				
K-40	pCi/g	23	23	13.332	3.520	7.170	23.100	13.270
La-140	pCi/g	0	1	0.000				
Mn-54	pCi/g	0	23	0.000				
Nb-95	pCi/g	1	23	0.049		0.049	0.049	0.049
Np-239	pCi/g	0	1	0.000				
Pb-212	pCi/g	23	23	0.580	0.231	0.247	1.090	0.517
Pb-214	pCi/g	23	23	0.394	0.124	0.170	0.676	0.367
Ra-226	pCi/g	9	12	1.185	0.254	0.830	1.630	1.160
Ru-103	pCi/g	0	23	0.000				
Ru-106	pCi/g	0	23	0.000				
Sb-124	pCi/g	2	23	0.031	0.016	0.019	0.042	0.031
Sb-125	pCi/g	0	2	0.000				
Tl-208	pCi/g	18	18	0.596	0.226	0.259	1.011	0.575
U-235	pCi/g	0	1	0.000				
Zn-65	pCi/g	0	23	0.000				
Zr-95	pCi/g	1	23	0.063		0.063	0.063	0.063

Table 3
Summary of Detected Results Above Criteria
NOL-06 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	22	22		pCi/g	0	1.09
Ag-108m	1	38	8.52	pCi/g	0	0.03
Ag-110m	0	23		pCi/g	0	
Am-241	0	23	44.35	pCi/g	0	
Bi-212	13	17		pCi/g	0	1.15
Bi-214	21	21		pCi/g	0	0.58
Ce-144	1	23		pCi/g	0	0.17
Co-58	0	40		pCi/g	0	
Co-60	23	40	4.84	pCi/g	0	1.82
Cs-134	1	40	6.71	pCi/g	0	0.08
Cs-137	23	40	12.24	pCi/g	0	0.54
Eu-152	0	2	12.06	pCi/g	0	
Fe-59	0	23		pCi/g	0	
I-132	0	1		pCi/g	0	
K-40	23	23		pCi/g	0	23.10
La-140	0	1		pCi/g	0	
Mn-54	0	23	21.66	pCi/g	0	
Nb-95	1	23		pCi/g	0	0.05
Np-239	0	1		pCi/g	0	
Pb-212	23	23		pCi/g	0	1.09
Pb-214	23	23		pCi/g	0	0.68
Ra-226	9	12		pCi/g	0	1.63
Ru-103	0	23		pCi/g	0	
Ru-106	0	23	68.21	pCi/g	0	
Sb-124	2	23		pCi/g	0	0.04
Sb-125	0	2	37.73	pCi/g	0	
Tl-208	18	18		pCi/g	0	1.01
U-235	0	1		pCi/g	0	
Zn-65	0	23		pCi/g	0	
Zr-95	1	23		pCi/g	0	0.06

Table 4
Rad
NOL-06 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-111 (530)	IR-116 (535)	IR-120 (540)	IR-127 (554)	IR-128 (555)	IR-129 (556)
Sample ID	IRTS-111	IRTS-116	IRTS-120	IRTS-127	IRTS-128	IRTS-129
Date Sampled	6/30/1994	6/30/1994	8/3/1994	8/3/1994	8/4/1994	8/5/1994
Ac-228						
Ag-108m	0.06 UM	0.056 UM	0.073 UM	0.043 UM	0.047 UM	0.041 UM
Ag-110m						
Am-241						
Bi-212						
Bi-214						
Ce-144						
Co-58	0.09 UM	0.069 UM	0.098 UM	0.061 UM	0.058 UM	0.059 UM
Co-60	1.816	0.195	1.731	0.183	0.327	0.08
Cs-134	0.069 UM	0.065 UM	0.072 UM	0.06 UM	0.057 UM	0.045 UM
Cs-137	0.322	0.201	0.11 UM	0.213	0.236	0.0584
Eu-152						
Fe-59						
I-132						
K-40						
La-140						
Mn-54						
Nb-95						
Np-239						
Pb-212						
Pb-214						
Ra-226						
Ru-103						
Ru-106						
Sb-124						
Sb-125						
Tl-208						
U-235						
Zn-65						
Zr-95						
SOF	0.402	0.057	0.358	0.055	0.087	0.021

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-06 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-130 (557)	IR-35 (431)	IR-38 (437)	IR-80 (470)	IR-81 (472)	IR-84 (478)	IR-85 (480)
Sample ID	IRTS-130	IRTS-35	IRTS-38	IRTS-80	IRTS-81	IRTS-84	IRTS-85
Date Sampled	8/5/1994	5/17/1993	5/18/1993	6/20/1994	6/20/1994	6/20/1994	6/20/1994
Ac-228							
Ag-108m	0.067 UM			0.042 UM	0.046 UM	0.053 UM	0.044 UM
Ag-110m							
Am-241							
Bi-212							
Bi-214							
Ce-144							
Co-58	0.088 UM	0.0665 UM	0.0633 UM	0.061 UM	0.05 UM	0.06 UM	0.059 UM
Co-60	1.255	0.0992 UM	0.0885 UM	0.073 UM	0.071 UM	0.0788 UM	0.163
Cs-134	0.085 UM	0.08 UM	0.057 UM	0.048 UM	0.056 UM	0.056 UM	0.05 UM
Cs-137	0.122	0.123 UM	0.0803 UM	0.079 UM	0.0712 UM	0.0755 UM	0.056
Eu-152							
Fe-59							
I-132							
K-40							
La-140							
Mn-54							
Nb-95							
Np-239							
Pb-212							
Pb-214							
Ra-226							
Ru-103							
Ru-106							
Sb-124							
Sb-125							
Tl-208							
U-235							
Zn-65							
Zr-95							
SOF	0.269						0.038

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-06 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IR-88 (486)	IR-89 (488)	IR-92 (494)	IR-93 (496)	SB002.3 (3060)	SB002.3 (3060)
Sample ID	IRTS-88	IRTS-89	IRTS-92	IRTS-93	SB002.3A	SB002.3B
Date Sampled	6/21/1994	6/20/1994	6/21/1994	6/22/1994	7/2/1998	7/2/1998
Ac-228					0.7697	1.024
Ag-108m	0.06 UM	0.036 UM	0.055 UM	0.048 UM	-0.001219 U	-0.007873 U
Ag-110m					0.007597 U	0.01948 U
Am-241					0 U	0 U
Bi-212					0.5965	0.8964
Bi-214					0.4235	0.576
Ce-144					0.00286 U	0.03845 U
Co-58	0.075 UM	0.05 UM	0.063 UM	0.065 UM	0.02396 U	0.02055 U
Co-60	0.0987 UM	0.0804 UM	0.0805 UM	0.0953 UM	0.01031 U	0.01075 U
Cs-134	0.067 UM	0.045 UM	0.059 UM	0.049 UM	-0.03339 U	-0.07869 U
Cs-137	0.0927 UM	0.0614 UM	0.0339	0.0858 UM	0.02077 U	0 U
Eu-152						
Fe-59					-0.02894 U	-0.04089 U
I-132						
K-40					15.65	18.82
La-140						
Mn-54					0.02243 U	-0.003039 U
Nb-95					-0.007481 U	0.0312 U
Np-239						
Pb-212					0.84	0.9744
Pb-214					0.4565	0.5526
Ra-226						1.323
Ru-103					-0.00688 U	-0.005124 U
Ru-106					-0.1292 U	-0.1238 U
Sb-124					0.0104 U	-0.006893 U
Sb-125						
Tl-208					0.8533	1.011
U-235						
Zn-65					0.05582 U	-0.009246 U
Zr-95					0.004444 U	-0.01371 U
SOF			0.003			

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-06 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SB002.3 (3060)	SI001.14 (3101)	SI001.14 (3101)	SI001.14 (3101)	SI001.15 (3102)
Sample ID	SB002.3C	SI001.14A	SI001.14B	SI001.14C	SI001.15A
Date Sampled	7/2/1998	8/31/1999	8/31/1999	8/31/1999	8/31/1999
Ac-228	0.7709	0.3003	0.8008	0.7396	0.3725
Ag-108m	-0.02007 U	-0.02427 U	-0.01347 U	-0.004864 U	0.004881 U
Ag-110m	0.008553 U	-0.03506 U	0.02905 U	-0.003589 U	0.01808 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212	1.146			0.8947	
Bi-214	0.4722	0.2312	0.3879	0.2992	0.254
Ce-144	-0.103 U	0.0528 U	-0.1001 U	0.07627 U	-0.05065 U
Co-58	0.007226 U	0.02089 U	-0.01483 U	-0.008568 U	-0.01391 U
Co-60	0.003597 U	0.7019	0.05545	-0.0138 U	0.1596
Cs-134	-0.03923 U	-0.01497 U	-0.0459 U	-0.014 U	-0.02289 U
Cs-137	0.002479 U	0.2848	0.1881	0.5353	0.1199
Eu-152					
Fe-59	0.07034 U	-0.003604 U	-0.005871 U	-0.04352 U	0.006821 U
I-132					
K-40	17.62	12.71	12.97	12.34	12.9
La-140					
Mn-54	-0.04524 U	-0.008971 U	-0.01157 U	0.01671 U	-0.003192 U
Nb-95	0.03049 U	0.04876	0.008727 U	0.004014 U	-0.01456 U
Np-239					
Pb-212	0.9124	0.3723	0.7381	0.6706	0.4051
Pb-214	0.5633	0.348	0.4472	0.3595	0.3282
Ra-226	1.189		1.16	1.154	0.9366
Ru-103	-0.01187 U	-0.001416 U	0.002246 U	0.02233 U	-0.01942 U
Ru-106	-0.04141 U	-0.03654 U	0.04743 U	-0.06105 U	0.1907 U
Sb-124	0.002882 U	0.006785 U	-0.03993 U	-0.01487 U	-0.01602 U
Sb-125					0.018 U
Tl-208	0.8663	0.2976	0.5896	0.7322	
U-235					
Zn-65	-0.001683 U	0.01177 U	0.03573 U	-0.08876 U	0.006383 U
Zr-95	-0.008716 U	-0.0343 U	-0.042 U	0.03264 U	0.01608 U
SOF		0.168	0.027	0.044	0.043

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
NOL-06 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SI001.15 (3102)	SI001.15 (3102)	SI001.16 (3103)	SI001.16 (3103)	SI001.16 (3103)
Sample ID	SI001.15B	SI001.15C	SI001.16A	SI001.16B	SI001.16C
Date Sampled	8/31/1999	8/31/1999	8/31/1999	8/31/1999	8/31/1999
Ac-228		0.4476	0.2808	0.1561	0.7897
Ag-108m	0.01616 U	-0.006506 U	0.01493 U	-0.0006652 U	0.01228 U
Ag-110m	0.009301 U	0.009788 U	0.0303 U	-0.0118 U	0.02698 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212		0.5599	0.5159	0.3503	0.7913
Bi-214	0.1904	0.2138	0.3088		0.4025
Ce-144	0.167	-0.01254 U	-0.2217 U	-0.1359 U	-0.02006 U
Co-58	-0.01218 U	0.006392 U	-0.01509 U	-0.006832 U	0.01248 U
Co-60	0.04043	0.08318	0.1774	0.02883 U	0.03007 U
Cs-134	-0.0453 U	0.005961 U	-0.08124 U	0.003937 U	0.002223 U
Cs-137	0.02596 U	0.08041	0.152	0.04827	0.3871
Eu-152					
Fe-59	-0.009689 U	-0.01645 U	-0.01078 U	-0.01634 U	-0.04239 U
I-132					
K-40	7.486	7.594	14.17	7.17	12.35
La-140	0.1113 U				
Mn-54	-0.005722 U	-0.002536 U	0.004683 U	-0.01794 U	0.0136 U
Nb-95	-0.02537 U	0.006441 U	-0.01179 U	0 U	0.00224 U
Np-239					
Pb-212	0.301	0.3623	0.3561	0.2474	0.5269
Pb-214	0.2073	0.2369	0.3116	0.1703	0.3642
Ra-226					
Ru-103	0.003306 U	-0.002675 U	-0.009035 U	0.002584 U	0.02636 U
Ru-106	-0.271 U	0.08092 U	-0.03406 U	0 U	0.1132 U
Sb-124	-0.008534 U	0.02709 U	-0.03473 U	0.01735 U	-0.01592 U
Sb-125					
Tl-208		0.3116	0.3187	0.2592	0.6639
U-235					
Zn-65	-0.03158 U	0.03977 U	0.06514 U	-0.09719 U	0.02759 U
Zr-95	-0.00903 U	-0.01343 U	0.01887 U	0.01 U	0.04189 U
SOF	0.008	0.024	0.049	0.004	0.032

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-06 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SI001.18 (3104)	SI001.19 (3105)	SI001.20 (3107)	SI001.21 (3108)	SI001.22 (3109)
Sample ID	SI001.18	SI001.19	SI001.20	SI001.21	SI001.22
Date Sampled	11/8/1999	11/8/1999	11/8/1999	11/8/1999	11/8/1999
Ac-228	0.6175	0.7257	0.4342	0.5612	0.6108
Ag-108m	-0.01721 U	0.007511 U	0.01297 U	0.004716 U	-0.001928 U
Ag-110m	0.001836 U	0.004191 U	-0.01218 U	-0.0155 U	0.02477 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212		0.3863 U	0.5398	0.3373 U	
Bi-214	0.3326	0.5207	0.457	0.347	0.433
Ce-144	0.04175 U	0.05049 U	0.1197 U	-0.08695 U	0.1125 U
Co-58	-0.01012 U	-0.01647 U	-0.009727 U	0.008786 U	-0.02025 U
Co-60	0.0636	0.002543 U	0.3749	0.1267	0.1089
Cs-134	0.03885 U	0.01382 U	0.04756 U	-0.01071 U	-0.05504 U
Cs-137	0.06265	0.02455 U	0.2179	0.2116	0.1294
Eu-152		-0.0687 U			
Fe-59	0.02787 U	0.01146 U	0.0606 U	-0.04717 U	-0.0112 U
I-132					
K-40	13.6	14.24	14.11	12.87	14.13
La-140					
Mn-54	-0.02007 U	0.01173 U	0.02244 U	0.01575 U	-0.009877 U
Nb-95	-0.004318 U	0.002329 U	0.001656 U	-0.006042 U	0.01282 U
Np-239			0.2991 U		
Pb-212	0.6525	0.72	0.6169	0.5149	0.5169
Pb-214	0.4831	0.4406	0.5102	0.4069	0.367
Ra-226	0.8325 U	1.63		0.6981 U	0.8862 U
Ru-103	-0.01396 U	0.01633 U	-0.006151 U	-0.002842 U	0.0001952 U
Ru-106	0.08324 U	0.2476 U	-0.002051 U	0.06199 U	0.07136 U
Sb-124	-0.008914 U	-0.01909 U	-0.001176 U	0.01939	-0.01171 U
Sb-125				-0.03534 U	
Tl-208		0.7288	0.5467		0.5608
U-235				0.2629 U	
Zn-65	-0.03374 U	-0.01412 U	0.02083 U	-0.0725 U	0.0177 U
Zr-95	0.01157 U	0.0307 U	0.005724 U	0.01143 U	0.01843 U
SOF	0.018		0.095	0.043	0.033

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-06 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SI001.23 (3110)	SI001.24 (3111)	SI001.25 (3112)	SI001.26 (3113)	TS476 (3208)
Sample ID	SI001.23	SI001.24	SI001.25	SI001.26	TS476
Date Sampled	11/8/1999	11/8/1999	11/8/1999	11/12/1999	6/8/1998
Ac-228	0.4996	0.4359	0.6715	0.7785	1.088
Ag-108m	0.007087 U	0.007555 U	0.03147	0.001673 U	-0.02546 U
Ag-110m	0.03166 U	-0.01579 U	-0.03042 U	0.01035 U	-0.02448 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212	0.4222 U	0.3736	0.5304 U	0.6755	0.8154
Bi-214		0.2725	0.3862	0.4172	0.5711
Ce-144	0.04125 U	-0.02658 U	0.01801 U	0.06503 U	0.1979 U
Co-58	-0.02413 U	0.00111 U	-0.002974 U	-0.01601 U	-0.01419 U
Co-60	0.1243	0.06533	0.06632	0.03541	0.05097
Cs-134	0.01626 U	0.01955 U	-0.03125 U	0.0756	0.005364 U
Cs-137	0.1421	0.1064	0.1389	0.03652 U	0.02052 U
Eu-152		0.05118 U			
Fe-59	-0.005601 U	-0.00423 U	0.03887 U	-0.00538 U	-0.04548 U
I-132				1.135 U	
K-40	13.69	10.31	13.27	13.93	23.1
La-140					
Mn-54	0.00116 U	-0.002245 U	-0.005218 U	-0.01258 U	0.01608 U
Nb-95	-0.002176 U	0.01988 U	0.007241 U	-0.0155 U	0.02249 U
Np-239					
Pb-212	0.5045	0.3442	0.4465	0.803	1.09
Pb-214	0.411	0.2692	0.3298	0.5348	0.6763
Ra-226	0.9945	0.8296		1.452	
Ru-103	-0.02498 U	0.01204 U	-0.0192 U	0.01085 U	0.007986 U
Ru-106	0.1035 U	0.1043 U	0.06077 U	0.1811 U	-0.1943 U
Sb-124	0.03394 U	0.04188	-0.006616 U	0.01765 U	0.03119 U
Sb-125					
Tl-208		0.4169	0.5358	0.6293	0.922
U-235					
Zn-65	-0.04364 U	0.05017 U	-0.07984 U	0.04505 U	-0.05535 U
Zr-95	-0.002789 U	-0.000707 U	0.01101 U	-0.02938 U	0.06288
SOF	0.037	0.022	0.029	0.019	0.011

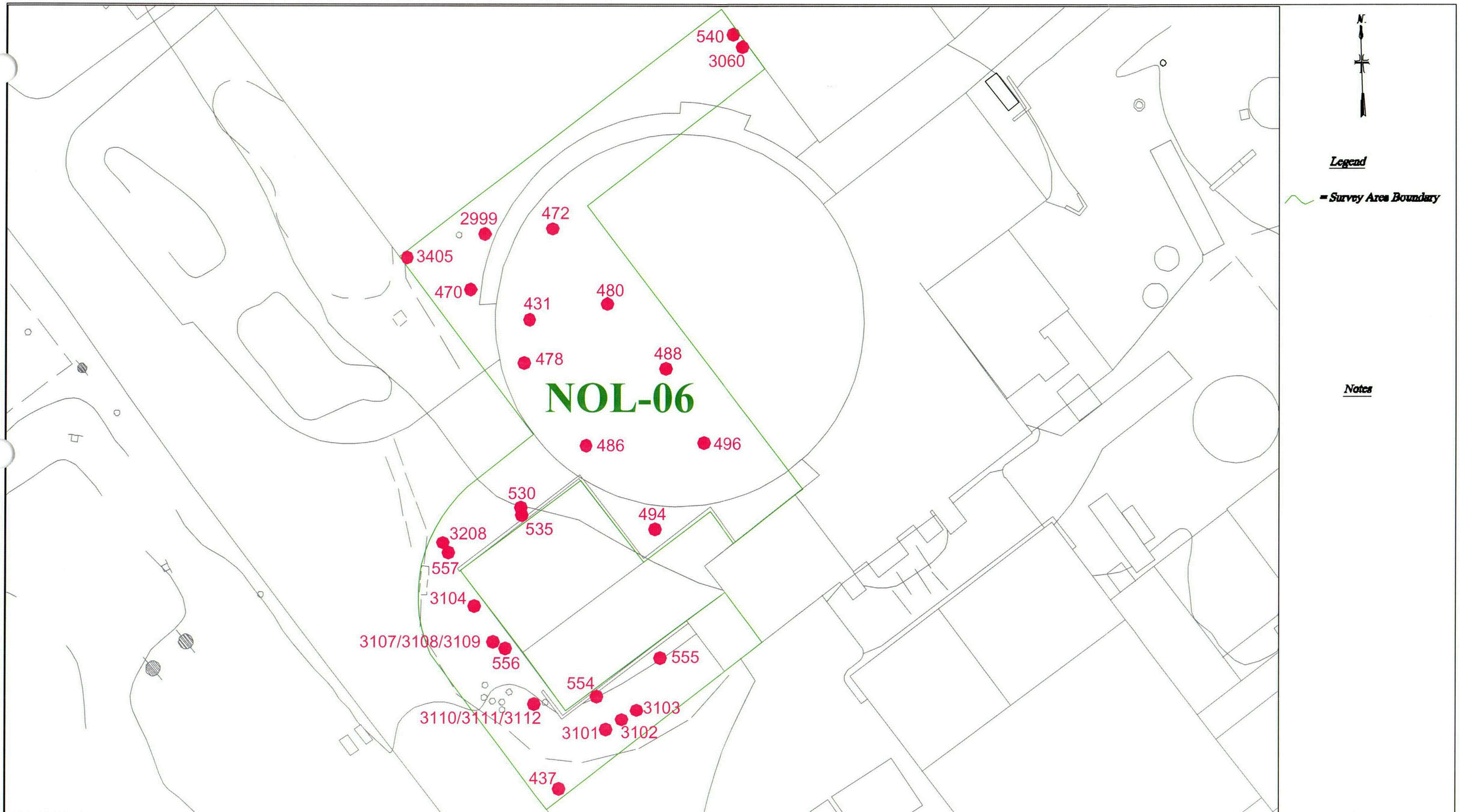
U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-06 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	WSD05 (3405)
Sample ID	WSD05
Date Sampled	9/28/1999
Ac-228	0.5246
Ag-108m	0.003805 U
Ag-110m	-0.01591 U
Am-241	0 U
Bi-212	0.4542
Bi-214	0.275
Ce-144	0.132 U
Co-58	0.002002 U
Co-60	0.01921 U
Cs-134	0.001616 U
Cs-137	0.02872 U
Eu-152	
Fe-59	0.02478 U
I-132	
K-40	11.61
La-140	
Mn-54	-0.01843 U
Nb-95	0.0243 U
Np-239	
Pb-212	0.4229
Pb-214	0.2906
Ra-226	
Ru-103	-0.01243 U
Ru-106	0.055 U
Sb-124	-0.00494 U
Sb-125	
Tl-208	0.4858
U-235	
Zn-65	-0.06304 U
Zr-95	0.02658 U
SOF	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed



	Yankee Atomic Power Company *Soil Sample Locations - NOL-06*	YANKEE	*Date: October 2003* *Revision: 4*	*Figure: 22*

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Historical Site Assessment and Classification Summary

Survey Area Name: ISFSI RCA Yard Designator: **NOL-07**

Survey Area Description

Survey area NOL-07 consists of land area that forms the RCA within the security fence of the ISFSI and contains about 1717 square meters of asphalt covered surface area.

Survey area NOL-07 is bounded by entirely by survey area OOL-10.

Items of note located within Surface items of note located within and to be evaluated as part of NOL-07 include:

- ISFSI Support building.

Other items located within NOL-01 that will be evaluated separately from survey area NOL-01 include:

- The ISFSI Pad (NSY-10).

Sub-surface systems that traverse or connect within NOL-07 include:

- The abandoned section of the Potable water system
- Electrical grounding cables.
- Electrical conduits

Survey Area History

The area around the ISFSI pad was posted and controlled as a RCA after the first loaded VCC was placed on the ISFSI (Ref 1).

A radiological assessment survey of the ISFSI is performed on a routine basis. There have been no documented occurrences of radiological contamination of the ISFSI or ISFSI RCA yard area. The primary radiological concern relative to the ISFSI RCA is direct radiation emitted from the loaded VCCs.

Translocation Pathways

Modes and vectors of contamination transmigration include:

- Contamination of survey area NOL-07 may result from contamination migration from the exterior of the MPCs located within the VCCs.
- Once contamination had been deposited on the surface of the NOL-07 personnel foot traffic might further spread the contamination.
- Snow removal is necessary within NOL-07 in order to facilitate access to the VCCs. Snow removal may move contamination present on the surface of NOL-07 to locations where snow accumulates.
- Surface water run-off resulting from rain and snowmelt may transport surface contamination into storm drains and/or into in low areas where it would collect. There are no storm drain system inputs located in NOL-07. Surface water tends not to collect in NOL-07. Due to the slope of NOL-07 surface water run-off occurs in the direction of OOL-10.
- There is potential for contamination to be introduced to NOL-07 from the YNPS RCA resulting from inadvertent release of material into NOL-07 or by personnel foot traffic.

Modifications to NOL-07 have not been performed and none are anticipated.

Scoping/Characterization

Scoping surveys were performed and the resulting data collected was used to develop the YNPS Decommissioning Plan (Ref 2). This information applies to the area prior to construction of the ISFSI.

Additional scoping survey data was collected in support of the construction activities performed in NOL-07 in support of decommissioning. The progress of these efforts are documented via RP Memo 96-76 Protocol for Sampling of Soil and Asphalt from Excavations and DP-8120 Collection of Site Characterization and FSS Samples. During these modifications some soils excavated contained radionuclide concentrations in excess of the current DCGL's for soil and are identified as remediated. Soil excavations with

radionuclide concentrations less than the current DCGL's for soil are identified as mitigation.

Decommissioning

No decommissioning activities have been performed for survey area NOL-07. Survey area NOL-07 has been affected by decommissioning activities performed on structures that formerly occupied the footprint of NOL-07.

Survey Area Name: ISFSI RCA Yard Designator: **NOL-07**

Findings

Survey area NOL-07 is a land area that is located within the current configuration of the ISFSI RCA.

Survey area NOL-07 is impacted as a result of its location to the ISFSI itself. To date no loose surface contamination has been identified consequently it is not expected that contamination will be present at levels greater a small fraction of the DCGL.

The radionuclide mix likely to be present in NOL-07 includes all radionuclides identified in the radioactive systems of the plant (Ref3). The primary radionuclides of concern for survey area NOL-07 are Co-60, Cs-137, Ag-108m, Sr-90, Ni-63 and tritium.

Current Status

NOL-07 remains as the ISFSI RCA and continues to be potentially impacted by personnel traffic, radioactive material transportation, and by decommissioning activities.

A soil sample location map (Figure 23) has been prepared to show the distribution of sampling locations in NOL-07. Only samples representative of soils still present are included on the map (samples of soils representative of soils removed during remediation activities are not presented). One survey media was assessed in NOL-07, Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for NOL-07 is presented at the end of Table 1 for each survey medium. The results are summarized below.

Soil: Mean SOF is 0.004.
Maximum SOF for a single soil sample is 0.015 (key# 3290) at the mid point north of the ISFSI pad.
Minimum SOF for a single soil sample is 0.006 (key# 131) at southwest corner of ISFSI pad.

Historical Site Assessment and Classification Summary

Survey Area Name: ISFSI RCA Yard Designator: **NOL-07**

Classification Statement

Based upon the historical use and radiological conditions associated with this survey area NOL-07 is identified as a Class 3 Area.

Historical Site Assessment and Classification Summary

Survey Area Name: ISFSI RCA Yard Designator: **NOL-07**

Drawings

ISFSI-FY-2
ISFSI-FY-5, Sh. 1
ISFSI-FY-5, Sh. 2

References

1.	Memorandum ESG 00-009, "Protocol for Release of Excavated Soil at YNPS," dated August 25, 2000.
2.	YNPS Decommissioning Plan, Rev. 0.0.
3.	"Radionuclides for Building Surfaces and Soil DCGL Determinations," YA-REPT-00-001-03

Table 1
Sum of Fractions
NOL-07 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
3290	TS583	TS583B		0.004
3290	TS583	TS583A		0.015
973	OG020-014	OG020GUFD014		0.005
144	OG007-015	OG007GAFD015		0.004
131	OG007-002	OG007GAFD002		0.003
			Min	0.003
			Max	0.015
			Mean	0.006

Table 2
Statistical Data Summary – NOL-07 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	14	14	0.704	0.134	0.432	0.903	0.726
Ag-108m	pCi/g	0	14	0.000				
Ag-110m	pCi/g	0	14	0.000				
Am-241	pCi/g	0	14	0.000				
Bi-212	pCi/g	10	11	0.734	0.165	0.444	0.925	0.765
Bi-214	pCi/g	14	14	0.427	0.086	0.220	0.551	0.440
Ce-144	pCi/g	0	14	0.000				
Co-57	pCi/g	0	1	0.000				
Co-58	pCi/g	0	16	0.000				
Co-60	pCi/g	0	16	0.000				
Cs-134	pCi/g	0	16	0.000				
Cs-137	pCi/g	4	16	0.079	0.071	0.042	0.185	0.044
Fe-59	pCi/g	0	14	0.000				
I-131	pCi/g	0	1	0.000				
K-40	pCi/g	14	14	16.837	2.919	10.540	20.610	17.220
Kr-85	pCi/g	0	3	0.000				
Mn-54	pCi/g	1	14	0.043		0.043	0.043	0.043
Nb-95	pCi/g	0	14	0.000				
Np-239	pCi/g	0	3	0.000				
Pb-212	pCi/g	14	14	0.723	0.136	0.448	0.905	0.761
Pb-214	pCi/g	14	14	0.441	0.076	0.254	0.570	0.450
Ra-226	pCi/g	7	9	1.461	0.340	1.098	2.090	1.389
Ru-103	pCi/g	0	14	0.000				
Ru-106	pCi/g	1	14	0.296		0.296	0.296	0.296
Sb-124	pCi/g	0	14	0.000				
Tl-208	pCi/g	12	12	0.673	0.122	0.502	0.867	0.661
Zn-65	pCi/g	0	14	0.000				
Zr-95	pCi/g	2	14	0.060	0.017	0.048	0.072	0.060

Table 3
Summary of Detected Results Above Criteria
NOL-07 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	14	14		pCi/g	0	0.90
Ag-108m	0	14	8.52	pCi/g	0	
Ag-110m	0	14		pCi/g	0	
Am-241	0	14	44.35	pCi/g	0	
Bi-212	10	11		pCi/g	0	0.93
Bi-214	14	14		pCi/g	0	0.55
Ce-144	0	14		pCi/g	0	
Co-57	0	1		pCi/g	0	
Co-58	0	16		pCi/g	0	
Co-60	0	16	4.84	pCi/g	0	
Cs-134	0	16	6.71	pCi/g	0	
Cs-137	4	16	12.24	pCi/g	0	0.18
Fe-59	0	14		pCi/g	0	
I-131	0	1		pCi/g	0	
K-40	14	14		pCi/g	0	20.61
Kr-85	0	3		pCi/g	0	
Mn-54	1	14	21.66	pCi/g	0	0.04
Nb-95	0	14		pCi/g	0	
Np-239	0	3		pCi/g	0	
Pb-212	14	14		pCi/g	0	0.91
Pb-214	14	14		pCi/g	0	0.57
Ra-226	7	9		pCi/g	0	2.09
Ru-103	0	14		pCi/g	0	
Ru-106	1	14	68.21	pCi/g	0	0.30
Sb-124	0	14		pCi/g	0	
Tl-208	12	12		pCi/g	0	0.87
Zn-65	0	14		pCi/g	0	
Zr-95	2	14		pCi/g	0	0.07

Table 4
Rad
NOL-07 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IA-28 (632)	IA-29 (633)	OG007-001 (130)	OG007-002 (131)	OG007-015 (144)
Sample ID	IATS-28	IATS-29	OG007GAFD001	OG007GAFD002	OG007GAFD015
Date Sampled	5/17/1993	5/6/1993	9/14/1998	9/14/1998	9/15/1998
Ac-228			0.7985	0.7377	0.7134
Ag-108m			-0.006273 U	0.01304 U	-0.0255 U
Ag-110m			0.03198 U	0.005171 U	-0.01718 U
Am-241			0 U	0 U	0 U
Bi-212				0.8467	0.5967
Bi-214			0.4757	0.4556	0.3915
Ce-144			0.1166 U	0.04395 U	0.01217 U
Co-57					
Co-58	0.101 UM	0.058 UM	-0.01277 U	-0.02296 U	0.0002826 U
Co-60	0.124 UM	0.0918 UM	0.01457 U	0.01621 U	0.01796 U
Cs-134	0.088 UM	0.054 UM	0.01904 U	-0.06162 U	-0.0252 U
Cs-137	0.151 UM	0.0771 UM	-0.01315 U	0.04234	0.04444
Fe-59			-0.01877 U	-0.03064 U	0.04607 U
I-131					
K-40			20.61	16.96	19.62
Kr-85					
Mn-54			0.004529 U	-0.03349 U	0.0008123 U
Nb-95			-0.01399 U	-0.01818 U	0.00155 U
Np-239			6.868 U	-22.1 U	
Pb-212			0.8809	0.7663	0.705
Pb-214			0.5701	0.4613	0.451
Ra-226				2.09	1.249
Ru-103			0.0008963 U	-0.005268 U	-0.02894 U
Ru-106			-0.05807 U	0.1894 U	0.04197 U
Sb-124			-0.01657 U	-0.007533 U	0.00976 U
Tl-208			0.8667	0.8239	
Zn-65			-0.05149 U	-0.0002897 U	-0.0464 U
Zr-95			0.04779	-0.03073 U	0.03499 U
SOF				0.003	0.004

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-07 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	OG007-016 (145)	OG020-011 (971)	OG020-013 (972)	OG020-014 (973)	TS583 (3290)
Sample ID	OG007GAFD016	OG020GUFD011	OG020GUFD013	OG020GUFD014	TS583A
Date Sampled	9/15/1998	9/21/1998	9/21/1998	9/22/1998	10/12/1998
Ac-228	0.7101	0.903	0.852	0.794	0.6796
Ag-108m	0.02013 U	0.00564 U	-0.00543 U	-0.0265 U	-0.01015 U
Ag-110m	0.002389 U	-0.04 U	-0.00739 U	-0.0174 U	-0.01368 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212	0.8685	0.905	0.925	0.571	
Bi-214	0.4943	0.551	0.516	0.508	0.3913
Ce-144	-0.222 U	0.0383 U	0.0558 U	0.0464 U	0.1545 U
Co-57					
Co-58	0.009181 U	-0.0143 U	-0.019 U	-0.00262 U	0.005443 U
Co-60	-0.02061 U	-0.0136 U	0.0223 U	0.0196 U	0.01967 U
Cs-134	0.04148 U	-0.0122 U	0.00173 U	-0.059 U	-0.004424 U
Cs-137	0.0003577 U	0.0164 U	0.0309 U	0.0427	0.1846
Fe-59	0.03891 U	-0.0422 U	0.0113 U	-0.0287 U	0.03538 U
I-131				0.71 U	
K-40	19.65	17.4	18.6	18.5	17.04
Kr-85					5.328 U
Mn-54	0.02471 U	-0.00814 U	0.0248 U	0.0433	0.01656 U
Nb-95	-0.01657 U	-0.00108 U	0.0422 U	0.0252 U	-0.02579 U
Np-239					
Pb-212	0.7811	0.905	0.775	0.867	0.6354
Pb-214	0.449	0.498	0.516	0.452	0.4158
Ra-226	1.194		0.982 U	1.56	0.7858 U
Ru-103	-0.01022 U	-0.00856 U	-0.00639 U	-0.0102 U	-0.01537 U
Ru-106	-0.1404 U	-0.0528 U	-0.111 U	-0.0774 U	0.1327 U
Sb-124	0 U	0.0159 U	-0.0412 U	0 U	-0.004832 U
Tl-208	0.5753	0.843	0.534	0.698	0.6316
Zn-65	-0.06945 U	0.0331 U	-0.128 U	-0.0529 U	-0.1042 U
Zr-95	0.01749 U	-0.00443 U	0.00828 U	0.0719	-0.03669 U
SOF				0.005	0.015

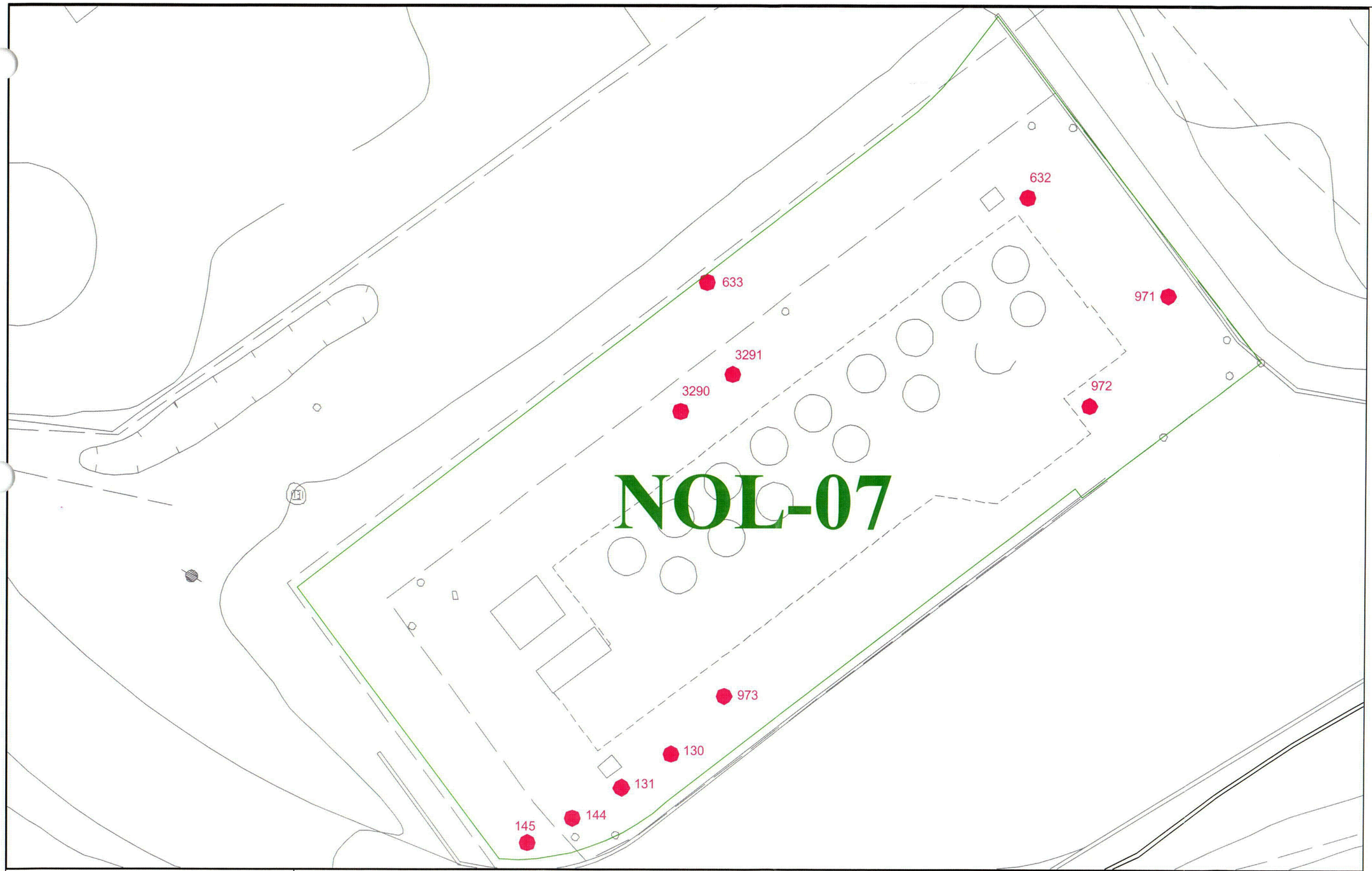
U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NOL-07 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS583 (3290)	TS583 (3290)	TS584 (3291)	TS584 (3291)	TS584 (3291)	TS585 (3292)
Sample ID	TS583B	TS583C	TS584A	TS584B	TS584C	TS585B
Date Sampled	10/12/1998	10/12/1998	10/12/1998	10/12/1998	10/12/1998	10/12/1998
Ac-228	0.7835	0.4682	0.7411	0.6545	0.432	0.5863
Ag-108m	-0.03605 U	-0.001355 U	0.01048 U	-0.0251 U	0.003925 U	0.01594 U
Ag-110m	0.01265 U	0.01024 U	-0.02066 U	-0.0007032 U	-0.02094 U	-0.02673 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Bi-212	0.8313	0.4442	0.4308 U	0.6979		0.6506
Bi-214	0.4378	0.3856	0.3521	0.4412	0.2196	0.3592
Ce-144	-0.1675 U	-0.05298 U	-0.1155 U	0.001059 U	-0.09523 U	-0.1569 U
Co-57						0.01991 U
Co-58	-0.002753 U	0.0117 U	-0.02856 U	0.00491 U	0.01012 U	-0.004785 U
Co-60	0.03187 U	0.002419 U	-0.02151 U	0.01672 U	0.00508 U	-0.004075 U
Cs-134	-0.00448 U	-0.002138 U	0.009675 U	0.0141 U	-0.002857 U	0.01604 U
Cs-137	0 U	0.01836 U	0.04137 U	-0.03174 U	0.01402 U	0.01406 U
Fe-59	0.01222 U	-0.0936 U	0.01853 U	-0.05081 U	-0.02341 U	-0.04374 U
I-131						
K-40	13.97	10.54	14.91	18.53	12.35	17.04
Kr-85			1.52 U		-1.455 U	
Mn-54	0.002459 U	-0.006982 U	0.001508 U	-0.01583 U	0.01603 U	-0.009858 U
Nb-95	-0.004998 U	-0.003781 U	-0.004554 U	0.03726 U	0.006049 U	0.02313 U
Np-239		-0.3007 U				
Pb-212	0.6875	0.4664	0.7567	0.7643	0.4484	0.6812
Pb-214	0.4956	0.3859	0.3615	0.4458	0.2543	0.4119
Ra-226	1.648	1.098		1.389		
Ru-103	-0.001701 U	-0.001833 U	-0.00023 U	0.0003272 U	-0.006518 U	-0.01435 U
Ru-106	0.2963	-0.08702 U	0.09844 U	-0.07175 U	-0.2267 U	-0.0002742 U
Sb-124	0.01791 U	-0.008177 U	0.02112 U	0.001281 U	-0.01091 U	-0.007494 U
Tl-208	0.7139		0.6527	0.5607	0.502	0.6688
Zn-65	0.07379 U	-0.1179 U	0.1194 U	-0.1167 U	0.04654 U	0.02059 U
Zr-95	0.01379 U	0.02695 U	0.008629 U	0.01774 U	0.04491 U	0.001304 U
SOF	0.004					

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed



N.

Legend

= Survey Area Boundary

Notes

Yankee Atomic Power Company Soil Sample Locations - NOL-07	YANKEE	Date: October 2003 Revision: 4	Figure: 23

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Building Historical Site Assessment and Classification Summary

Survey Area Name: Primary Auxiliary Building #1 Designator: **AUX-01**

Information current as of July 31, 2003

Survey Area Description

The Primary Auxiliary Building (PAB) has been divided into two survey areas: AUX-01 and AUX-02. These survey areas are delineated based upon their construction, systems present and operating history. Further division of these survey areas into survey units is dependent upon the decommissioning end state configuration of the PAB structure.

Survey Area AUX-01 consists of the reinforced concrete floor, foundations and sub-grade structures of the PAB expected to remain after demolition of the above-grade structure is complete. Due to the change in grade elevation between the north and south sides of the PAB, the north wall will be removed to 1022'and the south wall to be removed to 1035'. Portions of the east and west end walls may remain to provide support for the south wall.

The AUX-01 footprint includes the floor areas of varying elevations. (See referenced drawings) The majority of the floor area of AUX-01 consists of the cubicle corridor at elevation 1021'and cubicles that are at elevation 1022' 8" (Charging Pump cubicle, Purification pump cubicle, Low Pressure Surge Tank Cooling Pump cubicle and Shutdown Cooling Pump cubicle). The vertical pipe chase floor elevation is 1010'. The floor elevation of the waste tank cubicles is 1004'. The depth of some of the cubicles will create four-walled sub-grade survey units. The total surface area in square meters for AUX-01 cannot be determined until demolition activities are complete. Survey Area AUX-01 will be divided into survey units as necessary to meet the maximum survey unit size limitation of 100 m^2.

The spaces identified as AUX-01 were specifically designed and constructed to contain and channel radioactive liquid leakage to the liquid waste collection tanks. All system components were placed within cubicles and all piping was contained within cubicles or pipe chases. The cubicle and pipe chase floor drains were routed to a common drain system. The drain system terminated at the liquid waste collection tank. Piping runs that connected to other structures ran through sleeves that prevented system leakage from escaping into the environment. This configuration limited the spread of contamination to within the structure.

The main coolant (primary coolant) systems formerly present in AUX-01 included Charging and Volume Control, Purification System (reactor water clean-up), Low Pressure Surge Tank (LPST), LPST Cooling, Shutdown Cooling, Primary Chemistry Sampling System and Waste Liquid Collection System and tanks.

All spaces within AUX-01 were also connected to the PAB ventilation system that discharged to the Primary Vent Stack (PVS). The negative atmospheric pressure maintained within AUX-01 channeled the release of any airborne radioactivity through a charcoal filtration system and a bank of "high efficiency particulate air" (HEPA) filters.

The air was then discharged into the PVS. The PVS is the principle monitored release pathway.

The soils present under and adjacent to the PAB structure include back fill, overburden and lodgment till. The lodgment till is relatively impermeable to groundwater flow. The overburden is more permeable. The backfill is the most permeable media. Consequently, areas containing backfill are the most likely pathways for subsurface migration of radioactivity by surface water infiltration or groundwater movement. Backfill is present at the perimeter of the sub-grade structures including the deepest of the cubicles, and at the locations where systems connect to or run under the PAB. There is a hydraulic gradient across the PAB structure resulting in groundwater movement generally from south to north under the slab. This is the result of a perforated drainpipe installed at elevation 1022' along the south foundation wall of the PAB (effective groundwater table on the south side) and the average groundwater table on the north side of the PAB between 2' and 5' below the 1022' grade level.

Survey Area History

The section of the Primary Auxiliary Building (PAB) identified as AUX-01 was designed to contain radioactive operating systems and the minor leakage of radioactivity expected to be associated with such systems. The structure was subject to contaminating events involving leakage of radioactive liquids from pump seals, pipe failure and the general spread of contamination by operations and maintenance activities commencing shortly after initial plant operations (Ref. 1) and continuing through decommissioning.

The AUX-01 portion of the PAB was controlled as a "Potentially Contaminated Area" (PCA) under the Radiation Protection Program. (Ref. 2) Contamination controls for AUX-01 consisted of placement of Step-Off-Pads (SOPs) at the entrances to the areas and/or portions of areas that were identified as contaminated. In the late 1980s an effort was made to reduce the contaminated surface area AUX-01. Consequently, normally accessible portions of the PAB were decontaminated and stricter regimens of access and contamination controls were implemented to maintain these areas at a low surface activity status (<1000dpm/100cm^2).

Although generation or build-up of airborne radioactivity was infrequent within AUX-01, the structure was designed to manage and control this source of activity.

Due to the hydraulic gradient across the PAB structure, the core borehole in the floor of the PAB cubicle corridor trench (CB-11A) at elevation 1021' allowed groundwater to enter into the structure in an artesian manner. As it was desirable to maintain this borehole as a groundwater monitoring station, the borehole was not plugged. Instead a standpipe was added above floor grade to mitigate water intrusion by this pathway. Only the cubicle corridor trench appears to be affected by this groundwater influx. The lower elevation cubicles are currently dry.

Translocation Pathways

The exterior surfaces in some locations of the AUX-01 structure were impacted below grade by radioactivity originating from documented events external to the AUX-01 structure (See Appendix A2). Low-level radioactivity may have been distributed from the surface of the RCA yard area (Ref. 3) down along the outer walls by surface water (rain) infiltration. This migration occurs when particulate or liquid radioactivity moves down the gap between vertical concrete surfaces and surrounding soils or is moved horizontally through permeable soil (primarily backfill) by surface water infiltration and channeling. Remediation of sub-surface soils has been conducted in areas in the vicinity of AUX-01 both upstream (south) and downstream (north) of the hydraulic gradient.

Survey Area Name: Primary Auxiliary Building #1 Designator: **AUX-01**

Potential Contaminants

Contaminants present in AUX-01 include all potential contaminants in the radionuclide mix identified in Radionuclides for Building Surfaces and Soil DCGL Determinations, YA-REPT-00-001-03 (Ref. 4).

Scoping/Characterization Surveys (Historical)

Surveys and assessments performed in AUX-01 consisted of concrete core samples, sub-floor soil samples, loose-surface contamination swipes and general exposure rates. The concrete cores were segmented and evaluated to determine the depth of penetration of surface radioactivity into the concrete. The results of the concrete core sample analysis of three 6mm thick concrete wafers collected from the first 18mm of the core bore sample indicate Co-60 and Cs-137 present to a depth of 6mm and Cs-137 present to a depth of 15mm with no detectable penetration beyond 18mm. These results were used to establish guidelines for the depth of surface decontamination (scabbling) performed within the AUX-01 portion of the PAB structure.

The results of the radiological assessments performed are reported in YNPS Decommissioning Plan section 3.1.7 Site Characterization Surveys (Ref. 5) and Memorandum, RP-98-06 Radiological Analysis of Subsurface and Sub-floor Soils at YNPS (Ref. 6).

Decommissioning Activities

Decommissioning Work Plans (DWP) activities performed in the AUX-01 survey area included the following:

- CCWS-01 Component Cooling, Fuel Pit Cooling and Service Water (Primary Plant Systems) (Ref. 7)
- CH-01 Charging and Volume Control System (Ref. 8)
- CH-02 Low Pressure Surge Tank, Cooler and Pump System (Ref. 9)
- PABA-01 PAB Tank Removal (Ref.10)
- PABA-02 Removal of PAB MCC4 (Ref.11)
- PABA-03 PAB Upper/Lower Level West Section (Ref.12)
- PABA-05 PAB Concrete/Steel Decontamination and Removal (Ref.13)
- PABA-06 PAB/UPC SEP Mods Removal (Ref.14)
- SA-01 Primary Plant Sample System (Ref.15)
- PSW-01 Purification and Seal Water System Removal (Ref.16)

The decommissioning activities performed have removed all radiologically contaminated piping, pumps, tanks, and other system components from AUX-01. In addition concrete surfaces have been de-contaminated via surface removal techniques.

Survey Area Name: Primary Auxiliary Building #1 Designator: **AUX-01**

Portions of the cubicle corridor and cubicles as well as the chemistry sample cubicle were surveyed for the purpose of turnover in preparation for Final Status Surveys under the previously withdrawn LTP. (Ref.17)

Additional decommissioning activities to be performed will, at a minimum, remove the above grade portions the structure. Continuing scoping surveys will be performed in support of further investigations of subsurface radioactivity if required. The extent of contamination of the exterior surface of the PAB structure below grade and sub-foundation soil will require further investigation.

Findings

The history of AUX-01 would suggest that this structure is radiologically impacted at levels greater than DCGL as a result of plant operations.

The radionuclide mix in AUX-01 includes all radionuclides identified in the radioactive systems of the plant. The primary radionuclides of concern for AUX-01 are Co-60, Cs-137, Ag-108m, Sr-90, and H-3.

Contaminated Media and Remediations

These radionuclides were distributed in media including reinforced concrete, paint and soil. Sub-floor samples obtained beneath AUX-01 in 1997 and 1998 resulted in remediation being performed in two areas and mitigation being performed in one additional area beneath the concrete slab. The results of initial sampling leading to these remediation/mitigation activities, the results of samples marking progress and the results of samples representing the "as left" condition of the excavations is documented on the "remediated areas" sheet attached to this report.

Current Status

Survey Area AUX-01 is in an advanced stage of decommissioning with all systems removed and surface decontamination performed. All areas below the concrete slab known to be contaminated above levels equivalent to the soil DCGLs were remediated to non-detectable levels.

A soil sample location map (Figure 24) has been prepared to show the distribution of sampling locations below AUX-01. Only samples representative of soils still present are included on the map (samples of soils representative of soils removed during remediation activities are not presented). The results and analyses of the samples plotted as "key numbers" on the map (Tables 1-4 in this section) represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL. Only those samples with detectable results of the radionuclides of concern appear in Table 1. An assessment of the maximum, minimum and mean sum of fractions (SOF) for AUX-01 is presented at the end of Table 1. The mean SOF for the AUX-01 Survey Area is 0.085.

AUX-01 Dose Rate and Contamination Summary

Surveys of the lower walls, floors and foundation of AUX-01 indicate numerous instances (18) of elevated (alarm) surface scan measurements (ranging from 1053 cpm to 2790 cpm above the background level). (Ref. 17)

Survey Area Name: Primary Auxiliary Building #1 Designator: **AUX-01**

Information current as of July 31, 2003

Classification Statement

Based upon the radiological conditions identified in the operating history and as a result of the decommissioning activities performed to date, survey area AUX-01 is identified as a Class 1 Survey Area.

Non-Radiological Concerns

PCB Paint application.

Residual chromate from component cooling.

Building Historical Site Assessment and Classification Summary

Survey Area Name: Primary Auxiliary Building #1 Designator: **AUX-01**

Drawings

9699-FA-16 A
9699-FA-16 B
9699-FC-40 D
9699-FC-40 F
9699-FC-40 G
9699-FC-40 J
9699-FC-40 K
9699-FC-40 P
9699-FC-40 Q
9699-FC-40 R
9699-RC-40 A
YR-E-10-016

References

1.	OPs Report #13 for the Month of January 1961, dated February 19, 1962.
2.	Radiation Protection Memorandum RP-98-23, "Overview of the YNPS Historical Material Release Evaluation" March 5, 1998.
3.	Plant Information Report (PIR) 75-07, "Yard Area Contamination," dated August 12, 1975.
4.	"Radionuclides for Building Surfaces and Soil DCGL Determinations," YA-REPT- 00-001-03.
5.	Yankee Nuclear Power Station, Decommissioning Plan, Rev. 0.0, Section 3.
6.	Radiation Protection Memorandum RP-98-06, "Radiological Analysis of Subsurface and Sub-floor Soils at YNPS," dated January 22, 1998.
7.	Decommissioning Work Package (DWP) CCWS-01, "Component Cooling, Fuel Pit Cooling and Service Water (Primary Plant) Systems," dated September 5, 1995.
8.	DWP CH-01, "Charging and Volume Control System," dated June 22, 1994.
9.	DWP CH-02, "Low Pressure Surge Tank (LPST) and Shutdown Cooler (SC) Pumps, and Piping System Removal," dated December 1, 1994.
10.	DWP PABA-01, "Primary Auxiliary Building Tank Removal," dated December 18, 1995.
11.	Memorandum YPR 145/96, "Recommendation to Proceed with Removal of Electrical Components in the PAB, DWP PABA-02," dated March 19, 1996.
12.	DWP PABA-03, "Primary Auxiliary Building – Mechanical/Electrical Component Removals."
13.	DWP PABA-05, "PAB Concrete/Steel Decontamination and Removal," dated May 29, 1997.
14.	DWP PABA-06,"PAB North Wall Structural Steel Frame and Conduit Removal/ PAB West Wall Structural Steel Removal."
15.	DWP SA-01, "Primary Plant Sample System."
16.	DWP PSW-01, "Purification and Seal Water System Removal"
17.	Turnover Survey data and Maps (see attachments to this section)

AUX-01

Remediated Areas								
Location	Sample #	Date	GLV SOF	Disposition	Nuclide	Conc. (pCi/gm)	Fraction of DCGL	DCGL SOF
Cubicle Corridor LPST pump area - 12"-24"	CC001.8B	7-Jan-98	2.470		Co-60	5.223E+00	1.080	1.267
					Cs-137	2.289E+00	0.187	
LPST pump area - N floor 30" - 36"	TS-563A	17-Sep-98	0.939	RD	Co-60	1.968E+00	0.407	0.482
					Cs-137	9.240E-01	0.075	
LPST pump area - S floor 30" - 36"	TS-563B	17-Sep-98	1.284		Co-60	2.901E+00	0.600	0.648
					Cs-137	5.899E-01	0.048	
LPST pump area - N wall 0" - 30"	TS-564A	17-Sep-98	ND	RD				
LPST pump area - botttom of N wall composite 52" - 58"	TS-568	28-Sep-98	0.050	ALAR	Co-60	1.248E-01	0.026	0.026
LPST pump area - botttom of S wall composite 52" - 58"	TS-569	28-Sep-98	0.071		Co-60	1.707E-01	0.035	0.035
LPST pump area - N wall composite	TS-570	28-Sep-98	ND	ALAR				
LPST pump area - S wall composite	TS-571	28-Sep-98	0.060		Co-60	1.441E-01	0.030	0.030
Vertical Pipe Chase floor drain 0" - 6" S	CC001.14A	3-Jun-98	3.024		Co-60	6.218E+00	1.285	1.561
					Cs-137	3.381E+00	0.276	
Vert. Pipe Chase floor drain excavation S comp 12" - 18"	TS-566	24-Sep-98	ND	AL				
Vert. Pipe Chase floor drain excavation N comp 12" - 18"	TS-565	27-Sep-98	ND	AL				
Vert. Pipe Chase floor drain excavation comp 12" - 18"	TS-567	28-Sep-98	ND	ALAR				
LPST pump drain floor comp 33" - 39"	TS-579	7-Oct-98	0.060	AL	Co-60	1.111E-01	0.023	0.032
					Cs-137	1.053E-01	0.009	
LPST pump drain floor comp 33" - 39"	TS-580	7-Oct-98	0.090	AL	Co-60	1.809E-01	0.037	0.046
					Cs-137	1.035E-01	0.008	
LPST pump drain walls comp 0" - 6"	TS-581	7-Oct-98	ND	AL				
LPST pump drain walls comp 0" - 6"	TS-582	7-Oct-98	ND	AL				

UNK - unknown
AB - as area backfill
ABC - ABC storage area
AL - as left
ALAR - as left after remediation
FR - further remediation
RD - rad disposal
TS - temporary storage tank

DCGL (pCi/gm)		
Nuclide	25 mrem/yr	10 mrem/yr
Ag-108m	8.521E+00	3.408E+00
Co-60	4.838E+00	1.935E+00
Cs-134	6.706E+00	2.682E+00
Cs-137	1.224E+01	4.896E+00

AUX-01 Dose Rate & Contamination Summary

Turnover surveys (April/May 99) of the lower walls, floor and foundation of AUX-01 indicate numerous instances (18) of elevated dose rate readings, ranging from 1053 cpm to 2790 cpm. No further work has yet been done in this area.

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 5-10-99 TIME 0700

SURVEYOR Payelin Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP100/51592	9-3-99
E600/5144	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

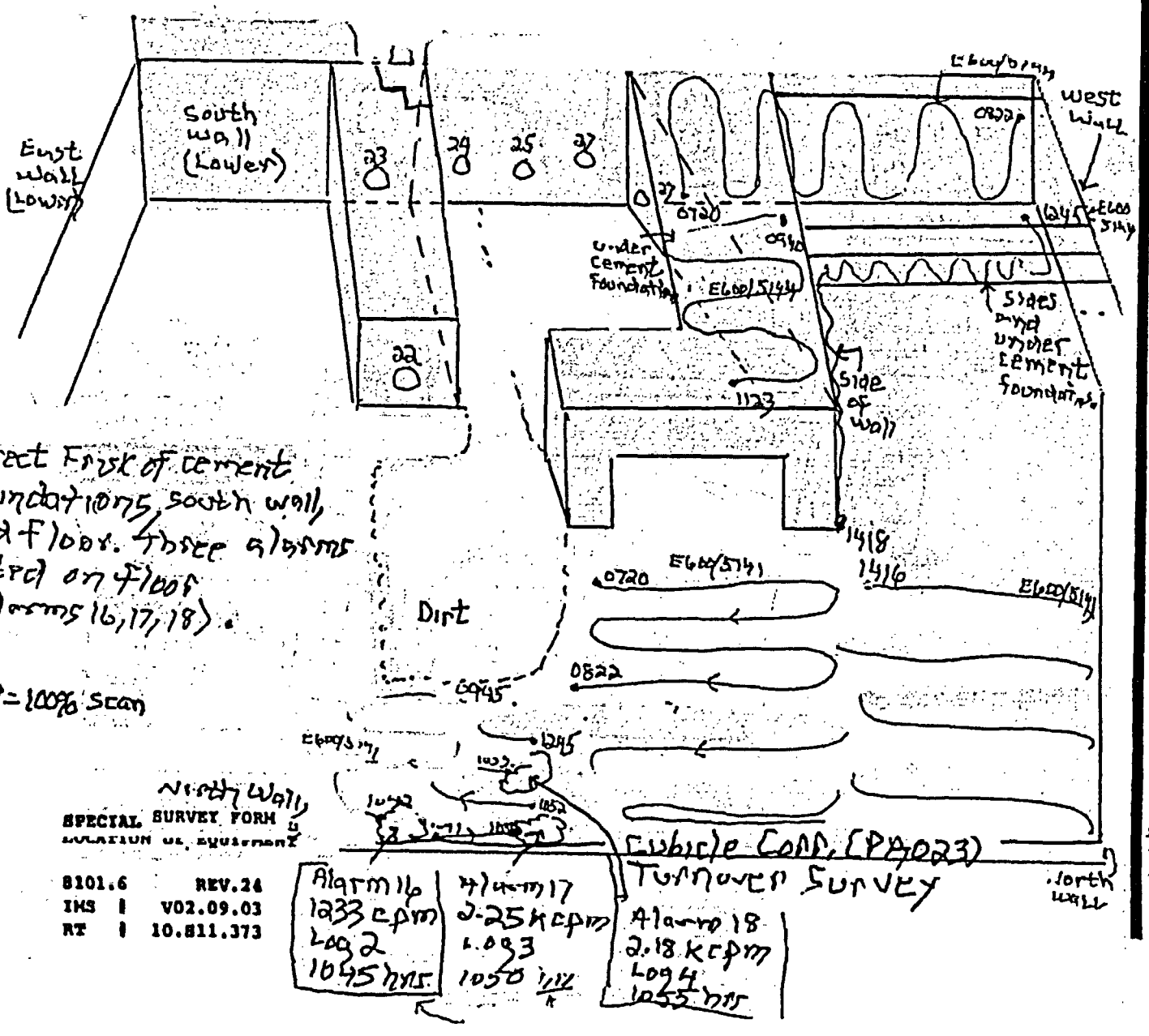
( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)



Direct Frisk of cement foundations, south wall, and floor. Three alarms noted on floor Alarms (16, 17, 18).

U = 100% scan

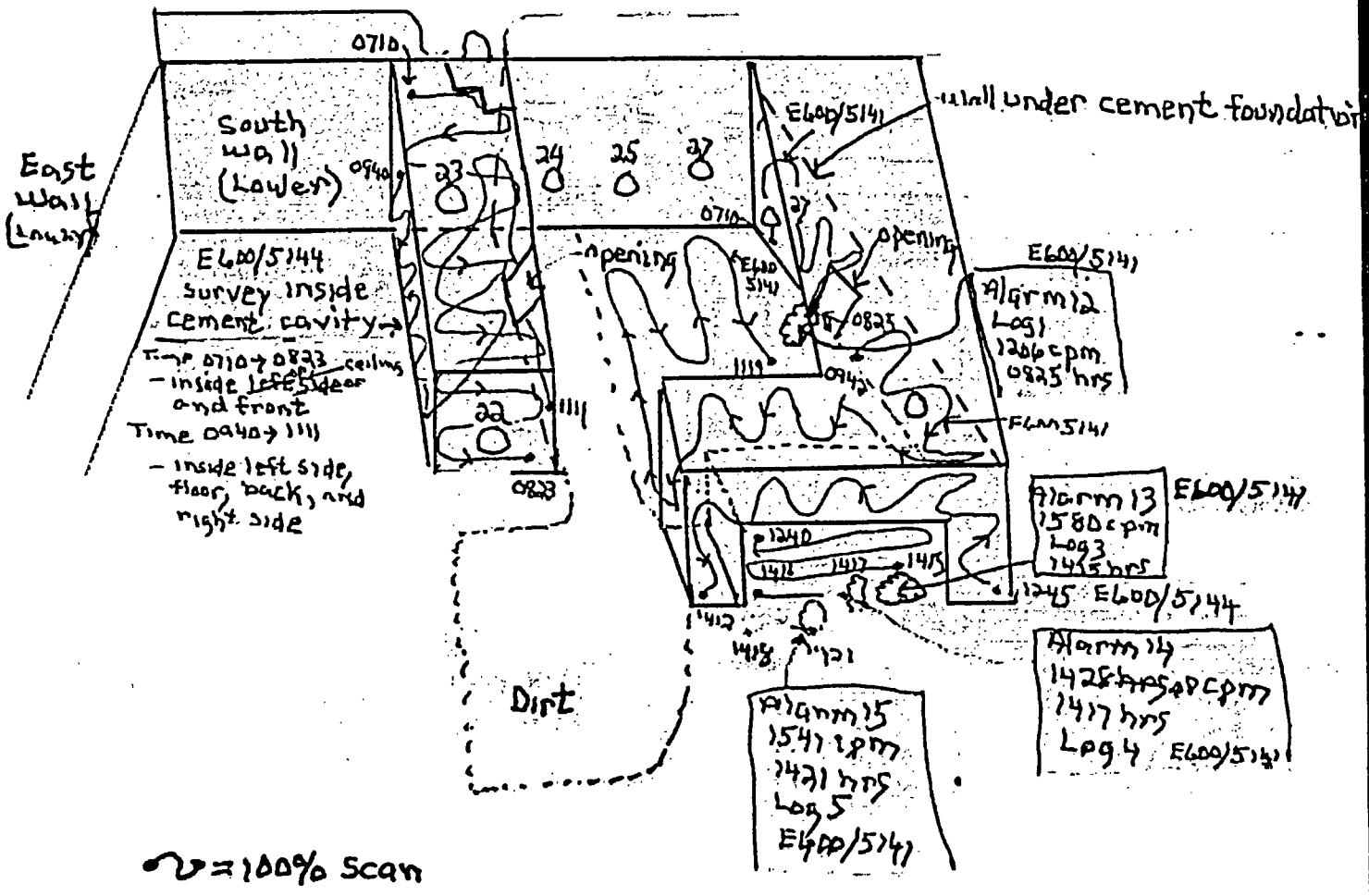
SPECIAL SURVEY FORM

LOCATION OF EQUIPMENT

8101.6 REV.24
IMS # V02.09.03
RT # 10.811.373

RADIATION PROTECTION SURVEY F

COPY



= 100% Scan

DATE 5-6-99 : 0700

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5144	8-17-99
HP100/506603	5-23-99
E600/5141	7-12-99

KEY

RADIATION GENERAL AREA

RADIATION CONTACT

SMEAR LOCATION

BARRIER HASELINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/571853 (9-3-99)

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT Cubicle Corr. (PA023) - Turnover Survey

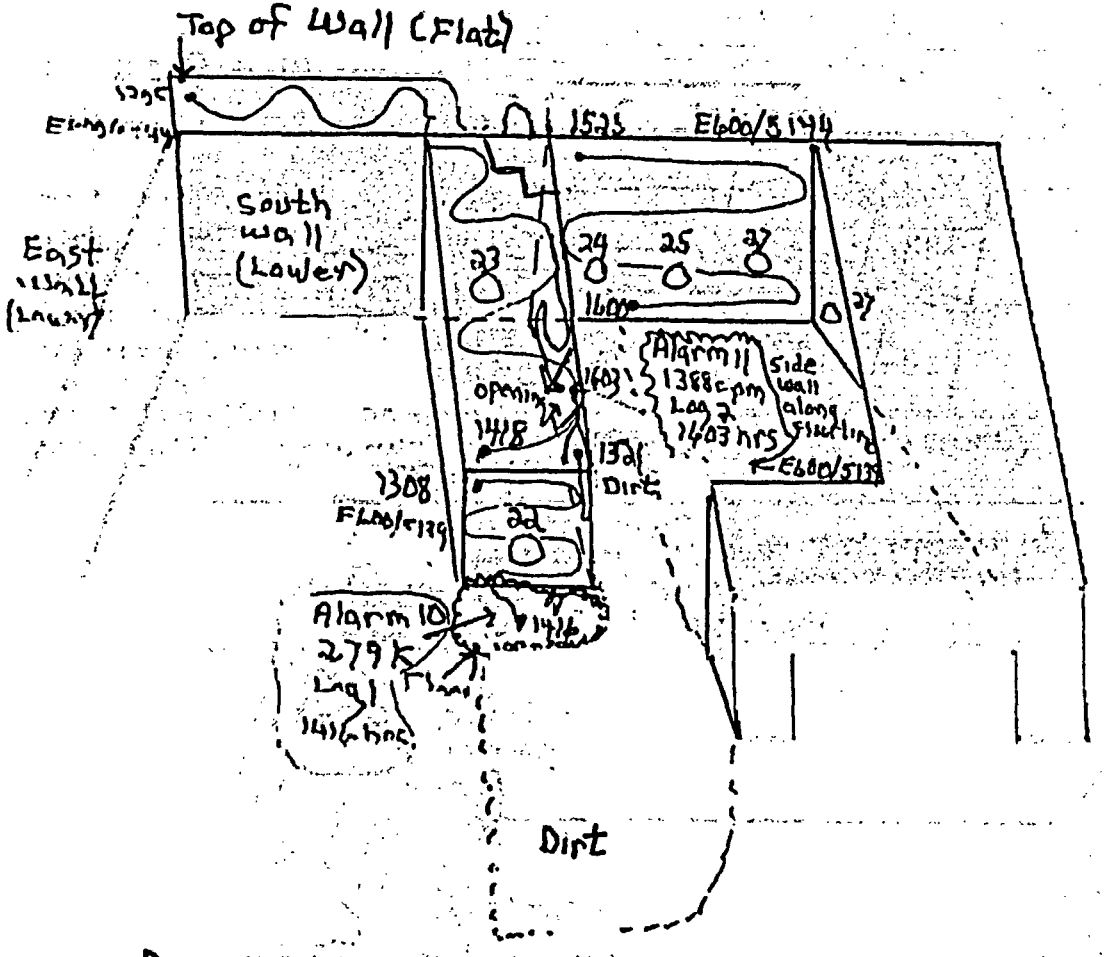
8101.6 REV.24
IMS | V02.09.03
RT | 10,811.373

Direct Frisk of cement foundations from south wall, and floor. Four alarms noted (Alarms 12,13,14,15) during survey. This is the 12th → 15th alarm within area.

COPY

...ELECTRONIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM



Direct Frisk of cement foundations and floor. Two alarms noted (Alarms 10, 11). This is the 10th and 11th alarm within this survey area

∴ = 100% Scan

SPECIAL SURVEY FORM
LOCATION OF EQUIPMENT Cubicle Corr. (PA023) - Turnover Survey

S101.6 REV.24
INS | V02.09.03
RT | 10.811.373

DATE 5-5-99 1300

SURVEYOR Payeup Thungtan

INSTRUMENT/#	CAL DUE
E600/5144	8-17-99
HP100/50603	5-23-99
E600/5139	10-26-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk
( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

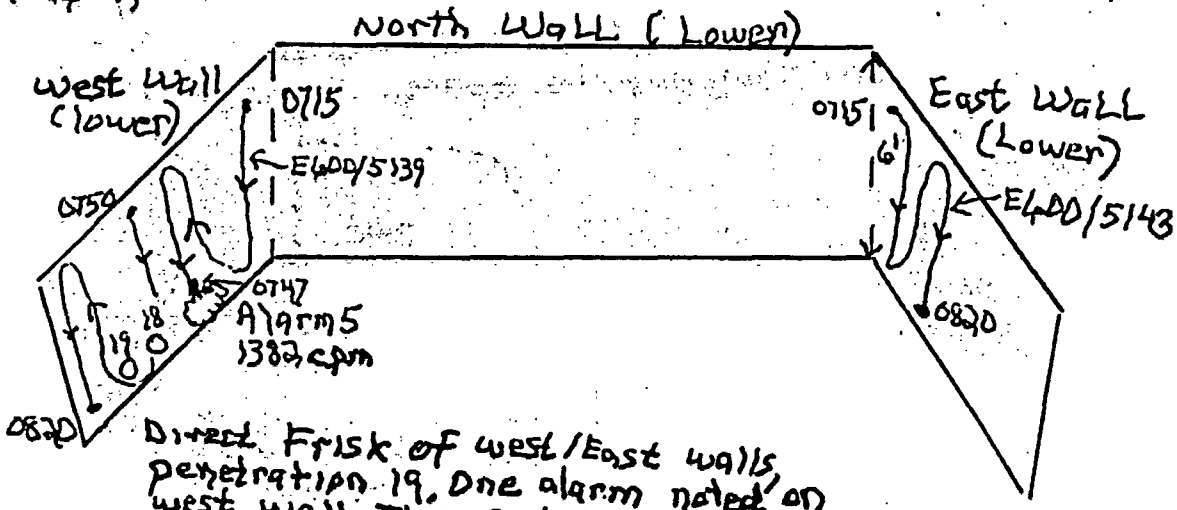
HP100/51853 (9-3-99)

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

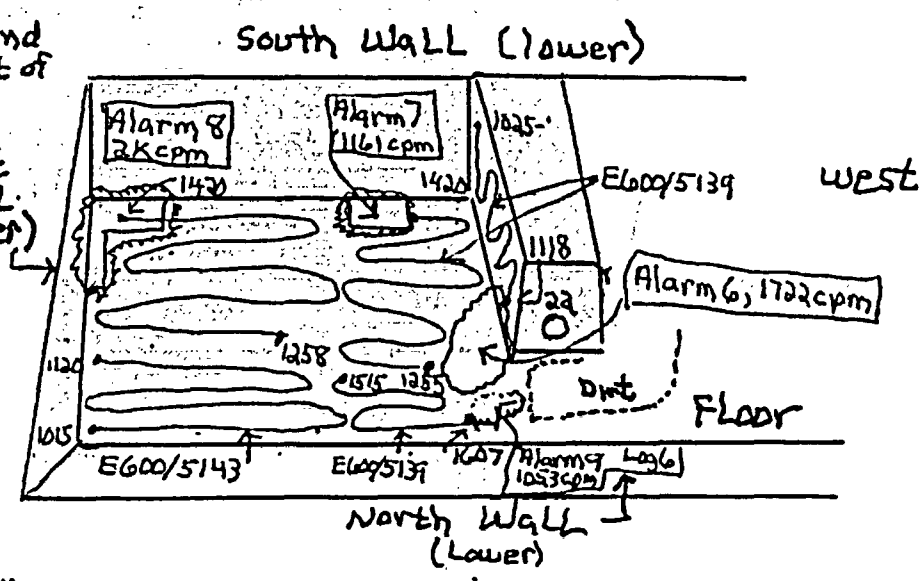
Resurveyed this area as meter failed source check on 4-26-99



Direct Frisk of west/East walls penetration 19. One alarm noted on west wall. This is the 5th alarm in this survey area.

Direct Frisk of floor and cement foundation out of south wall. Three alarms noted on floor-one alarm noted on foundation from south wall.

U = 100% Scan



SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PA023) - Turnover Survey

S101.6 REV.24
IMS 4 V02.09.03
RT 10.811.373

DATE 5-3-99 TIME 0700

SURVEYOR Dayeun, Thurston

INSTRUMENT/#	CAL DUE
E600/5139	10-26-99
HP100/50603	5-23-99
E600/5143	7-12-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

YANKEE ATOMIC ELECTRIC CO... ANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-26-99 TIME 0701

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP360/5N6022	8-18-99
E600/5069	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SHEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

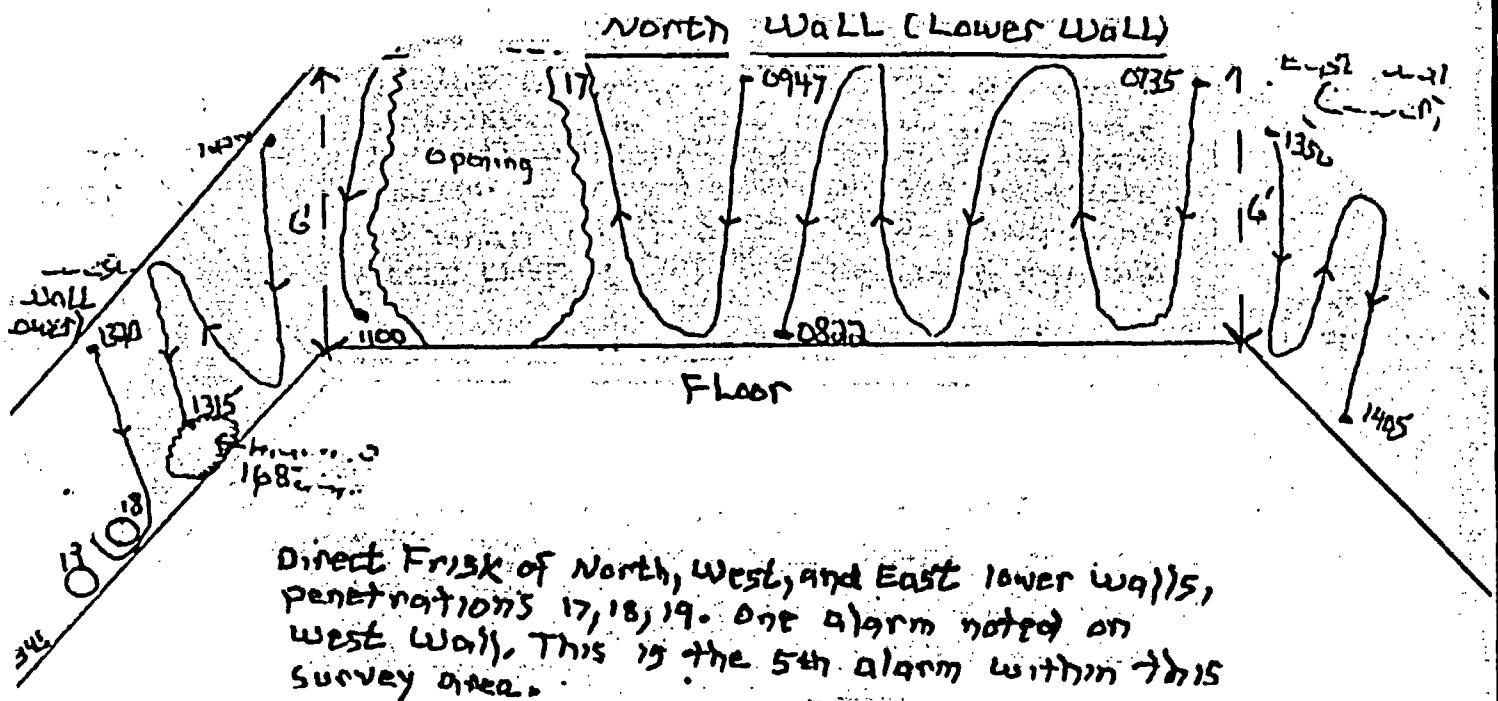
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: HP/DLY 5149 (5-10-99)



Direct Frisk of North, West, and East lower walls, penetrations 17, 18, 19. One alarm noted on West Wall. This is the 5th alarm within this survey area.

~ = 100% Scan

E600 5069 used on walls and penetrations 17, 19.
E600 5141 used on penetration 18.

SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PAD23) - Turnover Survey

S101.6 REV.24
IMS # V02.09.03
RT # 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

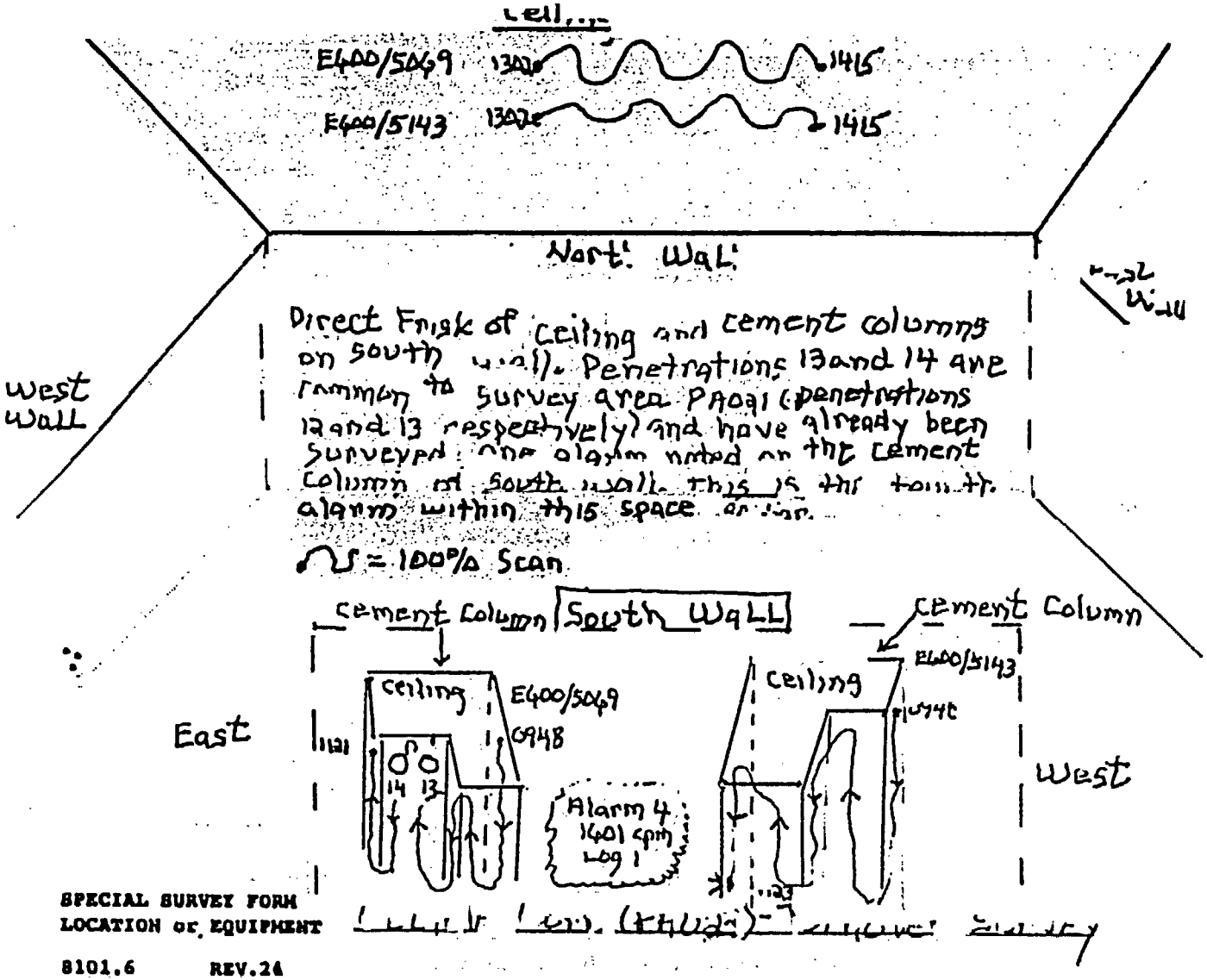
RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-14-99 TIME 0800

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5069	8-17-99
HP100/51792	6-28-99
E600/5143	7-12-99



KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT

8101.6 REV.24
IMS V02.09.03
RT 0.811.373

COPY

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

DATE 4-13-99 TIME 0700

SURVEYOR Payeur, Thursto

INSTRUMENT/#	CAL DUE
E600/5140	6-17-99
HP100/51792	6-28-99
E600/5069	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SHEAR LOCATION
- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

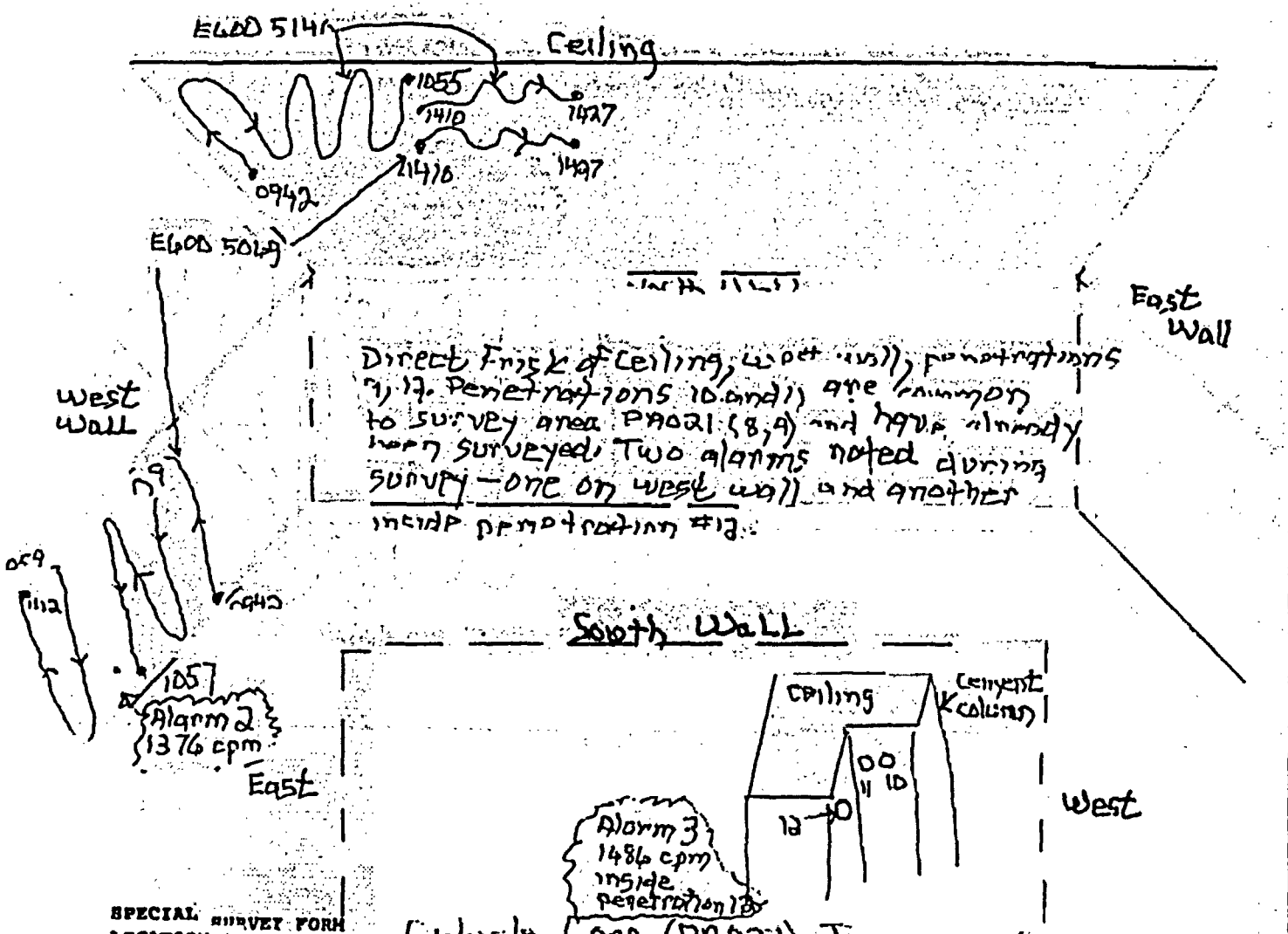
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) NOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 n/a	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: HP100/51893 (9-30-99)



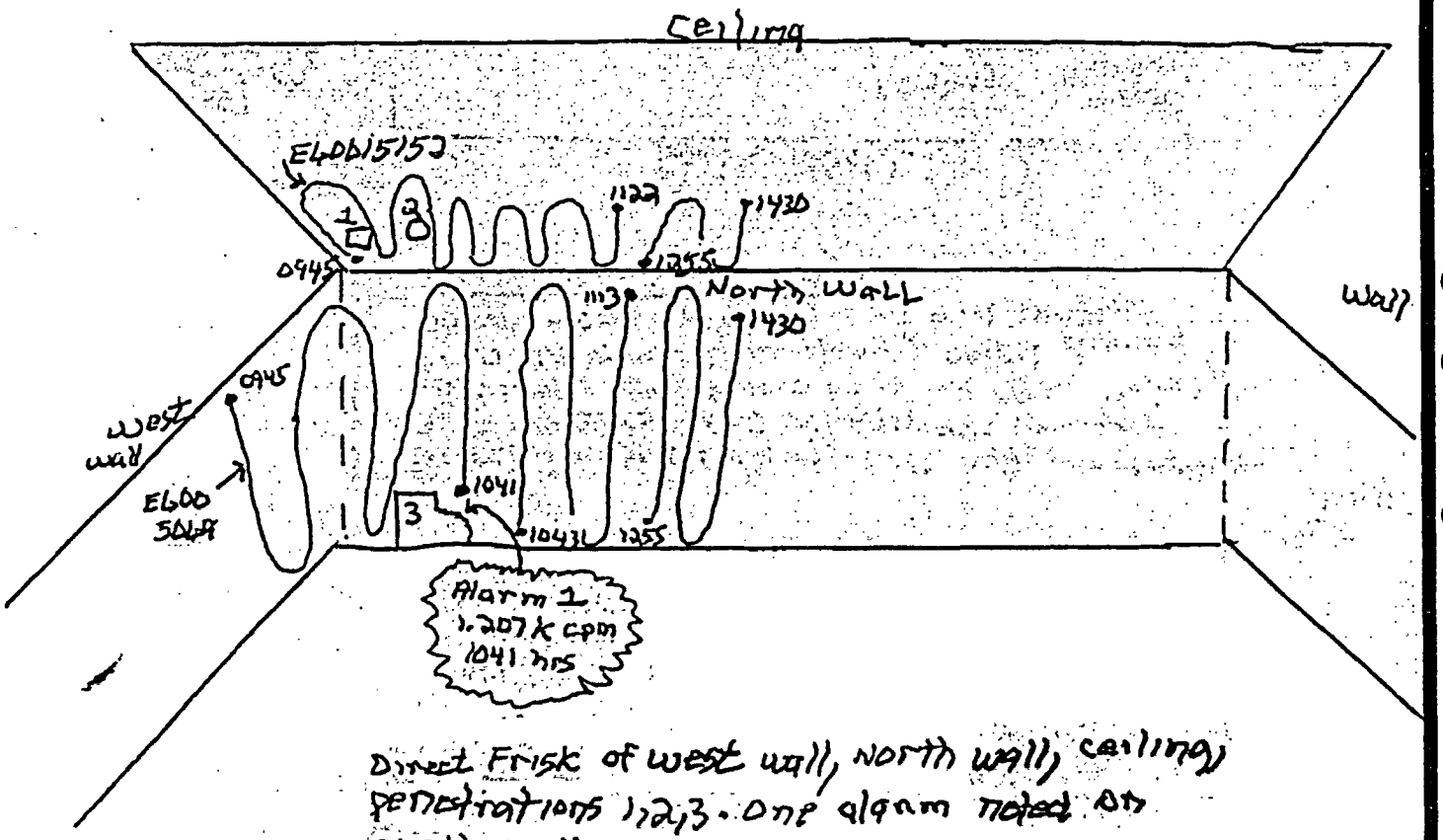
SPECIAL LOCATION SURVEY FORM or EQUIPMENT

S101.6 REV.24
IMS # V02.09.03
RT # 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY



Direct Frisk of west wall, North wall, ceiling, penetrations 1,2,3. One alarm noted on North wall

∿ = 100% scan

DATE 4-8-99 TIME 0800

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5152	5-12-99
HP100/55293	9-25-99
E600/5049	8-17-99

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- ✕✕ BARRIER
- ⊢⌒⊣ MASSLINE

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(x) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

HP300/50452 (1 -7-99)

SPECIAL SURVEY FORM

LOCATION or EQUIPMENT Cubicle Corr. (PA023) Turnover Survey

8101.6 REV.24

IMS # V02.09.03

RT # S11.373

RADIATION PROTECTION SURVEY F

11

COPY

DATE 5-6-99 700

SURVEYOR Payens Thurston

INSTRUMENT	CAL DUE
E600/5144	8-17-99
HP100/506603	5-23-99
E600/5141	7-12-99

KEY

RADIATION GENERAL AREA

RADIATION CONTACT

SMEAR LOCATION

BARRIER MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

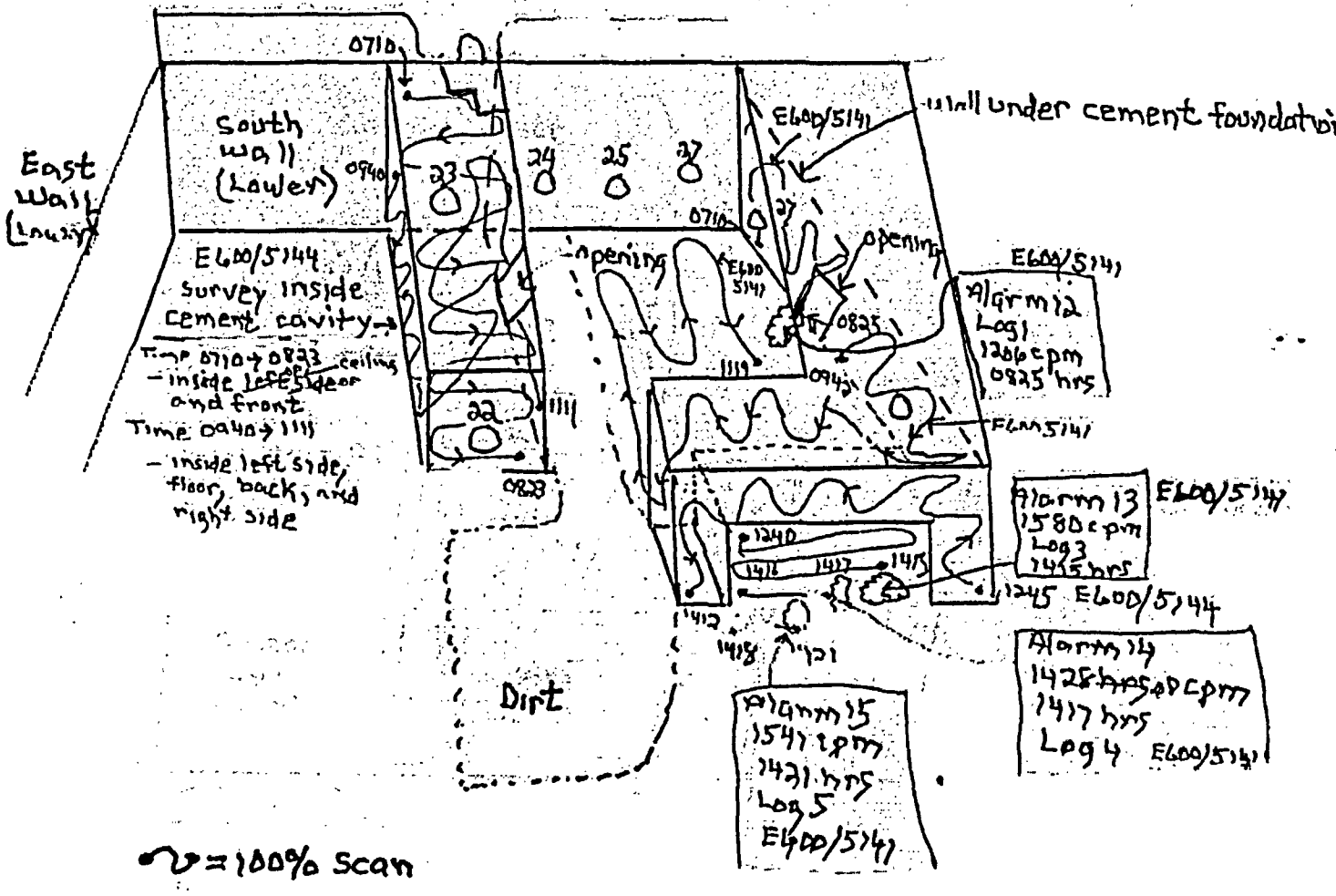
( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)



SPECIAL SURVEY FORM
LOCATION or EQUIPMENT Cubicle Lane (PA023) - Turnover Survey

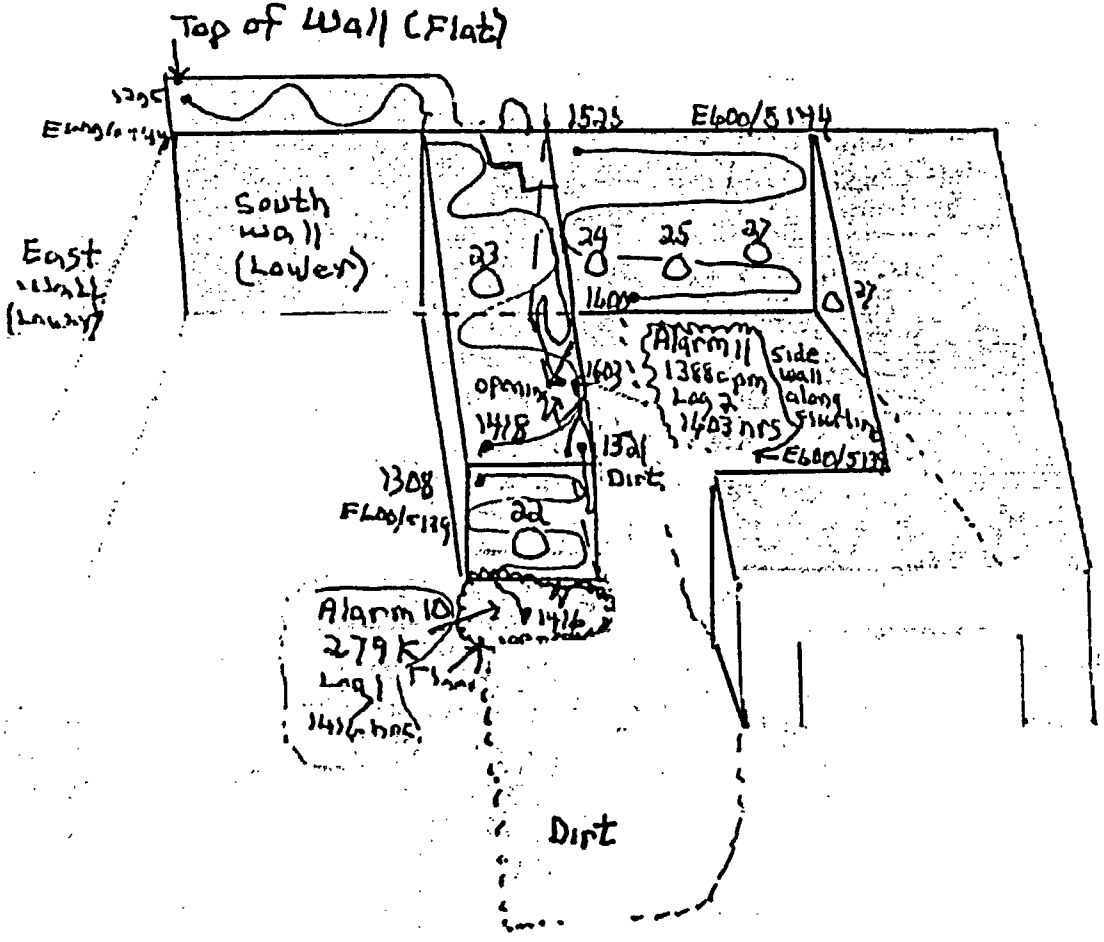
8101.6 REV.24
INS V02.09.03
RT 10.811.373

Direct Frisk of cement foundations from south wall, and floor. Four alarms noted (Alarms 12, 13, 14, 15) during survey. This is the 12th → 15th alarm within area.

COMMONWEALTH ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY



Direct Frisk of cement foundations and floor. Two alarms noted (Alarms 10, 11). This is the 10th and 11th alarm within this survey area

∿ = 100% scan

SPECIAL SURVEY FORM

LOCATION OF EQUIPMENT Cubicle Corr. (PR033) - Turnover Survey

8101.6 REV.24
IMS V02.09.03
RT 3.811.373

DATE 5-5-99 (1300

SURVEYOR Payeun Thurston

INSTRUMENT/#	CAL DUE
E600/5144	8-17-99
HP100/50603	5-23-99
E600/5139	10-26-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY. NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

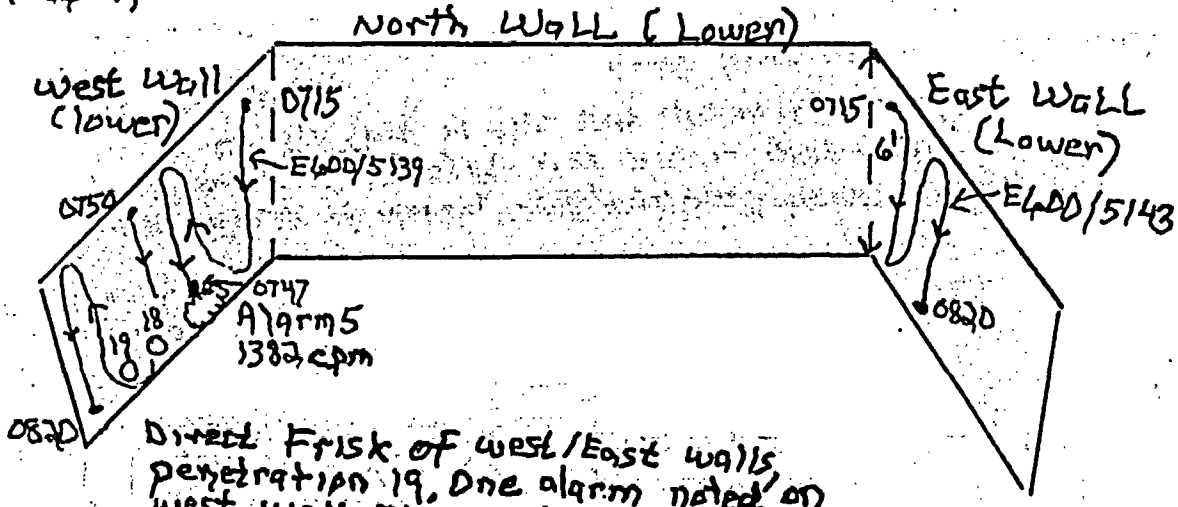
HP100/51853 (9-3-99)

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

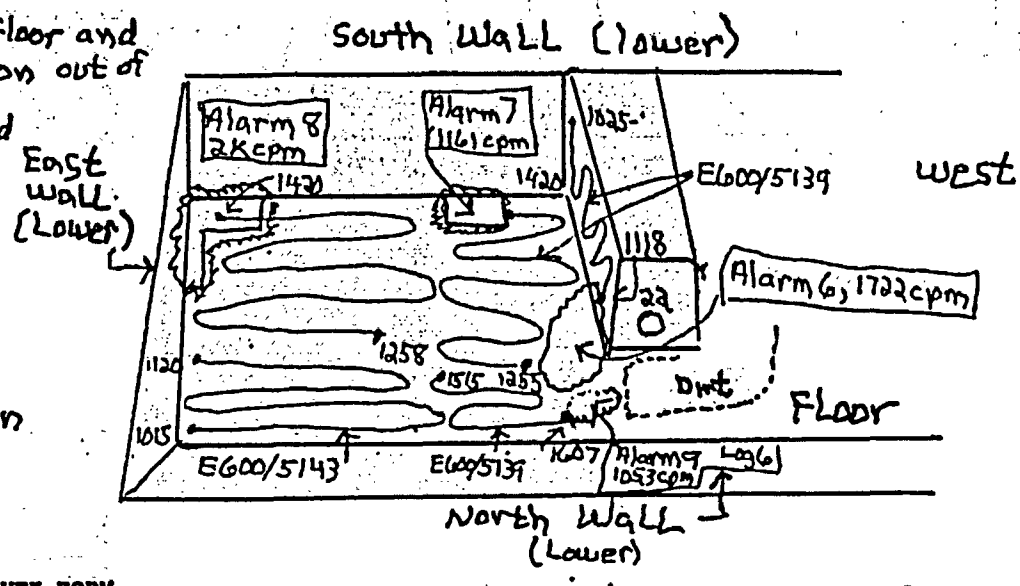
Resurveyed this area
as meter failed source
check on 4-26-99



Direct Frisk of west/East walls penetration 19. One alarm noted on west wall. This is the 5th alarm in this survey area.

Direct Frisk of floor and cement foundation out of south wall. Three alarms noted on floor-one alarm noted on foundation from south wall.

U = 100% scan



SPECIAL SURVEY FORM
LOCATION or EQUIPMENT Cubicle Corr. (PA023)-Turnover Survey

8101.6 REV.24
INS | V02.09.03
RT | 10.811.373

DATE 5-3-99 TIME 0700

SURVEYOR Dayeun Thurston

INSTRUMENT/#	CAL DUE
E600/5139	10-26-99
HP100/50603	5-23-99
E600/5143	7-12-99

KEY

RADIATION GENERAL AREA

RADIATION CONTACT

SMEAR LOCATION

BARRIER | HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (5-3-99)

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-26-99 TIME 0701

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP360/506222	8-18-99
E600/50469	8-17-99

KEY

RADIATION GENERAL AREA

RADIATION CONTACT

SMEAR LOCATION

BARRIER MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

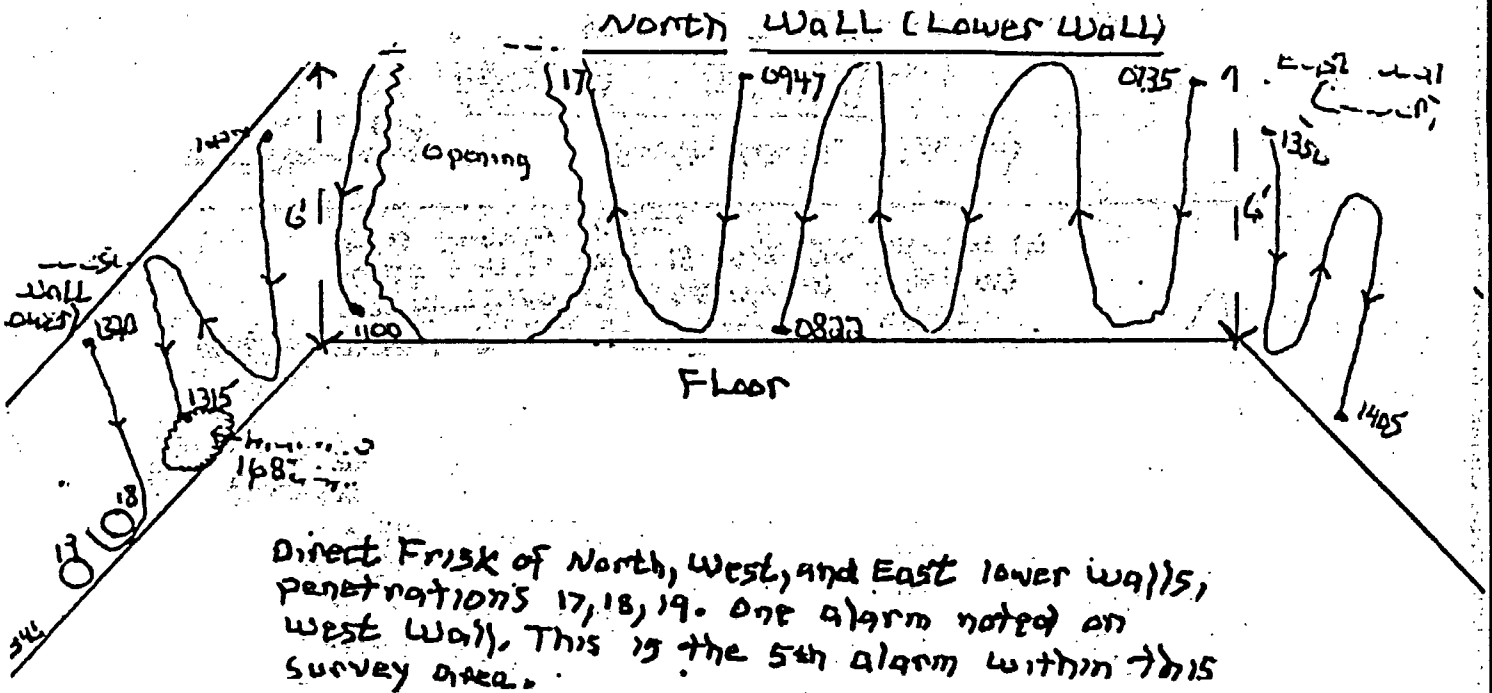
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

(( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: HP/DW 51441 (2-18-74)



Direct Frisk of North, West, and East lower walls, penetrations 17, 18, 19. One alarm noted on West Wall. This is the 5th alarm within this survey area.

∿ = 100% Scan

E600 50469 used on walls and penetrations 17, 19.
E600 5141 used on penetration 18.

SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PAD23) - Turnover Survey

S101.6 REV.24
IMS # V02.09.03
RT 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

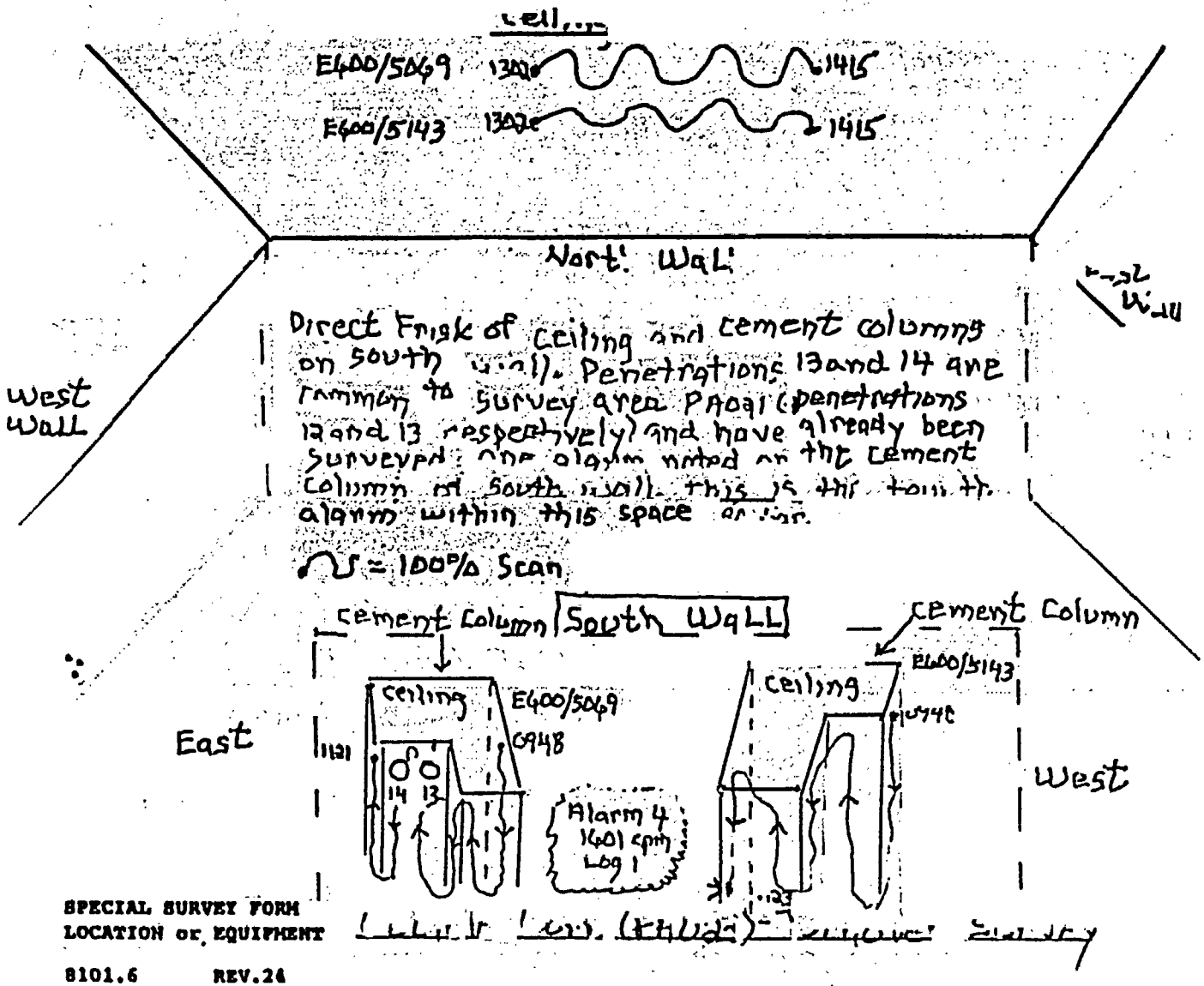
RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-14-99 TIME 0800

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5069	8-17-99
HP100/51792	4-28-99
E600/5143	7-12-99



KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- -X-X- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

SPECIAL SURVEY FORM LOCATION or EQUIPMENT

8101.6 REV.24
IHS | V02.09.03
RT | 10.811.373

COPY

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

DATE 4-13-99 TIME 0700

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5140	6-17-99
HP100/51792	6-28-99
E600/5069	8-17-99

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SHEAR LOCATION
- —X—X— BARRIER
- |—~—| HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

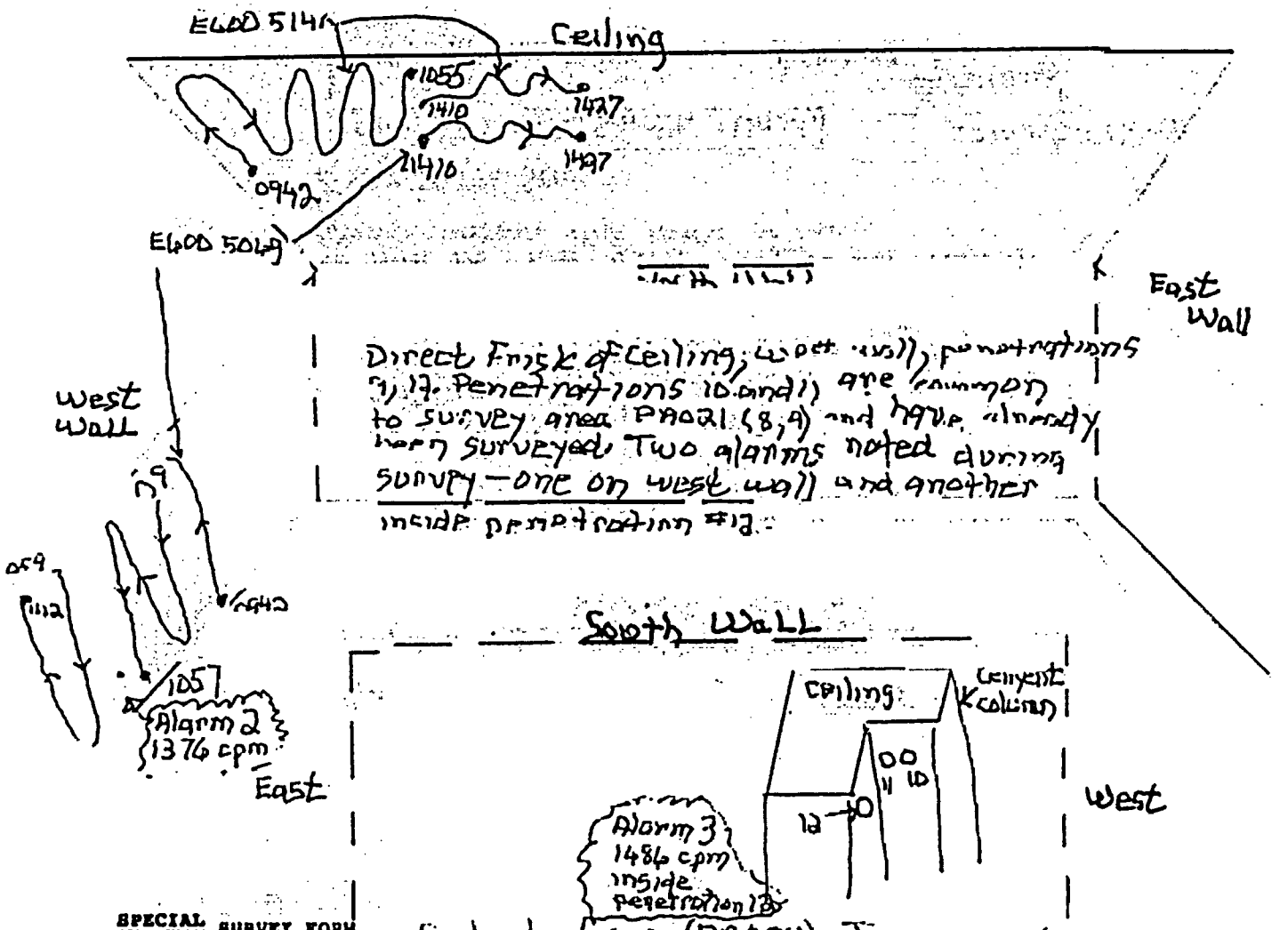
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: HP100/51893 (9-30-99)



Cubicle Corr. (PA023) - Turnover Survey

SPECIAL LOCATION SURVEY FORM OF EQUIPMENT

8101.6 REV.24
IMS | V02.09.03
R | 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

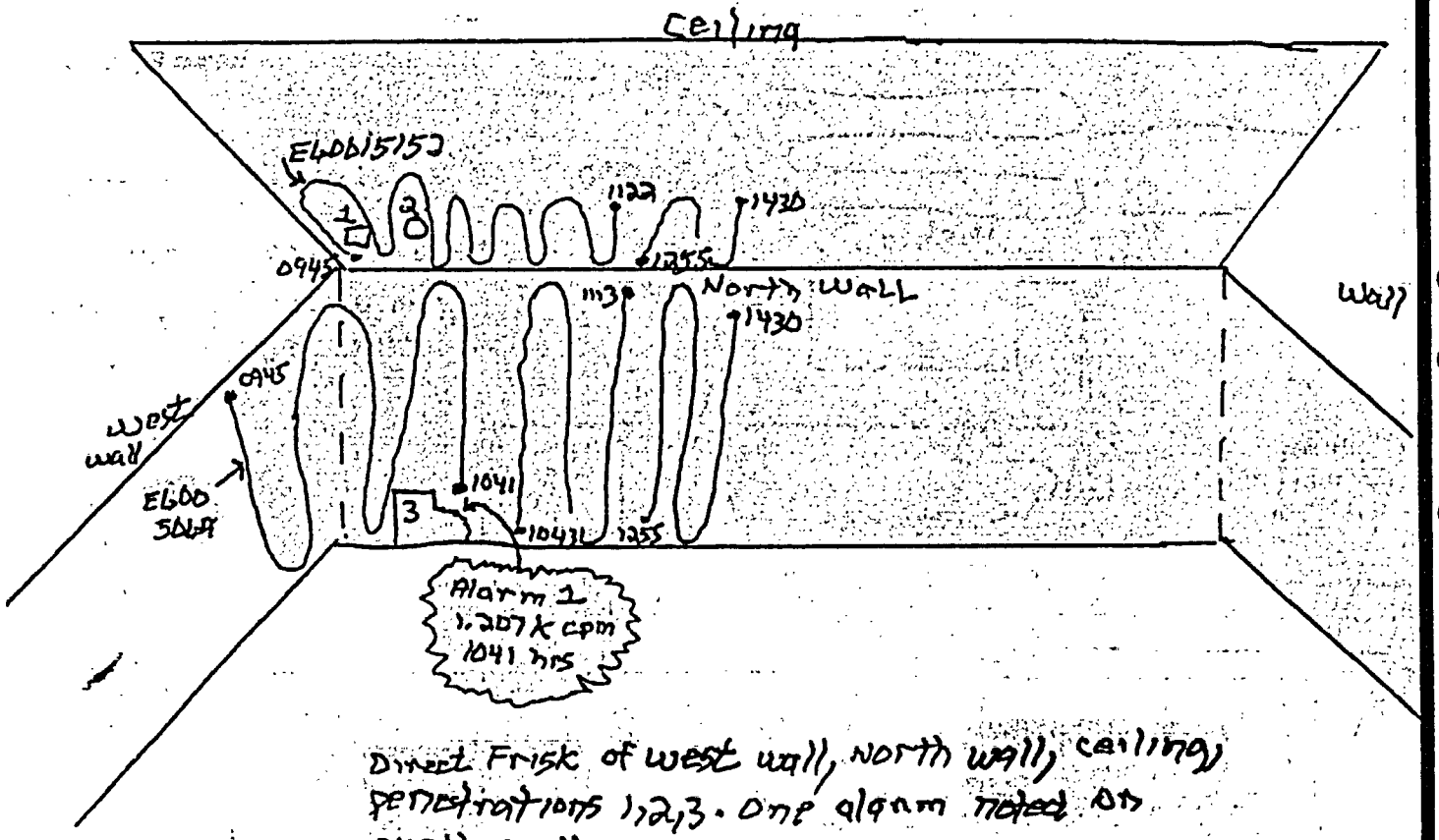
RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-8-99 TIME 0500

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/51552	5-12-99
HP100/55293	9-25-99
E600/5069	8-17-99



Direct Frisk of west wall, North wall, ceiling, penetrations 1,2,3. One alarm noted on north wall

~ = 100% scan

KEY

RADIATION GENERAL AREA

RADIATION CONTACT

SMEAR LOCATION

BARRIER MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(x) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

HP360/50652 (4-14-99)

SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PA023) Turnover Survey

8101.6 REV.24
IMS # V02.09.03
RT # 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 5-10-99 TIME 1700

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP100/51592	9-3-99
E600/5144	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER — HASSLINK

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Fnlsk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

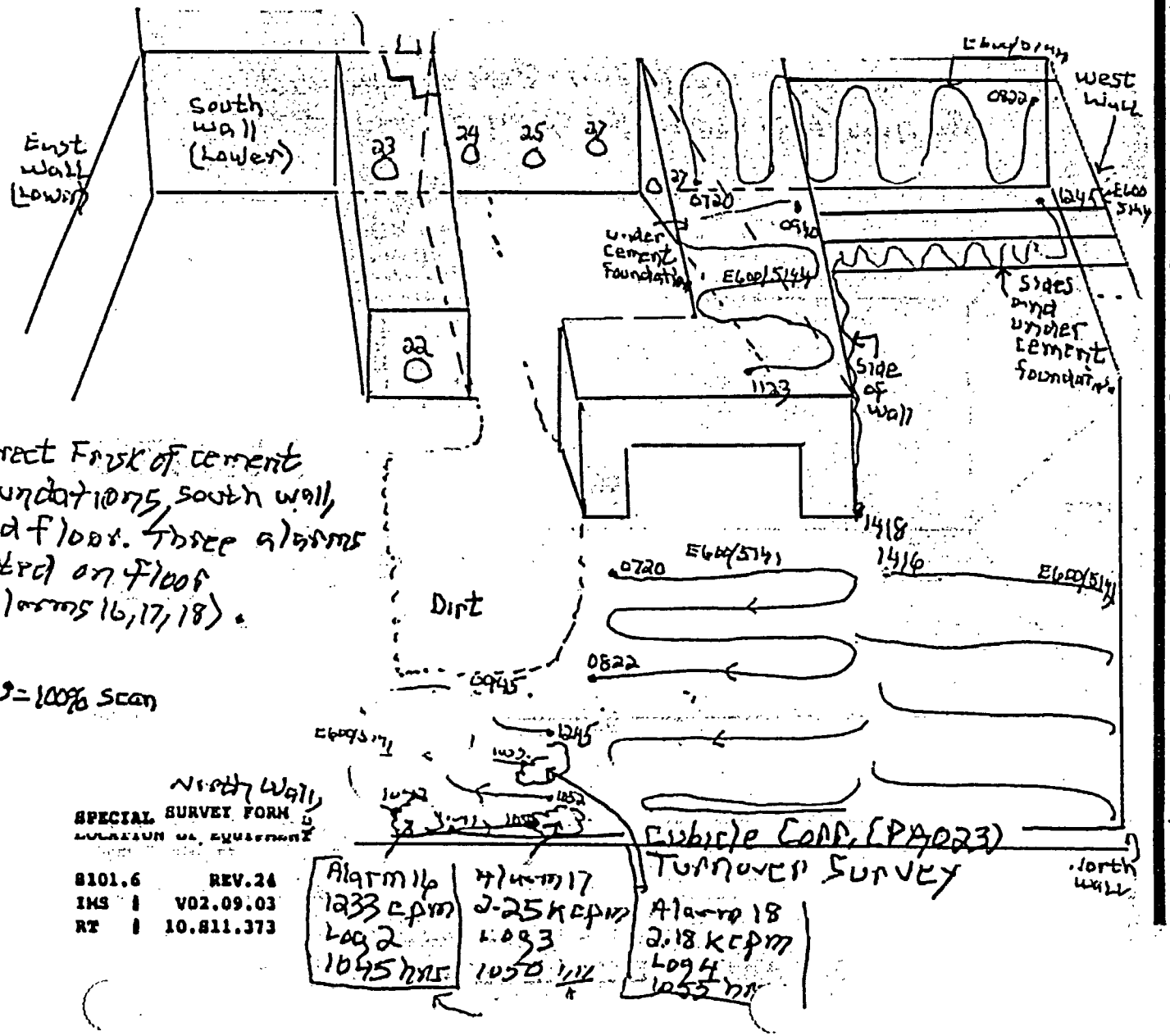
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1		11	21
2		12	22
3		13	23
4		14	24
5		15	25
6		16	26
7		17	27
8		18	28
9		19	29
10		20	30

COMMENTS: HP100/51853 (9-3-99)



Direct Frisk of cement foundations, south wall, and floor. Three alarms noted on floor (Alarms 16, 17, 18).

☞ = 100% scan

SPECIAL SURVEY FORM

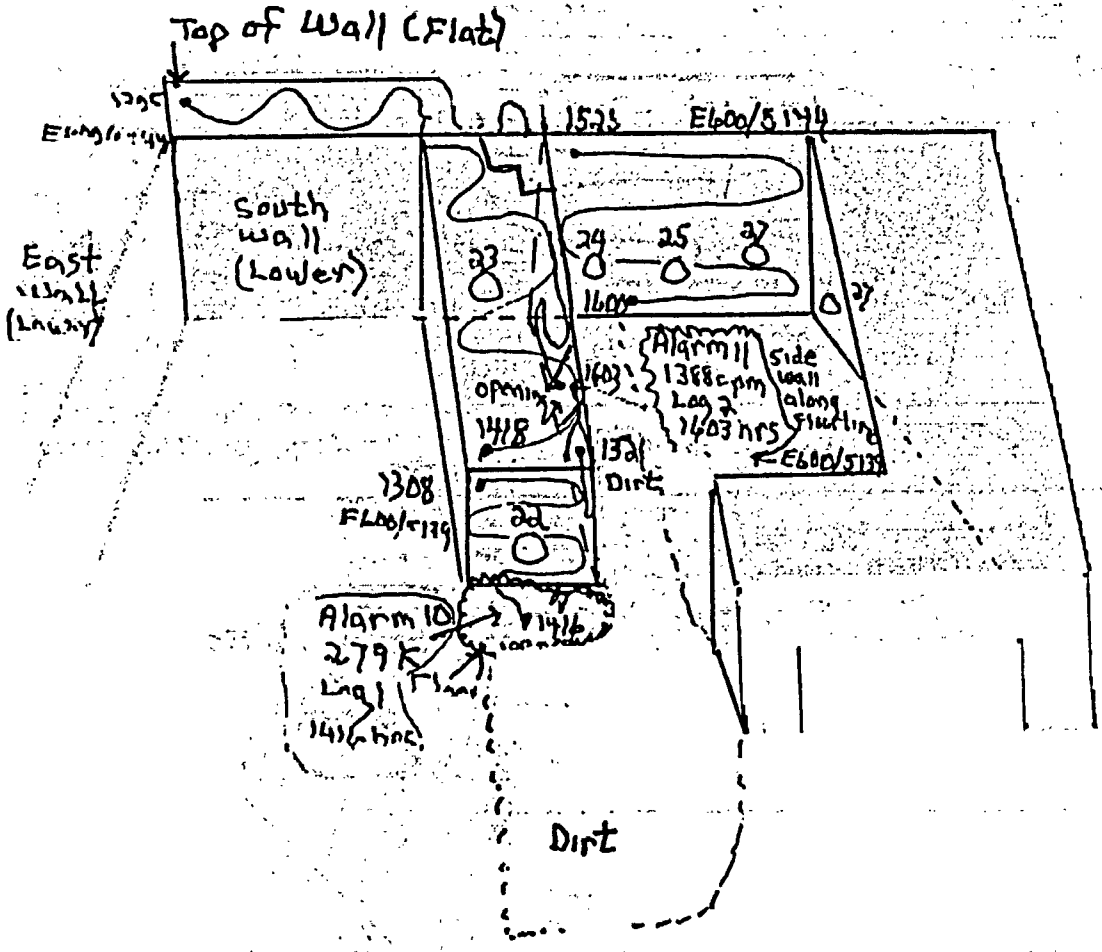
LOCATION OR EQUIPMENT

8101.6	REV.24
IMS #	V02.09.03
RT #	10.811.373

...ELECTRONIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY



Direct Frisk of cement foundations and floor. Two alarms noted (Alarms 10, 11). This is the 10th and 11th alarm within this survey area

∴ = 100% Scan

SPECIAL SURVEY FORM

LOCATION or EQUIPMENT Cubicle Corr. (PR023) - Turnover Survey

S101.6 REV.24
IMS | V02.09.03
RT | 10.811.373

DATE 5-5-99 TIME 1300

SURVEYOR Payeun Thurston

INSTRUMENT/#	CAL DUE
E600/5144	8-17-99
HP100/50603	5-23-99
E600/5139	10-26-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

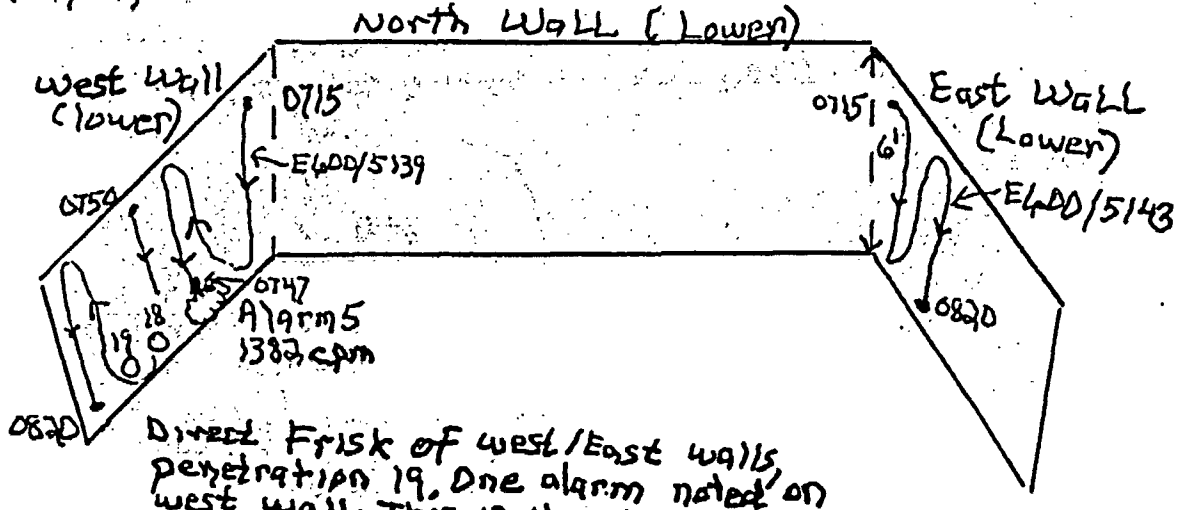
COPY

Resurveyed this area as meter failed source check on 4-26-99

DATE 5-3-99 TIME 0700

SURVEYOR Dayeun, Thurston

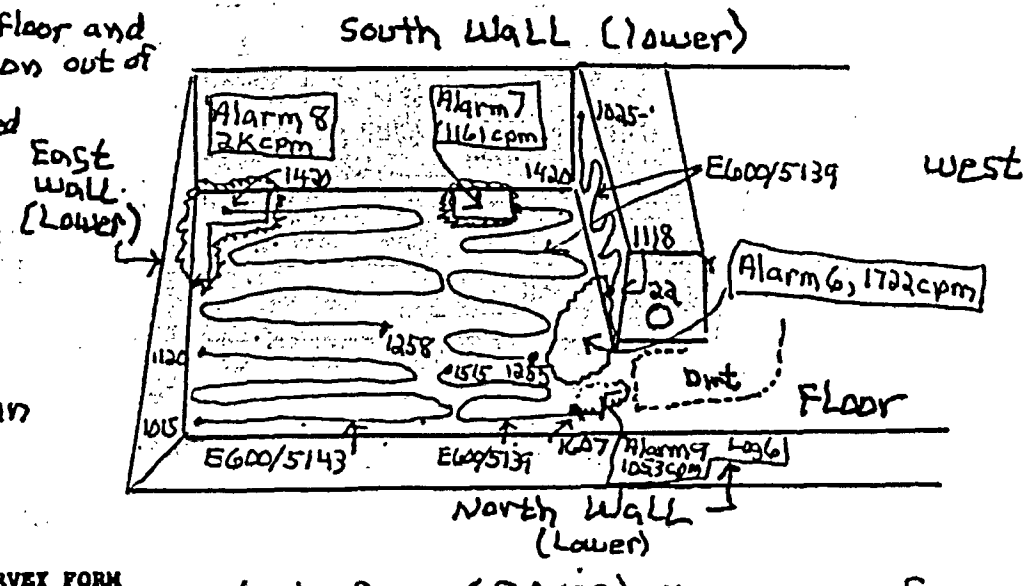
INSTRUMENT/#	CAL DUE
E600/5139	10-26-99
HP100/50603	5-23-99
E600/5143	7-12-99



Direct Frisk of west/East walls penetration 19. One alarm noted on west wall. This is the 5th alarm in this survey area.

Direct Frisk of floor and cement foundation out of south wall. Three alarms noted on floor-one alarm noted on foundation from south wall.

U = 100% scan



KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SHEAR LOCATION
- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PA023)-Turnover Survey

8101.6 REV.24
IMS V02.09.03
RT 10.811.373

YANKEE ATOMIC ELECTRIC CO. ANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-26-99 TIME 0701

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP360/506022	8-18-99
E600/5069	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

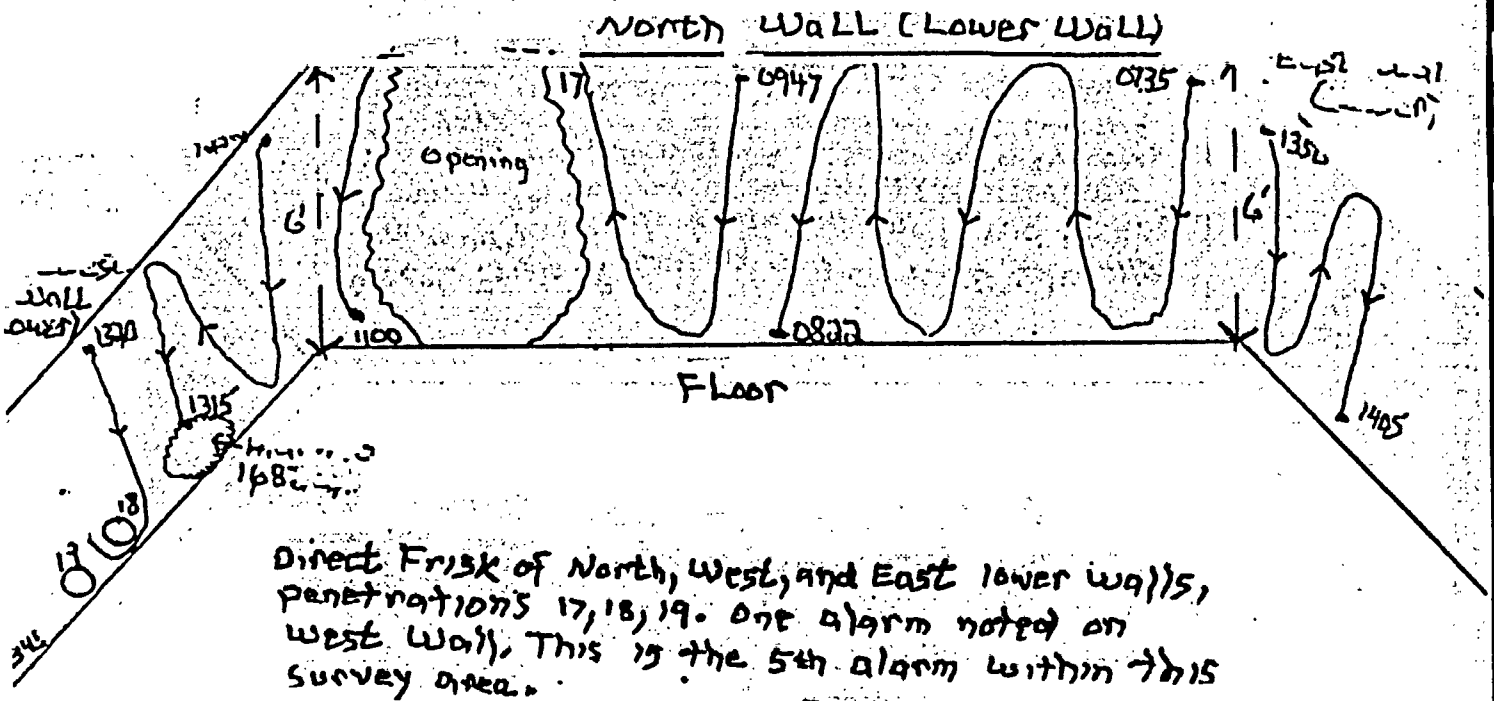
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 n/a	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: HP/DAY 5141 (5-18-99)



Direct Frisk of North, West, and East lower walls, penetrations 17, 18, 19. One alarm noted on West Wall. This is the 5th alarm within this survey area.

~ = 100% Scan

E600 5069 used on walls and penetrations 17, 19.
E600 5141 used on penetration 18.

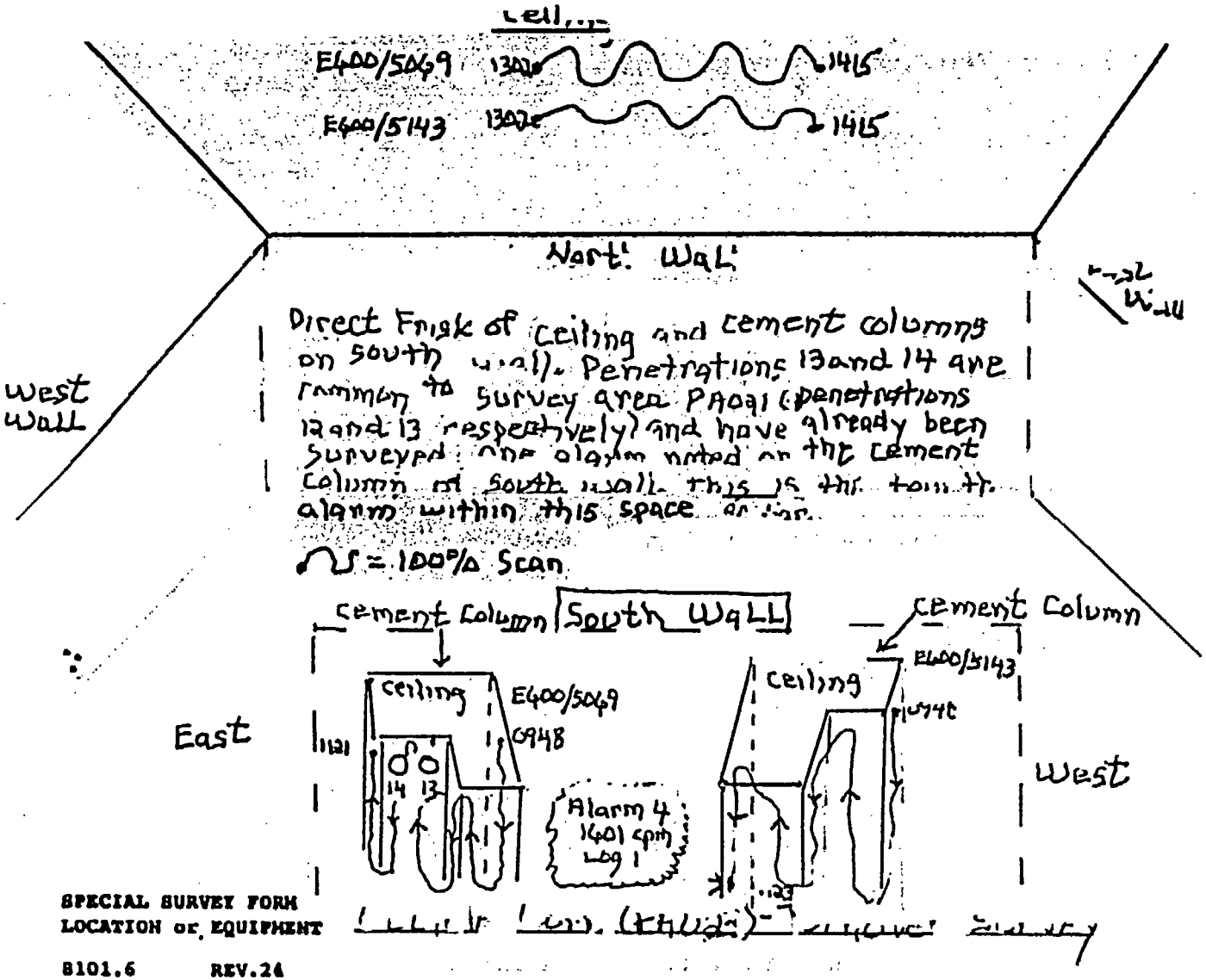
SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PAD23) - Turnover Survey

S101.6 REV.24
IMS V02.09.03
RT 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY



SPECIAL SURVEY FORM
LOCATION OF EQUIPMENT

B101.6 REV.24
IMS V02.09.03
RT).811.373

DATE 4-14-99 TIME 0800

SURVEYOR Payeur, Thurston

INSTRUMENT/S	CAL DUE
E600/5049	8-17-99
HP100/51792	6-28-99
E600/5143	7-12-99

KEY

- [ ] RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- -X-X- BARRIER
- MASSLINN

( ) DIRECT RADIATION
READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk
( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY
NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:
HP100/51853 (9-3-99)

COPY

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

DATE 4-13-99 TIME 0700

SURVEYOR Bayeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5140	6-17-99
HP100/51792	6-28-99
E600/5069	8-17-99

KEY

RADIATION GENERAL AREA

RADIATION CONTACT

SHEAR LOCATION

BARRIER HASELINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

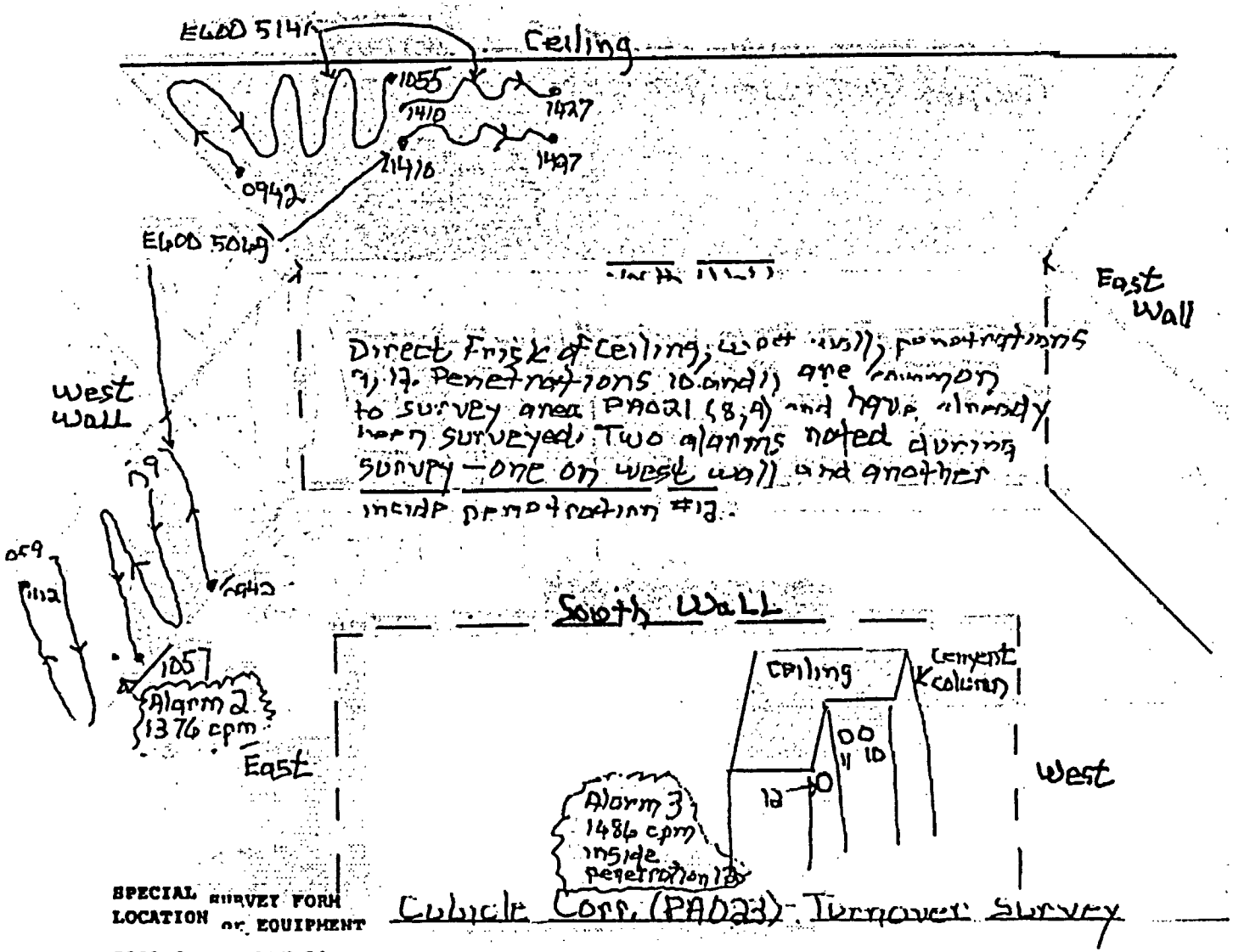
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: HP100/51853 (9-30-99)



Cubicle Corr. (PA023) Turnover Survey

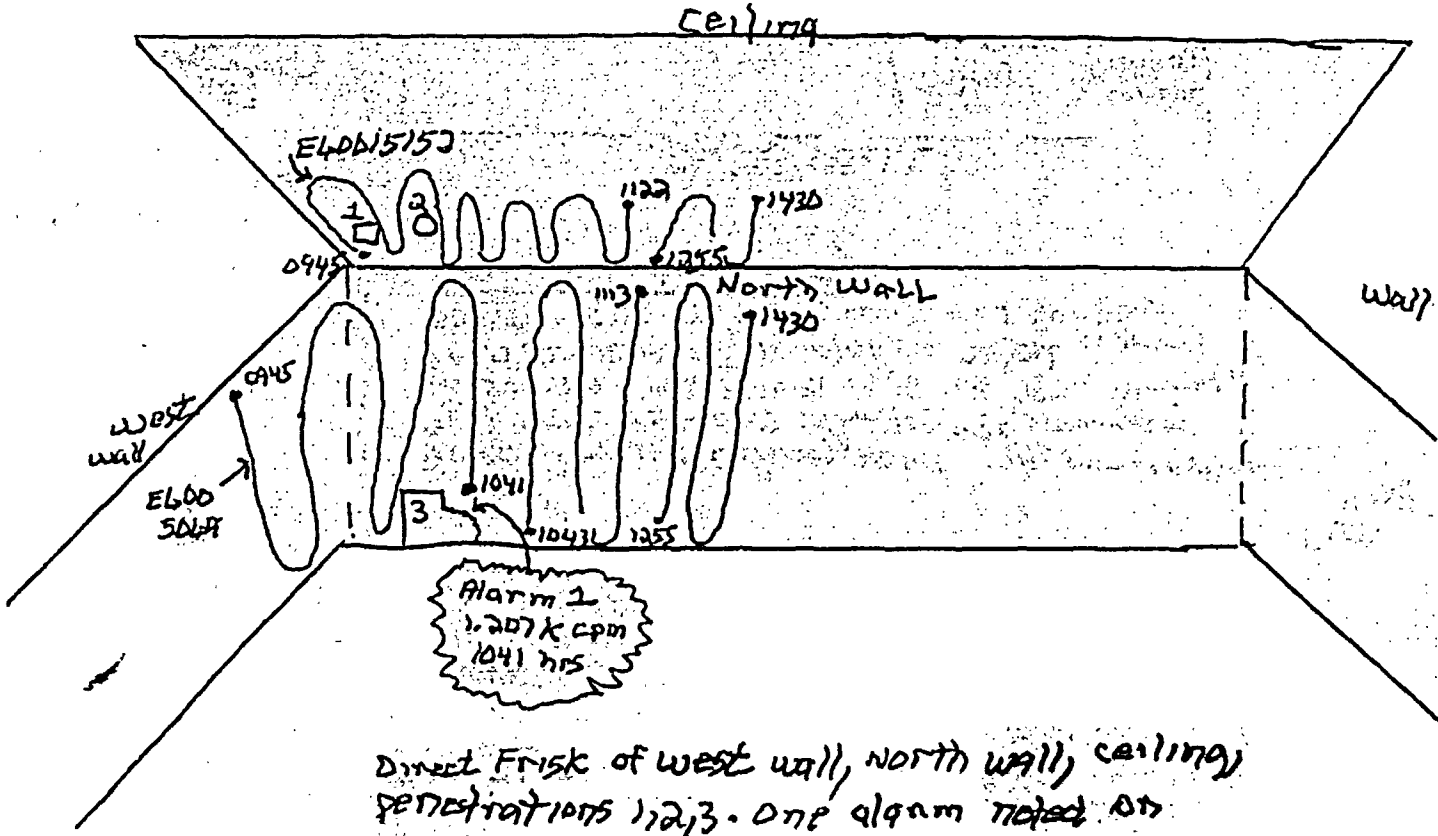
SPECIAL LOCATION SURVEY FORM or EQUIPMENT

S101.6 REV.24
IMS | V02.09.03
RT | 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY



Direct Frisk of west wall, North wall, ceiling penetrations 1,2,3. One alarm noted on north wall

∿ = 100% scan

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT Cubicle Cont. (PA023) Turnover Survey

8101.6 REV.24
IMS # V02.09.03
RT # S11.373

DATE 4-8-99 TIME 0500

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/15152	5-12-99
HP100/55293	9-25-99
E600/5049	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SHEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

HP360/50452 (4-7-99)

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 5-10-99 TIME 1700

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP100/51592	9-3-99
E600/5144	8-17-99

KEY

▭ RADIATION GENERAL AREA

○ RADIATION CONTACT

△ SHEAR LOCATION

-X-X- BARRIER |———| HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

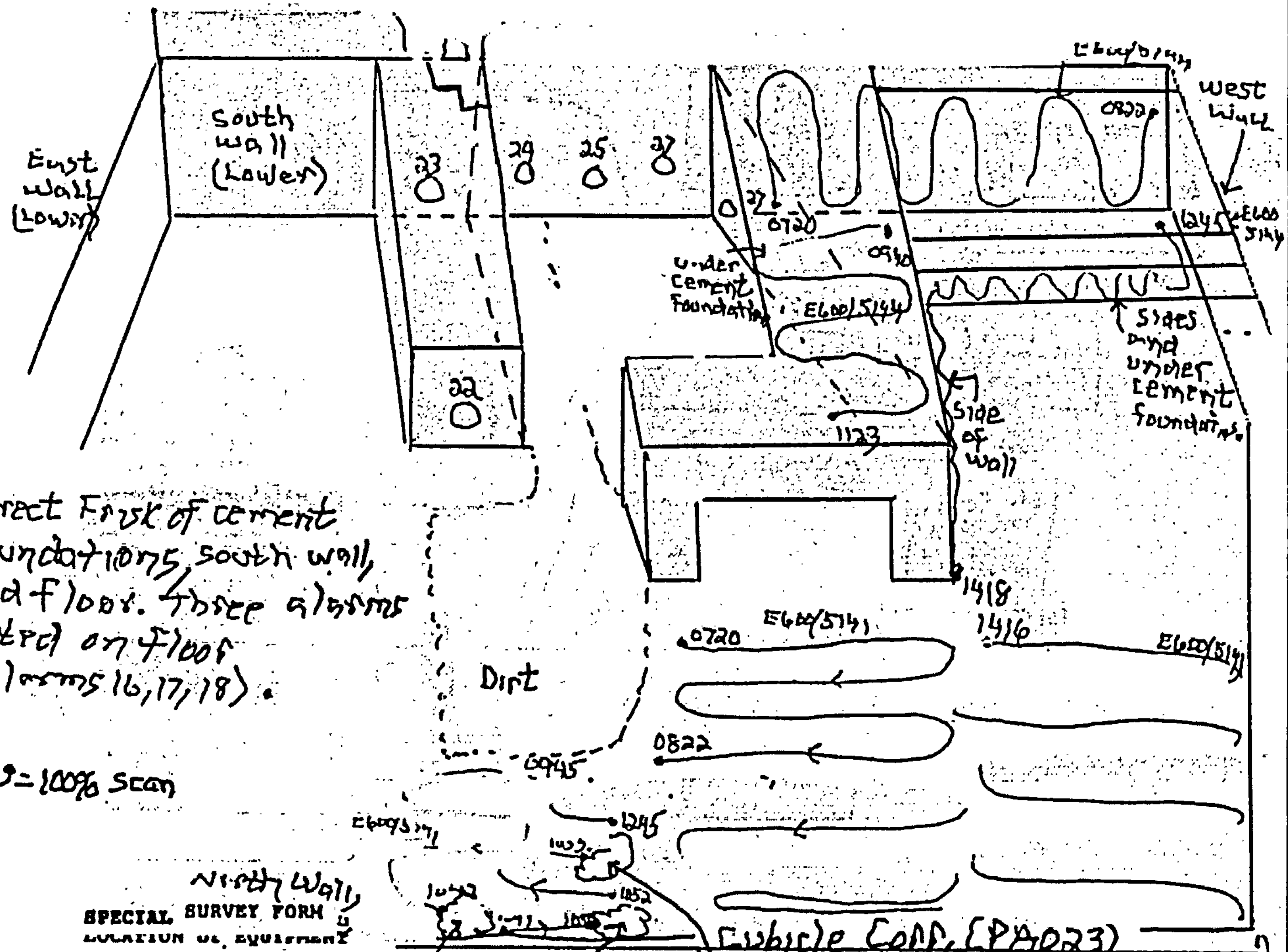
( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 n/a	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)



Direct Frisk of cement foundations, south wall, and floor. Three alarms noted on floor (Alarms 16, 17, 18).

ν = 100% scan

Turnover Survey

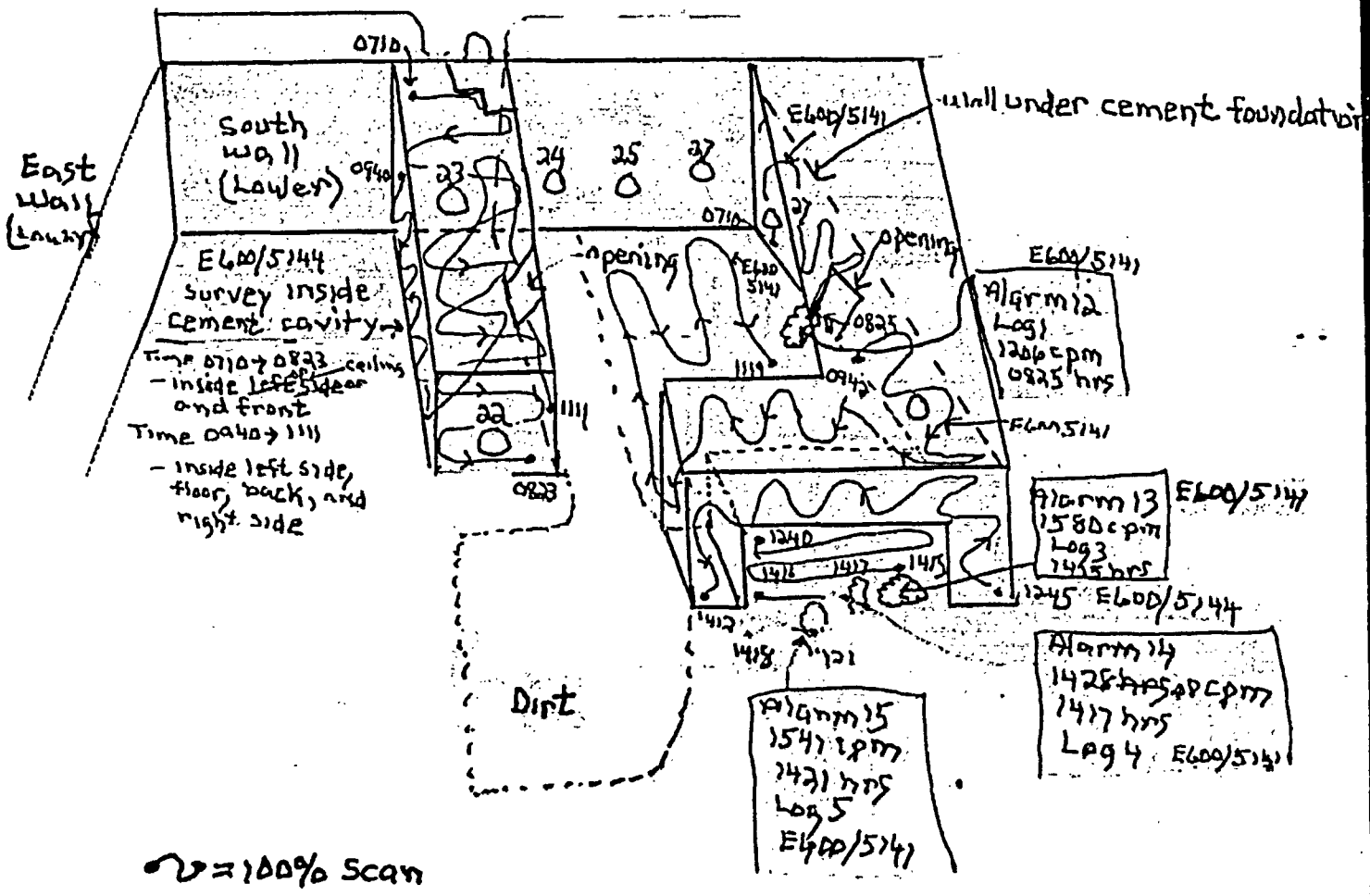
Alarm 16	Alarm 17	Alarm 18
1233 cpm	2.25 kcpm	2.18 kcpm
Log 2	Log 3	Log 4
1045 hrs	1050 hrs	1055 hrs

SPECIAL SURVEY FORM
LOCATION OF EQUIPMENT

8101.6 REV.24
IHS # V02.09.03
RT # 10.811.373

RADIATION PROTECTION SURVEY F

COPY



DATE 5-6-99 : 0700

SURVEYOR Payeur, Thurston

INSTRUMENT	CAL DUE
E600/5144	8-17-99
HP100/506603	5-23-99
E600/5141	7-12-99

KEY

RADIATION GENERAL AREA

RADIATION CONTACT

SHEAR LOCATION

BARRIER HASSLINK

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/571853 (9-3-99)

SPECIAL SURVEY FORM

LOCATION or EQUIPMENT Cubicle Conc. (PA023) - Turnover Survey

8101.6 REV.24
IMS | V02.09.03
RT | 10.811.373

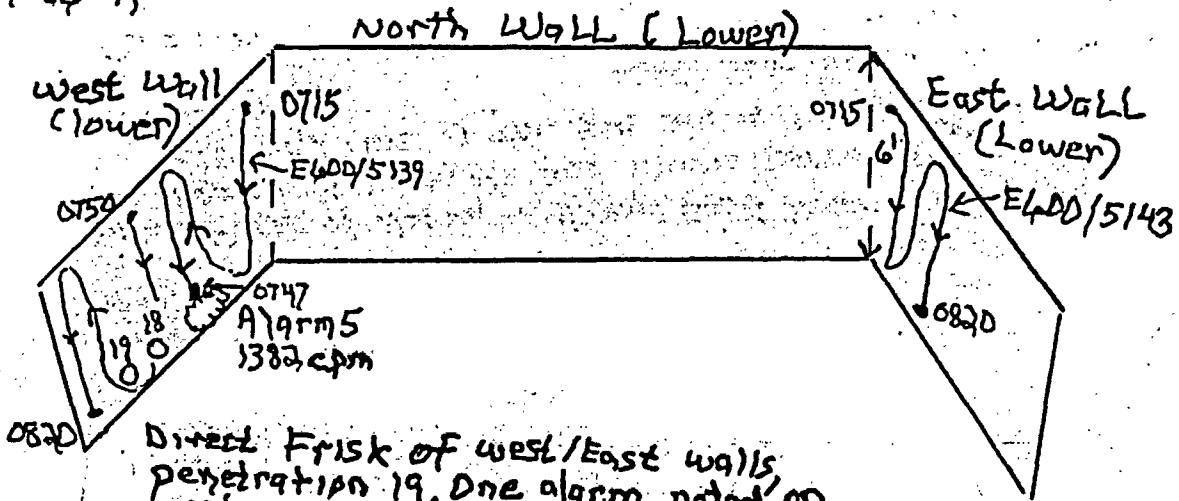
Direct Frisk of cement foundations from south wall, and floor. Four alarms noted (Alarms 12, 13, 14, 15) during survey. This is the 12th → 15th alarm within area.

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

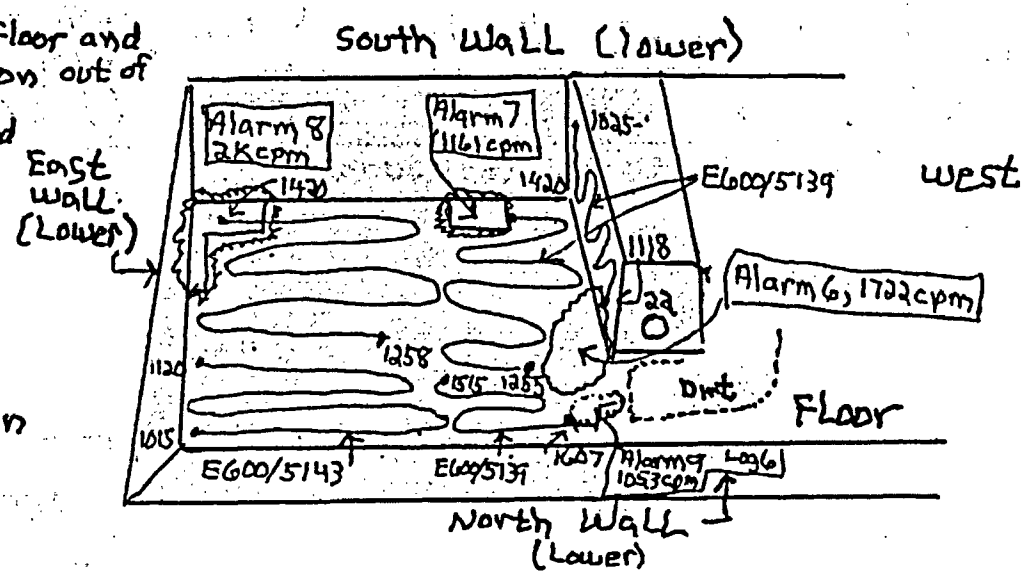
Resurveyed this area as meter failed source check on 4-26-99



Direct Frisk of west/East walls penetration 19. One alarm noted on west wall. This is the 5th alarm in this survey area.

Direct Frisk of floor and cement foundation out of south wall. Three alarms noted on floor-one alarm noted on foundation from south wall.

U = 100% scan



SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PA023)-Turnover Survey

8101.6 REV.24
INS | V02.09.03
RT | 10.811.373

DATE 5-3-99 TIME 0700

SURVEYOR Dayeun, Thurston

INSTRUMENT/#	CAL DUE
E600/5139	10-26-99
HP100/501603	5-23-99
E600/5143	7-12-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SHEAR LOCATION
- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-26-99 TIME 0701

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP360/506222	8-18-99
E600/5069	8-17-99

KEY

RADIATION GENERAL AREA

RADIATION CONTACT

SHEAR LOCATION

BARRIER HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

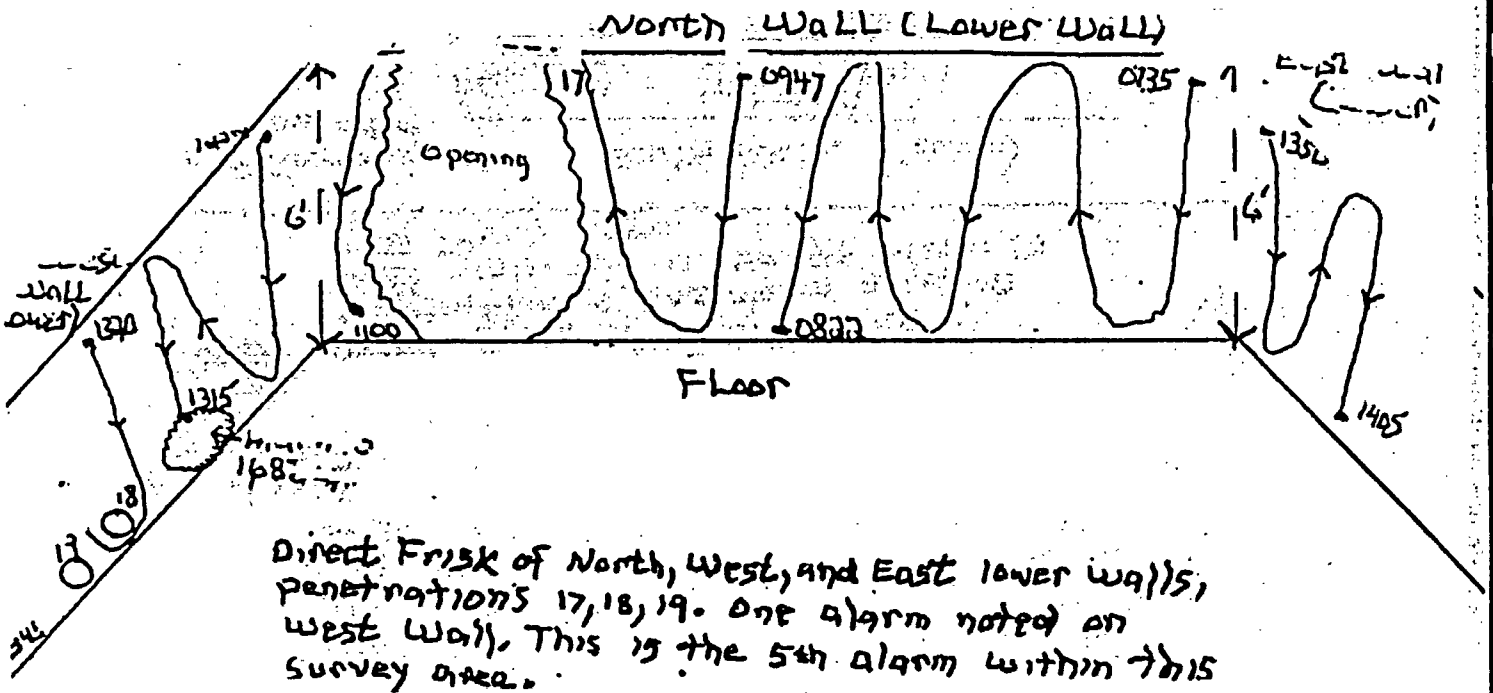
( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 n/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP/DAY 51491 (2-10-74)



Direct Frisk of North, West, and East lower walls, penetrations 17, 18, 19. One alarm noted on West Wall. This is the 5th alarm within this survey area.

∿ = 100% Scan

E600 5069 used on walls and penetrations 17, 19.
E600 5141 used on penetration 18.

SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PAD23) - Turnover Survey

8101.6 REV.24
IMS V02.09.03
RT 0.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-14-99 TIME 0800

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5069	8-17-99
HP100/51792	6-28-99
E600/5143	7-12-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

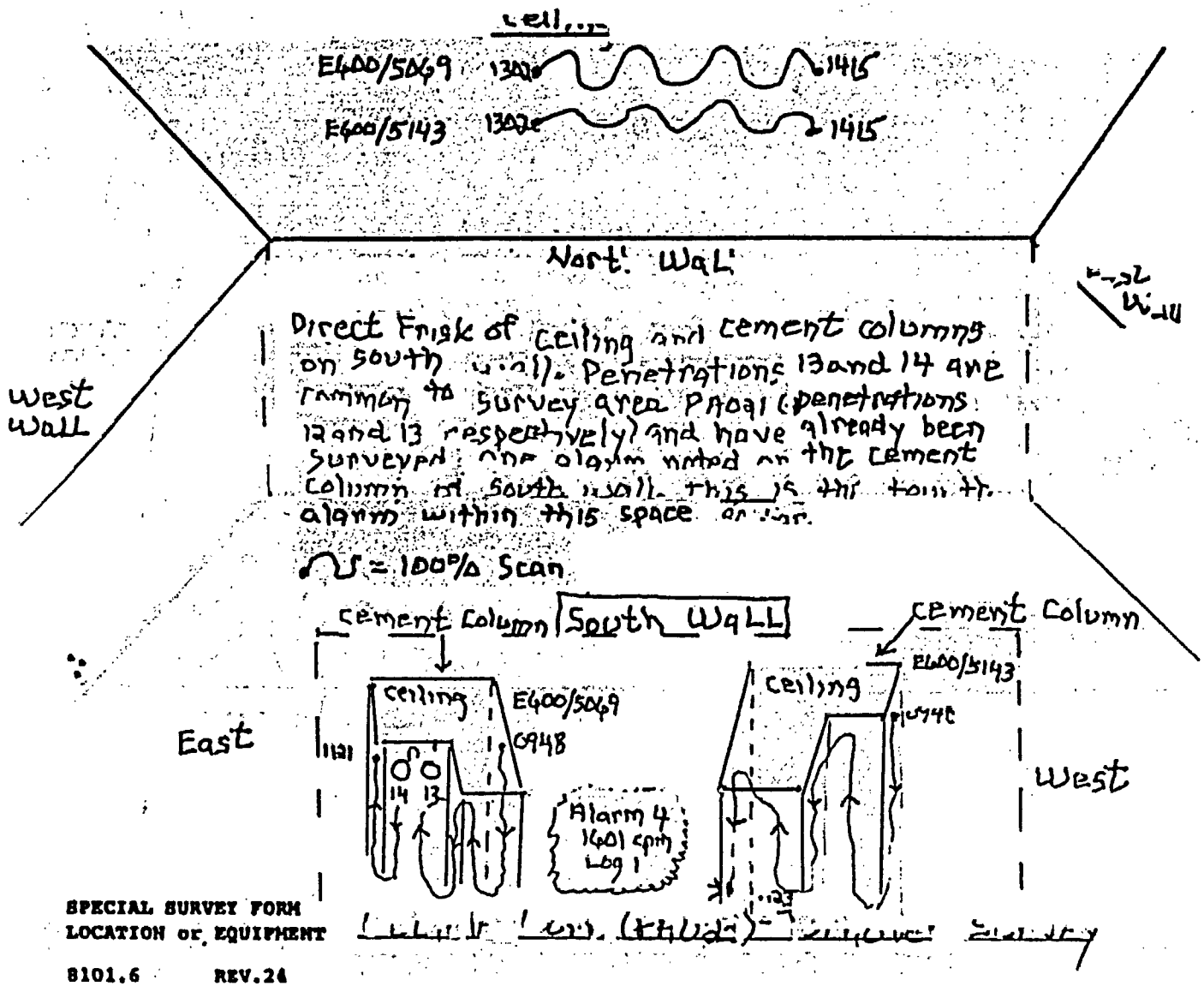
( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)



SPECIAL SURVEY FORM
LOCATION or EQUIPMENT

8101.6 REV.24
IHS # V02.09.03
RT # 10.811.373

COPY

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

DATE 4-13-99 TIME 0700

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5140	6-17-99
HP100/51792	6-28-99
E600/5069	8-17-99

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SHEAR LOCATION
- —X—X— BARRIER
- |—| HASELINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

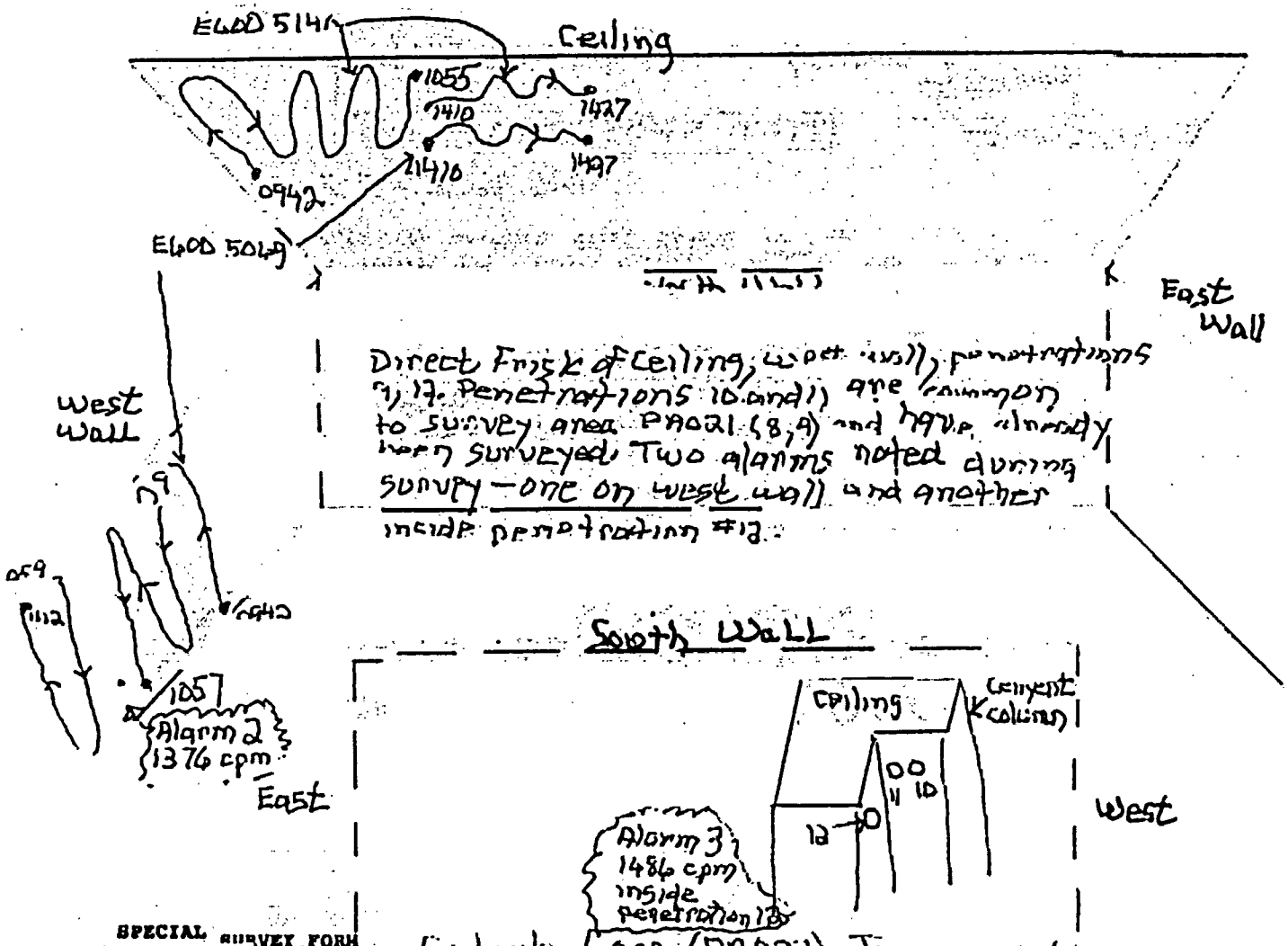
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: HP100/51893 (9-30-99)



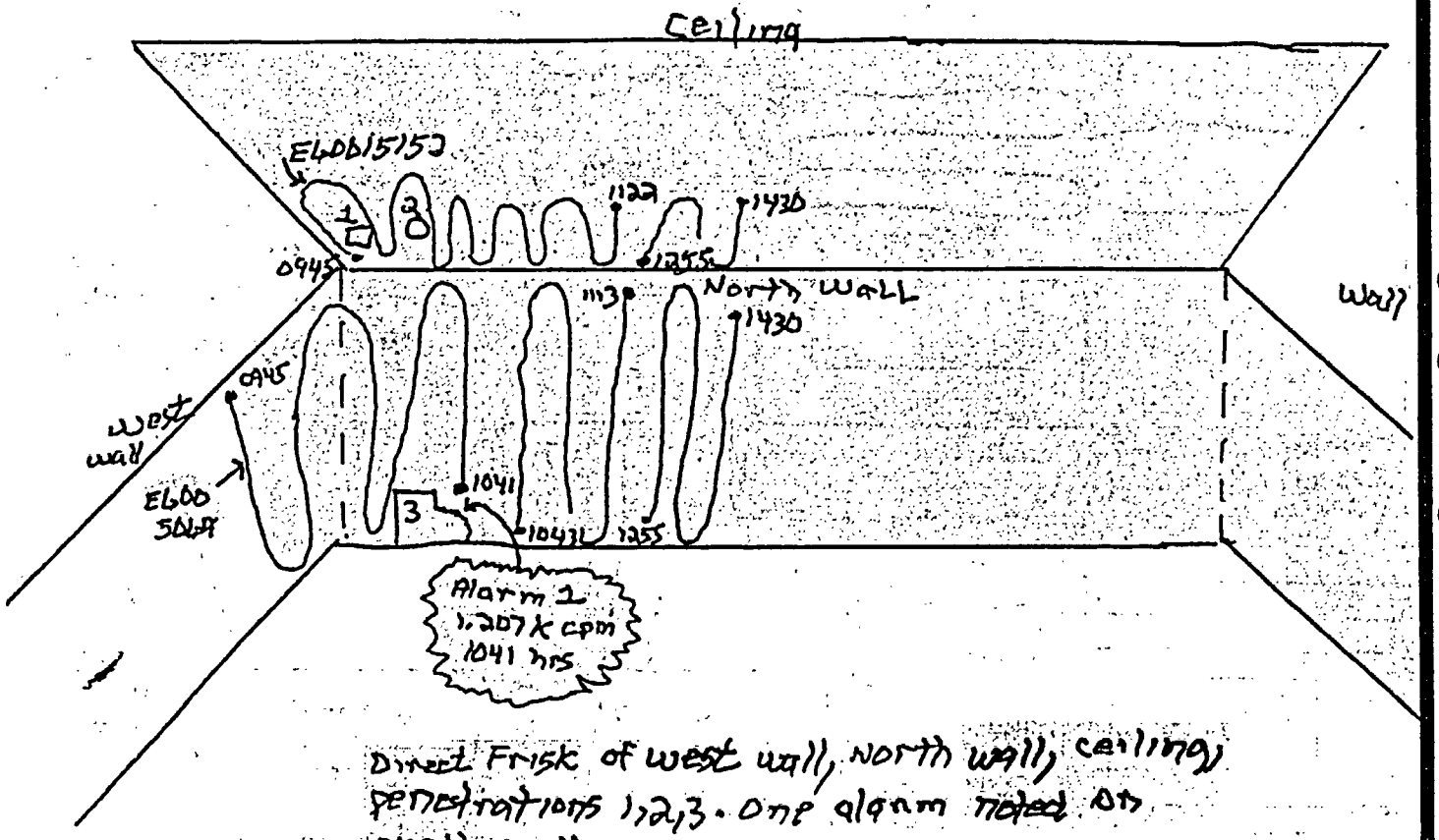
SPECIAL LOCATION SURVEY FORM OR EQUIPMENT

8101.6 REV.24
IMS # V02.09.03
RT 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY



Direct Frisk of west wall, North wall, ceiling, penetrations 1,2,3. One alarm noted on north wall

~ = 100% scan

DATE 4-8-99 TIME 0800

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/51552	5-12-99
HP100/55293	9-25-99
E600/50649	8-17-99

KEY

RADIATION GENERAL AREA

RADIATION CONTACT

SMEAR LOCATION

BARRIER MASSLINK

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(x) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

HP360/50652 (12-14-99)

SPECIAL SURVEY FORM

LOCATION or EQUIPMENT Cubicle Corr. (PA023) Turnover Survey

8101.6 REV.24

INS # V02.09.03

RT # 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 5-10-99 TIME 700

SURVEYOR Payelin Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP100/51592	9-3-99
E600/5144	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

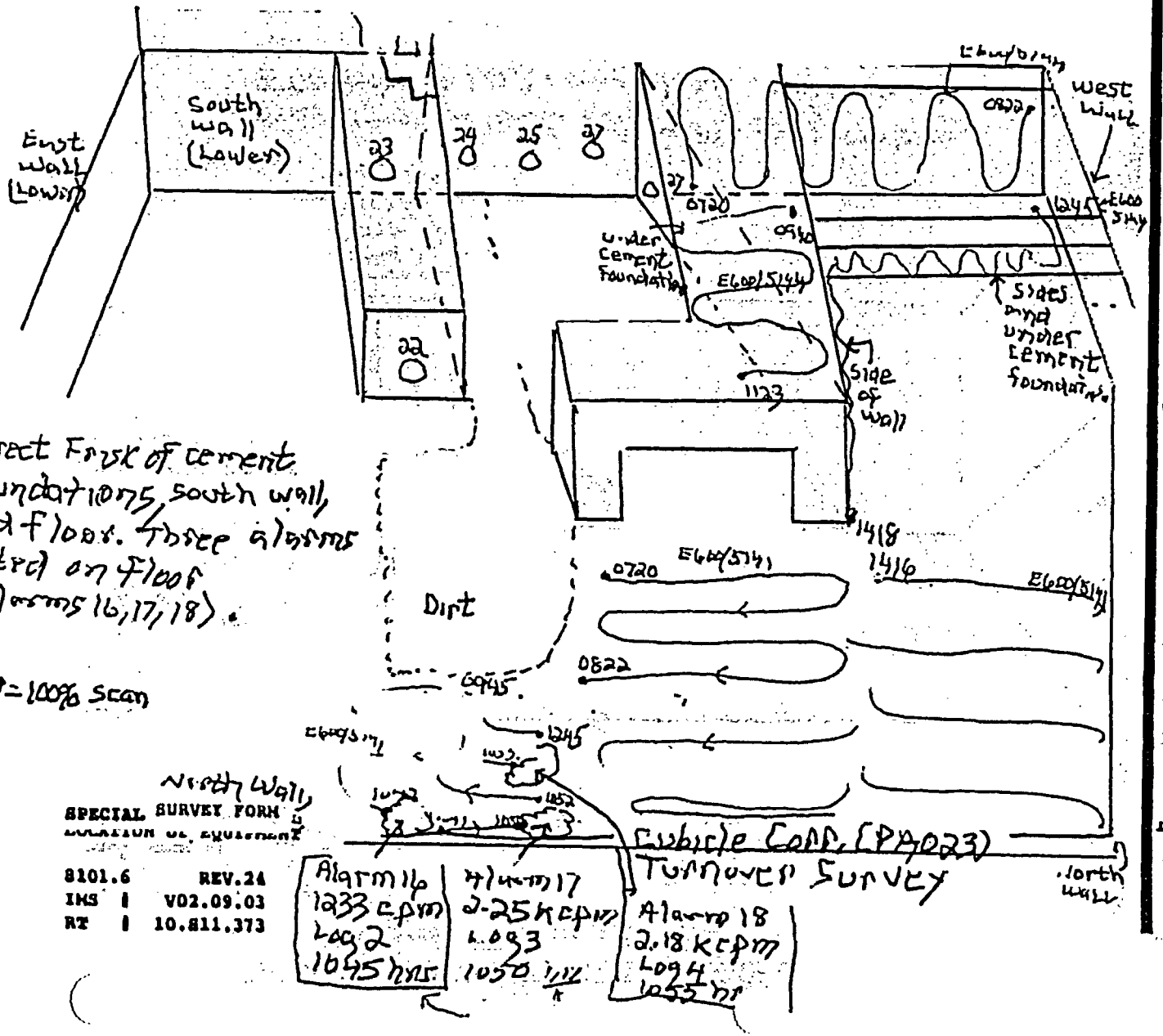
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUNDS UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21	
2	12	22	
3	13	23	
4	14	24	
5	15	25	
6	16	26	
7	17	27	
8	18	28	
9	19	29	
10	20	30	

COMMENTS: HP100/51853 (9-3-99)



Direct Frisk of cement foundations, south wall, and floor. Three alarms noted on floor (Alarms 16, 17, 18).

U = 100% scan

SPECIAL SURVEY FORM

LOCATION OF EQUIPMENT

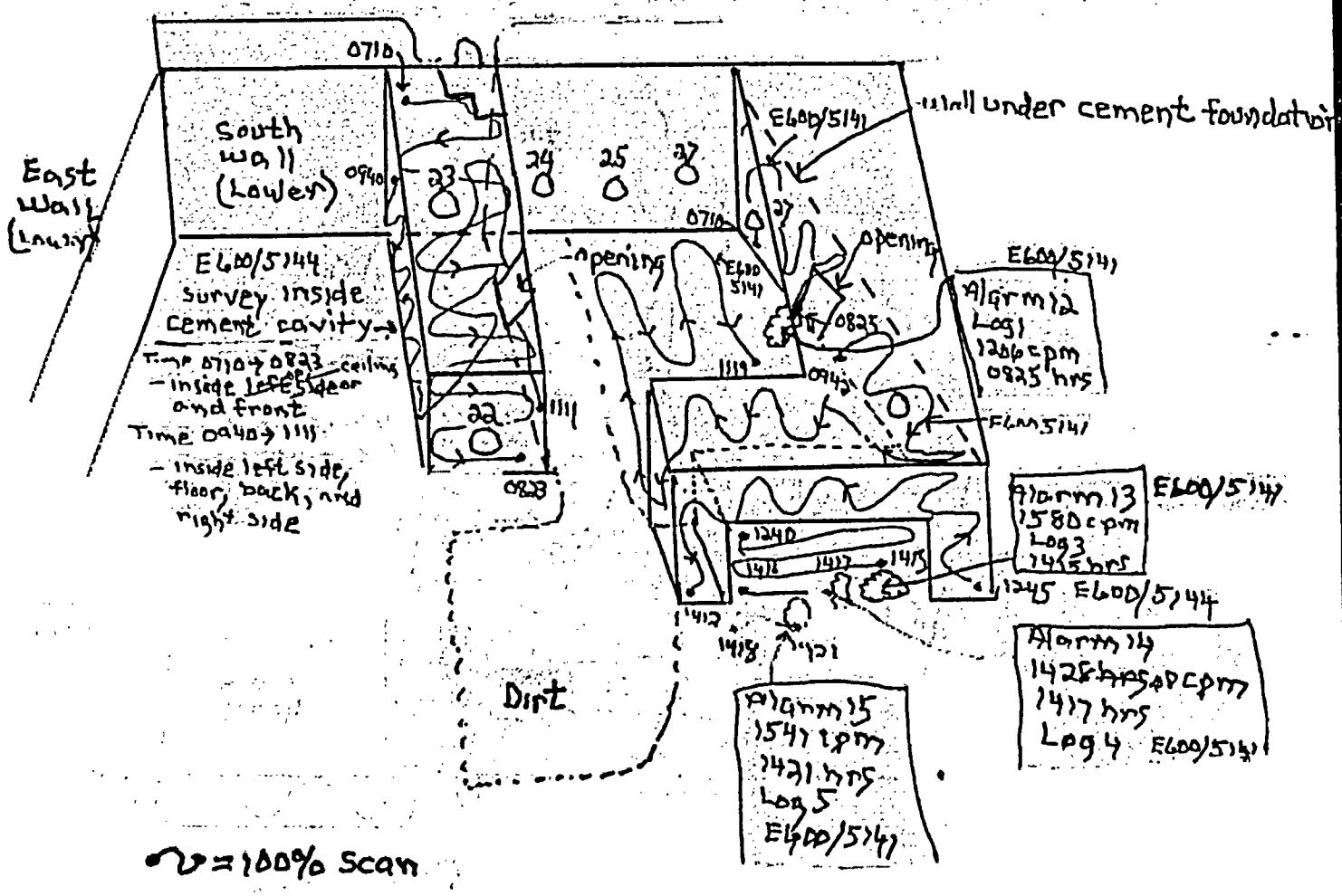
8101.6 REV.24

IMS # V02.09.03

RT # 10.811.373

RADIATION PROTECTION SURVEY F

COPY



DATE 5-6-99 700

SURVEYOR Payeng Thurston

INSTRUMENT	CAL DUE
E600/5144	8-17-99
HP100/504603	5-23-99
E600/5141	7-12-99

KEY

RADIATION GENERAL AREA

RADIATION CONTACT

SHEAR LOCATION

BARRIER MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT Cubicle Lane (PA023) - Turnover Survey

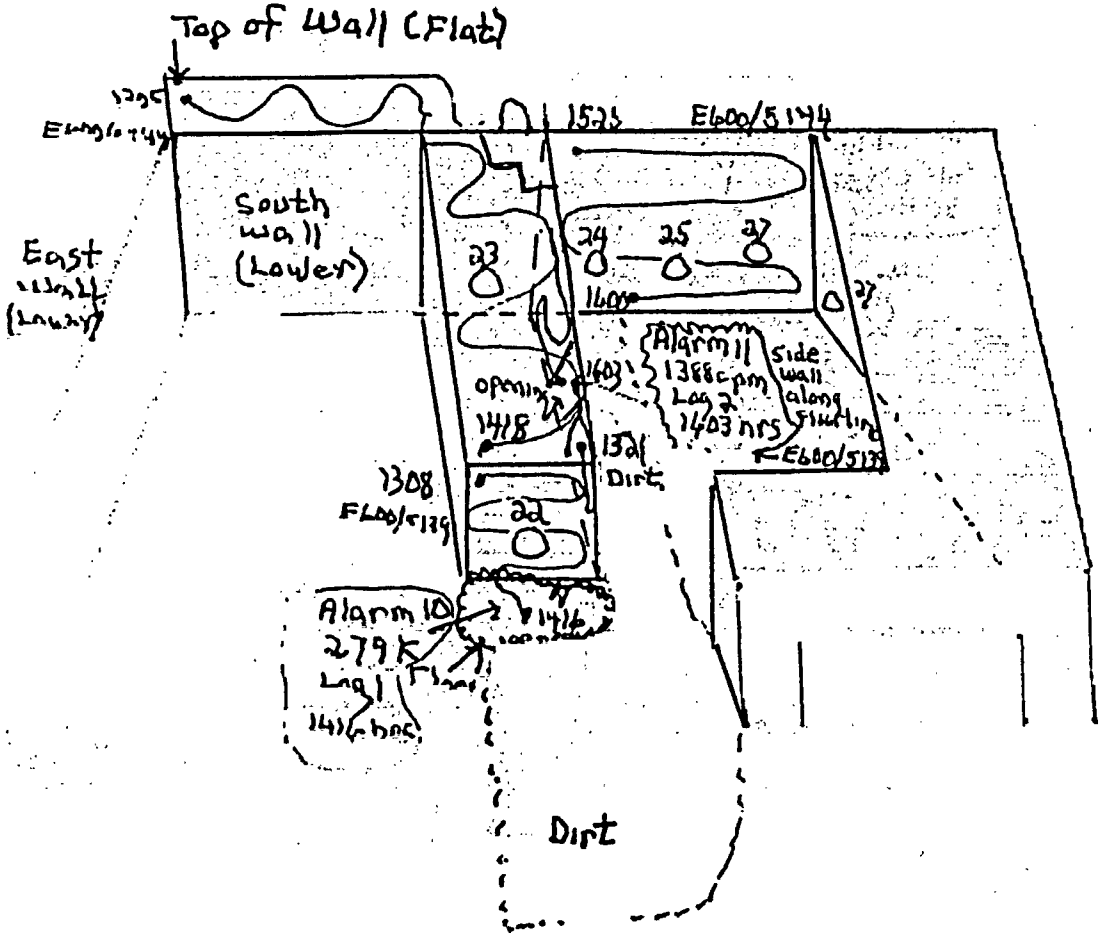
8101.6 REV.24
INS | V02.09.03
RT | 10.811.373

Direct Frisk of cement foundations from south wall, and floor. Four alarms noted (Alarms 12, 13, 14, 15) during survey. This is the 12th → 15th alarm within area.

COPY

...ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY F...



Direct Frisk of cement foundations and floor. Two alarms noted (Alarms 10, 11). This is the 10th and 11th alarm within this survey area

∿ = 100% Scan

SPECIAL SURVEY FORM

LOCATION OF EQUIPMENT Cubicle Corn (PR033) - Turnover Survey

8101.6 REV.24
IMS I V02.09.03
RT 0.811.373

DATE 5-5-99 (1300

SURVEYOR Payeun Thurston

INSTRUMENT/#	CAL DUE
E600/5144	8-17-99
HP100/50603	5-23-99
E600/5139	10-26-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

YANKEE ATOMIC ELECTRIC CO. ANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-26-99 TIME 0701

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP360/5X6032	8-18-99
E600/5069	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SHEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

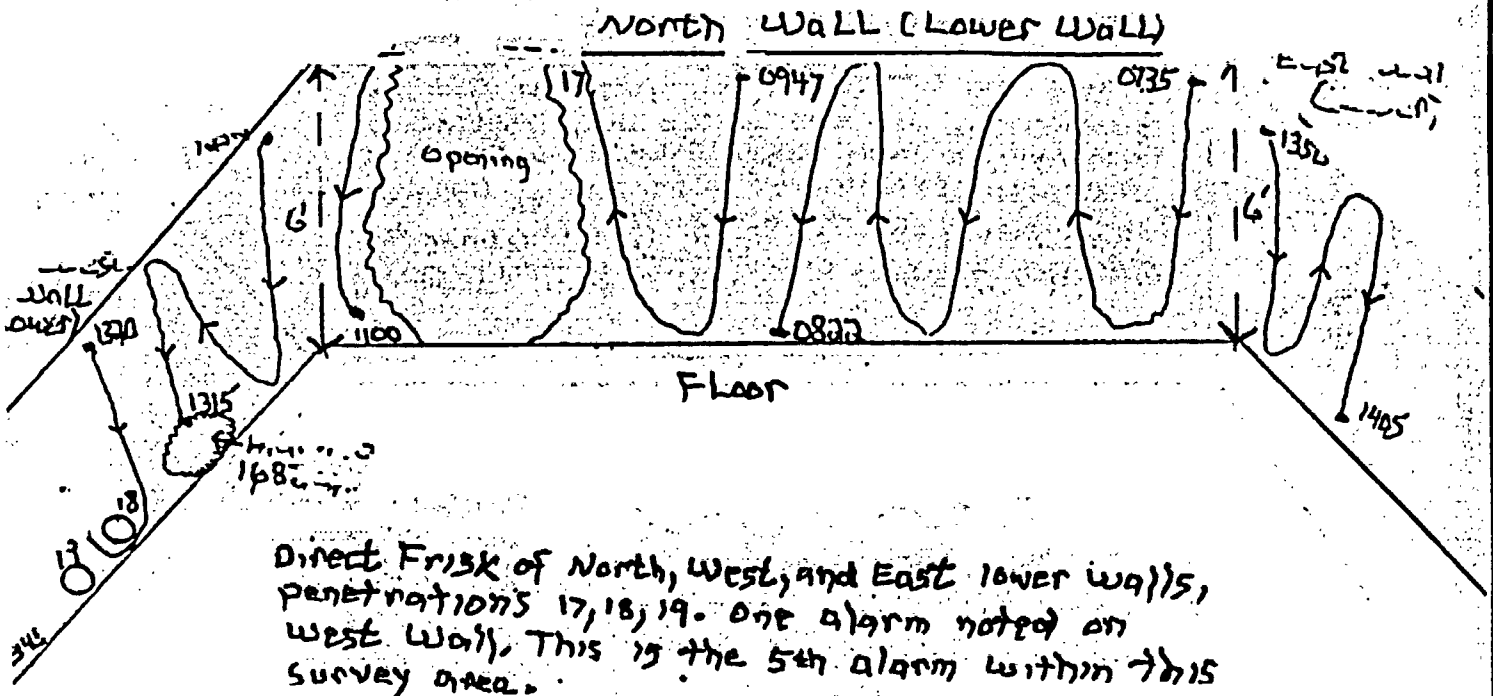
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: HP/DAV 5149 (5-10-99)



Direct Frisk of North, West, and East lower walls, penetrations 17, 18, 19. One alarm noted on West Wall. This is the 5th alarm within this survey area.

~ = 100% Scan

E600 5069 used on walls and penetrations 17, 19.
E600 5141 used on penetration 18.

SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PAD23) - Turnover Survey

S101.6 REV.24
IMS # V02.09.03
RT # 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-14-99 TIME 0800

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5049	8-17-99
HP100/51792	6-28-99
E600/5143	7-12-99

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- -X-X- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

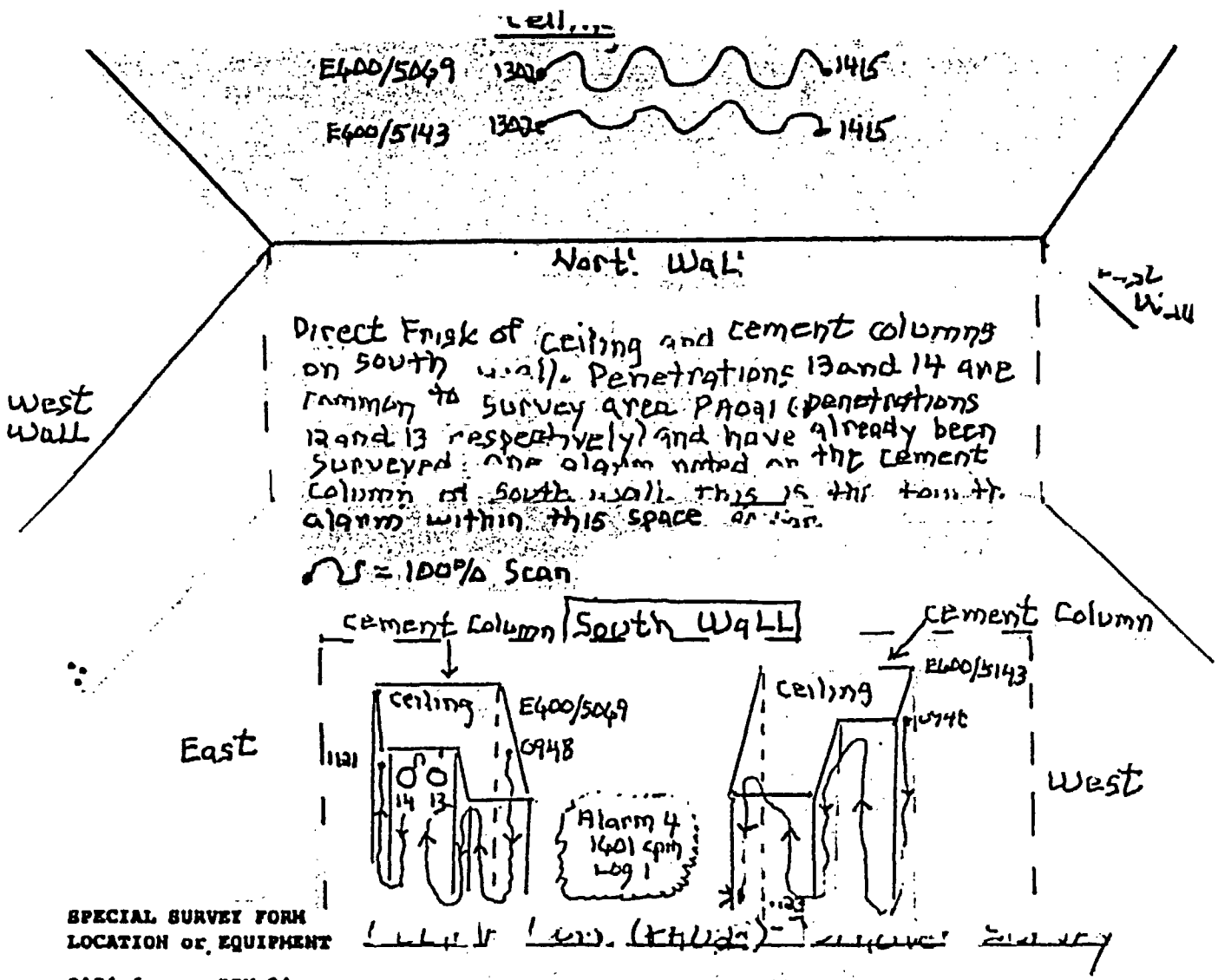
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: HP100/51853 (9-3-99)



SPECIAL SURVEY FORM
LOCATION or EQUIPMENT

8101.6 REV.24
IMS # V02.09.03
RT 0.811.373

COPY

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

DATE 4-13-99 TIME 0700

SURVEYOR Payeur, Thursto

INSTRUMENT/#	CAL DUE
E600/5140	6-17-99
HP100/51792	6-28-99
E600/5069	8-17-99

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SHEAR LOCATION
- -X-X- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

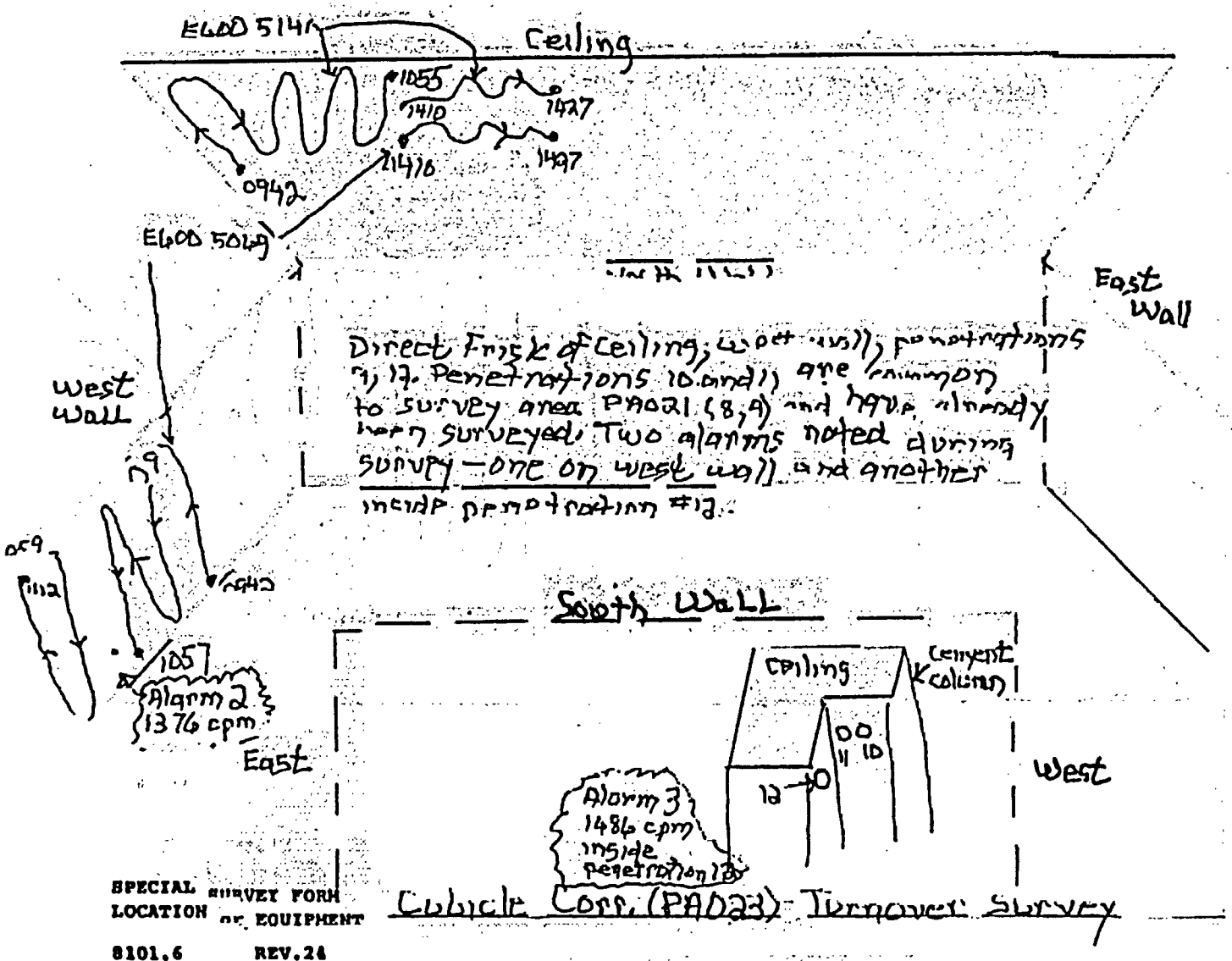
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 n/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: HP100/51893 (9-30-99)



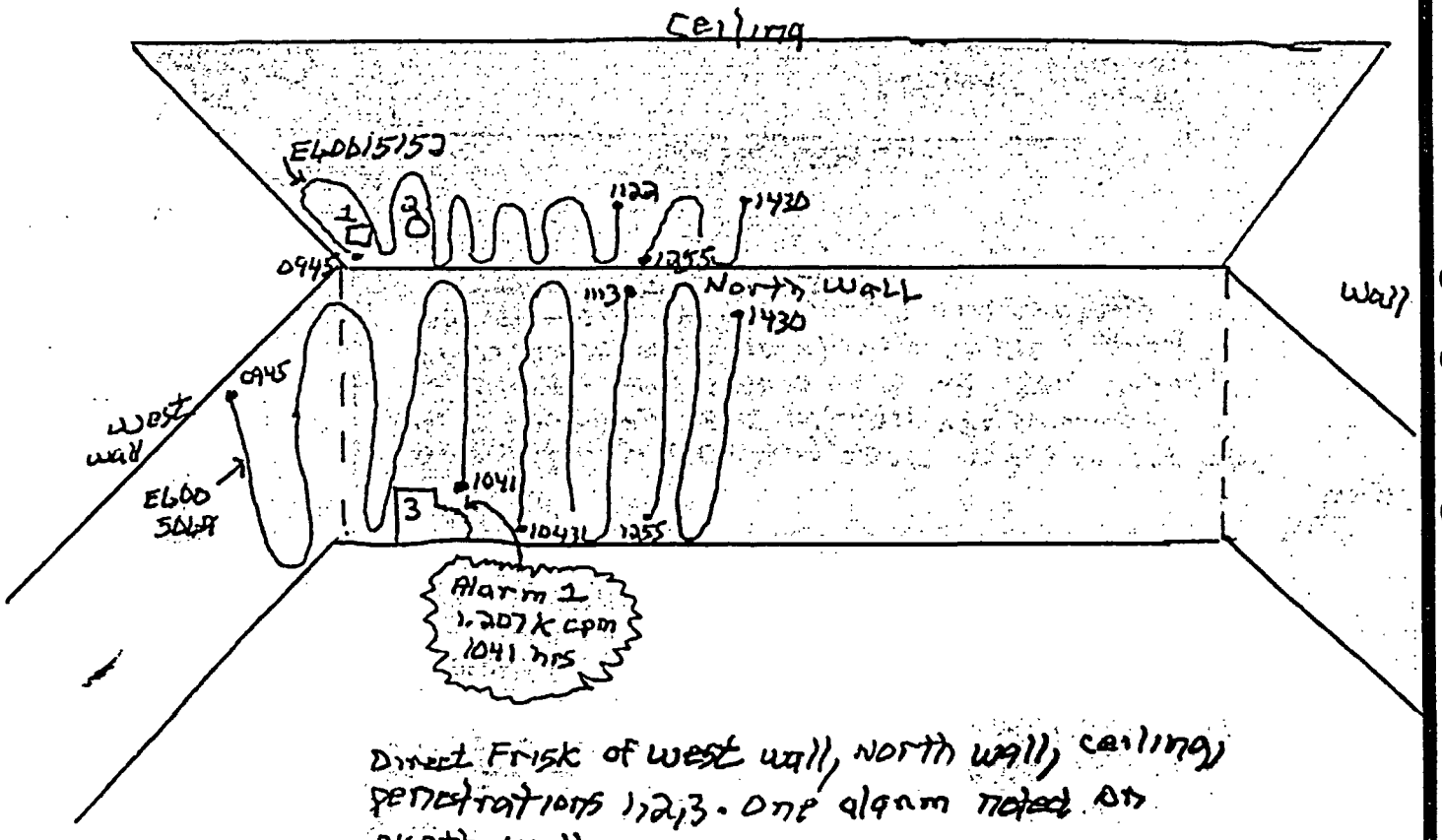
SPECIAL SURVEY FORM
LOCATION OF EQUIPMENT

8101.6 REV.24
IMS | V02.09.03
RT | 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY



Direct Frisk of west wall, North wall, ceiling, penetrations 1,2,3. One alarm noted on North wall

∿ = 100% scan

DATE 4-8-99 TIME 0800

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5152	5-12-99
HP100/55293	9-25-99
E600/5049	8-17-99

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- -X-X- BARRIER
- ⊢—⊣ MASSLINK

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

HP300/50452 (4-99)

SPECIAL SURVEY FORM

LOCATION or EQUIPMENT Cubicle Corr. (PA023) Turnover Survey

8101.6 REV.24

IMS # V02.09.03

RT # S11.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 5-10-99 TIME 700

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP100/51592	9-3-99
E600/5144	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

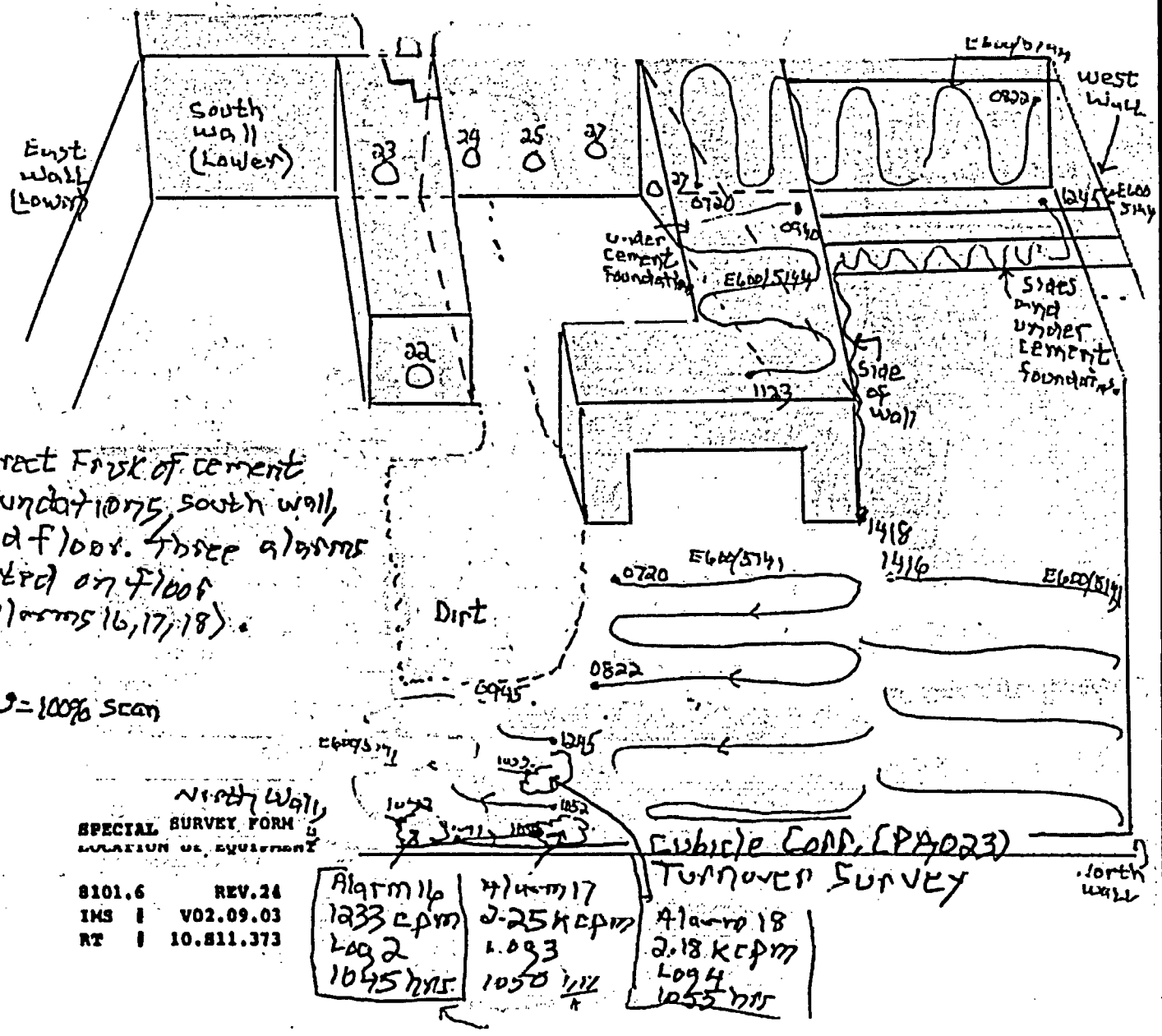
( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)



Direct Frisk of cement foundations, south wall, and floor. Three alarms noted on floor (Alarms 16, 17, 18).

U = 100% scan

SPECIAL SURVEY FORM

LOCATION OF EQUIPMENT

8101.6	REV.24
IMS #	V02.09.03
RT #	10.811.373

RADIATION PROTECTION SURVEY F

COPY

DATE 5-6-99 :0700

SURVEYOR Payeur, Thurston

INSTRUMENT	CAL DUE
E600/5144	8-17-99
HP100/506603	5-23-99
E600/5141	7-12-99

KEY

RADIATION GENERAL AREA

RADIATION CONTACT

SHEAR LOCATION

BARRIER HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

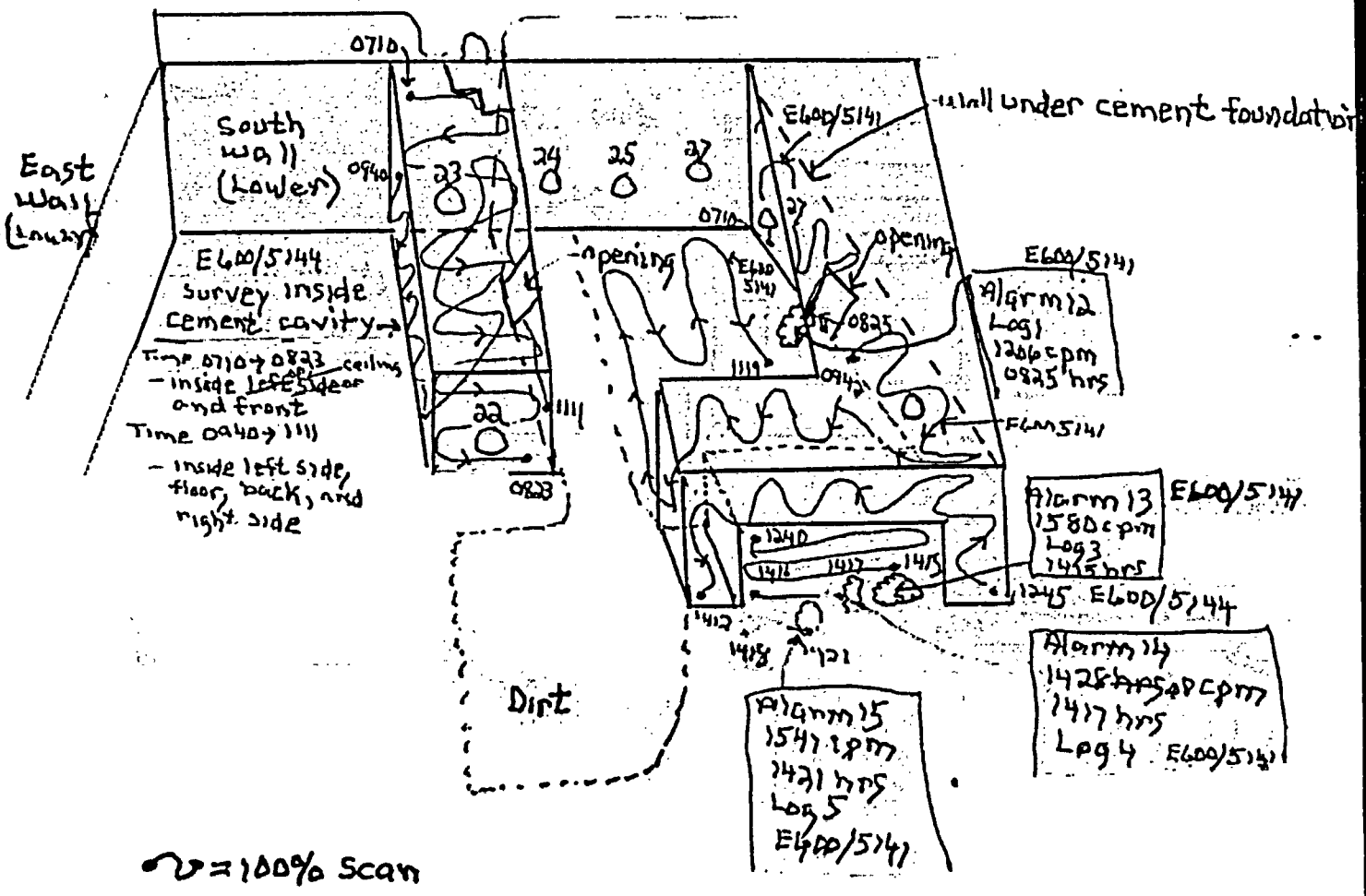
( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/571853 (9-3-99)



= 100% Scan

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT Cubicle Corr. (PA023) - Turnover Survey

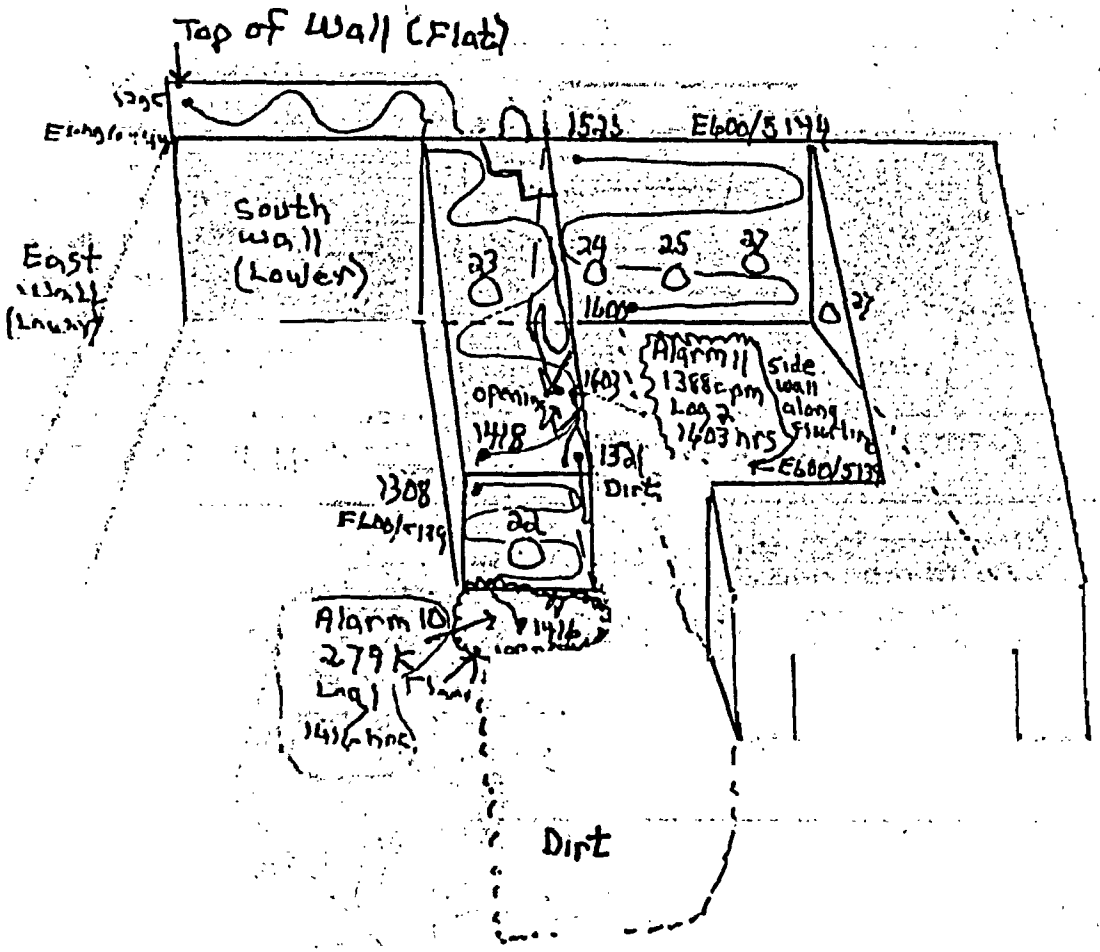
8101.6 REV.24
INS V02.09.03
RT 10.811.373

Direct Frisk of cement foundations from south wall, and floor. Four alarms noted (Alarms 12, 13, 14, 15) during survey. This is the 12th → 15th alarm within area.

COPY

...ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM



Direct Frisk of cement foundations and floor. Two alarms noted (Alarms 10, 11). This is the 10th and 11th alarm within this survey area

∴ = 100% Scan

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT Cubicle Cont. (PA023) - Turnover Survey

8101.6 REV.24
IMS | V02.09.03
RT | 10.811.373

DATE 5-5-99 TIME 1300

SURVEYOR Payeun Thunston

INSTRUMENT/#	CAL DUE
E600/5144	8-17-99
HP100/50603	5-23-99
E600/5139	10-26-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SWEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk
( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SWEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

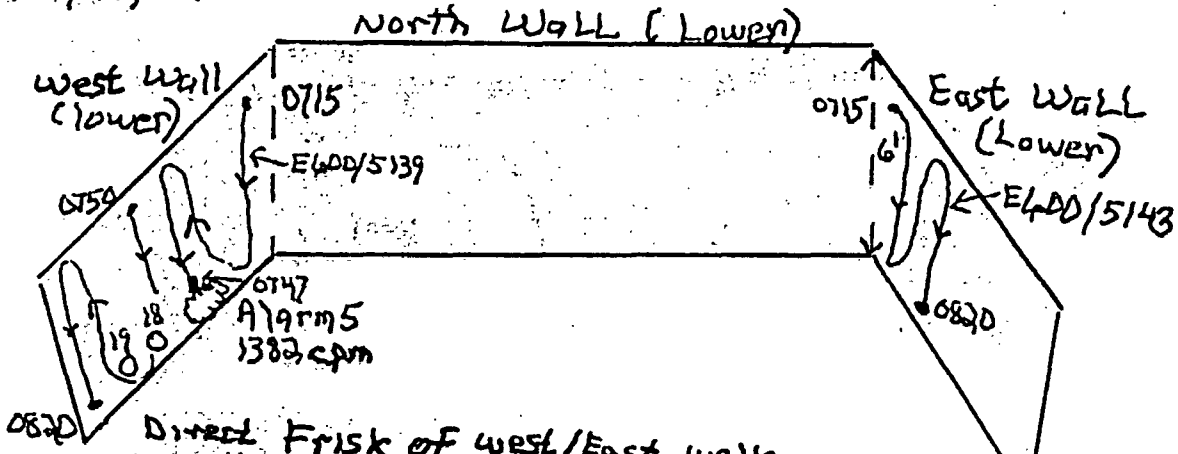
COMMENTS:
HP100/51853 (9-3-99)

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

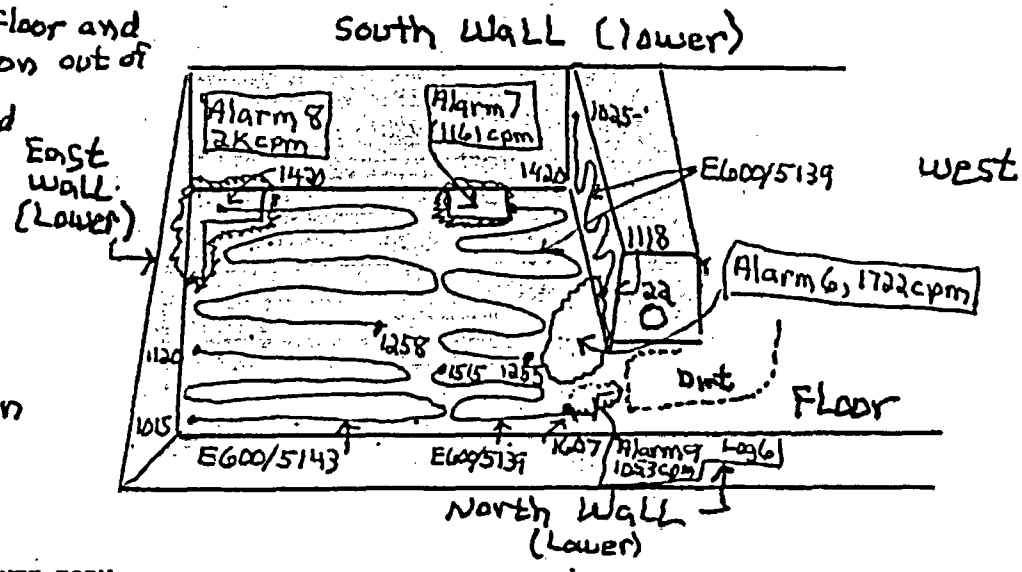
Resurveyed this area as meter failed source check on 4-24-99



Direct Frisk of west/East walls penetration 19. One alarm noted on west wall. This is the 5th alarm in this survey area.

Direct Frisk of floor and cement foundation out of south wall. Three alarms noted on floor-one alarm noted on foundation from south wall.

U = 100% Scan



SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PA023) - Turnover Survey

B101.6 REV.24
IMS A V02.09.03
RT 10.811.373

DATE 5-3-99 TIME 0700

SURVEYOR Dayeun, Thurston

INSTRUMENT/#	CAL DUE
E600/5139	10-26-99
HP100/50603	5-23-99
E600/5143	7-12-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SHEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-14-99 TIME 0800

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5069	8-17-99
HP100/51792	4-28-99
E600/5143	7-12-99

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- -X-X- BARRIER
- HASSLINK

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

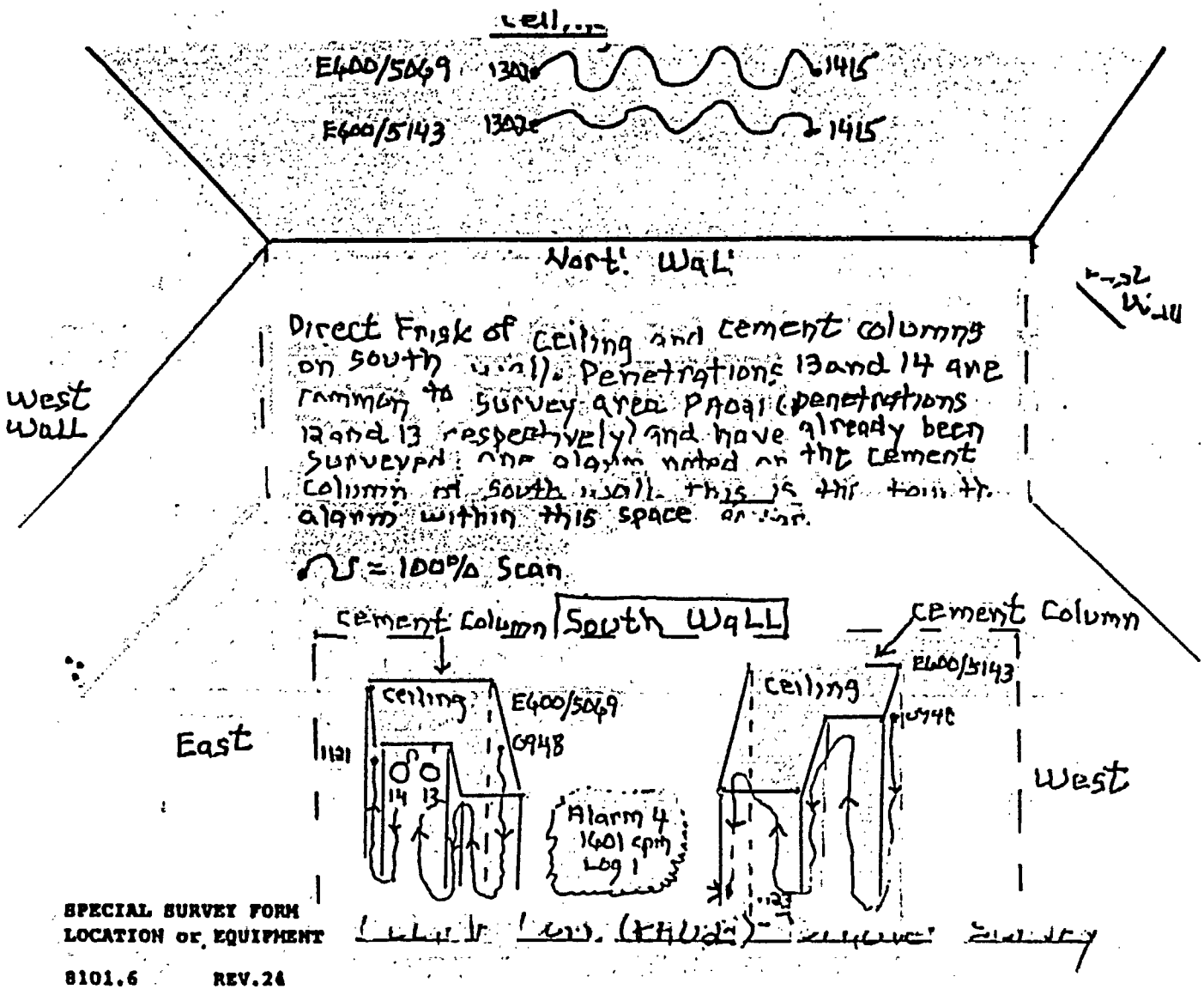
( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)



SPECIAL SURVEY FORM
LOCATION or EQUIPMENT

8101.6 REV.24
IHS | V02.09.03
RT | 10.811.373

COPY

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

DATE 4-13-99 TIME 0700

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5140	6-17-99
HP100/51792	6-28-99
E600/5069	8-17-99

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SHEAR LOCATION
- ─ BARRIER ─ HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

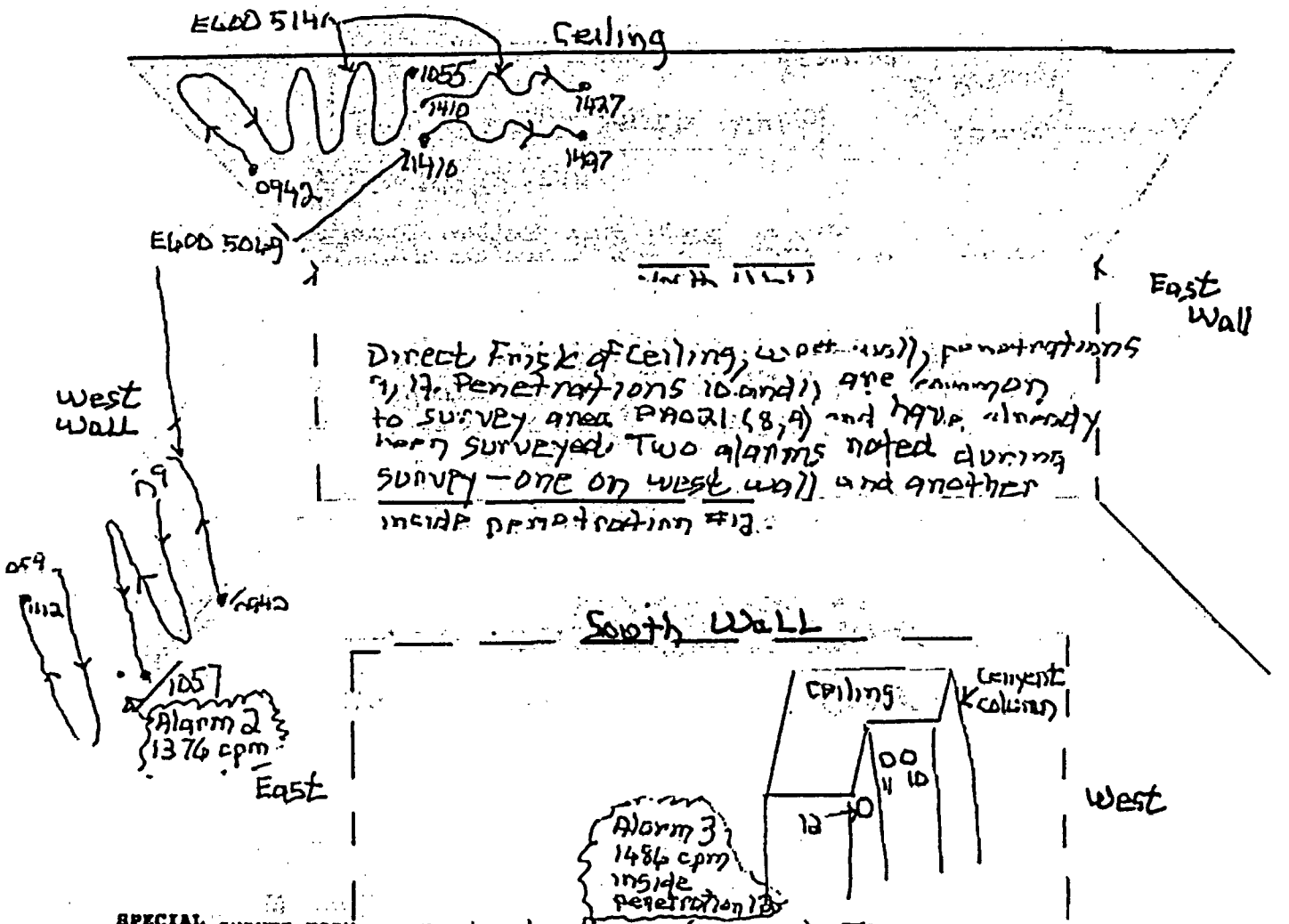
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: HP100/51893 (9-30-99)



Cubicle Corr. (PA023) - Turnover Survey

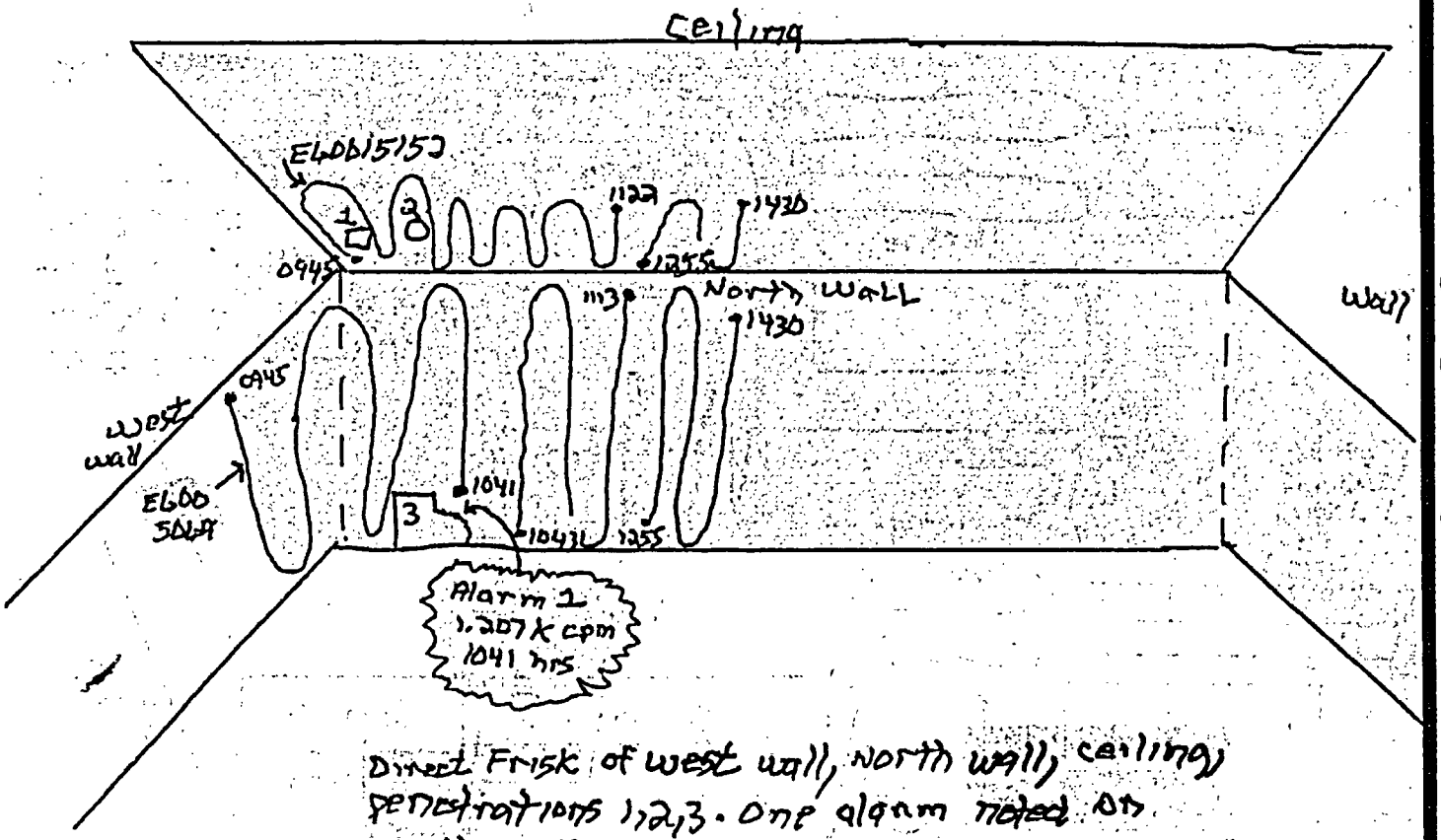
SPECIAL LOCATION SURVEY FORM OR EQUIPMENT

8101.6 REV.24
IMS I V02.09.03
RI 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY



Direct Frisk of west wall, North wall, ceiling penetrations 1,2,3. One alarm noted on north wall

∩ = 100% scan

DATE 4-8-99 TIME 0500

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/15152	5-12-99
HP100/55293	9-25-99
E600/5069	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINE

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

HP360/50652 (4-14-99)

SPECIAL SURVEY FORM

LOCATION or EQUIPMENT Cubicle Cont. (PA023) Turnover Survey

8101.6 REV.24

IMS # V02.09.03

RT # 10.S11.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 5-10-99 TIME 700

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP100/51592	9-3-99
E600/5144	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- HASSLINK

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

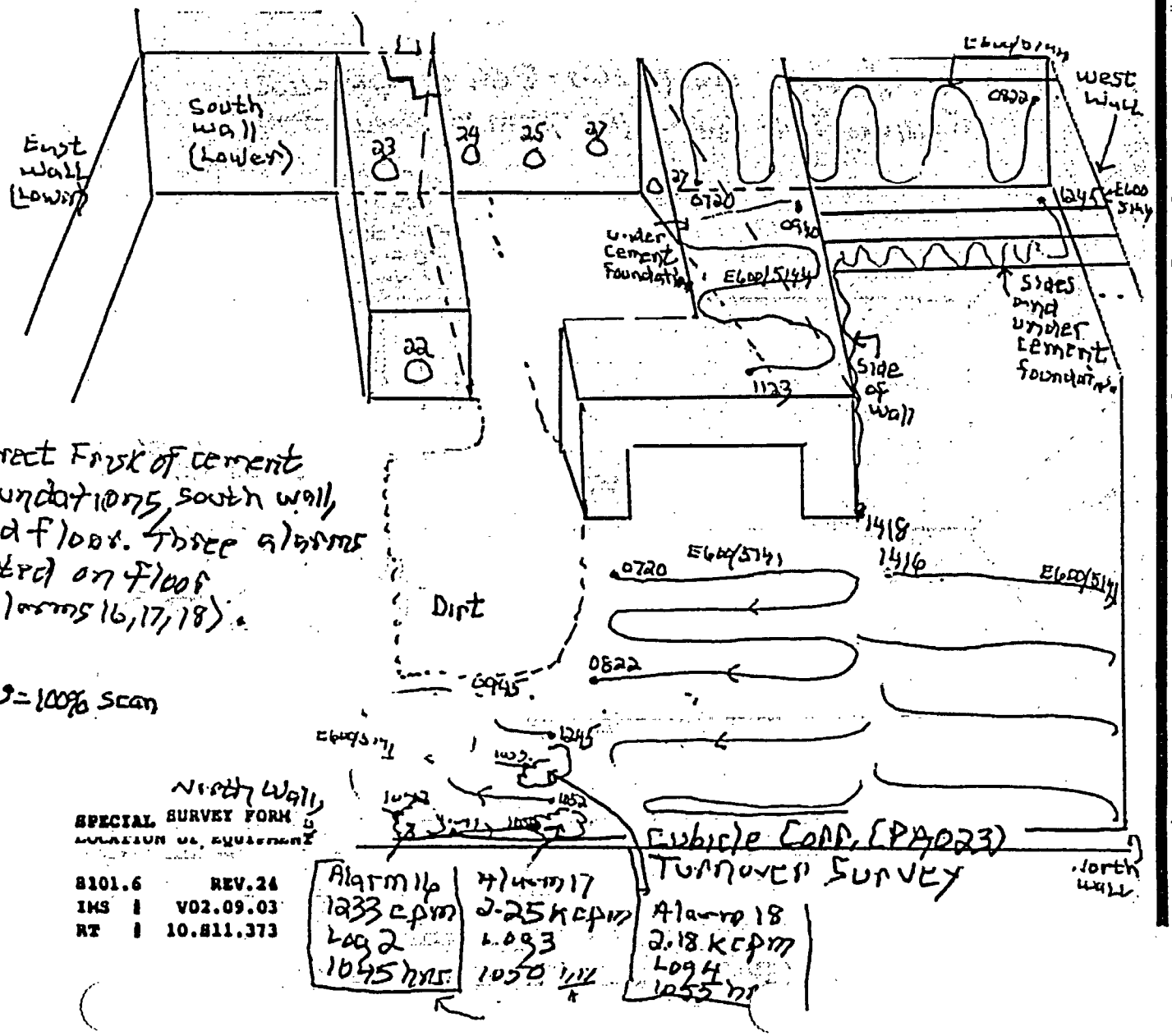
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1		11	21
2		12	22
3		13	23
4		14	24
5		15	25
6		16	26
7		17	27
8		18	28
9		19	29
10		20	30

COMMENTS: HP100/51853 (9-3-99)



SPECIAL SURVEY FORM

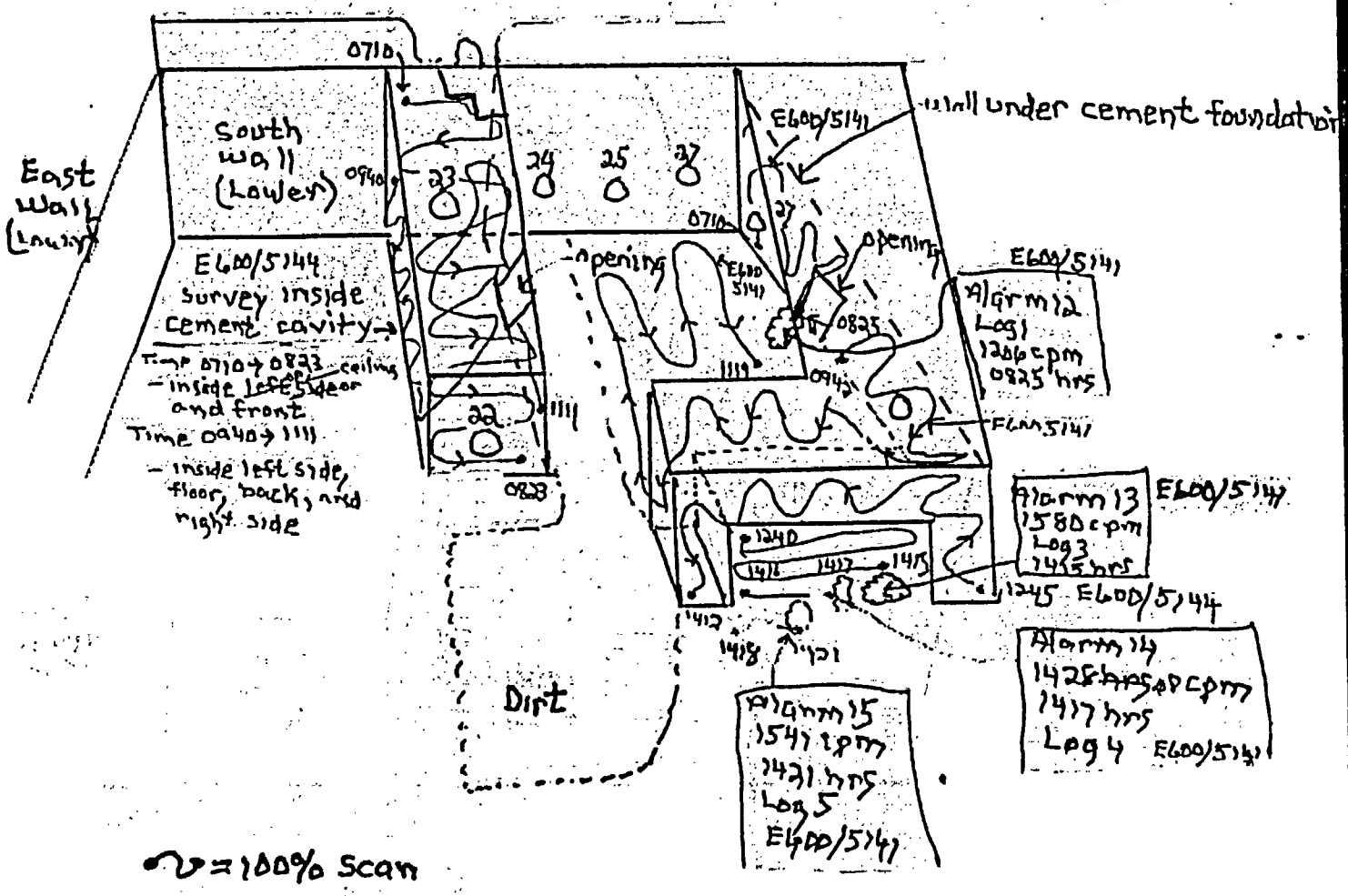
LOCATION OF EQUIPMENT

8101.6	REV.24
IMS #	V02.09.03
RT #	10.811.373

RADIATION PROTECTION SURVEY F

11

COPY



DATE 5-6-99 1700

SURVEYOR Payne, Thurston

INSTRUMENT	CAL DUE
E600/5144	8-17-99
HP100/506073	5-23-99
E600/5141	7-12-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT Cubicle Corr. (PA023) - Turnover Survey

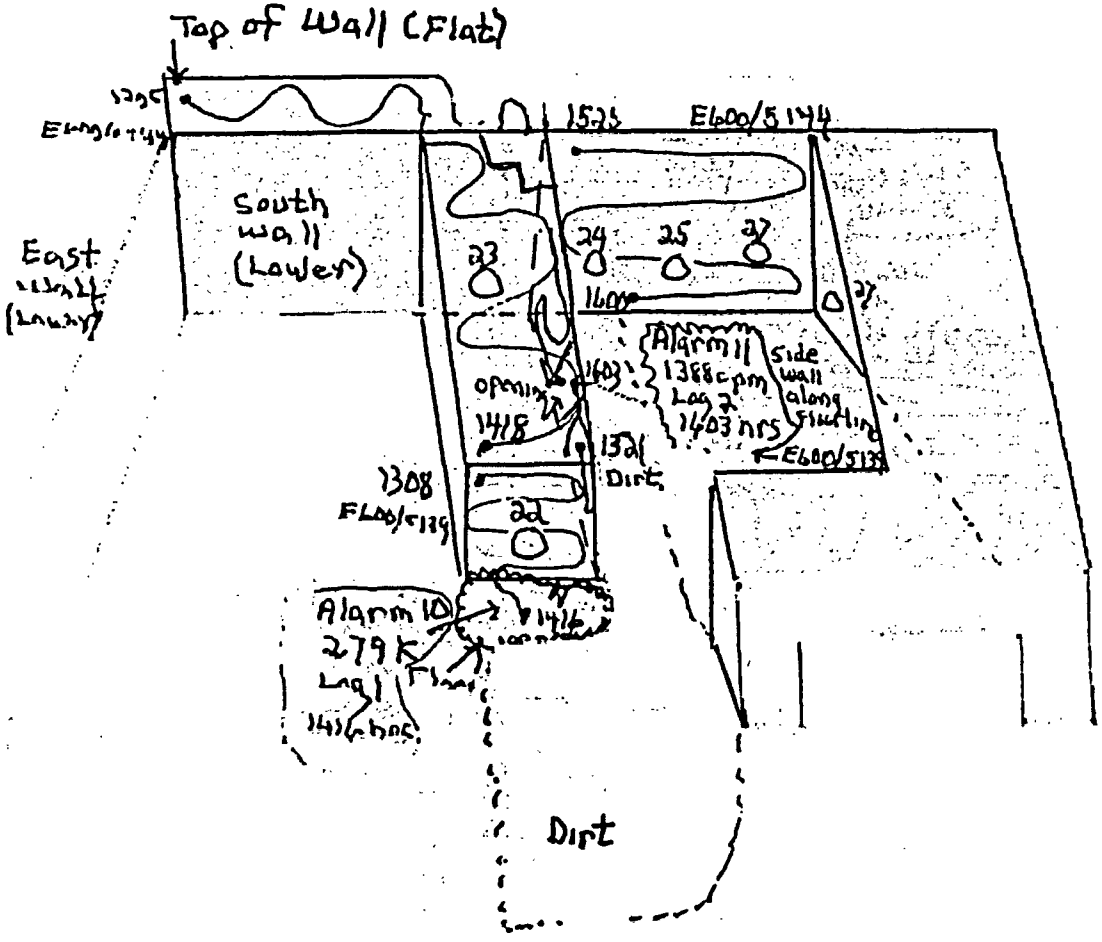
8101.6 REV.24
INS # V02.09.03
RT # 10.811.373

Direct Frisk of cement foundations from south wall, and floor. Four alarms noted (Alarms 12, 13, 14, 15) during survey. This is the 12th → 15th alarm within area.

COPY

...ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY F...



Direct Frisk of cement foundations and floor. Two alarms noted (Alarms 10, 11). This is the 10th and 11th alarm within this survey area

∿ = 100% Scan

SPECIAL SURVEY FORM

LOCATION OF EQUIPMENT Cubicle Corr. (PA033) - Turnover Survey

8101.6 REV.24
IMS V02.09.03
RT).811.373

DATE 5-5-99 ( ) 1300

SURVEYOR Payeun Thunstan

INSTRUMENT/#	CAL DUE
E600/5144	8-17-99
HP100/50603	5-23-99
E600/5139	10-26-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINE

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

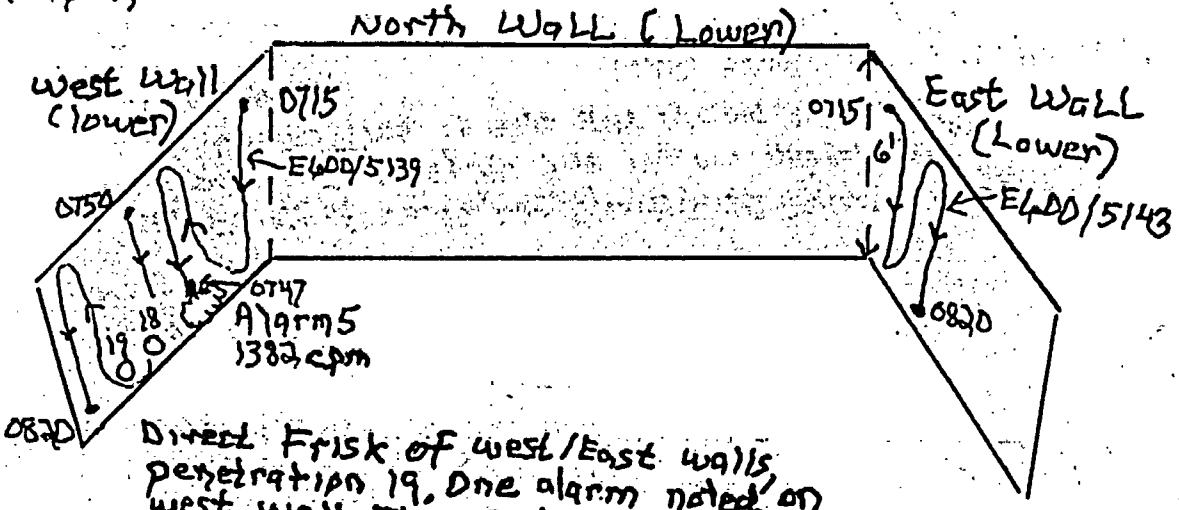
HP100/51853 (9-3-99)

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

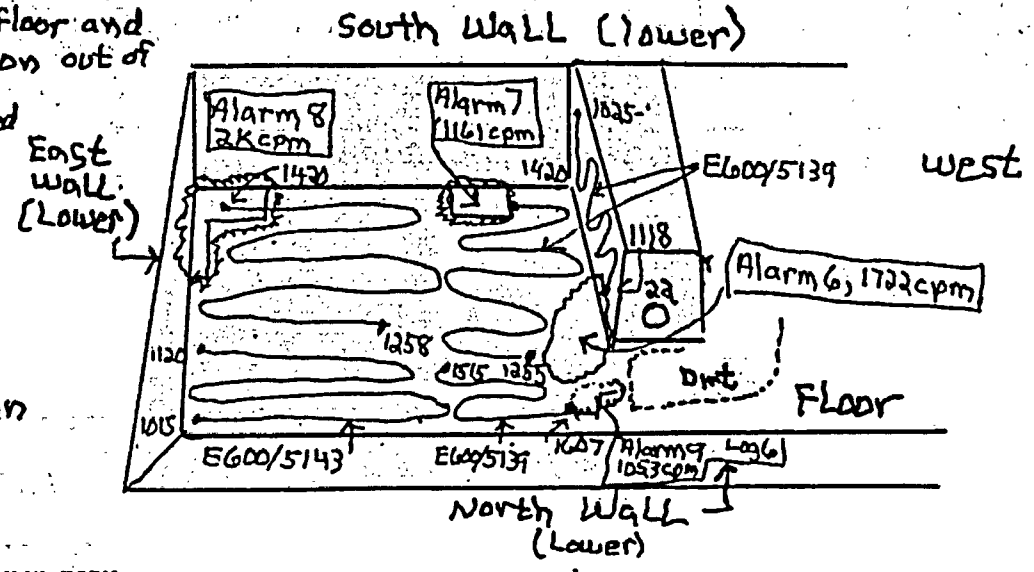
Resurveyed this area as meter failed source check on 4-26-99



Direct Frisk of west/East walls penetration 19. One alarm noted on west wall. This is the 5th alarm in this survey area.

Direct Frisk of floor and cement foundation out of south wall. Three alarms noted on floor-one alarm noted on foundation from south wall.

U = 100% scan



SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PA023)-Turnover Survey

8101.6 REV.24
IMS | V02.09.03
RT | 10.811.373

DATE 5-3-99 TIME 0700

SURVEYOR Dayeun, Thurston

INSTRUMENT/#	CAL DUE
E600/5139	10-26-99
HP100/501603	5-23-99
E600/5143	7-12-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-26-99 TIME 0701

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP360/506022	8-18-99
E600/5069	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SHEAR LOCATION
- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

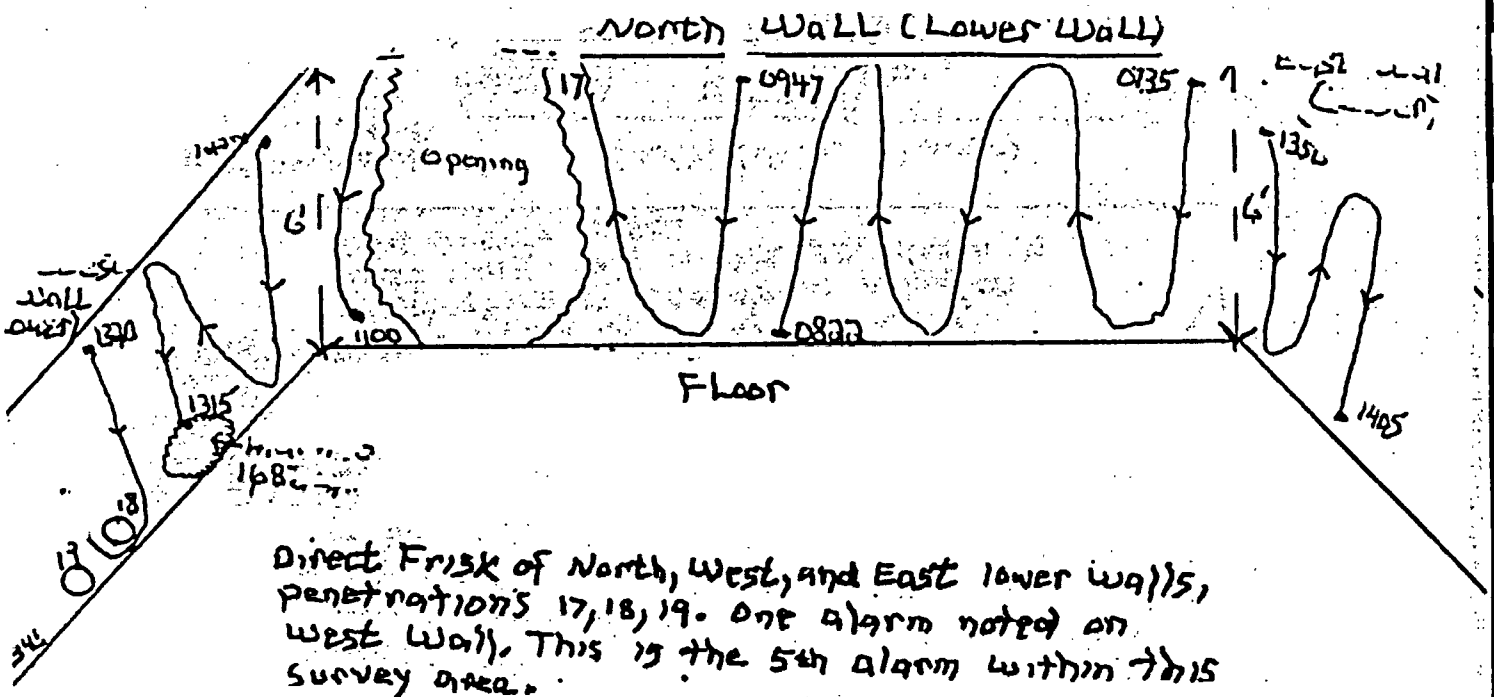
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: HP/DAV 5141 (2-18-99)



Direct Frisk of North, West, and East lower walls, penetrations 17, 18, 19. One alarm noted on West Wall. This is the 5th alarm within this survey area.

∿ = 100% Scan

E600 5069 used on walls and penetrations 17, 19.
E600 5141 used on penetration 18.

SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PAD23) - Turnover Survey

8101.6 REV.24
IMS V02.09.03
RT 10.811.373

COPY

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

DATE 4-13-99 TIME 0700

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5140	6-17-99
HP100/51792	6-28-99
E600/5069	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

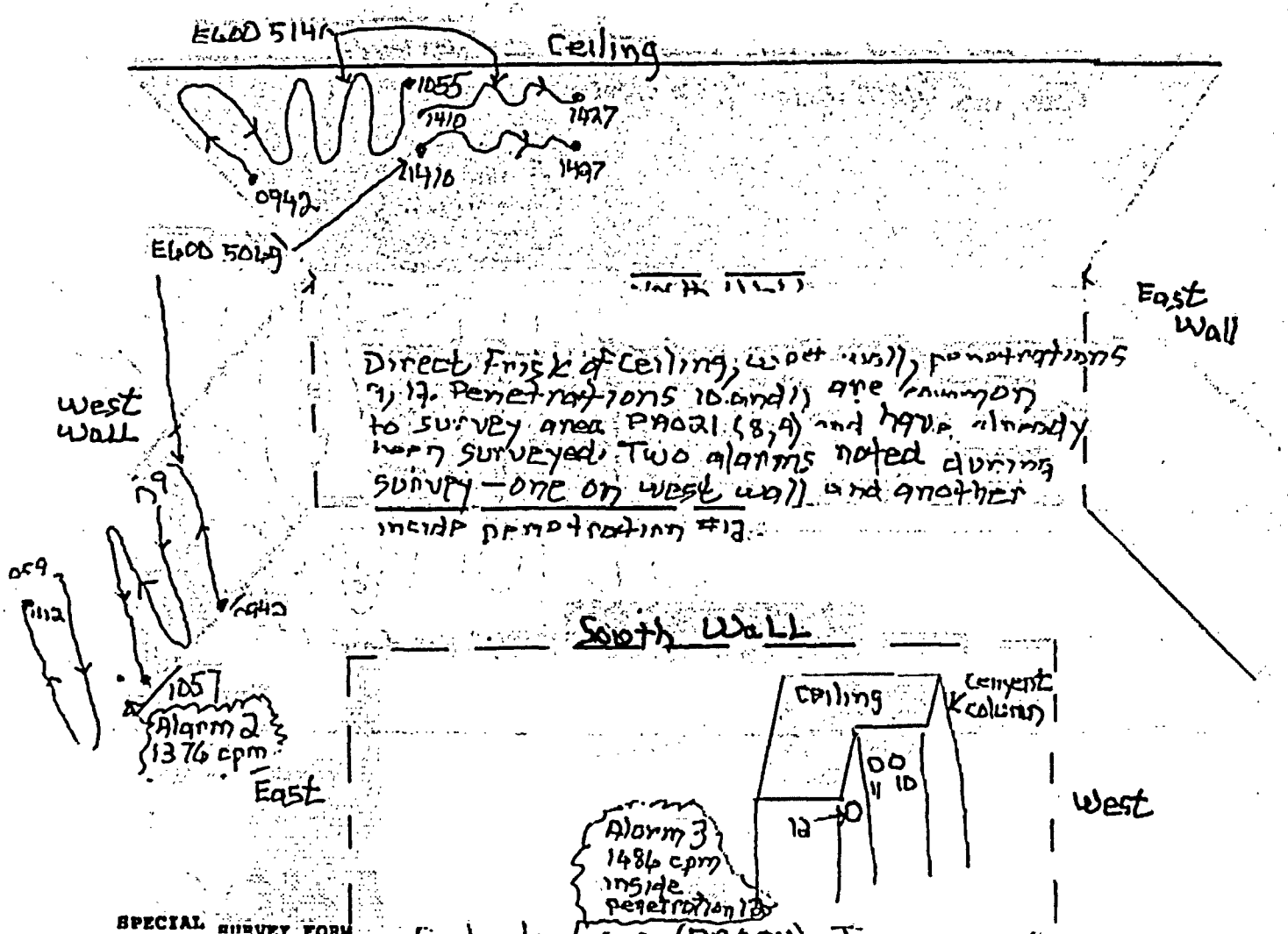
( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51893 (9-30-99)



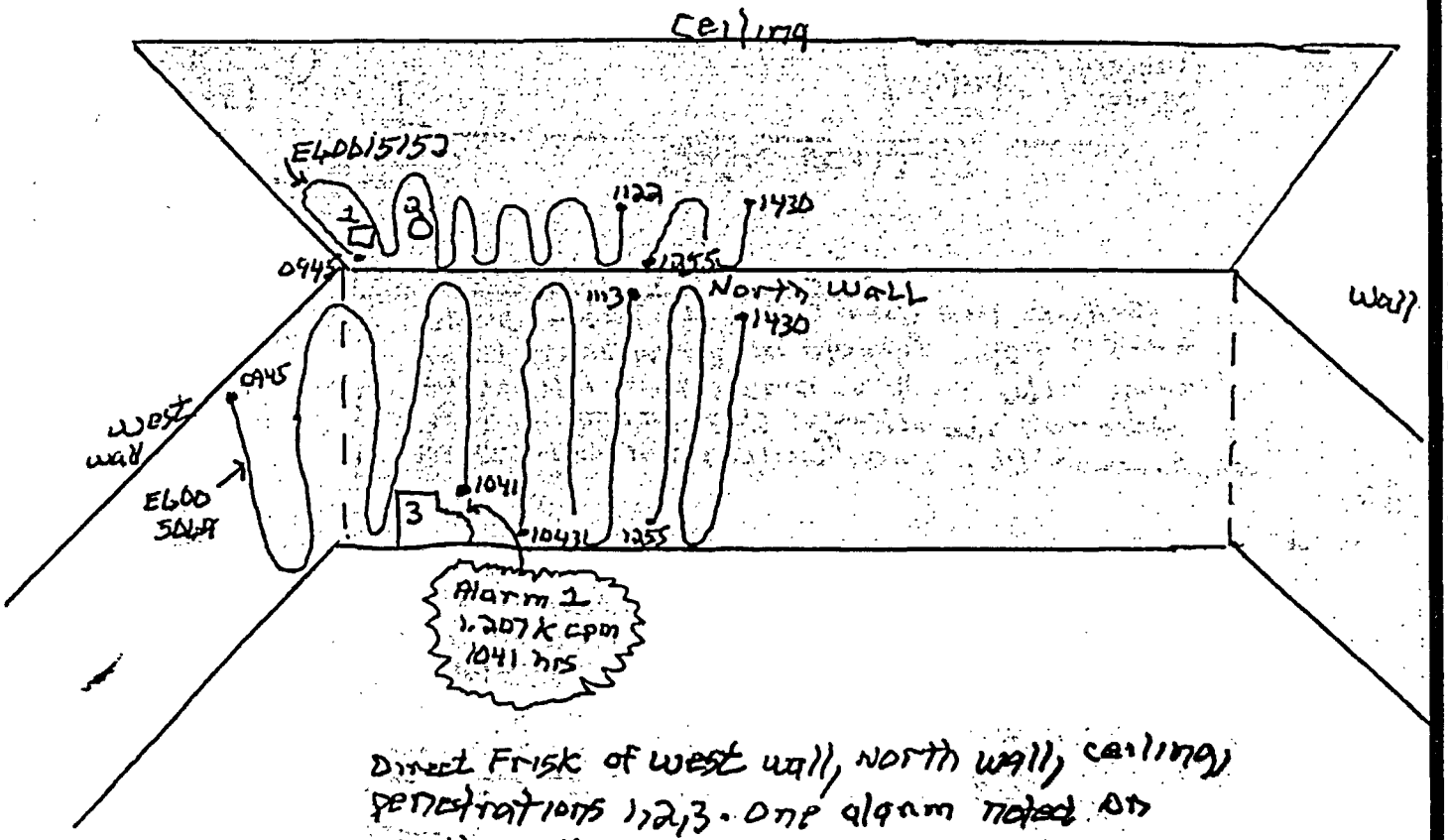
SPECIAL LOCATION SURVEY FORM or EQUIPMENT

8101.6 REV.24
IMS | V02.09.03
RT | 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY



Direct Frisk of west wall, North wall, ceiling, penetrations 1,2,3. One alarm noted on North wall

∿ = 100% scan

DATE 4-8-99 TIME 0800

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/51152	5-12-99
HP100/55293	9-25-99
E600/50149	8-17-99

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SHEAR LOCATION
- ~~X~~ ~~X~~ BARRIER
- ├──┤ MASSLINE

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(x) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (4-3-99)

HP3100/50452 (4-99)

SPECIAL SURVEY FORM

LOCATION or EQUIPMENT Cubicle Cont. (PA023) Turnover Survey

8101.6 REV.24

IMS # V02.09.03

RT # S11.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 5-10-99 TIME 0700

SURVEYOR Payelin Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP100/51592	9-3-99
E600/5144	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

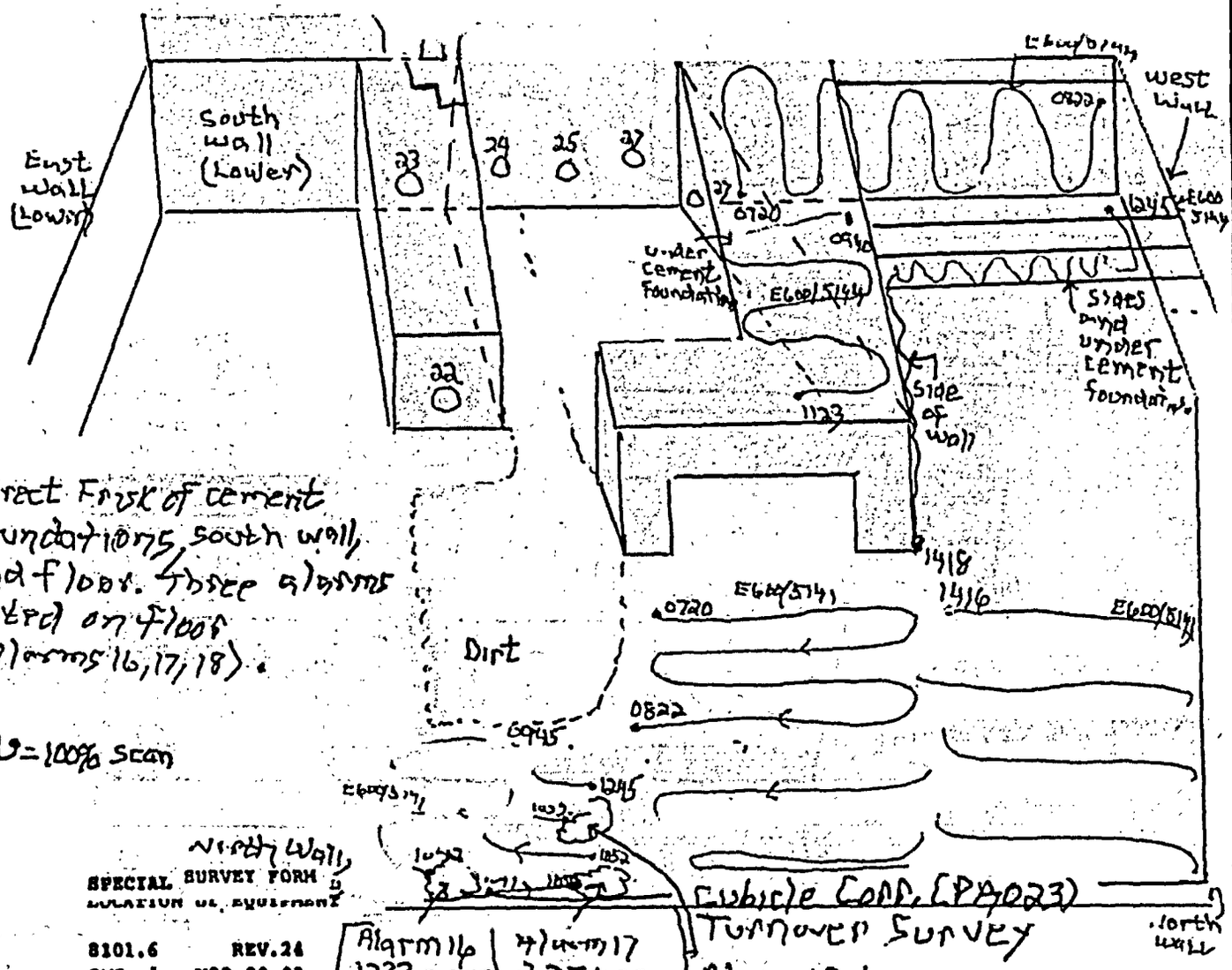
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: HP100/51853 (9-3-99)



Direct Frisk of cement foundations, south wall, and floor. Three alarms noted on floor (Alarms 16, 17, 18).

V = 100% Scan

SPECIAL SURVEY FORM

LOCATION OF EQUIPMENT

8101.6 REV.24
IMS # V02.09.03
RT # 10.811.373

Alarm 16	Alarm 17	Alarm 18
1233 cpm	2.25 kcpm	2.18 kcpm
Log 2	1.093	Log 4
1045 hrs	1050 hrs	1055 hrs

RADIATION PROTECTION SURVEY F

COPY

DATE 5-6-99 : 0700

SURVEYOR Payeur, Thurston

INSTRUMENT	CAL DUE
E600/5144	8-17-99
HP100/506603	5-23-99
E600/5141	7-12-99

KEY

RADIATION GENERAL AREA

RADIATION CONTACT

SMEAR LOCATION

BARRIER HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

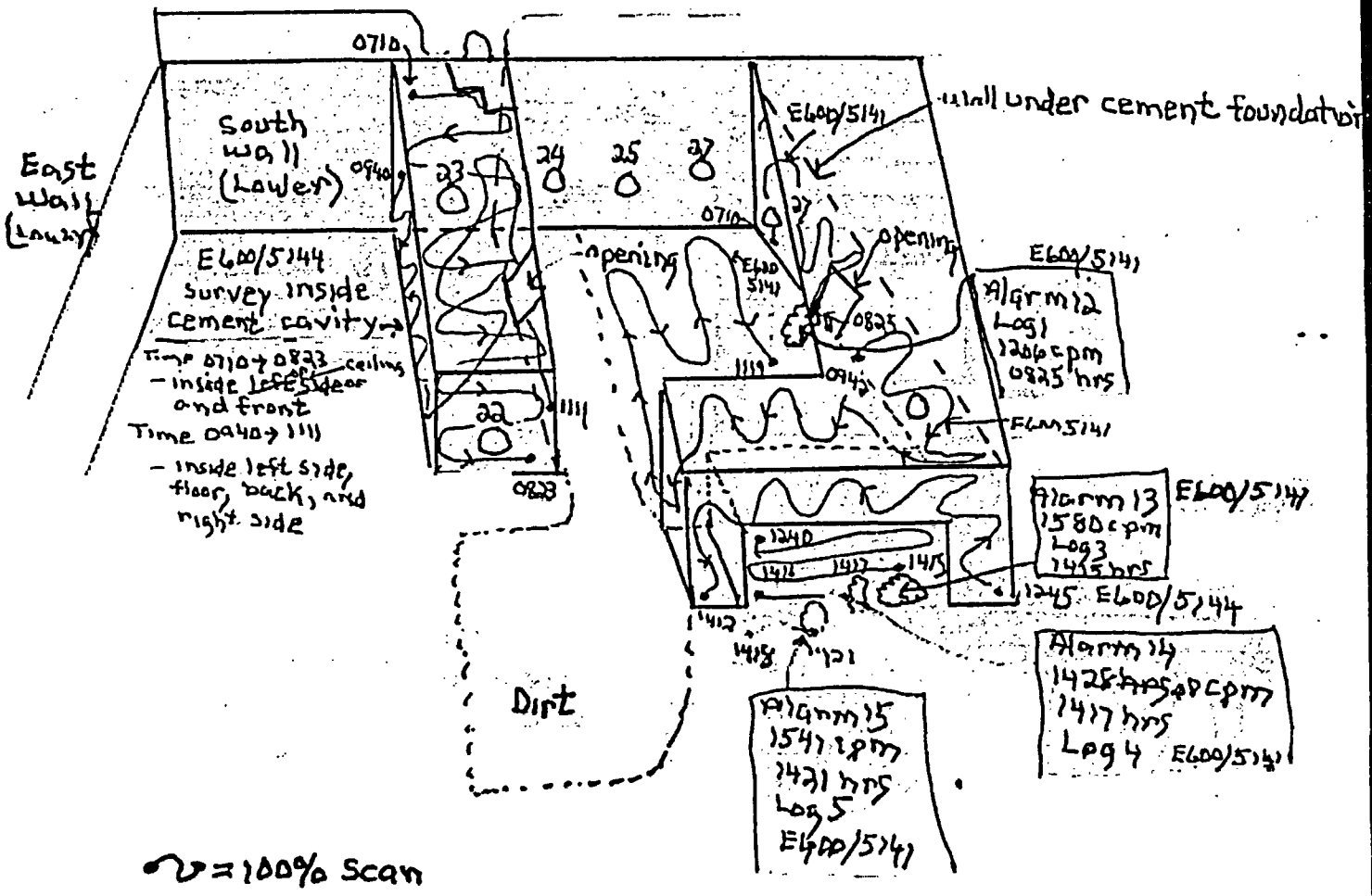
( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)



∿ = 100% Scan

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT Cubicle Conc. (PA023) - Turnover Survey

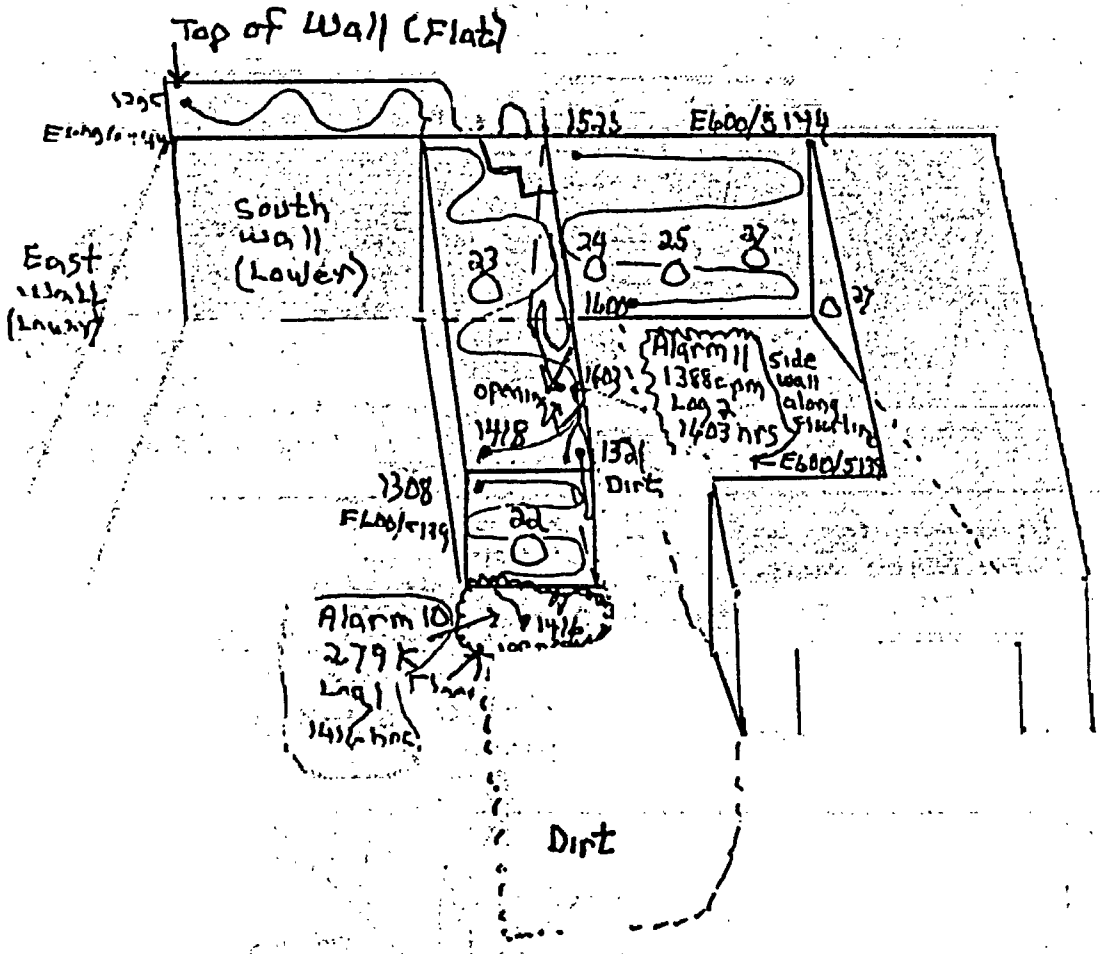
8101.6 REV.24
IMS V02.09.03
RT 10.811.373

Direct Frisk of cement foundations from south wall, and floor. Four alarms noted (Alarms 12, 13, 14, 15) during survey. This is the 12th → 15th alarm within area.

COPY

...ANY

RADIATION PROTECTION SURVEY F...



Direct Frisk of cement foundations and floor. Two alarms noted (Alarms 10, 11). This is the 10th and 11th alarm within this survey area

∴ = 100% scan

SPECIAL SURVEY FORM

LOCATION OF EQUIPMENT Cubicle Corr. (PB023) - Turnover Survey

8101.6 REV.24
IMS | V02.09.03
RT | 10.811.373

DATE 5-5-99 1300

SURVEYOR Payeun, Thunstad

INSTRUMENT/#	CAL DUE
E600/5144	8-17-99
HP100/50603	5-23-99
E600/5139	10-26-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

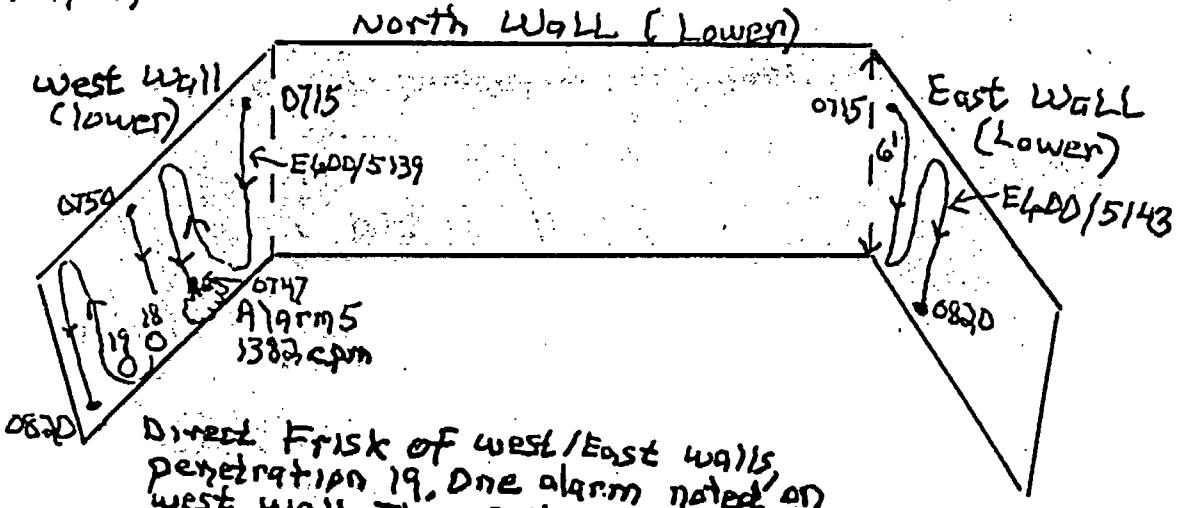
HP100/51853 (9-3-99)

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

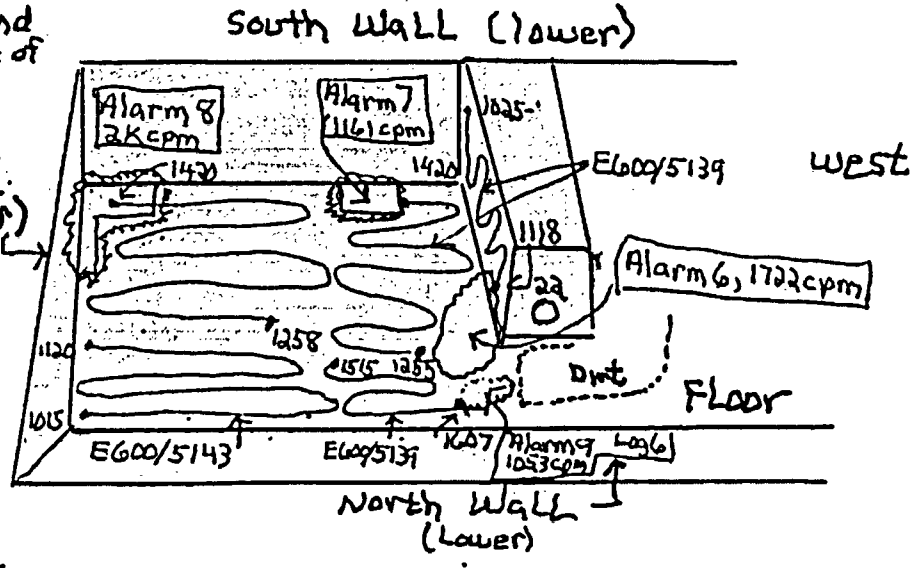
Resurveyed this area
as meter failed source
check on 4-26-99



Direct Frisk of west/East walls penetration 19. One alarm noted on west wall. This is the 5th alarm in this survey area.

Direct Frisk of floor and
cement foundation out of
south wall.
Three alarms noted
on floor-one
alarm noted on
foundation from
south wall.

U = 100% scan



SPECIAL SURVEY FORM
LOCATION or EQUIPMENT Cubicle Corr. (PA023) - Turnover Survey

S101.6 REV.24
IMS V02.09.03
RT 10.811.373

DATE 5-3-99 TIME 0700

SURVEYOR Dayeun, Thurston

INSTRUMENT/#	CAL DUE
E600/5139	10-26-99
HP100/50603	5-23-99
E600/5143	7-12-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SHEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

YANKEE ATOMIC ELECTRIC CO. ANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-26-99 TIME 0701

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP360/506022	8-18-99
E600/50409	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

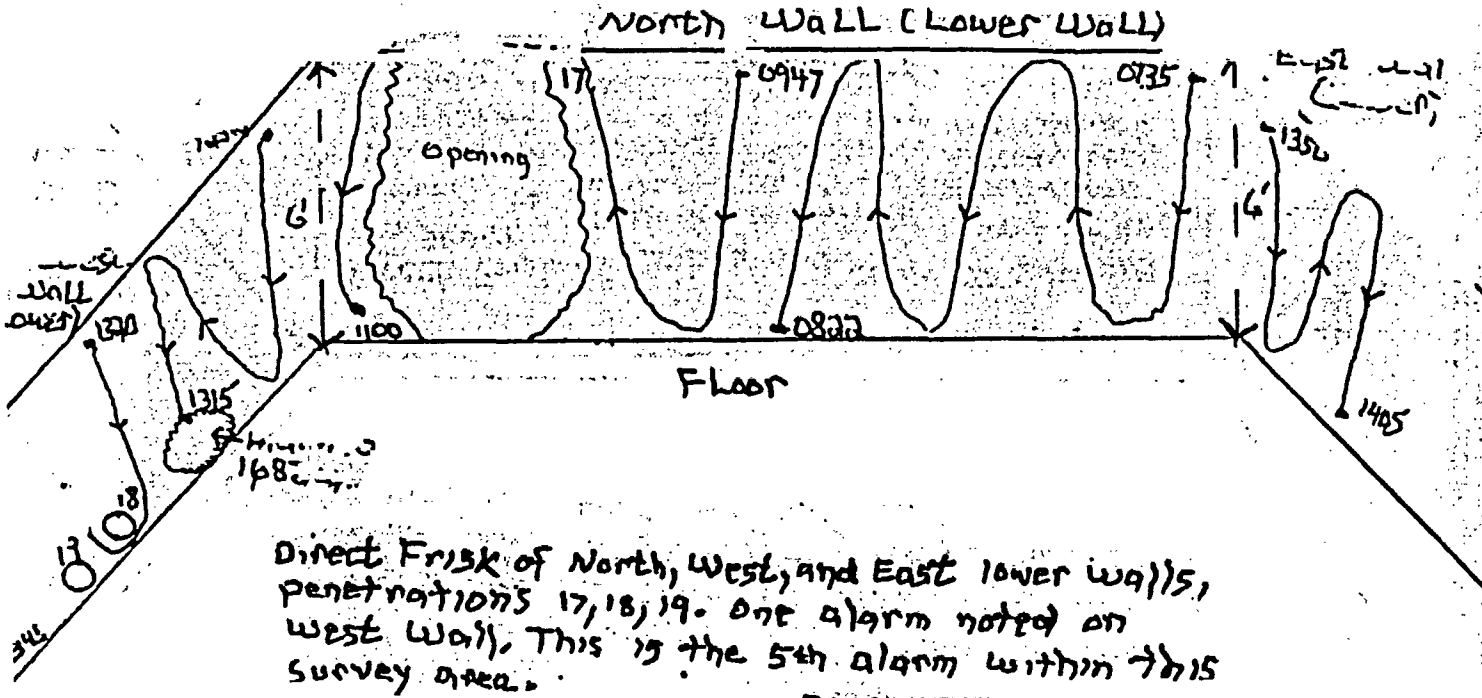
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: HP/IDX 51491 (5-10-94)



Direct Frisk of North, West, and East lower walls, penetrations 17, 18, 19. One alarm noted on West Wall. This is the 5th alarm within this survey area.

∿ = 100% Scan

E600 50409 used on walls and penetrations 17, 19.
E600 5141 used on penetration 18.

SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PAD23) - Turnover Survey

S101.6 REV.24
IMS | V02.09.03
RT | 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

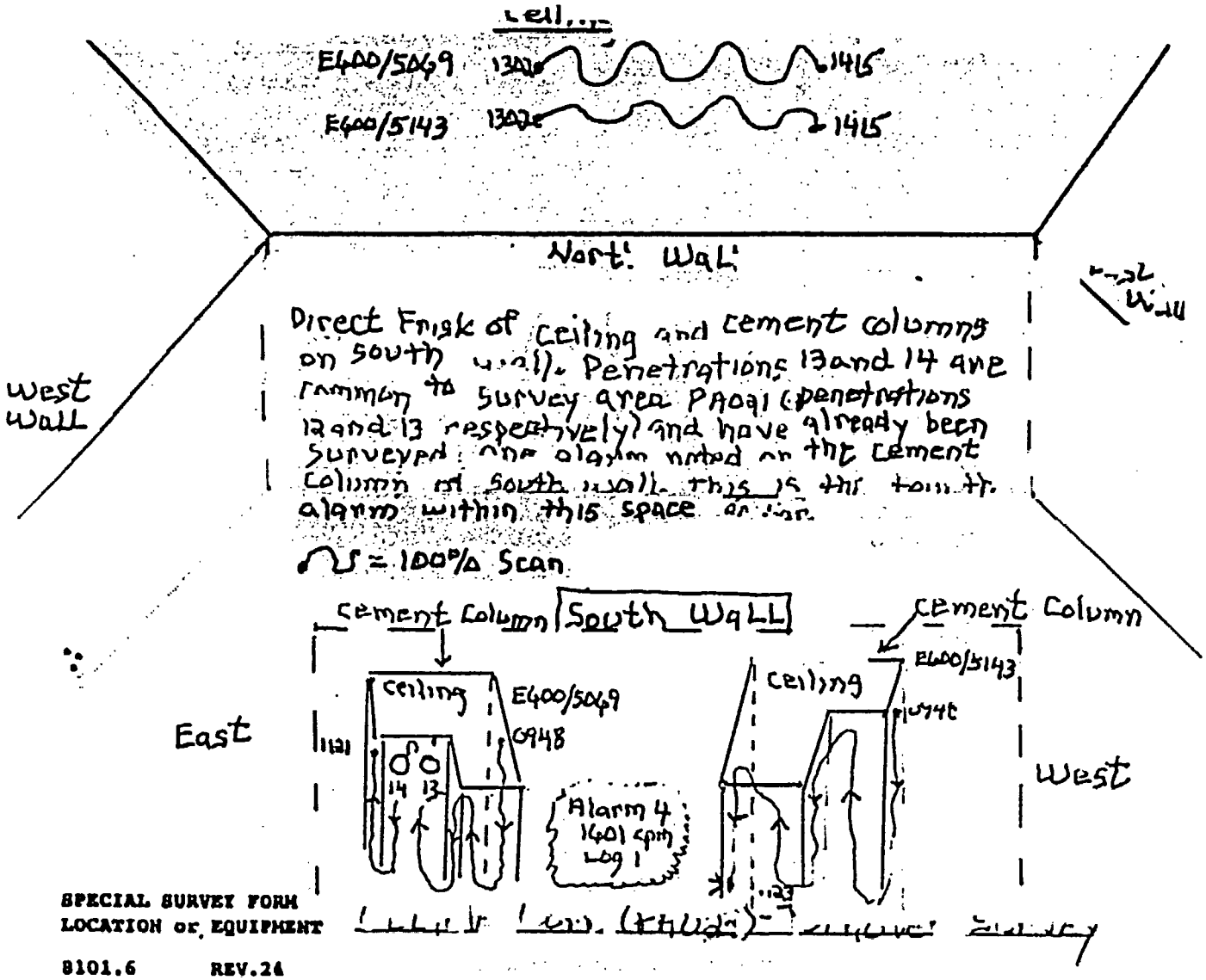
RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-14-99 TIME 0800

SURVEYOR Payeur, Thurston

INSTRUMENT/S	CAL DUE
E600/5069	8-17-99
HP100/51792	6-28-99
E600/5143	7-12-99



KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- -X-X- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & MET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

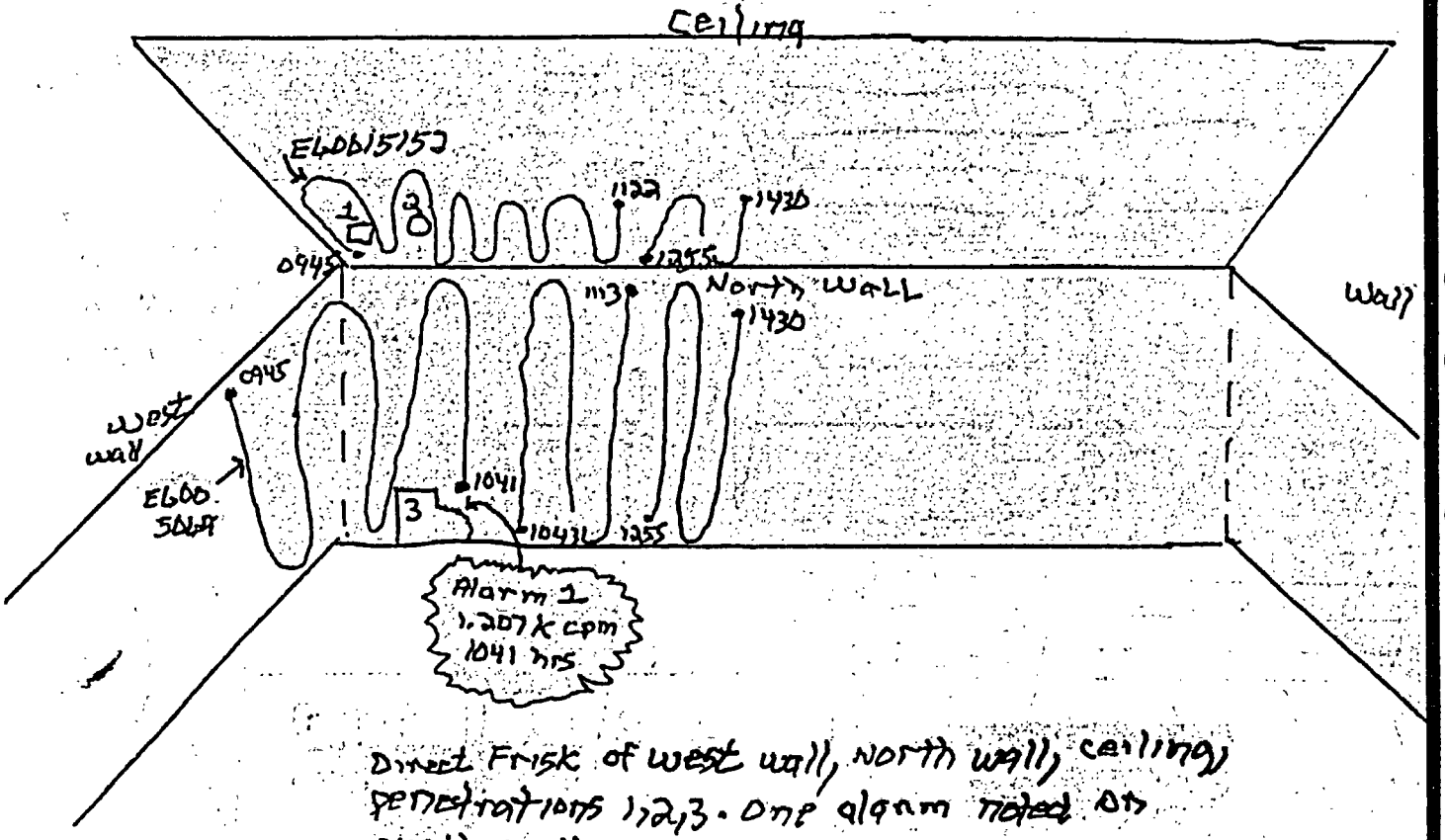
SPECIAL SURVEY FORM
LOCATION or EQUIPMENT

8101.6 REV.24
IHS V02.09.03
RT 0.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY



Direct Frisk of west wall, North wall, ceiling, penetrations 1,2,3. One alarm noted on North wall

~ = 100% scan

DATE 4-8-99 TIME 0800

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/51152	5-12-99
HP100/55293	9-25-99
E600/50169	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINE

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

HP300/50652 (4-14-99)

SPECIAL SURVEY FORM

LOCATION or EQUIPMENT Cubicle Cont. (PA023) Turnover Survey

8101.6 REV.24

IMS # V02.09.03

RT # 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 5-10-99 TIME 1700

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP100/51592	9-3-99
E600/5144	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER — HASSLINK

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(x) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

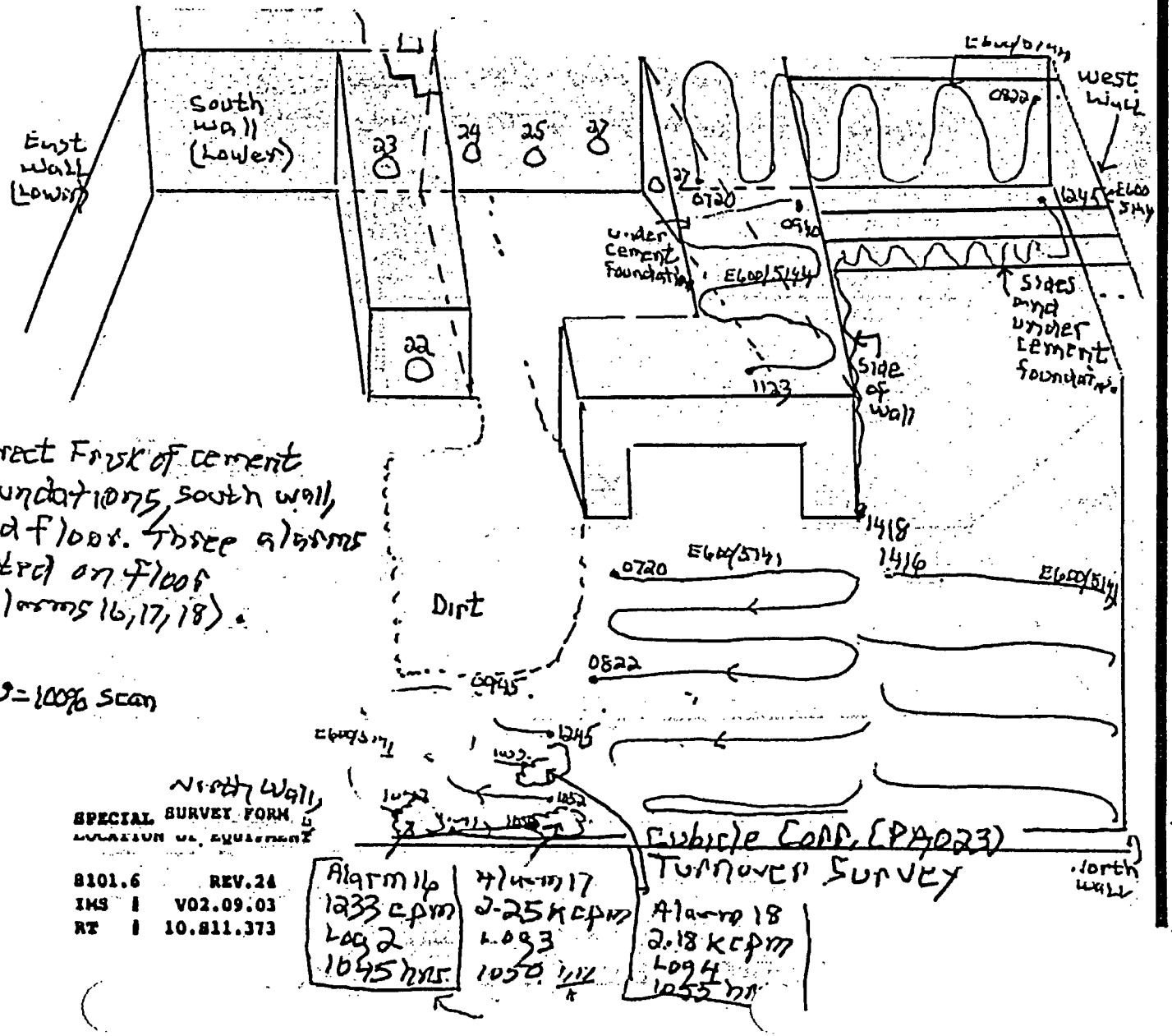
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1		11	21
2		12	22
3		13	23
4		14	24
5		15	25
6		16	26
7		17	27
8		18	28
9		19	29
10		20	30

COMMENTS: HP100/51853 (9-3-99)



Direct Frisk of cement foundations, south wall, and floor. Three alarms noted on floor (Alarms 16, 17, 18).

U = 100% scan

SPECIAL SURVEY FORM

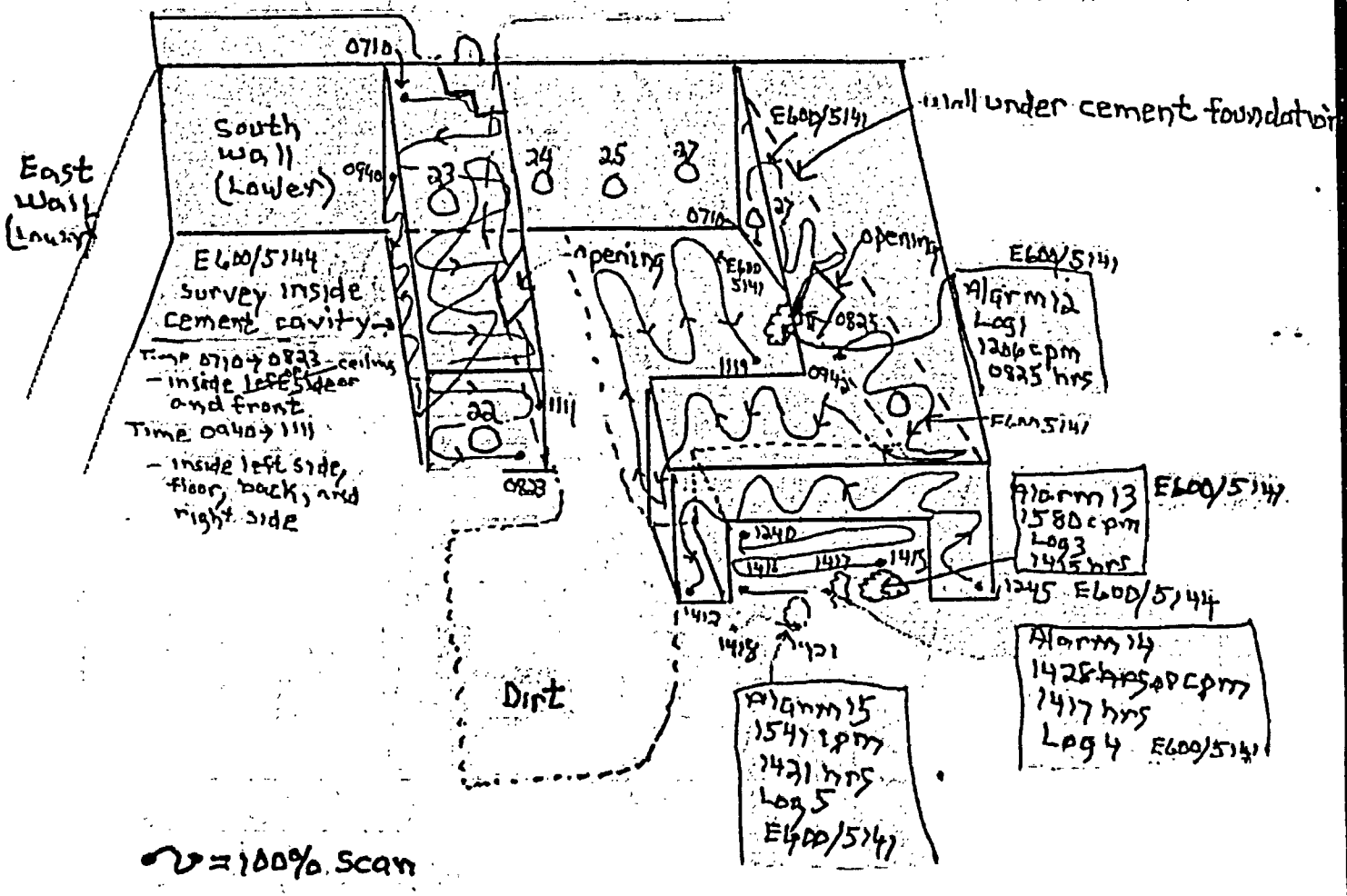
LOCATION OF EQUIPMENT

8101.6	REV.24
IMS #	V02.09.03
RT #	10.811.373

RADIATION PROTECTION SURVEY F

11

COPY



DATE 5-6-99 1700

SURVEYOR Payeur, Thurston

INSTRUMENT	CAL DUE
E600/5144	8-17-99
HP100/506023	5-23-99
E600/5141	7-12-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SHEAR LOCATION
- BARRIER
- HASSLINK

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/571853 (9-3-99)

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT Cubicle Corr. (PA023) - Turnover Survey

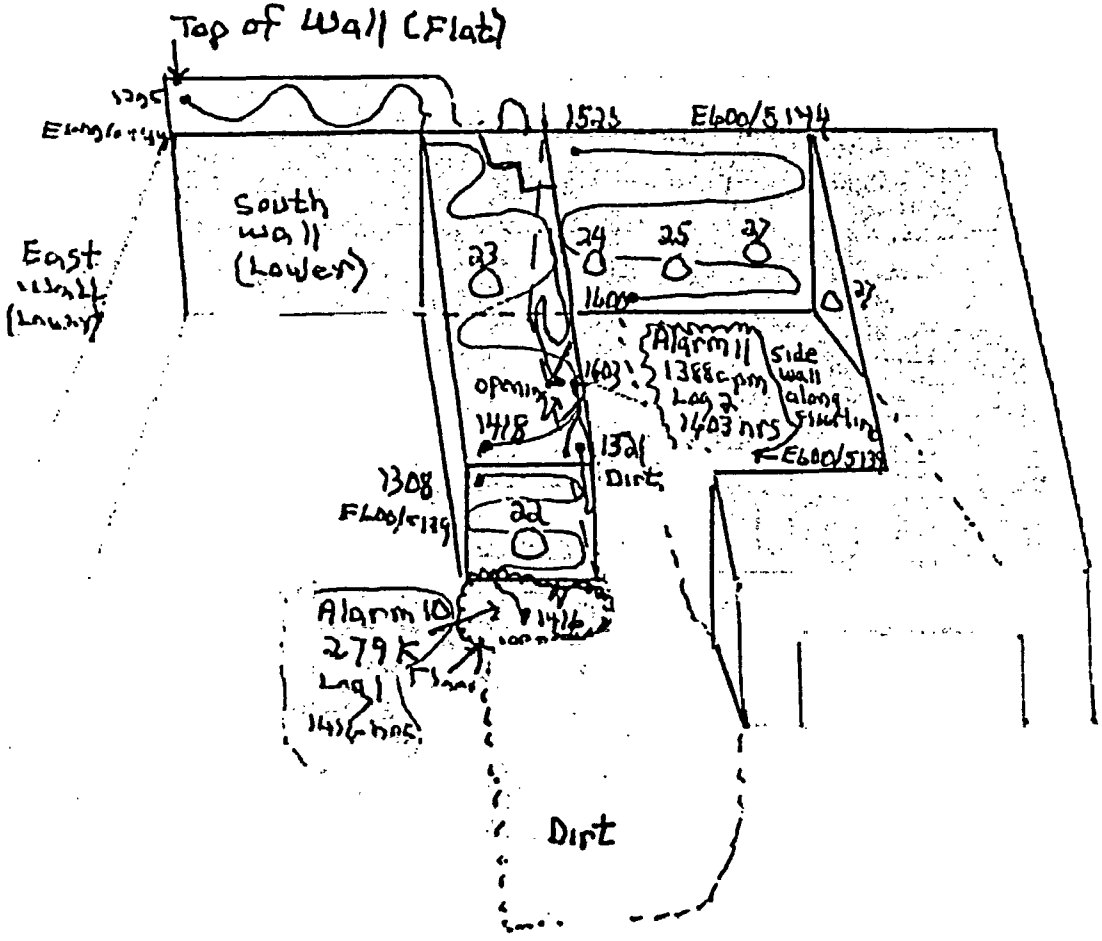
8101.6 REV.24
IMS | V02.09.03
RT | 10.811.373

Direct Frisk of cement foundations from south wall, and floor. Four alarms noted (Alarms 12, 13, 14, 15) during survey. This is the 12th → 15th alarm within area.

...ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY F(

COPY



Direct Frisk of cement foundations and floor. Two alarms noted (Alarms 10, 11). This is the 10th and 11th alarm within this survey area

∿ = 100% Scan

SPECIAL SURVEY FORM

LOCATION OF EQUIPMENT Cubicle Corr. (PA023) - Turnover Survey

8101.6 REV.24

IMS V02.09.03

RT 1.811.373

DATE 5-5-99 (1300

SURVEYOR Payeup Thunston

INSTRUMENT/#	CAL DUE
E600/5144	8-17-99
HP100/50603	5-23-99
E600/5139	10-26-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

N/A

COMMENTS:

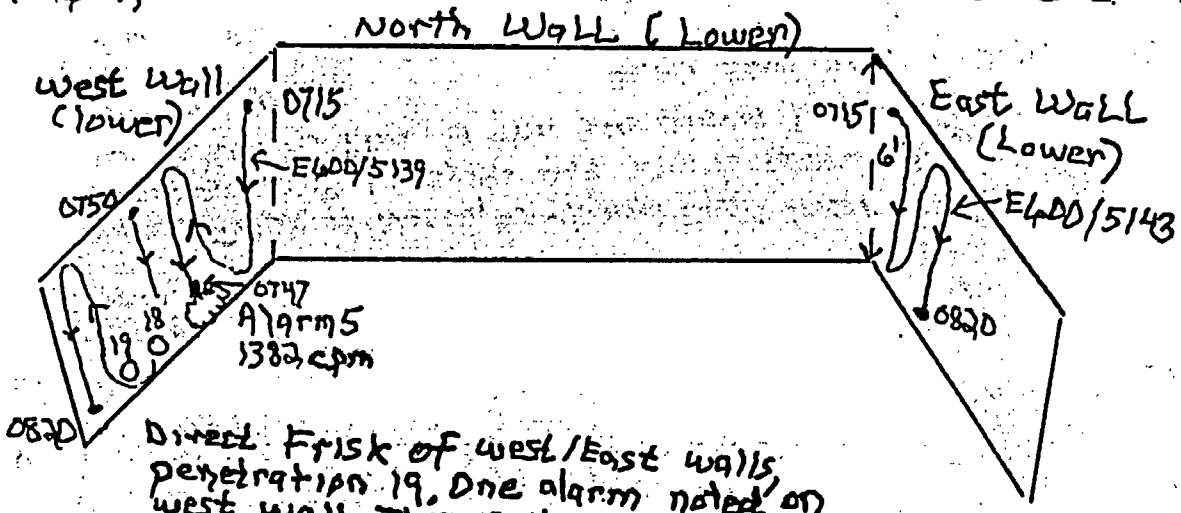
HP100/51853 (9-3-99)

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

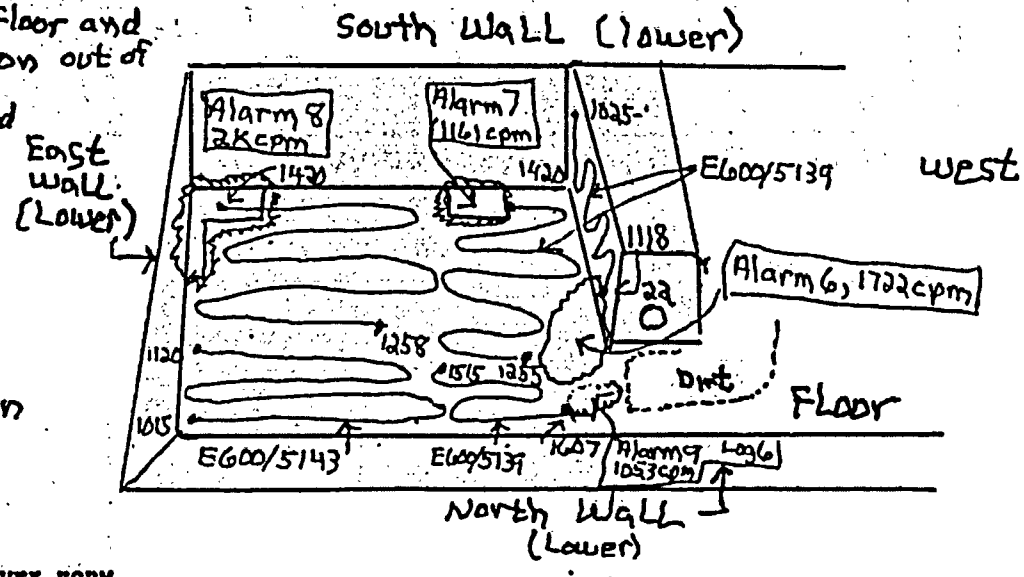
Resurveyed this area as meter failed source check on 4-26-99



Direct Frisk of west/East walls penetration 19. One alarm noted on west wall. This is the 5th alarm in this survey area.

Direct Frisk of floor and cement foundation out of south wall. Three alarms noted on floor-one alarm noted on foundation from south wall.

U = 100% scan



SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PA023)-Turnover Survey

8101.6 REV.24
IMS | V02.09.03
RT | 10.811.373

DATE 5-3-99 TIME 0700

SURVEYOR Dayeun Thurston

INSTRUMENT/#	CAL DUE
E600/5139	10-26-99
HP100/501603	5-23-99
E600/5143	7-12-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-26-99 TIME 0701

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5141	7-12-99
HP360/504022	8-18-99
E600/5049	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SHEAR LOCATION
- BARRIER
- HASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

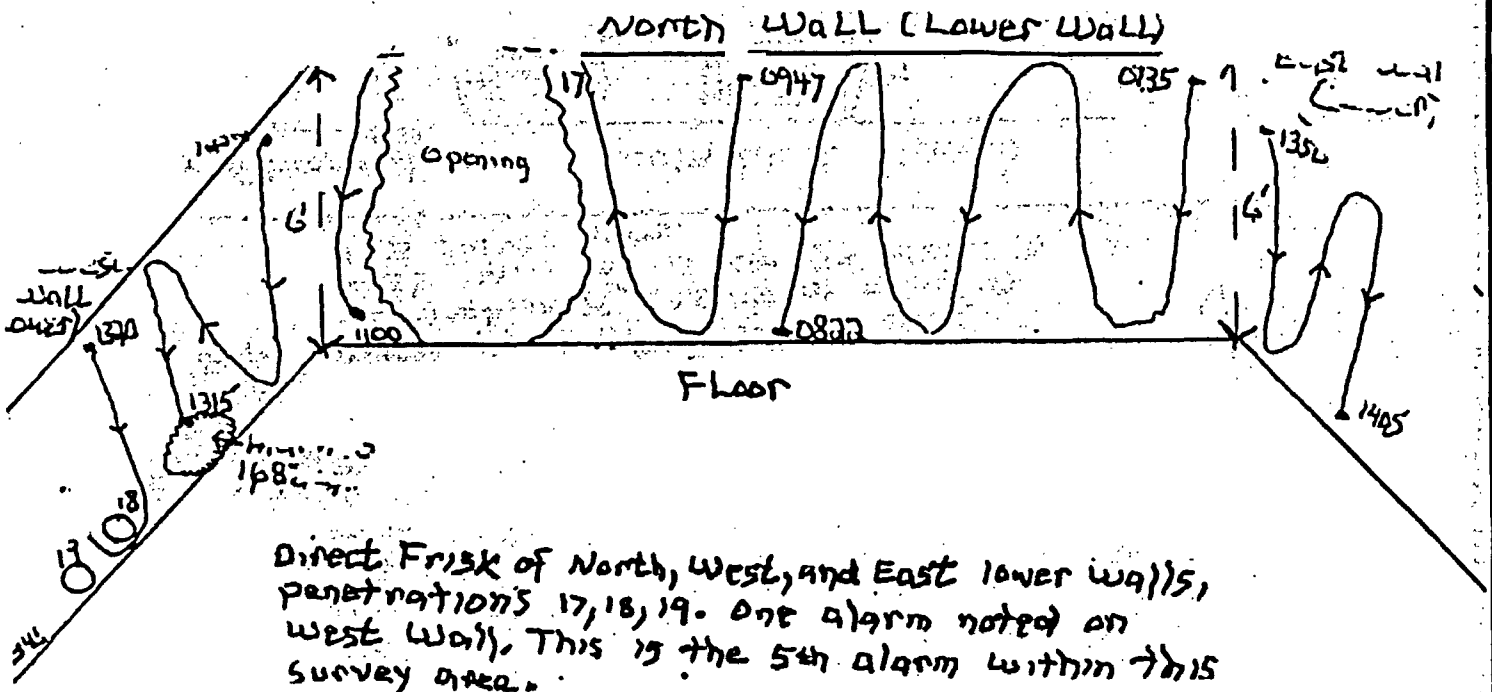
( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 n/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP/04/5149 (2-18-99)



Direct Frisk of North, West, and East lower walls, penetrations 17, 18, 19. One alarm noted on West Wall. This is the 5th alarm within this survey area.

∿ = 100% Scan

E600 5049 used on walls and penetrations 17, 19.
E600 5141 used on penetration 18.

SPECIAL SURVEY FORM LOCATION or EQUIPMENT Cubicle Corr. (PAD23) - Turnover Survey

S101.6 REV.24
IMS # V02.09.03
RT 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

COPY

DATE 4-14-99 TIME 0800

SURVEYOR Payeung Thurston

INSTRUMENT/#	CAL DUE
E600/5069	8-17-99
HP100/51792	6-28-99
E600/5143	7-12-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

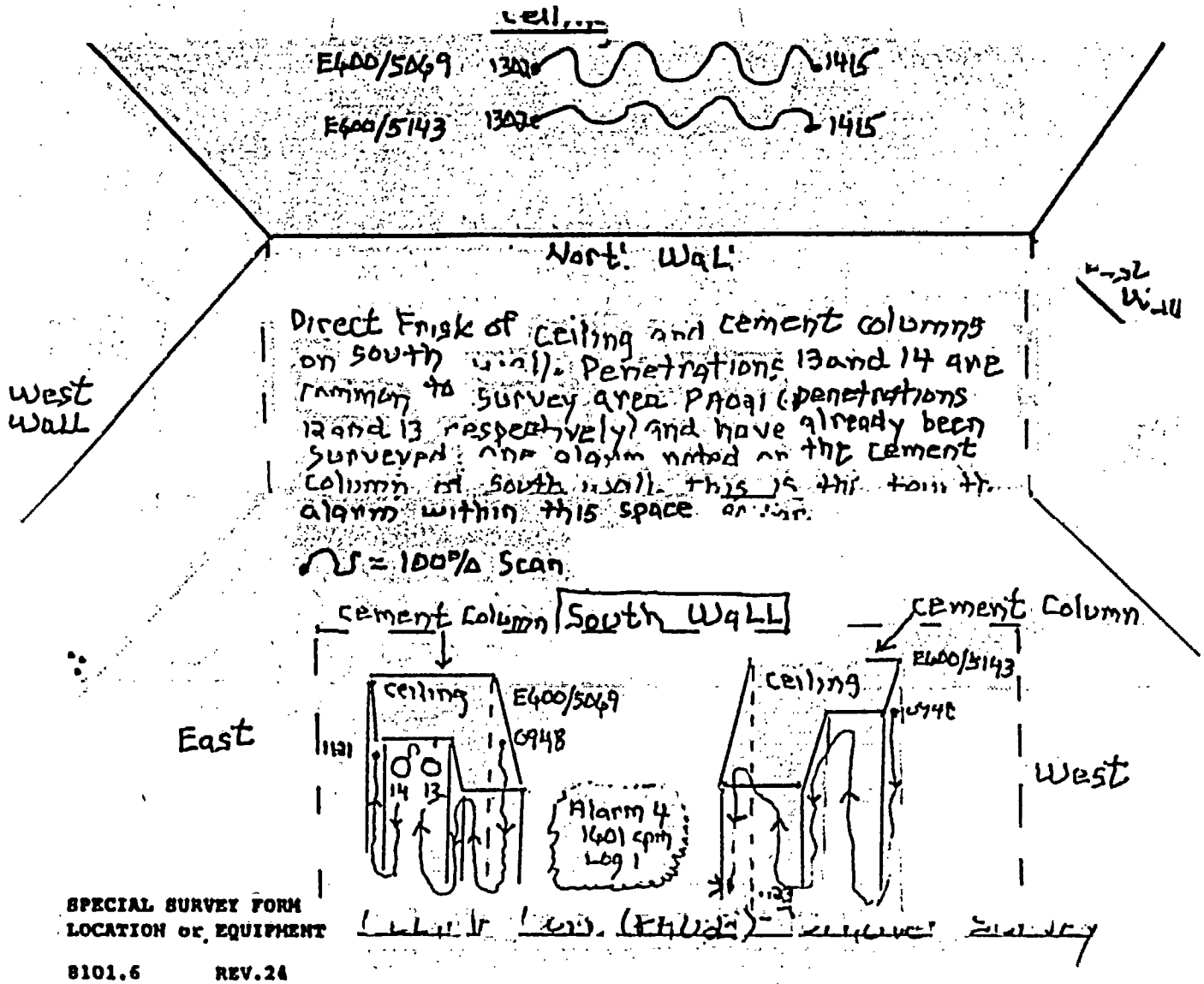
( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS:

HP100/51853 (9-3-99)



Direct Frisk of ceiling and cement columns on south wall. Penetrations 13 and 14 are common to survey area P4091 (penetrations 12 and 13 respectively) and have already been surveyed. One alarm noted on the cement column on south wall. This is the same alarm within this space on 4-12.

∩∩ = 100% Scan

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT

8101.6 REV.24
IHS | V02.09.03
RT | 10.811.373

COPY

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

DATE 4-13-99 TIME 0700

SURVEYOR Payeur, Thurston

INSTRUMENT/#	CAL DUE
E600/5140	6-17-99
HP100/51792	6-28-99
E600/5069	8-17-99

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SHEAR LOCATION
- BARRIER
- HASSLINK

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct Frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

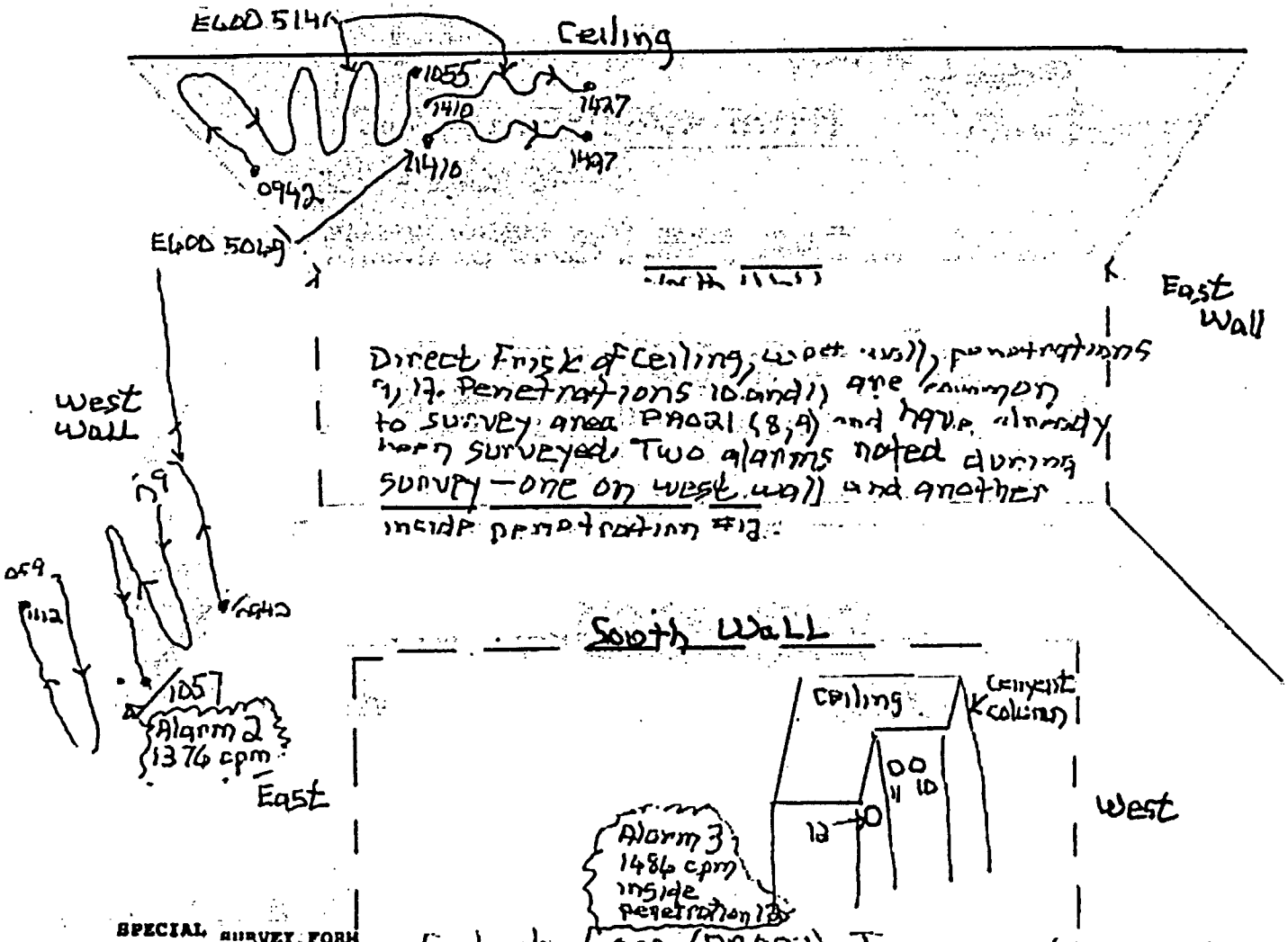
( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1		11		21	
2		12		22	
3		13		23	
4		14		24	
5		15	N/A	25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

COMMENTS: HP100/51893 (9-30-99)



Cubicle Corr. (PA023) - Turnover Survey

SPECIAL SURVEY FORM
LOCATION OR EQUIPMENT

8101.6 REV.24
IMS I V02.09.03
R 1 10.811.373

Primary Cooling Historical Tritium

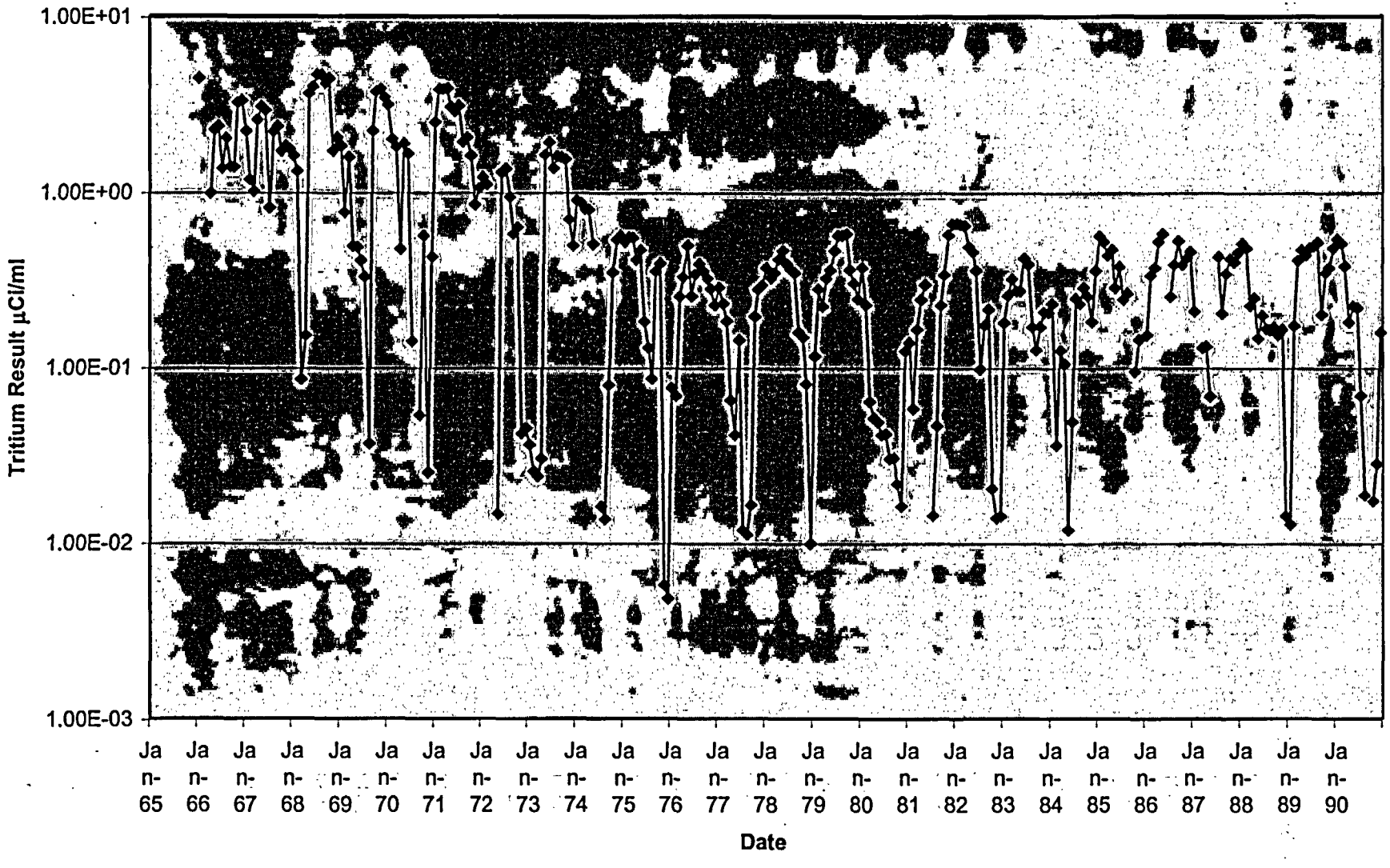


Table 1
Sum of Fractions
AUX-01 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID	Sum Of Fractions
3013	CC001.7	CC001.7A	0.186
3001	CB11A	CB11A.2	0.071
3001	CB11A	CB11A.3	0.109
3001	CB11A	CB11A.5	0.027
3001	CB11A	CB11A.6	0.023
3001	CB11A	CB11A.7	0.057
3001	CB11A	CB11A.8	0.024
3004	CC001.10	CC001.10A	0.019
3004	CC001.10	CC001.12A	0.027
3007	CC001.16	CC001.16A	0.032
3008	CC001.2	CC001.2A	0.002
3008	CC001.2	CC001.2B	0.007
3009	CC001.3	CC001.3B	0.003
3010	CC001.4	CC001.4A	0.076
3001	CB11A	CB11A.1	0.029
3273	TS563	TS563A	0.503
3287	TS580	TS580	0.048
3286	TS579	TS579	0.032
3281	TS571	TS571	0.035
3279	TS569	TS569	0.035
3278	TS568	TS568	0.026
3012	CC001.6	CC001.6A	0.110
3273	TS563	TS563B	0.648
3012	CC001.6	CC001.6B	0.067
3043	PAB001.2	PAB001.2B	0.133
3019	MW4	MW4A	0.003
3014	CC001.8	CC001.8C	0.017

Table 1
Sum of Fractions
AUX-01 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
3014	CC001.8	CC001.8A		0.051
3013	CC001.7	CC001.7B		0.230
3288	TS581	TS581		0.003
3275	TS565	TS565		0.010
			Min	0.002
			Max	0.648
			Mean	0.085

Table 2
Statistical Data Summary – AUX-01 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	49	49	0.974	0.414	0.600	2.246	0.831
Ag-108m	pCi/g	4	49	0.057	0.046	0.026	0.124	0.039
Ag-110m	pCi/g	3	49	0.038	0.005	0.032	0.042	0.041
Am-241	pCi/g	0	49	0.000				
Ba-133	pCi/g	0	1	0.000				
Bi-212	pCi/g	40	45	0.966	0.414	0.456	2.051	0.813
Bi-214	pCi/g	49	49	0.572	0.256	0.287	1.321	0.476
Ce-144	pCi/g	0	49	0.000				
Co-58	pCi/g	1	49	0.037		0.037	0.037	0.037
Co-60	pCi/g	27	49	0.380	0.625	0.034	2.901	0.166
Cs-134	pCi/g	3	49	0.087	0.059	0.024	0.142	0.095
Cs-137	pCi/g	15	49	0.363	0.456	0.042	1.533	0.156
Eu-152	pCi/g	0	2	0.000				
Fe-59	pCi/g	0	49	0.000				
I-132	pCi/g	1	4	34.950		34.950	34.950	34.950
I-133	pCi/g	0	1	0.000				
I-135	pCi/g	1	1	0.399		0.399	0.399	0.399
K-40	pCi/g	49	49	20.437	8.795	13.990	41.430	16.440
Kr-85	pCi/g	0	1	0.000				
Mn-54	pCi/g	2	49	0.040	0.002	0.038	0.042	0.040
Mo-99	pCi/g	0	1	0.000				
Nb-95	pCi/g	4	49	0.068	0.042	0.031	0.120	0.060
Np-239	pCi/g	0	7	0.000				
Pb-212	pCi/g	49	49	0.983	0.424	0.587	2.150	0.832
Pb-214	pCi/g	49	49	0.627	0.328	0.339	1.762	0.485
Ra-226	pCi/g	19	27	1.979	1.162	0.951	4.595	1.425
Ru-103	pCi/g	0	49	0.000				
Ru-106	pCi/g	2	49	0.300	0.077	0.246	0.354	0.300
Sb-124	pCi/g	1	49	0.134		0.134	0.134	0.134
Sb-125	pCi/g	0	2	0.000				
Tl-208	pCi/g	46	46	0.931	0.401	0.494	2.164	0.793
Zn-65	pCi/g	2	49	0.261	0.183	0.132	0.391	0.261
Zr-95	pCi/g	4	49	0.073	0.026	0.050	0.108	0.066

Table 3
Summary of Detected Results Above Criteria
AUX-01 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	49	49		pCi/g	0	2.25
Ag-108m	4	49	8.52	pCi/g	0	0.12
Ag-110m	3	49		pCi/g	0	0.04
Am-241	0	49	44.35	pCi/g	0	
Ba-133	0	1		pCi/g	0	
Bi-212	40	45		pCi/g	0	2.05
Bi-214	49	49		pCi/g	0	1.32
Ce-144	0	49		pCi/g	0	
Co-58	1	49		pCi/g	0	0.04
Co-60	27	49	4.84	pCi/g	0	2.90
Cs-134	3	49	6.71	pCi/g	0	0.14
Cs-137	15	49	12.24	pCi/g	0	1.53
Eu-152	0	2	12.06	pCi/g	0	
Fe-59	0	49		pCi/g	0	
I-132	1	4		pCi/g	0	34.95
I-133	0	1		pCi/g	0	
I-135	1	1		pCi/g	0	0.40
K-40	49	49		pCi/g	0	41.43
Kr-85	0	1		pCi/g	0	
Mn-54	2	49	21.66	pCi/g	0	0.04
Mo-99	0	1		pCi/g	0	
Nb-95	4	49		pCi/g	0	0.12
Np-239	0	7		pCi/g	0	
Pb-212	49	49		pCi/g	0	2.15
Pb-214	49	49		pCi/g	0	1.76
Ra-226	19	27		pCi/g	0	4.60
Ru-103	0	49		pCi/g	0	
Ru-106	2	49	68.21	pCi/g	0	0.35
Sb-124	1	49		pCi/g	0	0.13
Sb-125	0	2	37.73	pCi/g	0	
Tl-208	46	46		pCi/g	0	2.16
Zn-65	2	49		pCi/g	0	0.39
Zr-95	4	49		pCi/g	0	0.11

Table 4
Rad
AUX-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	CB11A (3001)	CB11A (3001)	CB11A (3001)	CB11A (3001)	CB11A (3001)
Sample ID	CB11A.1	CB11A.2	CB11A.3	CB11A.4	CB11A.5
Date Sampled	12/18/1997	12/18/1997	12/18/1997	12/18/1997	12/18/1997
Ac-228	2.246	2.089	1.14	1.51	1.354
Ag-108m	0.007726 U	-0.004694 U	0.01769 U	-0.03617 U	0.02498 U
Ag-110m	-0.1051 U	-0.04049 U	0.06316 U	0.01742 U	-0.0436 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Bi-212	1.765	1.552	1.55		2.051
Bi-214	0.9285	1.321	0.8456	0.849	0.9759
Ce-144	-0.7113 U	-0.05931 U	-0.5287 U	-0.122 U	-0.03076 U
Co-58	-0.02157 U	-0.01911 U	-0.0408 U	-0.01724 U	0.004709 U
Co-60	0.142	0.3416	0.5256	0.08315 U	0.1316
Cs-134	-0.3672 U	-0.6217 U	-0.1206 U	-0.2257 U	0.0108 U
Cs-137	0.05459 U	-0.007992 U	0.05802 U	0.07812 U	-0.01969 U
Eu-152					
Fe-59	-0.002606 U	-0.1903 U	0.00000001318 U	0.07764 U	0.1794 U
I-132	7.562 U				
I-133					
I-135					
K-40	33.16	41.43	33.64	36.08	35.33
Kr-85					
Mn-54	0.0704 U	0.01614 U	0.00129 U	0.03471 U	0.02516 U
Mo-99					
Nb-95	0.03908 U	0.03434 U	-0.0007698 U	0.1203	0.02279 U
Np-239				-1.163 U	
Pb-212	1.939	2.15	1.114	1.768	1.752
Pb-214	0.9404	1.762	1.147	1.078	1.037
Ra-226	4.426	4.595	2.716	2.137	1.868 U
Ru-103	-0.02008 U	-0.005079 U	0.03955 U	0.0162 U	-0.0177 U
Ru-106	0.303 U	-0.06716 U	0.161 U	0.05037 U	0.2201 U
Sb-124	-0.0354 U	0.1344	0 U	0.0518 U	0 U
Sb-125					
Tl-208	1.846	2.164	1.38	1.704	1.693
Zn-65	0.1694 U	0.03249 U	0.3911	-0.1136 U	0.08487 U
Zr-95	-0.01232 U	0.009632 U	0.1362 U	0.02119 U	0.06611 U
SOF	0.029	0.071	0.109		0.027

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed

Table 4
Rad
AUX-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	CB11A (3001)	CB11A (3001)	CB11A (3001)	CC001.10 (3004)	CC001.11 (3005)
Sample ID	CB11A.6	CB11A.7	CB11A.8	CC001.10A	CC001.11A
Date Sampled	12/18/1997	12/18/1997	12/18/1997	6/3/1998	6/4/1998
Ac-228	1.561	1.351	1.714	0.7728	0.7183
Ag-108m	0.02686 U	-0.03841 U	0.008273 U	0.02159 U	-0.01132 U
Ag-110m	-0.09106 U	0.01304 U	0.04914 U	-0.01648 U	0.005409 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Bi-212		1.58	1.489	0.7514	0.8955
Bi-214	0.8639	0.9937	1.142	0.4038	0.3288
Ce-144	-0.2568 U	0.3877 U	-0.257 U	0.06223 U	-0.06362 U
Co-58	-0.02412 U	-0.03232 U	-0.04441 U	0.01497 U	-0.02161 U
Co-60	0.1121	0.2742	0.1138	0.09356	0.006151 U
Cs-134	-0.05093 U	-0.1387 U	0.09386 U	-0.02229 U	-0.01906 U
Cs-137	-0.01239 U	0.06575 U	0.01126 U	0.01072 U	0 U
Eu-152					
Fe-59	0.05644 U	-0.07481 U	-0.08443 U	-0.05517 U	0.01039 U
I-132			2.574 U		
I-133					
I-135					
K-40	38.54	39.29	36.37	16.44	15.16
Kr-85					
Mn-54	0.05194 U	-0.004274 U	-0.02478 U	0.01411 U	0.008908 U
Mo-99					
Nb-95	0.02657 U	0.007376 U	0.02998 U	0.01853 U	-0.005481 U
Np-239				0.1148 U	
Pb-212	1.56	1.583	1.845	0.7463	0.7774
Pb-214	0.9318	1.176	1.455	0.4302	0.4112
Ra-226			3.781		0.8036 U
Ru-103	0.02192 U	-0.04685 U	-0.005487 U	-0.008235 U	-0.009841 U
Ru-106	-0.4153 U	0.09133 U	0.04685 U	0.2134 U	0.1416 U
Sb-124	-0.00000001029 U	-0.04863 U	-0.03045 U	-0.03073 U	0.004926 U
Sb-125					
Tl-208		1.424	1.504	0.6358	0.5953
Zn-65	-0.07539 U	-0.079 U	0.166 U	0.02141 U	-0.09092 U
Zr-95	-0.01092 U	0.07979 U	0.09557 U	0.01914 U	0.003778 U
SOF	0.023	0.057	0.024	0.019	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
AUX-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	CC001.10 (3004)	CC001.11 (3005)	CC001.16 (3007)	CC001.1 (3003)	CC001.2 (3008)
Sample ID	CC001.12A	CC001.13A	CC001.16A	CC001.1B	CC001.2A
Date Sampled	6/3/1998	6/4/1998	9/1/1998	11/12/1997	11/12/1997
Ac-228	0.7476	0.7107	0.6606	0.7689	0.7618
Ag-108m	0.01185 U	0.001493 U	0.008719 U	0.003979 U	-0.0104 U
Ag-110m	-0.01109 U	-0.01112 U	-0.008478 U	-0.02199 U	-0.001738 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Bi-212	0.7057	0.9267		0.6969	0.5835
Bi-214	0.5115	0.3993	0.287	0.4759	0.4555
Ce-144	-0.09695 U	0.04977 U	-0.01265 U	-0.02134 U	-0.06185 U
Co-58	-0.008721 U	0.0009814 U	-0.02115 U	0.004318 U	0.005137 U
Co-60	0.04382	0.0159 U	0.1188	-0.01879 U	0 U
Cs-134	0.09499	-0.0674 U	-0.05562 U	0.01363 U	-0.08851 U
Cs-137	0.0497	-0.01733 U	0.08616	0.001849 U	0.009604 U
Eu-152					
Fe-59	-0.004862 U	0.00512 U	-0.03356 U	-0.02255 U	-0.01419 U
I-132					
I-133					
I-135					
K-40	17.56	17.1	16.28	15.34	15.8
Kr-85					
Mn-54	0.01905 U	-0.009234 U	-0.0127 U	0.009135 U	0.03812
Mo-99					
Nb-95	-0.02663 U	0.01348 U	0.01363 U	0.004052 U	0.006609 U
Np-239					
Pb-212	0.7417	0.868	0.6334	0.5866	0.6951
Pb-214	0.5003	0.4088	0.3393	0.5574	0.4544
Ra-226	1.119	0.8699 U	0.9694	1.537	
Ru-103	-0.01186 U	0.001258 U	-0.006676 U	0.0002812 U	-0.004168 U
Ru-106	0.03588 U	-0.07237 U	0.1072 U	-0.03099 U	-0.1336 U
Sb-124	0.002422 U	0.009568 U	-0.02778 U	-0.01654 U	0.004608 U
Sb-125			-0.07791 U		
Tl-208	0.6687	0.6925	0.6665	0.6993	0.76
Zn-65	-0.04864 U	-0.04374 U	0.03226 U	0.06528 U	-0.06004 U
Zr-95	-0.007446 U	-0.01931 U	0.014 U	-0.0006739 U	0.0138 U
SOF	0.027		0.032		0.002

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed

Table 4
Rad
AUX-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	CC001.2 (3008)	CC001.3 (3009)	CC001.3 (3009)	CC001.4 (3010)	CC001.4 (3010)
Sample ID	CC001.2B	CC001.3A	CC001.3B	CC001.4A	CC001.4B
Date Sampled	11/12/1997	11/18/1997	11/18/1997	11/20/1997	11/20/1997
Ac-228	0.6714	0.676	0.7072	0.6432	0.5996
Ag-108m	0.005226 U	-0.008199 U	0.02676	0.0002195 U	0.01665 U
Ag-110m	0.02847 U	0.04118	0.03223	0.01057 U	-0.0259 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Bi-212	0.7116	0.4956	0.7115	0.4353 U	0.6321
Bi-214	0.3808	0.3193	0.3986	0.3769	0.4674
Ce-144	-0.02738 U	0 U	-0.05728 U	-0.1694 U	-0.3107 U
Co-58	0.003508 U	0.00879 U	-0.004816 U	-0.04298 U	-0.0002498 U
Co-60	0.03431	-0.008429 U	0.002149 U	0.2575	0.01803 U
Cs-134	-0.06694 U	0.04104 U	-0.06097 U	0.02405	-0.0917 U
Cs-137	0.009197 U	-0.007196 U	-0.01322 U	0.2396	0.007727 U
Eu-152					
Fe-59	-0.02684 U	-0.01741 U	-0.01241 U	0.02844 U	0.01111 U
I-132					
I-133					
I-135					
K-40	14.54	14.28	14.7	13.99	14.46
Kr-85					
Mn-54	-0.01041 U	0.00647 U	0.005783 U	0.004147 U	-0.01974 U
Mo-99					
Nb-95	0.01776 U	-0.0005637 U	0.002325 U	0.006865 U	0.03806
Np-239	-1.766 U				
Pb-212	0.7601	0.6939	0.6001	0.7201	0.7338
Pb-214	0.4453	0.3467	0.4078	0.4578	0.4321
Ra-226		1.212	0.9512	1.259	
Ru-103	0.002253 U	-0.01547 U	0.001723 U	-0.003565 U	-0.03655 U
Ru-106	-0.1217 U	0.08045 U	0.03043 U	-0.1268 U	-0.04287 U
Sb-124	-0.004803 U	0.006941 U	-0.00247 U	0.007193 U	0 U
Sb-125					
Tl-208	0.6695	0.5899	0.7623		0.7891
Zn-65	0.1317	-0.04362 U	0.04653 U	-0.07639 U	0.01351 U
Zr-95	0.04114 U	0.02301 U	0.01265 U	0.01428 U	0.01099 U
SOF	0.007		0.003	0.076	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
AUX-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	CC001.5 (3011)	CC001.5 (3011)	CC001.6 (3012)	CC001.6 (3012)	CC001.7 (3013)
Sample ID	CC001.5A	CC001.5B	CC001.6A	CC001.6B	CC001.7A
Date Sampled	12/1/1997	12/1/1997	11/25/1997	11/25/1997	11/20/1997
Ac-228	0.633	0.6047	1.856	2.022	1.207
Ag-108m	0.001644 U	-0.005014 U	-0.01407 U	-0.01052 U	0.05184
Ag-110m	0.01537 U	-0.006775 U	0.01684 U	0.03546 U	0.02914 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Bi-212	0.5132	0.4088 U	0.8873 U	1.666	0.7155
Bi-214	0.4084	0.3427	1.142	1.144	0.8739
Ce-144	-0.08092 U	0.04015 U	0.002507 U	-0.1288 U	0.105 U
Co-58	-0.01167 U	0.01627 U	0.009484 U	-0.01055 U	-0.03291 U
Co-60	0.01107 U	0.006276 U	0.4564	0.2683	0.449
Cs-134	-0.09416 U	-0.05315 U	-0.03596 U	-0.08482 U	-0.1069 U
Cs-137	0.007635 U	-0.007512 U	0.1876	0.1419	1.065
Eu-152					
Fe-59	-0.001091 U	-0.007154 U	0.05391 U	-0.02086 U	0.04402 U
I-132					
I-133					
I-135					
K-40	14.62	15.04	39.31	38.35	25.3
Kr-85					
Mn-54	0.02142 U	0.01544 U	0.006147 U	0.03683 U	-0.01627 U
Mo-99					
Nb-95	0.02234 U	0.03054	0.0816	-0.005837 U	-0.01555 U
Np-239	0.1915 U				
Pb-212	0.6174	0.5878	1.836	1.952	1.124
Pb-214	0.4118	0.3587	1.165	1.383	0.8562
Ra-226		0.8398 U	2.278	2.693	
Ru-103	0.005793 U	-0.01814 U	0.01551 U	0.01343 U	-0.01776 U
Ru-106	0.02302 U	0.05841 U	-0.3222 U	-0.08776 U	0.234 U
Sb-124	-0.01169 U	-0.01235 U	-0.01304 U	-0.05041 U	-0.0195 U
Sb-125					
Tl-208	0.5709	0.4939	1.542	1.776	1.242
Zn-65	-0.02989 U	0.03091 U	0.05619 U	-0.01793 U	0.03269 U
Zr-95	-0.006651 U	0.04974	-0.05679 U	-0.06078 U	0.03213 U
SOF			0.11	0.067	0.186

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
AUX-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	CC001.7 (3013)	CC001.8 (3014)	CC001.8 (3014)	MW4 (3019)	MW4 (3019)
Sample ID	CC001.7B	CC001.8A	CC001.8C	MW4A	MW4B
Date Sampled	11/24/1997	1/6/1998	1/20/1998	6/10/1998	6/10/1998
Ac-228	0.7325	0.8533	0.7506	0.9168	0.9917
Ag-108m	0.1243	-0.0034 U	-0.01767 U	0.02607	0.006746 U
Ag-110m	-0.000928 U	0.006739 U	-0.009865 U	0.02132 U	-0.007524 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Bi-212	0.5757	0.6023	0.5877	0.7982	0.7631
Bi-214	0.5385	0.395	0.497	0.5443	0.5097
Ce-144	0.1307 U	-0.01377 U	-0.1809 U	-0.07702 U	0.05413 U
Co-58	-0.008194 U	-0.03425 U	-0.006752 U	-0.03265 U	0.006621 U
Co-60	0.4365	0.1663	0.08317	0.006843 U	-0.02842 U
Cs-134	0.0116 U	-0.04742 U	-0.01753 U	-0.01137 U	-0.006117 U
Cs-137	1.533	0.1559	0.0108 U	-0.0004715 U	0.008019 U
Eu-152					
Fe-59	-0.02115 U	-0.01991 U	0.003989 U	0.01129 U	0.04168 U
I-132					
I-133				11.9 U	
I-135					
K-40	14	14.29	14.83	17.44	16.92
Kr-85					
Mn-54	0.02818 U	0.01144 U	-0.00329 U	-0.01574 U	0 U
Mo-99					
Nb-95	0.01657 U	0.02048 U	0.01647 U	-0.01942 U	-0.01195 U
Np-239	0.2643 U				
Pb-212	0.7393	0.8545	0.7021	0.9601	0.9596
Pb-214	0.5876	0.4675	0.4207	0.6201	0.5484
Ra-226		0.6563 U			1.077
Ru-103	-0.02752 U	-0.003524 U	0.001716 U	-0.003283 U	0.02308 U
Ru-106	0.1613 U	0.2455	-0.021 U	-0.09858 U	0 U
Sb-124	-0.01775 U	0.005859 U	-0.007978 U	0.02905 U	0.04103 U
Sb-125					
Tl-208	0.6353	0.7077	0.5958	0.8077	0.6934
Zn-65	-0.01842 U	0.02896 U	-0.064 U	-0.1748 U	-0.02543 U
Zr-95	0.02503 U	0.02365 U	0.007269 U	-0.02969 U	0.0004982 U
SOF	0.23	0.051	0.017	0.003	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
AUX-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	MW4 (3019)	PAB001.2 (3043)	PAB001.22 (3044)	PAB001.2 (3043)	PAB001.2 (3043)
Sample ID	MW4C	PAB001.2	PAB001.22A	PAB001.2A	PAB001.2B
Date Sampled	6/10/1998	11/20/1997	11/6/1997	11/6/1997	11/6/1997
Ac-228	0.8275	0.6938	0.8026	0.6573	0.9316
Ag-108m	0.01081 U	-0.001573 U	0.008104 U	0.008482 U	-0.0308 U
Ag-110m	0.01506 U	-0.01097 U	0.02006 U	-0.01003 U	-0.06908 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Bi-212	0.506 U	0.6628	0.8208	50.9 U	0.9323
Bi-214	0.3248	0.5438	0.4416	0.4422	0.5823
Ce-144	0.06921 U	0.06936 U	-0.08549 U	-0.000952 U	-0.1348 U
Co-58	-0.01105 U	0.01139 U	0.007891 U	0.008629 U	-0.03599 U
Co-60	0.0036 U	0 U	-0.01755 U	-0.0979 U	0.5563
Cs-134	0.01407 U	-0.04391 U	-0.0007756 U	-0.02889 U	0.01745 U
Cs-137	-0.01762 U	0.01827 U	0.02163 U	-0.007579 U	0.1629
Eu-152					
Fe-59	-0.03321 U	0.01346 U	-0.0336 U	-0.02837 U	-0.01135 U
I-132					
I-133					
I-135					
K-40	16.03	16.89	16.37	14.93	16.77
Kr-85					
Mn-54	0.01708 U	0.01427 U	-0.02864 U	-0.001841 U	-0.00154 U
Mo-99					
Nb-95	0.02102 U	-0.0121 U	0.03559 U	0.02667 U	0.0241 U
Np-239			4.4 U		
Pb-212	0.7807	0.8756	0.755	0.7261	0.9468
Pb-214	0.457	0.6105	0.5141	0.5104	0.5068
Ra-226				0.9703	1.419
Ru-103	0.0005875 U	-0.009443 U	0.001903 U	0 U	-0.0222 U
Ru-106	-0.1668 U	-0.07626 U	-0.06125 U	0.06411 U	0.3542
Sb-124	0.01715 U	-0.01484 U	-0.002129 U	-0.007644 U	0.004969 U
Sb-125		-0.08008 U			
Tl-208	0.8325	0.7708	0.8623	0.7965	0.8066
Zn-65	0.1239 U	0.0412 U	0.01505 U	-0.02968 U	0.03505 U
Zr-95	0.001387 U	0.002439 U	-0.002786 U	0.03764 U	0.07728
SOF					0.133

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

 Blank results indicate chemical not analyzed

Table 4
Rad
AUX-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS563 (3273)	TS563 (3273)	TS564 (3274)	TS565 (3275)	TS566 (3276)	TS567 (3277)
Sample ID	TS563A	TS563B	TS564A	TS565	TS566	TS567
Date Sampled	9/17/1998	9/17/1998	9/17/1998	9/24/1998	9/24/1998	9/28/1998
Ac-228	0.9189	0.8305	0.9186	0.7876	0.856	0.6115
Ag-108m	-0.01185 U	0.003033 U	0.00902 U	0.01793 U	0.0175 U	-0.004759 U
Ag-110m	-0.01104 U	0.03191 U	0.001414 U	0.04173	-0.007798 U	0.01041 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Ba-133						
Bi-212	1.744		0.547	1.079	1.163	0.689
Bi-214	0.5549	0.4398	0.3553	0.5334	0.476	0.4986
Ce-144	-0.04568 U	-0.02907 U	0.117 U	-0.03565 U	-0.02743 U	-0.08782 U
Co-58	-0.019 U	-0.02642 U	0.009525 U	-0.0101 U	-0.01289 U	0.03718
Co-60	1.968	2.901	-0.0138 U	0.05061	0.02598 U	0.04953 U
Cs-134	0.1415	-0.1571 U	0.01786 U	0.03129 U	0.007306 U	0.03683 U
Cs-137	0.924	0.5899	-0.01666 U	0.03712 U	-0.002391 U	0.01625 U
Eu-152		-0.07469 U				
Fe-59	-0.08723 U	-0.07326 U	-0.04948 U	-0.02546 U	0 U	-0.01056 U
I-132				17.47 U	34.95	
I-133						
I-135				0.3992		
K-40	17.02	16.06	18.34	15.72	17.45	18.38
Kr-85						
Mn-54	0.01164 U	0.02885 U	0.01088 U	0.006937 U	0.01439 U	-0.02946 U
Mo-99						
Nb-95	-0.003962 U	0.03195 U	0.02206 U	-0.01042 U	-0.008321 U	0.02945 U
Np-239						
Pb-212	0.7487	0.9406	0.8422	0.7306	0.7472	0.7125
Pb-214	0.3754	0.516	0.4317	0.4687	0.5254	0.4415
Ra-226	1.425				1.73	0.61 U
Ru-103	0.01147 U	-0.02192 U	-0.01261 U	-0.01196 U	0.006492 U	0.005952 U
Ru-106	-0.2173 U	-0.1459 U	-0.1578 U	-0.1816 U	-0.04956 U	-0.07084 U
Sb-124	-0.02132 U	0.01504 U	0.008715 U	0.02034 U	0.03591 U	0.002531 U
Sb-125						
Tl-208		0.8105	0.9313	0.7449	0.8635	0.5827
Zn-65	-0.1119 U	-0.1036 U	0.005187 U	0.01548 U	-0.07993 U	0.0899 U
Zr-95	-0.003727 U	0.1078	0.01666 U	-0.01955 U	-0.02557 U	-0.0146 U
SOF	0.503	0.648		0.01		

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
AUX-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS568 (3278)	TS569 (3279)	TS570 (3280)	TS571 (3281)	TS579 (3286)	TS580 (3287)
Sample ID	TS568	TS569	TS570	TS571	TS579	TS580
Date Sampled	9/28/1998	9/28/1998	9/28/1998	9/28/1998	10/7/1998	10/7/1998
Ac-228	0.7769	0.6044	0.8413	0.9194	0.8395	0.9108
Ag-108m	0.003945 U	-0.03619 U	-0.002014 U	0.007026 U	0.009659 U	0.0009902 U
Ag-110m	0.01345 U	0.03431 U	0.008198 U	-0.008368 U	0.001673 U	-0.004204 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Ba-133					-0.03528 U	
Bi-212	1.134	0.8282	0.4559	0.8049	1.163	1.119
Bi-214	0.4548	0.4506	0.5356	0.4341	0.4312	0.4079
Ce-144	0.05806 U	0.01857 U	0.06006 U	-0.01654 U	0.02688 U	-0.06584 U
Co-58	0.00958 U	-0.01203 U	-0.02861 U	-0.01373 U	-0.01374 U	-0.02135 U
Co-60	0.1248	0.1707	0.008712 U	0.1441	0.1111	0.1809
Cs-134	-0.01325 U	-0.00755 U	-0.02441 U	0.007049 U	0 U	0.007495 U
Cs-137	0.01922 U	0.022 U	-0.007014 U	0.0644	0.1053	0.1035
Eu-152				0.223 U		
Fe-59	-0.0231 U	-0.0247 U	0.05708 U	-0.06663 U	-0.04067 U	-0.04393 U
I-132						
I-133						
I-135						
K-40	16.71	16.53	16.99	14.94	15.03	16.21
Kr-85						
Mn-54	0.0184 U	0.004693 U	-0.001425 U	0.02755 U	-0.008837 U	0.0416
Mo-99				0.2202 U		
Nb-95	0.01487 U	-0.01514 U	0.01317 U	0.03378 U	0.00547 U	-0.01863 U
Np-239		-0.03668 U				
Pb-212	0.7708	0.7732	0.8672	0.8408	0.8764	0.8366
Pb-214	0.4538	0.5225	0.4432	0.4853	0.555	0.4445
Ra-226	1.314					0.9358 U
Ru-103	-0.01125 U	-0.001895 U	0.0049 U	-0.005972 U	-0.004776 U	0.009983 U
Ru-106	-0.1035 U	0 U	-0.1388 U	0.2302 U	0.09486 U	-0.03813 U
Sb-124	0.02772 U	-0.01757 U	0.01452 U	-0.02141 U	-0.01423 U	-0.01737 U
Sb-125						
Tl-208	0.7552	0.8157	0.9149	0.7265	0.827	0.8333
Zn-65	-0.02222 U	0.0043 U	-0.07179 U	0.06961 U	-0.06853 U	0.1248 U
Zr-95	-0.02984 U	-0.03754 U	0.001841 U	-0.03294 U	0.05531	0.02987 U
SOF	0.026	0.035		0.035	0.032	0.048

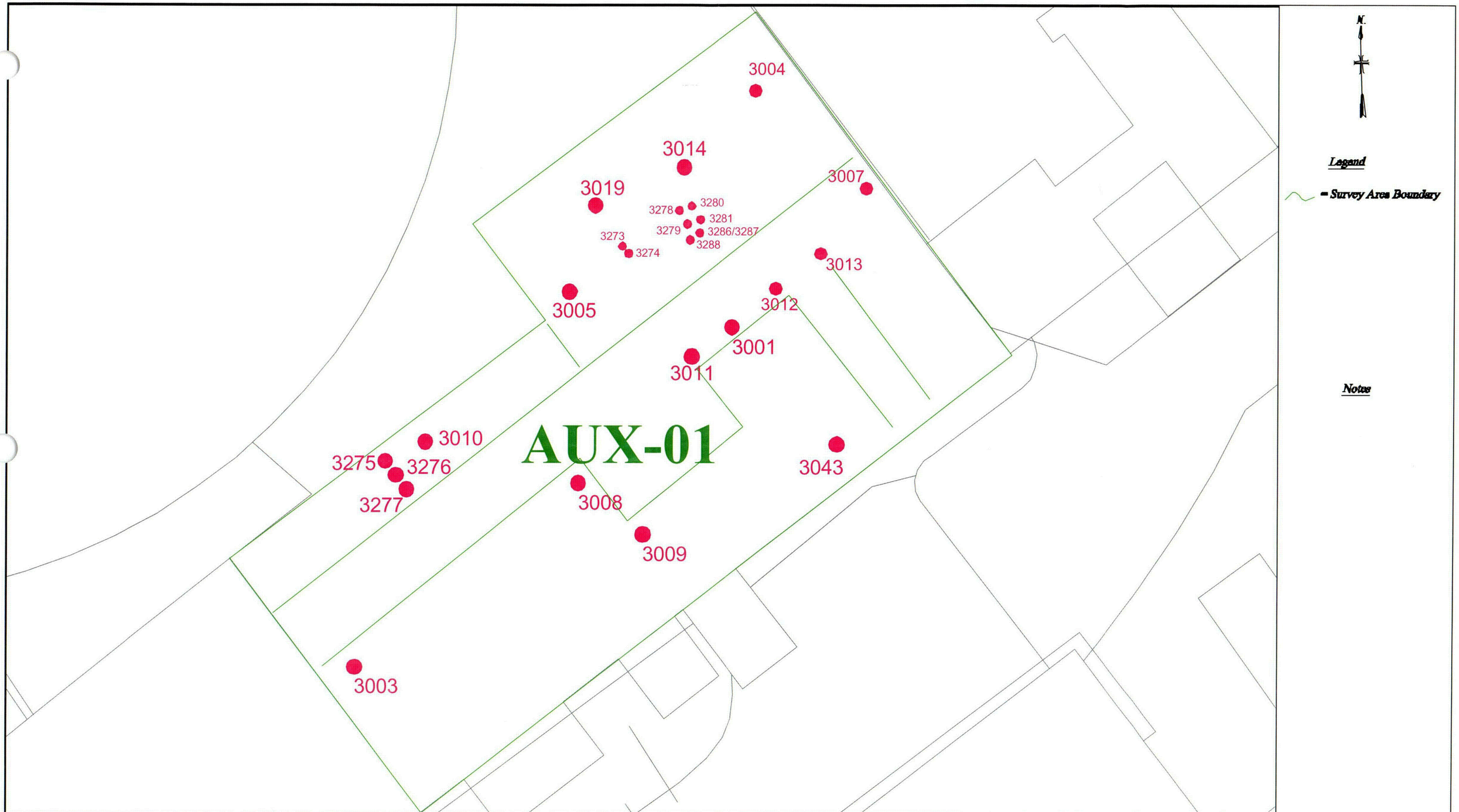
U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed

Table 4
Rad
AUX-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS581 (3288)	TS582 (3289)
Sample ID	TS581	TS582
Date Sampled	10/7/1998	10/7/1998
Ac-228	0.9407	1.062
Ag-108m	0.01393 U	-0.01121 U
Ag-110m	-0.01155 U	0.01364 U
Am-241	0 U	0 U
Ba-133		
Bi-212	1.191	0.9761
Bi-214	0.4738	0.5441
Ce-144	-0.2536 U	-0.1232 U
Co-58	-0.01438 U	-0.037 U
Co-60	0.02805 U	0.02158 U
Cs-134	-0.2093 U	0.01146 U
Cs-137	0.04167	-0.002603 U
Eu-152		
Fe-59	-0.0381 U	0.0347 U
I-132		
I-133		
I-135		
K-40	15.31	16.15
Kr-85		5.957 U
Mn-54	0.0127 U	0.02539 U
Mo-99		
Nb-95	-0.007966 U	0.01743 U
Np-239		
Pb-212	0.8315	0.9868
Pb-214	0.4807	0.4457
Ra-226	0.8391 U	
Ru-103	0.02195 U	-0.004025 U
Ru-106	-0.04063 U	0 U
Sb-124	0.04425 U	0.0104 U
Sb-125		
Tl-208	0.7759	0.8848
Zn-65	-0.1356 U	-0.1152 U
Zr-95	0.02008 U	-0.02801 U
SOF	0.003	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed



Yankee Atomic Power Company Soil Sample Locations - AUX-01	YANKEE	Date: October 2003 Revision: 4	Figure: 24

C28

Building Historical Site Assessment and Classification Summary

Survey Area Name: Primary Auxiliary Building #2 Designator: **AUX-02**

Information current as of July 31, 2003

Survey Area Description

The Primary Auxiliary Building (PAB) has been divided into two survey areas: AUX-01 and AUX-02. These survey areas are delineated based upon their construction, type of systems present and operating history. Further division of these survey areas into survey units is dependent upon the decommissioning end state configuration of the PAB structure. AUX-02 was commonly referred to as the "Lower PAB".

Survey Area AUX-02 consists of the reinforced concrete floor, foundations and sub-grade structures of the PAB expected to remain after demolition of the above-grade structure is complete. Due to the change in grade elevation between the north and south sides of the PAB the north wall will be removed to 1022' and the south wall to be removed to 1035'. Portions of the east and west walls may remain to provide support for the south wall.

The AUX-02 footprint includes the Lower PAB west of AUX-01. The floor area of AUX-02 is at elevation 1022'. Radioactive systems in AUX-02 were the Chemical Injection pumps (one low pressure and two high pressure), Steam Generator Blow-down Tank, Safety Injection Tank heating, Seal Water pressure maintenance tank and the floor drain system.

Because none of these systems were expected to contain radioactive liquids, this area was not designed with an independent controlled (filtered) ventilation system. A passive ventilation arrangement in AUX-02 allowed air to be drawn first through AUX-02 through louvers in the north wall of the ground floor and then through AUX-01 by the draw of its significant negative atmospheric pressure. As stated in the AUX-01 survey area description, the AUX-01 ventilation discharge was controlled and filtered prior to discharge through the monitored PVS. Survey Area AUX-02 will be divided into survey units as necessary to meet the maximum survey unit size limitation of 100 m^2.

The soils present under and adjacent to the PAB structure include back fill, overburden and lodgment till. The lodgment till is relatively impermeable to groundwater flow. The overburden is more permeable. The backfill is the most permeable media. Consequently, areas containing backfill are the most likely pathways for subsurface migration of radioactivity by surface water infiltration or groundwater movement. Backfill is present at the perimeter of the sub-grade structures and at the locations where systems connect to or run under the PAB. Backfill is present at the perimeter of the foundation and subsurface systems. The structures and systems present include the electrical conduit duct bank, floor drain sump pit, floor drain piping, service water piping, safety injection piping and steam generator blow-down discharge piping connecting to the service water system.

Survey Area Name: Primary Auxiliary Building #2 Designator: **AUX-02**

Hydraulics

There is a hydraulic gradient across the PAB structure resulting in groundwater movement generally from south to north under the slab. This is the result of a perforated drainpipe installed at elevation 1022' along the south foundation wall of the PAB (effective groundwater table on the south side) and the average groundwater table on the north side of the PAB between 2' and 5' below the 1022' grade level.

Survey Area History

The Chemical Injection pumps were abandoned in place around 1970 when the new Safety Injection Building was constructed and placed into service. These pumps were then modified in the early 1980's (post Three Mile Island modification) to become the electrically driven emergency boiler feed pumps.

The section of the Primary Auxiliary Building (PAB) identified as AUX-02 was not designed to contain leakage of radioactivity from the systems within the structure as these systems were not anticipated to contain significant amounts of radioactivity by virtue of their intended function. The floor drain system originally conducted system leakage to the storm drain system.

Events that resulted in the introduction of radioactivity into systems in AUX-02 include those described in Abnormal Occurrence Reports (AOR) 64-08 (Ref. 1) and AOR 66-08 (Ref. 2).

AOR 64-08 describes the contamination of the Seal-Water System by a back flow from the Shut-Down-Cooling System. This event resulted in contamination of the lower PAB, upper PAB, the PAB roof and the storm drain system. The storm drain system received inputs from both the PAB roof drains and the upper and lower PAB floor drains. After this event the entire seal water system was relocated to the shutdown cooling cooler cubicle in AUX-01. At this point isolation of the floor drain inputs to the storm drain system was not implemented.

AOR 66-08 describes contamination of the storm drain system via the floor drain in the lower PAB resulting from a leak on the Safety Injection Tank heating system relief valve.

After this event the floor drains were isolated from the storm drain system. A floor drain sump and pump were installed that pumped all floor drain into the overhead and then to AUX-01 to the Gravity Drain Tank.

Translocation Pathways

This structure was subjected to contamination spread from adjacent contaminated areas. These include AUX-01 (PAB cubicle corridor) and the valve room and the chemistry sample cubicle on the upper floor of AUX-02. The general areas of the upper and lower levels of AUX-02 were maintained as non-contaminated areas. The valve room and the chemistry sample cubicle, which are located in the upper level of AUX-02, were controlled as contaminated areas for much of the plant history. Migration of contamination out of these posted contaminated areas occasionally resulted in contamination of the adjacent upper and lower levels of the PAB. These areas were decontaminated when contamination was identified by routine radiological

surveillance. Events described in the historical account above resulted in migration of radioactivity through the floor drain system to the storm drain catch basin (WCB-009). This storm drain is part of the west storm drain system that ultimately drains into the surface water tributary passing through OOL-06 and thence to OOL-05 where it meets the Deerfield River.

Potential Contaminants

Contaminants present in AUX 02 include all potential contaminants in the radionuclide mix identified in Radionuclides for Building Surfaces and Soil DCGL Determinations, YA-REPT-00-001-03 (Ref. 3).

Scoping/Characterization Surveys (Historical)

Scoping surveys performed of the AUX 02 survey area consisted of concrete core samples, subsurface and sub-floor soil samples, contamination smear samples and direct measurement dose rates. The results of the concrete core sample analysis of the two AUX-02 wall samples were negative (no activity detected).

The results of the radiological assessments performed are reported in YNPS Decommissioning Plan section 3.1.7 Site Characterization Surveys (Ref. 4) and Memorandum RP-98-06 Radiological Analysis of Subsurface and Sub-floor Soils at YNPS (Ref. 5).

All of the Lower PAB was surveyed for the purpose of turnover in preparation for NUREG-5849 FSS (Ref. 6 & 7). The results of this survey will be reviewed and may be qualified as characterization survey data applicable to this survey area.

Soils samples taken during the turnover survey are not included in the database as they are not available in digital format for importation. Review of hard copy results (Ref. 7) found that all five samples were either "not detected" or below the DCGL for radiological substances of concern. The result of the mean SOF would not be significantly influenced by the addition of these sample results to the database. The SOF of each of these five samples is presented below:

Lower PAB 1 - Not detected (only naturally occurring radionuclides detected)
Lower PAB 2 - Not detected (only naturally occurring radionuclides detected)
- indication of Te-129m (< MDA) is discounted on half life and genetic heritage not credible
Lower PAB 3 - Cs-137 at 1.72E-01 pC/gm = 0.014 DCGL
Co-60 at 2.34E-01 pC/gm = 0.048 DCGL
SOF = 0.062
Lower PAB 4 - Co-60 at 9.81E-02 pC/gm = 0.02 DCGL

Lower PAB 5 - Not detected (only naturally occurring radionuclides detected)
indication of Co-60 (< MDA) discounted only 1 peak of 2 detected

Lower PAB Dose Rate & Contamination Summary

Review of turnover surveys dated 8/26/98 and 8/27/98 for Lower PAB indicate that all smears were less than background or LLD, and all scans were less than alarm set-points. These surveys are attached to this section.

Decommissioning Activities

Decommissioning Work Plans (DWP) activities performed in the AUX-02 survey area included the following:

- BD-01 Steam Generator Blow-down (Ref. 8).
- CCWS-01 Component Cooling, Fuel Pit Cooling and Service Water (Primary Plant Systems) (Ref. 9)
- PABA-01 PAB Tank Removal (Ref.10)
- PABA-02 Removal of PAB MCC4 (Ref.11)
- PABA-03 PAB Upper/Lower Level West Section (Ref.12)
- PABA-05 PAB Concrete/Steel Decontamination and Removal (Ref.13)

The decommissioning activities performed have removed all radioactively contaminated piping, pumps, tanks, and other system components from AUX-02. In addition reinforced concrete and steel surfaces have been de-contaminated via surface removal techniques.

Findings

The history of the AUX-02 indicates that this structure is radiologically impacted as a result of plant operations.

The radionuclide mix in AUX-02 includes all radionuclides identified in the radioactive systems of the plant (Ref. 3). The primary radionuclides of concern for AUX-02 are Co-60, Cs-137, Ag-108m, Sr-90, and tritium.

Contaminated Media

These radionuclides were distributed in media including reinforced concrete, paint and soil.

Remediation/Mitigation

Removal of the floor drain system piping and sump pit also required removal of portion of the floor and sub-floor soils. Some of these soils were replaced with the original soil when it was determined to meet the soil re-use criteria for residual activity (< 3mrem/yr GLV), or with clean fill. Contaminated soils were dispositioned as radioactive waste.

Sub-floor samples obtained beneath AUX-02 in 1997 and 1998 resulted in remediation being performed in one area and mitigation being performed in other areas beneath the concrete slab. The results of initial sampling leading to these remediation/mitigation activities, the results of samples marking progress and the results of samples representing the "as left" condition of the excavations is documented on the "remediated areas" sheet attached to this report.

Current Status

Survey Area AUX-02 is in an advanced stage of decommissioning with all systems removed and surface decontamination performed. All areas below the concrete slab known to be contaminated above levels equivalent to the soil DCGLs were remediated to levels less than the soil DCGLs.

Review of turnover surveys dated 8/26/98 and 8/27/98 for Lower PAB indicate that all smears were less than background or LLD, and all scans were less than alarm set-points.

A soil sample location map (Figure 25) has been prepared to show the distribution of sampling locations below AUX-02. Only samples representative of soils still present are included on the map (samples of soils representative of soils removed during remediation activities are not presented). The results and analyses (Tables 1-4 in this section) of the

samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL. Only those samples with detectable results of the radionuclides of concern appear in Table 1. An assessment of the maximum, minimum and mean sum of fractions (SOF) for AUX-02 is presented at the end of Table 1. The mean SOF for the AUX-02 Survey Area is 0.013.

Additional decommissioning activities to be performed will remove, at a minimum, the above grade portions the structure. Continuing scoping surveys will be performed in support of further investigations of subsurface radioactivity if required. The extent of contamination of the exterior surface of the PAB structure below grade and sub-foundation soil will require further investigation.

Survey Area Name: Primary Auxiliary Building #2 Designator: **AUX-02**

Information current as of July 31, 2003

Classification Statement

Based upon the radiological conditions identified in the operating history and as a result of the decommissioning activities performed to date, survey area AUX-02 is identified as a Class 1 Survey Area.

Non-Radiological Concerns

PCB Paint application.

Residual chromate from component cooling.

Survey Area Name: Primary Auxiliary Building #2 Designator: **AUX-02**

Drawings

9699-FA-16 A
9699-FA-16 B
9699-FB-1 D
9699-FB-1 E
9699-FB-5 E
9699-FC-40 C
9699-FC-40 R
9699-RC-40 A

References

1.	Abnormal Occurrence Report (AOR) 64-08, "Seal Water Tank Spill," dated September 4, 1964.
2.	AOR 66-08, "Abnormal Activity in Storm Drains," dated September 27, 1966.
3.	"Radionuclides for Building Surfaces and Soil DCGL Determinations," YA-REPT- 00-001-03
4.	Yankee Nuclear Power Station, Decommissioning Plan, Rev. 0.0., Section 3.
5.	Radiation Protection Memorandum RP-98-06, "Radiological Analysis of Subsurface and Sub-floor Soils at YNPS," dated January 22, 1998.
6.	Turnover Surveys (see attachment to this section).
7.	Turnover Soil Sample Results - Lower PAB 1 through 5 (see attachment to this section).
8.	Decommissioning Work Package (DWP) BD-01, "Steam Generator Blow-down (Outside VC)," dated October 24, 1994.
9.	DWP CCWS-01, "Component Cooling, Fuel Pit Cooling and Service Water (Primary Plant) Systems," dated September 5, 1995.
10.	DWP PABA-01, "Primary Auxiliary Building Tank Removal," dated December 18, 1995.
11.	Memorandum YPR 145/96, "Recommendation to Proceed with Removal of Electrical Components in the PAB, DWP PABA-02," dated March 19, 1996.
12.	DWP PABA-03, "Primary Auxiliary Building – Mechanical/Electrical Component Removals."
13.	DWP PABA-05, "PAB Concrete/Steel Decontamination and Removal," dated May 29, 1997.

Lower PAB Dose Rate & Contamination Summary

Review of turnover surveys dated 8/26/98 and 8/27/98 for Lower PAB indicate that all smears were <background or LLD, and all scans were less than alarm setpoints.

AUX-02

Remediated Areas								
Location	Sample #	Date	GLV SOF	Disposition	Nuclide	Conc. (pCi/gm)	Fraction of DCGL	DCGL SOF
Lower PAB Sump 42" - 54"	PAB001.4E	11-Dec-97	2.496		Co-60	3.357E+00	0.694	1.391
					Cs-134	1.172E-01	0.017	
					Cs-137	8.320E+00	0.680	
Lower PAB Sump floor 74" - 80" comp	TS-519A	3-Aug-98	0.034		Co-60	8.270E-02	0.017	0.017
Lower PAB Sump floor 74" - 80" comp	TS-519B	3-Aug-98	ND					
PAB SUMP wall 0" - 74" comp	TS-520A	3-Aug-98	ND					
PAB SUMP wall 0" - 74" comp	TS-520B	3-Aug-98	ND					

UNK	- unknown
AB	- as area backfill
ABC	- ABC storage area
AL	- as left
ALAR	- as left after remediation
FR	- further remediation
RD	- rad disposal
TS	- temporary storage tank

DCGL (pCi/gm)		
Nuclide	25 mrem/yr	10 mrem/yr
Ag-108m	8.521E+00	3.408E+00
Co-60	4.838E+00	1.935E+00
Cs-134	6.706E+00	2.682E+00
Cs-137	1.224E+01	4.896E+00

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

Direct frisk of remaining lower walls except West wall, with E-600's + SHP-100's. Alarm setpt. - 1027 cpm, no alarms received.

COPY

DATE 8/26/78 TIME 1100

SURVEYOR S. Shipee / B. Cooke / [illegible]

INSTRUMENT/#	CAL DUE
E-600 / 5131	11-1-98
SHP-100 / 55991	9-10-98
E-600 / 5140	1-13-99
SHP-100 / 51451	10-8-98
E-600 / 5143	1-14-99
SHP-100 / 51331	11-7-98

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- -X-X- BARRIER
- ⊢—⊣ MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: Turnover survey

SPECIAL SURVEY FORM LOCATION or EQUIPMENT PA 020 LOWER PAB T/O SURVEY

8101.6 REV.24
IMS # 002.09.03
RT # 11.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

Remainder of Lower walls and Floor have been Scanned. Masslins and 40 smears Taken on Floor, Walls, & ceiling All < BKg or LLD. All scans were less than Alarm set points, No Alarms.

Survey Instruments
~~Instruments used~~

E600 5139	11-5-98
SHp100 51891	10-8-98
239-1F 51821	11-29-98
E600 5143	1-14-99
SHP100 50957	9-9-98
43-37 5566	2-5-99
CM-7 5559	5-22-99

COPY

DATE 8/27/98 TIME 13:10

SURVEYOR A Robinson / G Cooke / [illegible]

INSTRUMENT/#	CAL DUE
PIC #2 5712	4/29/99
N	
	A

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(✓) CONTAMINATION

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

A

N

COMMENTS: LLD = 30.80 dpm
BKG = 2.13 cpm

SPECIAL SURVEY FORM LOCATION or EQUIPMENT LPAB PA020 Turnover Survey

8101.6 REV.24
IMS # V02.09.03
RT # 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

Remainder of Lower walls and floor have been Scanned. Masslins and 46 smears Taken on floor, walls, & ceiling All < Bkg or LLD. All scans were less than Alarm set points, No Alarms.

Survey Instruments
~~Equipment~~

E600 5139	11-5-98
SHp100 51891	10-8-98
239-1F51821	11-29-98
E600 5143	1-14-99
SHP100 50957	9-9-98
43-37 5566	2-5-99
CM-7 5559	5-22-99

COPY

DATE 8/27/98 TIME 13:10

SURVEYOR A Robinson / G Cooke / [illegible]

INSTRUMENT/#	CAL DUE
PIC #2 5712	4/29/99
N	
	A

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- -X-X- BARRIER
- |—~—| MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(✓) CONTAMINATION

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

N A

COMMENTS: LLD = 30.80 dpm
BKG = 2.13 cpm

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT LPAB PA020 Turnover Survey

8101.6 REV.24
IHS # V02.09.03
RT # 1[illegible]11.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

Direct frisk of remaining lower walls except West wall, with E-600's + SHP-100's. Alarm setpt. - 1027 cpm, no alarms received.

COPY

DATE 8/26/98 TIME 1100

SURVEYOR [illegible] / S Cook / [illegible]

INSTRUMENT/#	CAL DUE
E-600 / 5132	11-1-98
SHP-100 / 55991	9-10-98
E-600 / 5140	1-13-99
SHP-100 / 51451	10-8-98
E-600 / 5143	1-14-99
SHP-100 / 51331	11-7-98

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- -X-X- BARRIER
- ⊢⌒⊣ MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(X) CONTAMINATION Direct frisk

( ) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

( ) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15 N/A	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: Turnover survey

SPECIAL SURVEY FORM LOCATION or EQUIPMENT PA020 LOWER PAB T/O SURVEY

8101.6 REV.24
IMS # V02.09.03
RT # 10.811.373

Table 1
Sum of Fractions
AUX-02 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
3248	TS520	TS520B		0.011
3248	TS520	TS520A		0.012
3247	TS519	TS519A		0.032
3046	PAB001.4	PAB001.4D		0.019
3046	PAB001.4	PAB001.4B		0.016
3046	PAB001.4	PAB001.4A		0.004
3041	PAB001.12	PAB001.12B		0.003
3040	PAB001.11	PAB001.11B		0.008
3039	PAB001.10	PAB001.10C		0.008
			Min	0.003
			Max	0.032
			Mean	0.013

Table 2
Statistical Data Summary – AUX-02 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	30	30	0.845	0.094	0.661	1.019	0.853
Ag-108m	pCi/g	2	30	0.030	0.002	0.029	0.032	0.030
Ag-110m	pCi/g	0	30	0.000				
Am-241	pCi/g	0	30	0.000				
Bi-212	pCi/g	26	28	0.844	0.254	0.472	1.465	0.821
Bi-214	pCi/g	29	29	0.436	0.046	0.334	0.522	0.446
Ce-144	pCi/g	0	30	0.000				
Co-58	pCi/g	0	30	0.000				
Co-60	pCi/g	6	30	0.055	0.016	0.038	0.083	0.055
Cs-134	pCi/g	1	30	0.097		0.097	0.097	0.097
Cs-137	pCi/g	3	30	0.082	0.021	0.058	0.095	0.092
Eu-152	pCi/g	0	3	0.000				
Fe-59	pCi/g	0	30	0.000				
I-132	pCi/g	0	3	0.000				
K-40	pCi/g	29	30	15.659	1.675	13.120	18.580	15.180
La-140	pCi/g	0	1	0.000				
Mn-54	pCi/g	0	30	0.000				
Nb-95	pCi/g	1	30	0.035		0.035	0.035	0.035
Np-239	pCi/g	0	5	0.000				
Pb-212	pCi/g	30	30	0.794	0.077	0.627	0.958	0.802
Pb-214	pCi/g	30	30	0.477	0.067	0.375	0.623	0.478
Ra-226	pCi/g	18	26	1.394	0.257	0.990	1.965	1.419
Ru-103	pCi/g	0	30	0.000				
Ru-106	pCi/g	1	30	0.259		0.259	0.259	0.259
Sb-124	pCi/g	0	30	0.000				
Sb-125	pCi/g	0	4	0.000				
Tl-202	pCi/g	0	1	0.000				
Tl-208	pCi/g	30	30	0.736	0.111	0.517	0.925	0.716
Zn-65	pCi/g	2	30	0.172	0.020	0.158	0.186	0.172
Zr-95	pCi/g	2	30	0.075	0.023	0.058	0.091	0.075

Table 3
Summary of Detected Results Above Criteria
AUX-02 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	30	30		pCi/g	0	1.02
Ag-108m	2	30	8.52	pCi/g	0	0.03
Ag-110m	0	30		pCi/g	0	
Am-241	0	30	44.35	pCi/g	0	
Bi-212	26	28		pCi/g	0	1.47
Bi-214	29	29		pCi/g	0	0.52
Ce-144	0	30		pCi/g	0	
Co-58	0	30		pCi/g	0	
Co-60	6	30	4.84	pCi/g	0	0.08
Cs-134	1	30	6.71	pCi/g	0	0.10
Cs-137	3	30	12.24	pCi/g	0	0.10
Eu-152	0	3	12.06	pCi/g	0	
Fe-59	0	30		pCi/g	0	
I-132	0	3		pCi/g	0	
K-40	29	30		pCi/g	0	18.58
La-140	0	1		pCi/g	0	
Mn-54	0	30	21.66	pCi/g	0	
Nb-95	1	30		pCi/g	0	0.03
Np-239	0	5		pCi/g	0	
Pb-212	30	30		pCi/g	0	0.96
Pb-214	30	30		pCi/g	0	0.62
Ra-226	18	26		pCi/g	0	1.97
Ru-103	0	30		pCi/g	0	
Ru-106	1	30	68.21	pCi/g	0	0.26
Sb-124	0	30		pCi/g	0	
Sb-125	0	4	37.73	pCi/g	0	
Tl-202	0	1		pCi/g	0	
Tl-208	30	30		pCi/g	0	0.93
Zn-65	2	30		pCi/g	0	0.19
Zr-95	2	30		pCi/g	0	0.09

Table 4
Rad
AUX-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	PAB001.10 (3039)	PAB001.10 (3039)	PAB001.11 (3040)	PAB001.11 (3040)
Sample ID	PAB001.10B	PAB001.10C	PAB001.11A	PAB001.11B
Date Sampled	12/9/1997	12/9/1997	12/8/1997	12/8/1997
Ac-228	0.8246	0.8034	0.6656	0.8059
Ag-108m	0.005472 U	-0.01224 U	-0.01076 U	0.03163
Ag-110m	-0.0139 U	0.009349 U	-0.01041 U	0.003792 U
Am-241	0 U	0 U	0 U	0 U
Bi-212	0.8528	0.4921	0.8057	1.124
Bi-214	0.4712	0.4886	0.3871	0.446
Ce-144	0.04976 U	-0.1159 U	-0.1174 U	0.0674 U
Co-58	-0.003964 U	-0.0316 U	-0.008893 U	-0.001731 U
Co-60	0.02292 U	0.03846	0.003034 U	0.006037 U
Cs-134	-0.0505 U	-0.06416 U	-0.0688 U	-0.00176 U
Cs-137	-0.01331 U	0.009027 U	0.01332 U	0.05833
Eu-152				
Fe-59	-0.007647 U	-0.07013 U	0.01795 U	-0.0425 U
I-132				
K-40	14.88	15.02	14.13	13.5
La-140				
Mn-54	0.009578 U	-0.006878 U	0.007221 U	0.002854 U
Nb-95	-0.01255 U	0.0002156 U	-0.01339 U	-0.007238 U
Np-239				
Pb-212	0.6717	0.7084	0.6267	0.8017
Pb-214	0.4776	0.4898	0.427	0.4248
Ra-226	0.7495 U	0.9895		1.573
Ru-103	-0.0003492 U	-0.0183 U	0.01271 U	-0.01404 U
Ru-106	0.02248 U	0.2245 U	-0.07363 U	0.06282 U
Sb-124	-0.006019 U	0.009013 U	-0.01085 U	0.02304 U
Sb-125	-0.1377 U			-0.127 U
Tl-202				
Tl-208	0.6491	0.7555	0.5167	0.6425
Zn-65	-0.02099 U	-0.00316 U	-0.03834 U	0.05705 U
Zr-95	0.02419 U	0.04005 U	-0.01119 U	0.01181 U
SOF		0.008		0.008

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
AUX-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	PAB001.11 (3040)	PAB001.12 (3041)	PAB001.12 (3041)	PAB001.13 (3042)
Sample ID	PAB001.11C	PAB001.12A	PAB001.12B	PAB001.13A
Date Sampled	12/9/1997	12/8/1997	12/8/1997	12/8/1997
Ac-228	0.7324	0.8426	0.8783	0.9533
Ag-108m	0.004407 U	0.01033 U	0.02865	-0.02331 U
Ag-110m	-0.0309 U	0.02677 U	-0.004643 U	-0.03135 U
Am-241	0 U	0 U	0 U	0 U
Bi-212	0.7667	0.9085	0.548	0.7478
Bi-214	0.4052	0.4537	0.4138	0.4347
Ce-144	0.0729 U	0.008109 U	0.007442 U	0 U
Co-58	-0.005308 U	-0.01306 U	0.001143 U	-0.01596 U
Co-60	0.02756 U	-0.007317 U	0.01959 U	-0.03904 U
Cs-134	-0.08607 U	-0.05987 U	0.002868 U	-0.002485 U
Cs-137	0.01268 U	-0.01767 U	0.00752 U	0.008945 U
Eu-152				
Fe-59	-0.05162 U	-0.02035 U	0.005011 U	-0.004978 U
I-132				
K-40	13.97	15.93	14.4	14.95
La-140				
Mn-54	-0.002761 U	0.006087 U	-0.004808 U	0.01606 U
Nb-95	-0.003232 U	0.03129 U	0.0123 U	0.01519 U
Np-239	-0.3798 U			
Pb-212	0.7611	0.7556	0.7038	0.7919
Pb-214	0.408	0.3768	0.4055	0.4867
Ra-226	1.379	0.6625 U		0.7189 U
Ru-103	-0.006205 U	0.01026 U	0.02529 U	-0.01421 U
Ru-106	-0.06883 U	0.07326 U	-0.01165 U	-0.07417 U
Sb-124	0.02927 U	0.0009819 U	-0.002002 U	0.02674 U
Sb-125				
Tl-202				0.02177 U
Tl-208	0.67	0.7005	0.806	0.7378
Zn-65	-0.1185 U	-0.05216 U	0.03221 U	-0.07682 U
Zr-95	0.01712 U	0.05814	0.02997 U	0.03086 U
SOF			0.003	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
AUX-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	PAB001.13 (3042)		PAB001.1 (3038)		PAB001.1 (3038)		PAB001.3 (3045)	
Sample ID	PAB001.13B		PAB001.1A		PAB001.1B		PAB001.3A	
Date Sampled	12/8/1997		11/3/1997		11/3/1997		11/13/1997	
Ac-228		0.7253		0.8267		0.9717		0.9045
Ag-108m	0.004211 U		-0.01191 U		-0.002178 U		-0.005929 U	
Ag-110m	-0.00271 U		-0.02457 U		0.01873 U		0.009121 U	
Am-241	0 U		0 U		0 U		0 U	
Bi-212		0.5108		0.8365		1.262		1.194
Bi-214		0.3336		0.3982		0.4925		0.4781
Ce-144	-0.04243 U		0.03178 U		-0.03008 U		-0.05209 U	
Co-58	-0.006237 U		-0.02023 U		0.002044 U		0.001296 U	
Co-60	-0.0161 U		0.02662 U		0.003879 U		-0.000874 U	
Cs-134	-0.1457 U		0.01881 U		0.01315 U		-0.03712 U	
Cs-137	0 U		-0.01153 U		0.03162 U		-0.02973 U	
Eu-152								
Fe-59	0.01193 U		-0.05258 U		-0.05769 U		-0.03559 U	
I-132								
K-40		13.3		17.92		17.5		18.37
La-140								
Mn-54	0.01001 U		-0.01352 U		0.02064 U		0.002907 U	
Nb-95	0.001492 U		0.03306 U		-0.01036 U		-0.00914 U	
Np-239			0.2725 U					
Pb-212		0.7229		0.8314		0.8117		0.8163
Pb-214		0.375		0.6228		0.566		0.4785
Ra-226		1.524	0.8474 U			1.55		1.307
Ru-103	-0.009707 U		0.002331 U		0.009066 U		-0.0006261 U	
Ru-106	0.09215 U		0.2876 U		-0.08174 U		-0.06175 U	
Sb-124	0.02422 U		0.01696 U		-0.00859 U		0.03389 U	
Sb-125								
Tl-202								
Tl-208		0.552		0.8327		0.6468		0.8478
Zn-65	0.007033 U		0.04846 U		0.0204 U		0.08562 U	
Zr-95	-0.001188 U		-0.04511 U		0.02859 U		-0.03468 U	
SOF								

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
AUX-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	PAB001.3 (3045)	PAB001.4 (3046)	PAB001.4 (3046)	PAB001.4 (3046)
Sample ID	PAB001.3B	PAB001.44A	PAB001.4A	PAB001.4B
Date Sampled	11/13/1997	12/11/1997	12/11/1997	12/11/1997
Ac-228	0.9929	0.8651	0.876	0.8523
Ag-108m	0.002169 U	-0.0119 U	-0.005653 U	0.01308 U
Ag-110m	-0.03177 U	0.03066 U	-0.01685 U	0.01137 U
Am-241	0 U	0 U	0 U	0 U
Bi-212	1.465	0.906	0.8972	0.6919
Bi-214	0.4487	0.3963	0.4285	0.4663
Ce-144	-0.01124 U	0.007799 U	-0.05076 U	0.001629 U
Co-58	-0.01726 U	0.01468 U	0.0006248 U	-0.0098 U
Co-60	-0.002531 U	0.02717 U	0.02004 U	0.04118
Cs-134	-0.1297 U	-0.001515 U	0.04104 U	-0.003557 U
Cs-137	-0.02016 U	-0.009366 U	0.004343 U	0.09243
Eu-152				
Fe-59	0.006277 U	-0.002989 U	-0.05026 U	0.01032 U
I-132				
K-40	17.42	15.55	15.74	14.93
La-140				
Mn-54	-0.008804 U	-0.03069 U	-0.002811 U	0.005408 U
Nb-95	0.00002139 U	0.009233 U	-0.005522 U	0.01579 U
Np-239	-1.816 U			
Pb-212	0.8528	0.8372	0.8338	0.8083
Pb-214	0.5996	0.5709	0.4683	0.5238
Ra-226	1.965	1.378		0.7326 U
Ru-103	0.007267 U	-0.01349 U	0.003737 U	-0.01158 U
Ru-106	-0.04573 U	0.05861 U	0.2594	-0.01836 U
Sb-124	-0.00951 U	0.004332 U	0.009222 U	0.01322 U
Sb-125				
Tl-202				
Tl-208	0.8945	0.9002	0.7029	0.8834
Zn-65	-0.01351 U	0.1858	-0.03243 U	-0.01109 U
Zr-95	0.02824 U	-0.02908 U	0.02604 U	0.01951 U
SOF			0.004	0.016

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
AUX-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	PAB001.4 (3046)	PAB001.4 (3046)	PAB001.5 (3047)	PAB001.6 (3048)
Sample ID	PAB001.4C	PAB001.4D	PAB001.5	PAB001.6A
Date Sampled	12/11/1997	12/11/1997	12/2/1997	12/3/1997
Ac-228	0.865	0.6609	0.8755	0.8134
Ag-108m	0.01395 U	-0.02196 U	-0.02744 U	-0.02269 U
Ag-110m	0.001262 U	-0.002741 U	0.0008815 U	0.02499 U
Am-241	0 U	0 U	0 U	0 U
Bi-212	0.8679	0.612	0.795	0.6043
Bi-214	0.4505	0.4332	0.4744	0.3837
Ce-144	-0.06071 U	-0.08618 U	0.0336 U	0.03302 U
Co-58	-0.01359 U	0.0004198 U	0.01336 U	0.01915 U
Co-60	0.01487 U	0.05497	0.03587 U	0.02108 U
Cs-134	-0.0191 U	-3.445 U	0.02642 U	-0.1001 U
Cs-137	0.01846 U	0.09515	0 U	0.01464 U
Eu-152				
Fe-59	-0.009622 U	0.02249 U	0.01032 U	0.01868 U
I-132				
K-40	16.9	15.62	15.79	13.12
La-140				
Mn-54	0.005879 U	0.00311 U	0.01308 U	-0.02424 U
Nb-95	0.002755 U	0.006808 U	-0.01913 U	0.03483
Np-239			0.1979 U	
Pb-212	0.7385	0.7304	0.8432	0.7457
Pb-214	0.4751	0.3918	0.5334	0.4179
Ra-226	1.502	1.012	0.7407 U	1.257
Ru-103	-0.005035 U	0.00379 U	-0.00937 U	-0.007968 U
Ru-106	-0.05133 U	-0.07906 U	-0.2657 U	0.03469 U
Sb-124	0.02503 U	0.008461 U	0.01592 U	0.009943 U
Sb-125				
Tl-202				
Tl-208	0.6411	0.714	0.9158	0.6203
Zn-65	-0.03083 U	-0.009643 U	-0.08302 U	0.1577
Zr-95	0.01347 U	0.01905 U	-0.003377 U	-0.006451 U
SOF		0.019		

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
AUX-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	PAB001.6 (3048)	PAB001.7 (3049)	PAB001.7 (3049)	PAB001.8 (3050)
Sample ID	PAB001.6B	PAB001.7A	PAB001.7B	PAB001.8A
Date Sampled	12/2/1997	12/2/1997	12/3/1997	12/2/1997
Ac-228	0.8952	0.762	0.8534	0.7815
Ag-108m	0 U	-0.001921 U	-0.02034 U	0.006145 U
Ag-110m	0.01978 U	-0.009822 U	-0.008345 U	0.02697 U
Am-241	0 U	0 U	0 U	0 U
Bi-212	0.946		0.4716	0.7717
Bi-214	0.4242	0.4565	0.4403	0.3537
Ce-144	-0.08018 U	-0.04928 U	-0.06764 U	-0.1437 U
Co-58	0.001999 U	-0.01289 U	-0.02698 U	-0.01843 U
Co-60	0.0002081 U	0.0194 U	-0.01256 U	-0.006381 U
Cs-134	-0.01318 U	-0.01656 U	-0.00233 U	-0.0164 U
Cs-137	-0.03071 U	0.00151 U	-0.01083 U	0 U
Eu-152		0.1598 U		
Fe-59	0.01482 U	-0.005903 U	-0.03387 U	-0.0404 U
I-132				
K-40	13.98	14.85	15.18	14.29
La-140				
Mn-54	0.005053 U	0.006873 U	0.003867 U	-0.01901 U
Nb-95	-0.02166 U	0.003505 U	-0.008761 U	0.03226 U
Np-239				0.2826 U
Pb-212	0.8266	0.7897	0.8022	0.7181
Pb-214	0.4782	0.4972	0.4767	0.4174
Ra-226	1.459		1.512	1.155
Ru-103	0.008286 U	-0.007769 U	-0.01533 U	-0.0143 U
Ru-106	0.05373 U	-0.2226 U	0.01797 U	-0.0211 U
Sb-124	-0.004895 U	-0.002263 U	-0.006439 U	0.005805 U
Sb-125		-0.09992 U		
Tl-202				
Tl-208	0.6962	0.7185	0.6847	0.6701
Zn-65	0.06561 U	-0.01779 U	0.09305 U	-0.05443 U
Zr-95	0.01316 U	0.006956 U	-0.02317 U	0.02537 U
SOF				

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
AUX-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

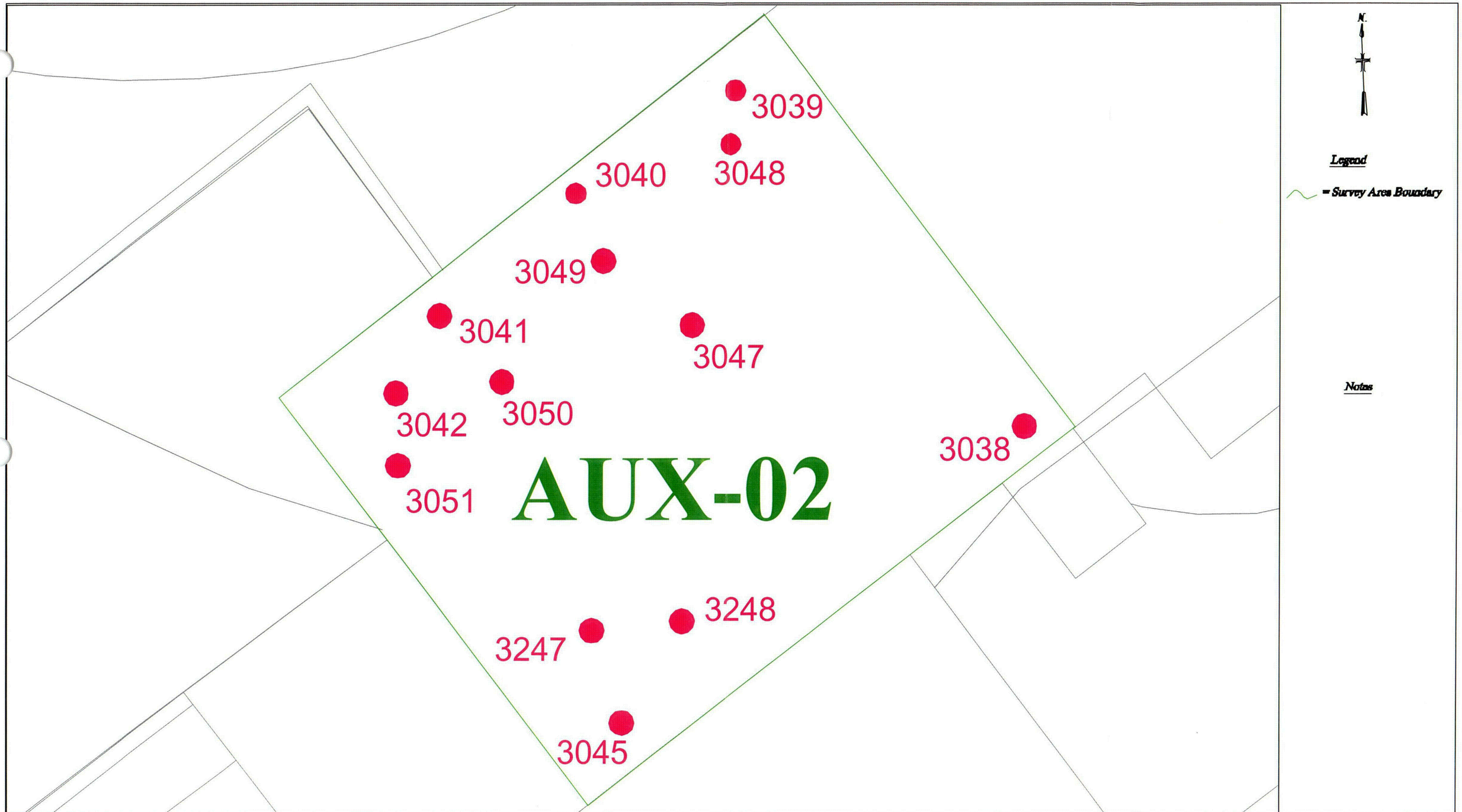
Station (Key)	PAB001.8 (3050)	PAB001.9 (3051)	TS519 (3247)	TS519 (3247)	TS520 (3248)
Sample ID	PAB001.8B	PAB001.9	TS519A	TS519B	TS520A
Date Sampled	12/2/1997	12/2/1997	8/3/1998	8/3/1998	8/3/1998
Ac-228	0.7052	0.9777	0.9638	1.019	0.7616
Ag-108m	0.005805 U	-0.03428 U	-0.01228 U	0.001198 U	-0.003479 U
Ag-110m	-0.0269 U	0.01907 U	0.01583 U	-0.004533 U	0.009153 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212		0.1177 U	0.6774	0.9386	1.261
Bi-214	0.3442		0.4795	0.4725	0.4619
Ce-144	-0.03481 U	0.006814 U	0.08315 U	0.01506 U	-0.1433 U
Co-58	-0.02108 U	-0.008488 U	0.006653 U	-0.02305 U	0.00682 U
Co-60	-0.01631 U	0.03638 U	0.0827	0.03365 U	0.05854
Cs-134	-0.008191 U	-0.008646 U	0.09748	-0.1317 U	0.007045 U
Cs-137	-0.01536 U	-0.005306 U	0.01648 U	-0.004828 U	0.0404 U
Eu-152			0.1912 U	0.524 U	
Fe-59	0.02015 U	-0.03614 U	0.04543 U	0.01608 U	-0.06153 U
I-132		2.219 U		3.851 U	
K-40	14.35	0.3864 U	18.35	18.1	17.5
La-140			0.1459 U		
Mn-54	-0.01434 U	-0.01132 U	-0.00776 U	0.004415 U	0.003899 U
Nb-95	0.001094 U	0.01696 U	0 U	0.003675 U	0.0004824 U
Np-239					
Pb-212	0.7337	0.9075	0.9584	0.9208	0.8837
Pb-214	0.4084	0.4087	0.5486	0.4966	0.516
Ra-226	0.8161 U	1.73	1.226	1.549	1.026
Ru-103	0.01549 U	-0.03562 U	-0.005803 U	-0.00731 U	-0.00602 U
Ru-106	0.03652 U	0.2199 U	-0.0211 U	0.0007411 U	0.08371 U
Sb-124	0 U	0.02853 U	0.01074 U	0.009643 U	-0.004002 U
Sb-125			-0.1379 U		
Tl-202					
Tl-208	0.5836	0.814	0.7256	0.8613	0.7738
Zn-65	-0.06443 U	-0.02647 U	-0.08078 U	-0.0508 U	-0.0567 U
Zr-95	0.03475 U	-0.003167 U	0.09127	0.02472 U	0.004309 U
SOF			0.032		0.012

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
AUX-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS520 (3248)
Sample ID	TS520B
Date Sampled	8/3/1998
Ac-228	0.8838
Ag-108m	0.01054 U
Ag-110m	0.009278 U
Am-241	0 U
Bi-212	0.5592 U
Bi-214	0.5216
Ce-144	-0.1267 U
Co-58	-0.01741 U
Co-60	0.05512
Cs-134	0.002216 U
Cs-137	0.027 U
Eu-152	
Fe-59	0 U
I-132	1.509 U
K-40	18.58
La-140	
Mn-54	0.02072 U
Nb-95	0.02775 U
Np-239	
Pb-212	0.8939
Pb-214	0.5318
Ra-226	0.7851 U
Ru-103	0.01344 U
Ru-106	-0.1174 U
Sb-124	0.02292 U
Sb-125	
Tl-202	
Tl-208	0.925
Zn-65	0.05279 U
Zr-95	-0.01236 U
SOF	0.011

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed



Yankee Atomic Power Company *Soil Sample Locations - AUX-02*	YANKEE	*Date: October 2003* *Revision: 4*	*Figure: 25*

C29

Survey Area Name: NDR/SDR/Fuel Transfer Enclosure Designator: **NSY-01**

Survey Area Description

Survey Area NSY-01 consists of the reinforced concrete floor, foundations and subsurface structures that comprise the Fuel Transfer Enclosure (FTE) expected to remain after demolition of the above-grade structures is complete. The FTE footprint includes the footprints of the former North and South Decon Rooms, which themselves include the footprints of the former #1 and #2 Decontamination Pads. There also are two drain/sump pits one located within the footprint of each decon room.

The North Decon Room (NDR) portion of the FTE footprint is approximately 58 square meters, the South Decon Room (SDR) is approximately 88 square meters and the footprint of the FTE addition is approximately 77 square meters. The total surface area of the FTE is approximately 223 square meters. There is approximately 104 linear meters of foundation that extends to a depth of 1.5 meters associated with the footprint of the FTE. The two drain/sump pits are approximately 1 meter on a side and are also 1.5 meters deep. Two pipes that were installed through south foundation wall for Decon Pad #1 to interconnect the drain/sump pits.

The drain/sump pits connect to the liquid waste sump tank and transfer pumps contained in the vault located below grade in the RCA yard area east of the FTE (NSY-11). A sub-floor non-radiological drainpipe connecting the SDR drain/sump pit to East Catch Basin number five (ECB#5) was closed to inputs and abandoned in place under the SDR floor and foundations. The fuel oil transfer line connecting the fuel oil storage tank to the auxiliary boilers also runs under the floor of the SDR along a line from east to west

The foundation grade beams for the yard crane structure also run under the floor of the South Decon Room along the north and south foundation walls of the South Decon room. The support columns for the yard area crane rise out of the floor in the FTE addition.

Further division of this survey area into survey units is dependent upon the post decommissioning end state configuration of these structures.

Survey Area Name: NDR/SDR/Fuel Transfer Enclosure Designator: **NSY-01**

Survey Area History

NSY-01 structure originally consisted of an out of doors decontamination pad, Decontamination Pad #1 (Decon. Pad #1). Decon. Pad #1 was located west of the hot side machine shop portion of the service building and south of the auxiliary boiler room portion of the Turbine Building. It consisted of a steel plate covered concrete slab surrounded by a curb. A steel lined drain/sump pit was located in the southwest corner of the slab. The pit was connected to the radioactive liquid waste sump tank located in an underground vault located south of the service building.

Decontamination Pad #2 (Decon Pad #2) was constructed in 1962 and is located south of Decon Pad #1. Decon. Pad #2 consists of a reinforced concrete pad with a drain trench cast into the perimeter of the surface. The pad and drain trench is covered with steel deck plate. The pad drain trench drain connects to a drain/sump pit located between pad and the drain/sump pit for Decon Pad #1. The Decon Pad #2 drain/sump pit connects to the sump pit of Decon. Pad #1 through two sleeved pipes that penetrate the yard crane foundation grade beam and the foundation of Decon Pad #1.

The decon pads were used for the decontamination of various plant equipment and fuel/waste transportation casks (Ref 1). For a time a tent like awning enclosure was used to cover the pads while decontamination was in progress. Later a steel frame structure with translucent fiberglass panels was fabricated for use as an enclosure during decontamination activities. The decontamination pads were routinely contaminated during decontamination activities. In June of 1964 a plant modification enclosed the decontamination pads within a permanent structural addition to the Service Building (Ref 2). This modification erected walls and a roof over the North Decon Pad to create the North Decon Room. In addition it created the South Decon Room by constructing foundations, walls and a roof over the South Decon Pad. The South Decon Room was about one and one half times the size of the North Decon Room. It also provided a concrete floor around the perimeter of Decon Pad #2. Access to the decon rooms was provided by doors from the hot side machine shop to the North decon Room. A door also connected the North Decon Room to the South Decon Room and a roll-up door in the east wall connected the South Decon Room to the RCA yard. The roof of the South Decon Room included a rolling hatch cover.

OPS Report #40 for April 1964 describes that in preparations for this modification Decon Pad #2 was decontaminated from 20 mr/hr and 4000 dpm/ft^2 down to 0.5mr/hr and 1500 dpm/ft^2. In addition to the decontamination of tools, equipment and fuel/waste transport casks these areas were used to store of radiologically contaminated tools and equipment.

At some point in time the steel deck plate covering of Decon Pad #1 was removed leaving the concrete surface exposed.

EDCR 00-001 modified the North and South Decon Rooms to function as the Fuel Transfer Enclosure (FTE). This modification removed the concrete block wall that separated the North and South Decon Rooms. It also removed the east, south, west walls and roof of the South Decon Room The area of the structure expanded in size to include the yard area south of the hot side machine shop. The new walls of the FTE are constructed of steel frame and insulated panels. The new roof is higher and has a new rolling hatch.

The FTE is where the NAC Transportable Storage Containers are closed in preparation for placement inside of a Vertical Concrete Cask. A portion of the FTE was established as a contaminated area within which all work on contaminated components was performed. No significant contaminating events occurred in the FTE.

The RCA yard area surface and sub-surface soils at the FTE and additions location are suspected of being contaminated. Residual radioactivity not removed with the construction spoils may still be present within the footprint of the FTE and additions.

The present location of the construction spoils generated by the FTE and additions is thought to be within the SE Construction Fill Area of the site (SEE OOL-009)

Scoping/Characterization

Memo ENV-2000-06 South Decon Room / North Decon Room / Hot Machine Shop Characterization - Final, Date February 10, 2000 (Ref 3) describes characterization of this area prior to commencing decommissioning activities. Additional characterization survey performed in this area consists of concrete core samples and sub-floor soil samples from within the north and south decon rooms. Further characterization of this area will be necessary in support of future decommissioning activities.

Decommissioning Activities

Decommissioning activities were performed under DWP SDRD–01 South Decon Room Removal. SDRD-01 was performed prior to work associated with EDCR 00-001 Fuel Transfer Enclosure.

Findings

The history of NYS-01 indicates that this structure is radiologically impacted as a result of plant operations. The soils within the footprint of NSY-01 were impacted by previous plant operations.

The radionuclide mix for the NSY-01 includes all radionuclides identified in the reactor radioactive systems of the plant (Ref 4). The primary radionuclides of concern for NSY-01 are Co-60, Cs-137, Ag-108m, Sr-90, Ni-63 and tritium. Ni-63 is specifically included here due to the flushing of Control Rod driveshaft dashpots which were documented to have contained chemically measurable quantities of nickel worn from control element surfaces of the first two fuel cycles.

These radionuclides were distributed in media including reinforced concrete, painted and unpainted steel and sub-floor soil.

Current Status

A soil sample location map (Figure 26) has been prepared to show the distribution of sampling locations in NSY-01. Only samples representative of soils still present are included on the map. One survey media was assessed in NSY-01, Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for NSY-01 is presented at the end of Table 1. The results are summarized below.

Soil: Mean SOF is 0.063.
Maximum SOF for a single soil sample is 0.535 (key# 3055) south decon room east of pad.
Minimum SOF for a single soil sample is 0.004 (key# 3355) south decon room east of pad.

This survey area is still in active use as a decontamination area.

Classification Statement

Based upon the radiological condition of this survey area identified in the operating history and as a result of the decommissioning activities performed to date, survey area NSY-01 is identified as a Class 1 Area.

Survey Area Name: NDR/SDR/Fuel Transfer Enclosure Designator: **NSY-01**

Drawings

9699-FA-1E
9699-FA-2C
9699-FA-2D
9699-FC-45A
9699-FC-50A
SK 00-001-S1
YC-H-1-1

References

1.	OPs Report #26 for February 1963, Health and Safety Section, dated March 29, 1963.
2.	OPs Report #42 for June 1964, dated July 24, 1964.
3.	Memo ENV-2000-06, "South Decon Room / North Decon Room / Hot Machine Shop Characterization - Final," dated February 10, 2000.
4.	Radionuclides for Building Surfaces and Soil DCGL Determinations YA-REPT-00-001-03.

Table 1
Sum of Fractions
NSY-01 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
3473	TS99.59b	TS99.59B		0.019
3356	TS99.59a	TS99.59A		0.007
3355	TS99.58	TS99.58B		0.007
3355	TS99.58	TS99.58A		0.004
3059	SB002.2	SB002.2C		0.012
3059	SB002.2	SB002.2A		0.020
3057	SB001.6	SB001.6C		0.033
3056	SB001.5	SB001.5C		0.014
3056	SB001.5	SB001.5A		0.009
3055	SB001.3	SB001.3B		0.038
3055	SB001.3	SB001.3A		0.535
3054	SB001.2	SB001.2A		0.009
3053	SB001.1	SB001.1B		0.021
3053	SB001.1	SB001.1A		0.153
			Min	0.004
			Max	0.535
			Mean	0.063

Table 2
Statistical Data Summary – NSY-01 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	28	28	0.968	0.219	0.648	1.931	0.938
Ag-108m	pCi/g	3	28	0.230	0.283	0.063	0.557	0.070
Ag-110m	pCi/g	1	28	0.047		0.047	0.047	0.047
Am-241	pCi/g	0	28	0.000				
Bi-212	pCi/g	27	28	0.961	0.271	0.541	1.438	0.918
Bi-214	pCi/g	26	26	0.464	0.066	0.317	0.550	0.488
Ce-144	pCi/g	0	28	0.000				
Co-58	pCi/g	2	28	0.036	0.002	0.035	0.037	0.036
Co-60	pCi/g	10	28	0.201	0.330	0.034	1.098	0.065
Cs-134	pCi/g	3	28	0.079	0.026	0.051	0.102	0.084
Cs-136	pCi/g	0	1	0.000				
Cs-137	pCi/g	7	28	0.612	1.355	0.040	3.681	0.087
Fe-59	pCi/g	0	28	0.000				
I-131	pCi/g	0	1	0.000				
I-132	pCi/g	0	1	0.000				
K-40	pCi/g	27	28	15.346	5.275	1.076	20.290	16.760
Kr-85	pCi/g	1	1	6.730		6.730	6.730	6.730
Mn-54	pCi/g	1	28	0.035		0.035	0.035	0.035
Nb-95	pCi/g	0	28	0.000				
Pb-212	pCi/g	28	28	0.946	0.261	0.644	2.195	0.917
Pb-214	pCi/g	28	28	0.493	0.050	0.393	0.606	0.484
Ra-226	pCi/g	15	20	1.549	0.292	1.260	2.079	1.437
Ru-103	pCi/g	1	28	0.031		0.031	0.031	0.031
Ru-106	pCi/g	0	28	0.000				
Sb-124	pCi/g	0	28	0.000				
Sb-125	pCi/g	0	2	0.000				
Tl-208	pCi/g	27	27	0.872	0.199	0.568	1.675	0.852
Zn-65	pCi/g	0	28	0.000				
Zr-95	pCi/g	4	28	0.066	0.003	0.064	0.071	0.065

Table 3
Summary of Detected Results Above Criteria
NSY-01 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	28	28		pCi/g	0	1.93
Ag-108m	3	28	8.52	pCi/g	0	0.56
Ag-110m	1	28		pCi/g	0	0.05
Am-241	0	28	44.35	pCi/g	0	
Bi-212	27	28		pCi/g	0	1.44
Bi-214	26	26		pCi/g	0	0.55
Ce-144	0	28		pCi/g	0	
Co-58	2	28		pCi/g	0	0.04
Co-60	10	28	4.84	pCi/g	0	1.10
Cs-134	3	28	6.71	pCi/g	0	0.10
Cs-136	0	1		pCi/g	0	
Cs-137	7	28	12.24	pCi/g	0	3.68
Fe-59	0	28		pCi/g	0	
I-131	0	1		pCi/g	0	
I-132	0	1		pCi/g	0	
K-40	27	28		pCi/g	0	20.29
Kr-85	1	1		pCi/g	0	6.73
Mn-54	1	28	21.66	pCi/g	0	0.04
Nb-95	0	28		pCi/g	0	
Pb-212	28	28		pCi/g	0	2.20
Pb-214	28	28		pCi/g	0	0.61
Ra-226	15	20		pCi/g	0	2.08
Ru-103	1	28		pCi/g	0	0.03
Ru-106	0	28	68.21	pCi/g	0	
Sb-124	0	28		pCi/g	0	
Sb-125	0	2	37.73	pCi/g	0	
Tl-208	27	27		pCi/g	0	1.68
Zn-65	0	28		pCi/g	0	
Zr-95	4	28		pCi/g	0	0.07

Table 4
Rad
NSY-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SB001.1 (3053)	SB001.1 (3053)	SB001.1 (3053)	SB001.2 (3054)	SB001.2 (3054)
Sample ID	SB001.1A	SB001.1B	SB001.1C	SB001.2A	SB001.2B
Date Sampled	6/23/1998	6/23/1998	6/23/1998	6/22/1998	6/22/1998
Ac-228	0.8368	0.9294	1.04	1.931	0.9269
Ag-108m	0.5572	0.07031	-0.01292 U	0.01894 U	-0.01503 U
Ag-110m	-0.02779 U	0.03756 U	0.03491 U	0.02368 U	0.03543 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212	0.575	1.119	1.303	1.438	0.9068
Bi-214	0.3169	0.5385	0.5295	0.5151	0.4987
Ce-144	-0.18 U	-0.1205 U	-0.09009 U	-0.02213 U	0.01609 U
Co-58	0.0002164 U	-0.02622 U	-0.03999 U	-0.002803 U	-0.01435 U
Co-60	0.352	0.05991	0.003499 U	0.04361	0.01499 U
Cs-134	-0.3476 U	-0.01131 U	0.007653 U	-0.08877 U	-0.05145 U
Cs-136	0.03756 U				
Cs-137	0.1825	0.005369 U	-0.01832 U	0.0324 U	0.02466 U
Fe-59	0.009646 U	-0.02514 U	0.0705 U	-0.03127 U	-0.0291 U
I-131					
I-132					
K-40	15.38	18.21	17.98	15.84	17.85
Kr-85					
Mn-54	0.01661 U	0.01527 U	-0.0509 U	0.00919 U	0.01041 U
Nb-95	-0.001041 U	-0.004367 U	-0.003802 U	0.01621 U	0.03018 U
Pb-212	0.7805	0.9712	0.9107	2.195	0.9182
Pb-214	0.4376	0.4818	0.4599	0.6062	0.5055
Ra-226		0.9977 U		0.7497 U	
Ru-103	0.01076 U	-0.01136 U	0.006338 U	0.02344 U	-0.005682 U
Ru-106	0.1604 U	0.06228 U	0.04111 U	0.1537 U	0.2147 U
Sb-124	0.0004806 U	0.01904 U	0.02139 U	0.01038 U	-0.0342 U
Sb-125					
Tl-208	0.7684	0.9285	0.8099	1.675	0.8383
Zn-65	-0.09481 U	-0.1542 U	-0.06694 U	-0.0943 U	0.07733 U
Zr-95	0.04889 U	-0.0241 U	0.0479 U	0.05984 U	0.01173 U
SOF	0.153	0.021		0.009	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SB001.2 (3054)	SB001.2 (3054)	SB001.2 (3054)	SB001.3 (3055)	SB001.3 (3055)
Sample ID	SB001.2C	SB001.2D	SB001.2E	SB001.3A	SB001.3B
Date Sampled	6/22/1998	6/22/1998	6/22/1998	6/23/1998	6/23/1998
Ac-228	1.026	0.9534	1.052	0.6475	0.8709
Ag-108m	0.0004483 U	0.003373 U	0.01569 U	0.06278	0.002571 U
Ag-110m	-0.03054 U	-0.01435 U	-0.02684 U	0.03371 U	0.02045 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212	0.9721	0.5413	0.8424	1.174	0.5416
Bi-214	0.4836	0.5447	0.4969	0.353	0.4296
Ce-144	-0.1207 U	0.05762 U	0.01281 U	-0.0007928 U	0.01646 U
Co-58	-0.01184 U	-0.03391 U	-0.01571 U	-0.01065 U	-0.0173 U
Co-60	-0.03239 U	-0.004055 U	0.007766 U	1.098	0.1078
Cs-134	0.02547 U	-0.119 U	-0.04026 U	0.02076 U	-0.05726 U
Cs-136					
Cs-137	0.01562 U	0.03077 U	0.01339 U	3.681	0.1717
Fe-59	-0.01176 U	0.01262 U	0.06046 U	0.05725 U	-0.03353 U
I-131					
I-132					
K-40	18.23	16.82	20.29	13.88	12.97
Kr-85					
Mn-54	0.02015 U	0.009884 U	0.00873 U	0.01866 U	0.03535
Nb-95	-0.01657 U	-0.002181 U	-0.023 U	0.02803 U	0.03565 U
Pb-212	0.8448	0.972	0.9776	0.6437	0.9226
Pb-214	0.4737	0.473	0.53	0.4034	0.4746
Ra-226		1.27	1.304		1.26
Ru-103	-0.01824 U	0.009047 U	-0.004428 U	-0.009286 U	0.01571 U
Ru-106	0.1729 U	0.1161 U	-0.2892 U	-0.0179 U	0.01077 U
Sb-124	0 U	-0.01884 U	0 U	0.02197 U	0.01893 U
Sb-125					
Tl-208	0.5676	0.8869	0.9385	0.5846	0.8338
Zn-65	0.04994 U	0.1094 U	0.09753 U	-0.1078 U	-0.0741 U
Zr-95	-0.004945 U	0.064	-0.02035 U	0.002598 U	-0.02631 U
SOF				0.535	0.038

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed

Table 4
Rad
NSY-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SB001.3 (3055)	SB001.5 (3056)	SB001.5 (3056)	SB001.5 (3056)	SB001.6 (3057)
Sample ID	SB001.3C	SB001.5A	SB001.5B	SB001.5C	SB001.6C
Date Sampled	6/23/1998	6/24/1998	6/24/1998	6/24/1998	6/24/1998
Ac-228	0.7689	0.9631	0.984	0.8826	0.9384
Ag-108m	0.02632 U	0.02955 U	-0.005853 U	-0.01704 U	-0.0008331 U
Ag-110m	0.005701 U	-0.0162 U	-0.0199 U	-0.0185 U	-0.01257 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212	0.5736	0.7018	0.9741	0.7912	1.373
Bi-214	0.3793	0.3476	0.4559	0.3937	0.5496
Ce-144	-0.05106 U	0.007494 U	0.03739 U	0.1391 U	0.09894 U
Co-58	-0.001929 U	0.01799 U	-0.0111 U	-0.007771 U	-0.01613 U
Co-60	0 U	0.04532	0.03653 U	0.07004	0.1618
Cs-134	-0.05627 U	0.004129 U	-0.09015 U	0.06314 U	-0.08526 U
Cs-136					
Cs-137	0.03605 U	0.01262 U	0.001998 U	0.02654 U	-0.001258 U
Fe-59	-0.005372 U	-0.07245 U	-0.04635 U	-0.01751 U	-0.04097 U
I-131					
I-132					
K-40	0.2093 U	15.36	16.97	15.74	16.52
Kr-85					6.73
Mn-54	0.0172 U	0.02452 U	0.0243 U	0.01439 U	-0.01443 U
Nb-95	0.01612 U	0.01061 U	-0.02179 U	-0.02772 U	-0.006963 U
Pb-212	0.7779	0.8983	0.9197	0.9181	0.849
Pb-214	0.511	0.4486	0.5039	0.5322	0.4693
Ra-226	1.677	1.617	1.331		0.6577 U
Ru-103	0.004305 U	-0.002971 U	0.03131	-0.0006849 U	0.002472 U
Ru-106	-0.03976 U	-0.005854 U	-0.04211 U	0.101 U	-0.05266 U
Sb-124	0.005356 U	0.01815 U	-0.01773 U	0.02549 U	0.006865 U
Sb-125	-0.07118 U				
Tl-208	0.7111	0.9703	0.6648	0.8327	0.9105
Zn-65	0.005081 U	0.08378 U	0.09961 U	-0.06792 U	0.083 U
Zr-95	-0.01537 U	0.01815 U	-0.01359 U	-0.03834 U	-0.003413 U
SOF		0.009		0.014	0.033

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-01 – Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SB002.1 (3058)	SB002.1 (3058)	SB002.1 (3058)	SB002.2 (3059)	SB002.2 (3059)
Sample ID	SB002.1B	SB002.1C	SB002.1D	SB002.2A	SB002.2B
Date Sampled	7/1/1998	7/1/1998	7/1/1998	7/2/1998	6/30/1998
Ac-228	1.156	1.048	1.106	0.6918	0.9655
Ag-108m	-0.02469 U	0.006819 U	0.01417 U	-0.01676 U	-0.00813 U
Ag-110m	0.0142 U	0.04661	-0.01418 U	0.05568 U	-0.03312 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212	1.028	1.279	0.653	0.5315 U	1.405
Bi-214	0.4434		0.4925		0.4946
Ce-144	-0.03828 U	0.0343 U	0.05009 U	0.05699 U	0.08223 U
Co-58	-0.01615 U	0.03227 U	-0.009582 U	0.02742 U	0.03497
Co-60	0 U	-0.01044 U	0.02608 U	0.03355	0.03046 U
Cs-134	0.0741 U	0 U	-0.1054 U	0.05133	-0.1232 U
Cs-136					
Cs-137	-0.01943 U	-0.02112 U	-0.02292 U	0.06907	0.02885 U
Fe-59	0.04449 U	0.05691 U	0.02423 U	-0.04447 U	-0.06373 U
I-131			0.1871 U		
I-132					
K-40	19.28	1.076	19.77	1.28	19.59
Kr-85					
Mn-54	0.02768 U	-0.002684 U	-0.0191 U	-0.002252 U	0.004168 U
Nb-95	-0.001413 U	0.03806 U	0.002241 U	-0.006984 U	-0.01518 U
Pb-212	1.063	0.915	0.9232	0.8259	1.083
Pb-214	0.5357	0.4853	0.5835	0.5813	0.5125
Ra-226	0.6806 U	2.079	1.911	1.015 U	1.997
Ru-103	-0.019 U	0.002223 U	-0.00965 U	0.0104 U	-0.00651 U
Ru-106	0.08064 U	-0.02208 U	-0.02134 U	-0.1835 U	-0.08789 U
Sb-124	0.01902 U	-0.01487 U	0.04352 U	0.02285 U	0.01991 U
Sb-125					
Tl-208	1.024	0.852	0.9352	0.7064	1.039
Zn-65	-0.00998 U	-0.01335 U	0.01084 U	-0.03168 U	0.04484 U
Zr-95	-0.006773 U	0.0646	0.07074	-0.06264 U	0.005244 U
SOF				0.02	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

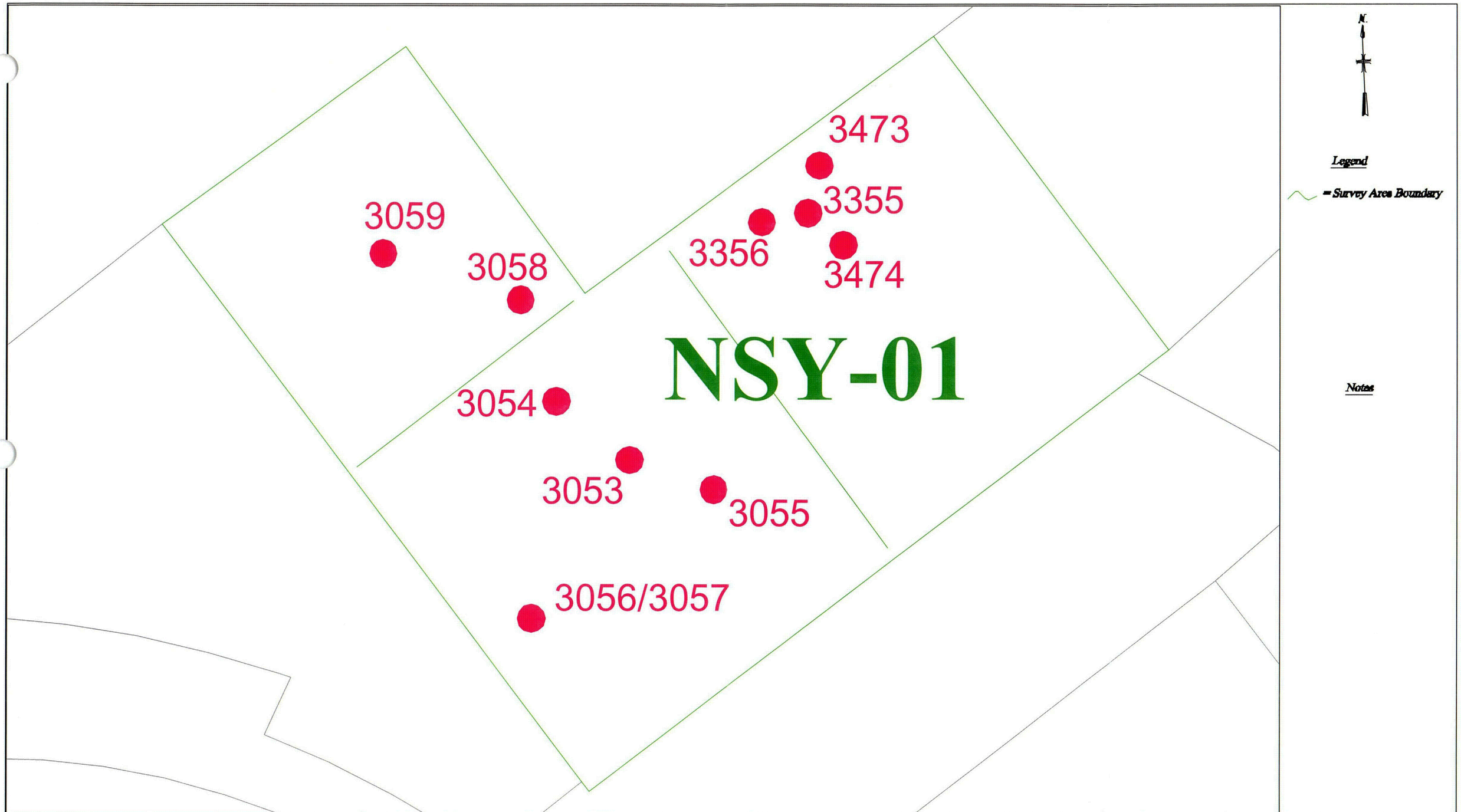
Station (Key)	SB002.2 (3059)	SB002.4 (3061)	TS99.58 (3355)	TS99.58 (3355)	TS99.58 (3355)
Sample ID	SB002.2C	SB002.4C	TS99.58A	TS99.58B	TS99.58C
Date Sampled	6/30/1998	6/30/1998	8/2/1999	8/2/1999	8/2/1999
Ac-228	1.011	0.9666	0.9336	0.9299	0.9385
Ag-108m	0.002834 U	0.009353 U	0.01816 U	-0.01616 U	-0.003669 U
Ag-110m	0.02115 U	-0.01778 U	0.02322 U	0.01942 U	0.01801 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212	0.9182	0.8755	0.8643	0.9054	0.7881
Bi-214	0.4722	0.5062	0.5289	0.4349	0.4743
Ce-144	-0.05814 U	0.09321 U	-0.2231 U	-0.1462 U	-0.1444 U
Co-58	0.03739	-0.03228 U	-0.01201 U	-0.01136 U	-0.02422 U
Co-60	0.00737 U	0.02635 U	-0.02929 U	0.03152 U	0.007263 U
Cs-134	0.08361	-0.01918 U	-0.1281 U	0.00005724 U	-0.00297 U
Cs-136					
Cs-137	-0.002026 U	-0.005175 U	0.04903	0.08693	0.03105 U
Fe-59	0.00789 U	-0.07114 U	0.01087 U	-0.03213 U	-0.04445 U
I-131					
I-132				2.227 U	
K-40	2.137	18.9	16.07	16.99	16.28
Kr-85					
Mn-54	0.0005302 U	-0.03196 U	-0.02381 U	0.01162 U	0.01069 U
Nb-95	0.006036 U	0.0182 U	0.02546 U	0.0205 U	0.02635 U
Pb-212	0.939	1.051	0.8871	0.8106	0.8477
Pb-214	0.4717	0.5435	0.4612	0.4661	0.4898
Ra-226	1.437		1.284	1.342	1.634
Ru-103	-0.02827 U	0.01631 U	0.01286 U	-0.007763 U	0.005993 U
Ru-106	0.04305 U	0.2199 U	-0.1016 U	0.1201 U	-0.08308 U
Sb-124	0.001317 U	-0.02556 U	-0.01413 U	0.008566 U	0.001111 U
Sb-125		0.1115 U			
Tl-208	0.9614	0.8792	0.9243		0.8151
Zn-65	-0.07137 U	-0.02683 U	0.09172 U	-0.03858 U	-0.0337 U
Zr-95	0.04514 U	0.041 U	0.008361 U	0.008236 U	-0.02564 U
SOF	0.012		0.004	0.007	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-01 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS99.59a (3356)	TS99.59b (3473)	TS99.59c (3474)
Sample ID	TS99.59A	TS99.59B	TS99.59C
Date Sampled	8/2/1999	8/2/1999	8/2/1999
Ac-228	0.9261	0.8295	0.8549
Ag-108m	0.01234 U	-0.009221 U	0.007131 U
Ag-110m	-0.02157 U	-0.005556 U	0.008935 U
Am-241	0 U	0 U	0 U
Bi-212	1.075	1.065	1.259
Bi-214	0.4968	0.5159	0.382
Ce-144	-0.174 U	0.00873 U	-0.06853 U
Co-58	-0.009381 U	0.01372 U	-0.003396 U
Co-60	0.03578	0.01812 U	0.02742 U
Cs-134	-0.03221 U	0.102	-0.05626 U
Cs-136			
Cs-137	0.009878 U	0.04045	0.01656 U
Fe-59	0.01095 U	-0.009621 U	-0.05775 U
I-131			
I-132			
K-40	16.76	17.78	16.4
Kr-85			
Mn-54	-0.01304 U	0.0174 U	0.01209 U
Nb-95	0.02827 U	0.02976 U	0.03452 U
Pb-212	0.8631	0.8376	0.953
Pb-214	0.4977	0.3932	0.4602
Ra-226	1.821		1.265
Ru-103	0.000762 U	0.006062 U	0.004384 U
Ru-106	0.04093 U	-0.01972 U	-0.03922 U
Sb-124	-0.01424 U	-0.03061 U	0.02677 U
Sb-125			
Tl-208	0.7975	0.8487	0.853
Zn-65	-0.01087 U	-0.1085 U	-0.000344 U
Zr-95	-0.01685 U	0.04872 U	0.06459
SOF	0.007	0.019	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed



Yankee Atomic Power Company *Soil Sample Locations - NSY-01*	YANKEE	*Date: October 2003* *Revision: 4*	*Figure: 26*

C30

Survey Area Name: Ion Exchange Pit Designator: **NSY-02**

Survey Area Description

Survey Area NSY-02 consists of the reinforced concrete floor, foundations, and subsurface structures of the Ion Exchange Pit (IX Pit) that remain after demolition of the above grade structure. The IX Pit abuts the Spent Fuel Pit (SFP) survey area SFP-01 on the north, the RCA yard area (NOL-02) on the east and south and the Primary Auxiliary Building (AUX-01) and the VC access elevator and stairway (NSY-09) on the west.

The IX Pit contained the valves, piping, ion exchange vessels and filter housings for the Spent Fuel Pool (SFP) and Main Coolant, Purification Systems (Drawing Number 9699-FM-35B). The IX Pit was designed to use water to shield the radioactivity associated with ion exchange vessels and filter housings. The IX Pit was not designed with a shield water clean-up capability. A self-contained skid mounted post accident water clean-up system consisting of filters and ion exchangers was installed in the northwest corner of the IX Pit in 1987. (See EDCR 87-308 and Drawing # 9699 FM-35-B).

The working level of the IX Pit has two personnel access points. The first is a set of stairs from the yard area at the southeast corner. The second is accessed from the stairway landing between the Fan Room of the PAB and the Vapor Container access elevator on the west side of the IX Pit at elevation 1039 feet 6 inches.

The IX Pit is divided into two compartments, south and north, by an interior wall. The exterior vertical surfaces of the IX Pit above grade are coated with a white (PCB) paint. The interior surface of the south compartment is painted white similar to the exterior vertical surfaces. The interior of the north compartment is not painted.

The north compartment is a nominal 6 meters by 8.4 meters by 5.4 meters deep. It is covered by a configuration of interlocking steel hatch covers that divide the area into five bays. Each bay contained one operating position for either ion exchange or filtration. The operating positions were located at the south end of the compartment under removable concrete shield blocks that fit flush with the concrete surface of the structure. A sixth operating position was located at about the midpoint of the west side of the pit and was used for Spent Fuel Pool water cleanup only.

The south compartment is a nominal 1.8 meters by 9meters by 1.5 meters deep and contained piping and the valves used to isolate and control flow to various ion exchange and filtration flow configurations. The valves were operated via reach rods that penetrated through removable concrete shield blocks covering the piping and valve gallery space. The continuation of the piping in this area followed a vertical and then a horizontal pipe chase that connects to the east end of the PAB cubicle corridor pipe trench.

The nominal dimensions of the vertical pipe chase are 1.2 meters by 1.5 meters by 3 meters deep. The nominal dimensions of the horizontal pipe chase are 3 meters by 1.2

meters by 1.5 meters deep. There is a floor drain present in the horizontal pipe chase that connects to the PAB cubicle floor drains.

The stairway access to the eastern end of the PAB cubicle corridor is attached to the southern end of the IX Pit south compartment. The foyer area between the bottom of the stairs and the doorway to the PAB is a nominal 3 meters by 4.2 meters by 2.4 meters deep. There is a floor drain present in the foyer area that drains to the PAB cubicle corridor pipe chase. Below this level within the foyer is a horizontal pipe chase that connects the PAB cubicle corridor pipe chase to the IX Pit vertical pipe chase.

Survey Area History

Initially the IX Pit was operated without water as shielding. In April 1961 water was added to the north compartment to provide shielding of radiation resulting from concentration of radioactivity in the ion exchange vessels and filter housings. Typically a minimum of twelve inches of water was maintained over the ion exchange vessels and filter housing during normal operation.

The original design of the IX Pit provided racks in each bay for storage of additional ion exchangers and filter housings. The lower section of the storage racks were subsequently encased in concrete as part of the IX Pit leak repair performed in 1965 (Ref 1).

The primary system purification system connected to the ion exchange vessels and filter housings through standpipes. The gasket connections were subject to leaks resulting in contamination of the shield water in the IX Pit (Ref 2, 3, 4). Contamination of the IX Pit water is also reported to have occurred due to misaligned valves allowing a back flow contaminated water into the IX Pit make-up system (Ref 5).

Translocation Pathways

During the early operations period, water level in the IX Pit was observed to slowly decrease over time requiring addition of make-up water in order to maintain minimum IX Pit level. The frequency with which water was required to be added indicates that a leak had developed in the IX Pit. Operations Report No. 42 for June 1964 identifies the leak commencing in May 1964 (Ref. 6). Prior to this there are entries in the primary auxiliary operator's logbook that chronicle the addition of water to the IX Pit (Ref. 7). This would indicate that a leak began at some time prior to September 1963. It is estimated that the leak resulted in a loss over the six-month period from January to June 1964 of approximately 428,000 gallons containing 3.87 millicuries of radioactivity (Ref. 8). The leak from the IX Pit continued until May 1965 at which time the leak was repaired (Ref. 1).

The location of the leak was observed to be a construction joint in the northwest corner of the IX Pit. The repair of the leak consisted of chipping and repacking the joint. Additionally a tar and felt liner were placed on the floor and approximately two feet up each of the four walls. A four-inch thick concrete floor was poured over the felt liner to protect the fabric and the water proofing from damage by ion exchanger vessel support legs. Wall support for the fabric was afforded utilizing loose concrete block (Ref 1).

At one point during the period when the IX Pit was leaking, a visible flow of water was observed on top of the asphalt in the area west of the IX Pit (Ref. 9). The leak was observed in between the elevator structure and the northeast corner of the PAB (See Survey Area NOL-01). The water on the surface flowed into the storm drain system at

East Catch Basin #5 (ECB-05) located at the northwest corner of the SFP. The sub-surface flow path of the water that leaked from the IX Pit is reported to have entered the storm drain system at East Catch Basin #4 (ECB-4) located at the southeast corner of the New Fuel Vault (Ref. 10). This indicates that some of the leakage flowed under the IX Pit and seeped out onto the surface of the slope around ECB-4 (NOL-02). The leakage is also believed to have followed along the back fill on the exterior of the north foundation of the PAB and west wall of the SFP. Consequently these locations within this area (NOL-01) are targeted for subsurface radioactivity investigation.

In July of 1965 following repair of the IX Pit leak, water samples from Sherman Spring (NOL-04) located approximately 850 feet down slope from the IX Pit were collected and analyzed for tritium. The results of the samples collected between July 2,1965 and December 30, 1965 are reported in Purchase Order No. 830555 Yankee Atomic Electric Company Summary Results October, 1964 - December, 1965 (Ref. 11). The tritium analysis results range from 7.5E+05 pCi/L in July of 1965 to a high of 7.195E+06 pCi/L in December of 1965. Monitoring of the tritium concentration in Sherman Spring has continued and the results show it has diminished significantly over time to the current level of < 3.8E+02 pCi/L, which is the Minimum Detectable Concentration (MDC) (Ref. 17).

Due to the unpainted condition of the north compartment of the IX Pit tritium released into the IX Pit was able to migrate through the concrete structure and into the ground water around the IX Pit (Ref 18). Since the north wall of the IX Pit is contiguous with the south wall of the SFP, tritium is able to migrate from both sources and into the groundwater. Residual radioactivity from the leak and from these two active contributors is thought to be the source of the tritium in Sherman Spring. Ground water contamination issues are being addressed programmatically through final site closure.

Normal operating procedures and maintenance operations performed in and around the IX Pit resulted in contamination of the interior and exterior surfaces of the structure (Ref. 12). Contamination of the south compartment interior generally was contained within the structure or migrated into the PAB cubical corridor (See Survey Area AUX-01). Contamination of the exterior surfaces resulted in potential contamination of surrounding surfaces of the structure and soil. (See Survey Area NOL-02, NOL-01). Contamination on the steel covers over the north compartment would run-off into a trough that connects to ECB # 4 located at the southeast corner of the New Fuel Vault.

A significant contaminating event to the interior of the north compartment of the IX Pit occurred when an ion exchange vessel sunk while resin transfer was in progress. The radioactive resins released into the shield water by this event were recovered during final drain down clean-up operations. (Ref. 15). Another resin transfer event, resulted in release of resin and radioactivity onto the asphalt and soil immediately adjacent to the IX Pit when a resin transfer hose split releasing approximately 1 quart of resin (See Survey

Area NOL-02) (Ref. 19). The radioactivity released during this event also had the potential to migrate to and down the exterior of the south compartment of the IX Pit.

Scoping/Characterization Survey

Characterization surveys performed of the IX Pit area consisted of concrete core samples, subsurface and sub-floor soil samples, contamination smear samples and direct measurement dose rates. The results of the radiological assessments performed are reported in Summary Report 1995 Site Characterization Activities, Appendix 5, Sub-Foundation Soil Sampling (Ref. 15), YNPS Decommissioning Plan section 3.1.7 Site Characterization Surveys (Ref. 16) and Memorandum, RP-98-06 Radiological Analysis of Subsurface and Sub-floor Soils at YNPS, Section 2.13 (Ref. 20).

Additional characterization survey is recommended for the IX Pit area concrete and also for subsurface and sub-floor soils following removal of the SFP from service and/or the structure is rendered to its end state configuration Additional characterization survey is recommended for the IX Pit area concrete and also for subsurface and sub-floor soils following removal of the SFP from service.

Remediations

No remediations have been conducted in this survey area

Decommissioning Activities

Decommissioning Work Plans (DWP) DWP IXP-001 (Ref. 13) and DWP IXP-002 (Ref.14) were performed in the IX Pit area.

DWP IXP-001 activities performed in 1995 and 1996 in this area removed the purification piping, valves, ion exchange vessels, filter housings and the post accident water clean-up system skid. The shield water in the IX Pit was removed and the accumulated loose resin on the floor of the IX Pit was removed.

DWP IXP-002 activities in NSY-02 were performed to decontaminate concrete floor and wall surfaces using a remotely operated machine with a chisel point tool. The north wall of the IX Pit is common to the SFP and cannot be decontaminated unit the SFP has been drained and removed from service.

The decommissioning activities necessary to bring the IX Pit structure to End State include removal of concrete to grade, decontamination of the north wall and contaminated soil remediation.

Survey Area Name: Ion Exchange Pit Designator: **NSY-02**

Findings

The history of the IX Pit indicates that this structure is radiologically impacted as a result of plant operations.

The radionuclide mix for the IX Pit includes all radionuclides identified in the reactor radioactive systems of the plant (Ref. 21). The primary radionuclides of concern for NSY-02 are Co-60, Cs-137, Ag-108m, Sr-90, and tritium.

Contaminated Media

These radionuclides were distributed in media including original construction painted and unpainted concrete, painted and unpainted steel, asphalt, surface soil and subsurface soil. Additional impacted media present as a result IX Pit modification and leak repair include "patch concrete", felt fabric and tar applied as water proofing (Ref. 1).

Current Status

Radiological Surveys of the concrete portions of NSY-02 are included in this section.

A soil sample location map (Figure 27) has been prepared to show the distribution of sampling locations in NSY-02. Only samples representative of soils still present are included on the map. One survey media was assessed in NSY-02, Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for NSY-02 is presented at the end of Table 1 for each survey medium. The results are summarized below.

Soil: Mean SOF is 0.274.
Maximum SOF for a single soil sample is 1.47 (key# 3006) at junction of horizontal and vertical pipe chases near AUX-01.
Minimum SOF for a single soil sample is 0.005 (key# 3016) top layer in IXP-01.1A floor boring.

Classification Statement

Based upon the radiological condition of this survey area identified in the operating history and as a result of the decommissioning activities performed to date, survey area NSY-02 is identified as a Class 1 Area.

Survey Area Name: Ion Exchange Pit Designator: **NSY-02**

Drawings

9699-FB-02 A
9699-FC-40 K
9699-FC-40 L
9699-FC-40 M
9699-FM-35 B
9699-FP-39 B
9699-FS-23 A

References

1.	Operations Report #53 for the month of May 1965, dated June 25, 1965.
2.	Incident #62.2 "Leakage into the IX Pit from IX Capsule, dated April 5, 1962.
3.	Abnormal Occurrence Report #65-6, "Purification System Leak Into Ion Exchange Pit," dated February 25, 1965.
4.	Abnormal Occurrence Report #65-8, "Purification System Filter Connection Leak Into Ion Exchange Pit," dated March 30, 1965.
5.	Incident #63-12, "Shield Tank Cavity Fill Water Spill," dated October 1, 1963.
6.	Operations Report #42 for June 1964, dated July 24, 1964.
7.	Primary Auxiliary Operators Logbook, selected pages August and September 1962
8.	Memorandum File 11.8, "Radioactivity Released Through IX Pit, Leakage January 1 to June 30, 1964" dated July 6, 1964.
9.	Abnormal Occurrence Report #64-13, "High Level In IX Pit Resulting in Pit Leakage Coming Up Through the Blacktop," dated October 13, 1964.
10.	Atomic Energy Commission, Inspection Report, RE Noncompliance Dated July 7,1965.
11.	Yankee Atomic Electric Company Summary Results from Controls for Radiation Inc. dated February 2,1966, Purchase Order No.830555
12.	Plant Information Report 81-06, dated June 4, 1981
13.	Decommissioning Work Plan IXP-001, "Ion Exchange Pit."
14.	Decommissioning Work Plan IXP-002, "Ion Exchange Pit Decon."
15.	Summary Report 1995 Site Characterization Activities, Appendix 5 Sub-Foundation Soil Sampling.
16.	Yankee Nuclear Power Station, Decommissioning Plan, Rev. 0.0, Section 3
17.	Yankee Nuclear Power Station, Annual Radiological Environmental Operating Report, 2002.
18.	YA-REPT-00-003-03, "Basis for Selection of Concrete Kd Values" dated June 23, 2003.
19.	Plant Information Report 80-9 dated June 12, 1981.
20.	Memorandum RP-98-06, "Radiological Analysis of Subsurface and Sub-floor Soils at YNPS," dated January 22, 2003, Section 2.13.
21.	Radionuclides for Building Surfaces and Soil DCGL Determinations, YA-REPT- 00-001-03

Table 1
Sum of Fractions
NSY-02 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
3017	IXP01.2	IXP01.2C		0.091
3000	CB10	CB10B		0.298
3000	CB10	CB10C		0.081
3000	CB10	CB10D		0.049
3006	CC001.15	CC001.15B		1.470
3006	CC001.15	CC001.15A		0.010
3016	IXP01.1	IXP01.1A		0.005
3016	IXP01.1	IXP01.1B		0.022
3016	IXP01.1	IXP01.1C		0.024
3016	IXP01.1	IXP01.1D		0.012
3000	CB10	CB10A		0.190
3017	IXP01.2	IXP01.2B		0.219
3065	SB5	SB5H		0.067
3017	IXP01.2	IXP01.2D		0.072
3018	IXP01.3	IXP01.3B		0.011
3018	IXP01.3	IXP01.3D		0.011
3065	SB5	SB5A		0.611
3065	SB5	SB5B		0.609
3065	SB5	SB5C		0.172
3065	SB5	SB5D		0.878
3065	SB5	SB5F		0.255
3065	SB5	SB5G		0.091
3017	IXP01.2	IXP01.2A		1.058
			Min	0.005
			Max	1.470
			Mean	0.274

Table 2
Statistical Data Summary – NSY-02 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	28	28	1.194	0.560	0.474	2.587	0.913
Ag-108m	pCi/g	21	28	0.945	1.240	0.044	5.179	0.511
Ag-110m	pCi/g	0	28	0.000				
Am-241	pCi/g	0	28	0.000				
Bi-212	pCi/g	25	27	1.277	0.701	0.517	2.804	0.962
Bi-214	pCi/g	28	28	0.686	0.354	0.326	1.302	0.464
Ce-144	pCi/g	1	28	0.590		0.590	0.590	0.590
Co-58	pCi/g	1	28	0.087		0.087	0.087	0.087
Co-60	pCi/g	14	28	1.065	1.906	0.041	6.593	0.186
Cs-134	pCi/g	4	28	0.100	0.087	0.031	0.215	0.076
Cs-137	pCi/g	15	28	0.680	0.968	0.034	3.816	0.247
Eu-152	pCi/g	0	2	0.000				
Fe-59	pCi/g	0	28	0.000				
K-40	pCi/g	28	28	25.101	11.400	14.430	50.310	17.345
La-140	pCi/g	0	1	0.000				
Mn-54	pCi/g	0	28	0.000				
Nb-95	pCi/g	0	28	0.000				
Np-239	pCi/g	0	4	0.000				
Pb-212	pCi/g	28	28	1.264	0.678	0.461	2.750	0.825
Pb-214	pCi/g	28	28	0.796	0.484	0.287	2.036	0.493
Ra-226	pCi/g	13	14	2.285	1.361	0.950	4.937	1.552
Ru-103	pCi/g	1	28	0.039		0.039	0.039	0.039
Ru-106	pCi/g	0	28	0.000				
Sb-124	pCi/g	1	28	0.046		0.046	0.046	0.046
Sb-125	pCi/g	0	5	0.000				
Te-129m	pCi/g	0	1	0.000				
Tl-208	pCi/g	26	26	1.136	0.511	0.553	2.149	0.824
Y-88	pCi/g	0	1	0.000				
Zn-65	pCi/g	0	28	0.000				
Zr-95	pCi/g	2	28	0.120	0.079	0.064	0.175	0.120

Table 3
Summary of Detected Results Above Criteria
NSY-02 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	28	28		pCi/g	0	2.59
Ag-108m	21	28	8.52	pCi/g	0	5.18
Ag-110m	0	28		pCi/g	0	
Am-241	0	28	44.35	pCi/g	0	
Bi-212	25	27		pCi/g	0	2.80
Bi-214	28	28		pCi/g	0	1.30
Ce-144	1	28		pCi/g	0	0.59
Co-58	1	28		pCi/g	0	0.09
Co-60	14	28	4.84	pCi/g	1	6.59
Cs-134	4	28	6.71	pCi/g	0	0.22
Cs-137	15	28	12.24	pCi/g	0	3.82
Eu-152	0	2	12.06	pCi/g	0	
Fe-59	0	28		pCi/g	0	
K-40	28	28		pCi/g	0	50.31
La-140	0	1		pCi/g	0	
Mn-54	0	28	21.66	pCi/g	0	
Nb-95	0	28		pCi/g	0	
Np-239	0	4		pCi/g	0	
Pb-212	28	28		pCi/g	0	2.75
Pb-214	28	28		pCi/g	0	2.04
Ra-226	13	14		pCi/g	0	4.94
Ru-103	1	28		pCi/g	0	0.04
Ru-106	0	28	68.21	pCi/g	0	
Sb-124	1	28		pCi/g	0	0.05
Sb-125	0	5	37.73	pCi/g	0	
Te-129m	0	1		pCi/g	0	
Tl-208	26	26		pCi/g	0	2.15
Y-88	0	1		pCi/g	0	
Zn-65	0	28		pCi/g	0	
Zr-95	2	28		pCi/g	0	0.18

Table 4
Rad
NSY-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	CB10 (3000)	CB10 (3000)	CB10 (3000)	CB10 (3000)	CC001.15 (3006)
Sample ID	CB10A	CB10B	CB10C	CB10D	CC001.15A
Date Sampled	12/19/1997	12/19/1997	12/19/1997	12/19/1997	3/3/1998
Ac-228	1.879	1.504	1.507	1.763	0.6203
Ag-108m	1.021	1.859	0.5583	0.4205	0.007039 U
Ag-110m	0.02237 U	-0.0922 U	0.03517 U	0.02328 U	0.0116 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212	1.827	2.281	2.507	2.804	0.5287
Bi-214	1.091	1.302	0.8943	1.043	0.3264
Ce-144	-0.7499 U	-0.2531 U	-0.1625 U	-0.5167 U	-0.06778 U
Co-58	-0.02798 U	0.06367 U	-0.00766 U	0.08725	-0.009006 U
Co-60	0.1324	0.135	-0.01472 U	0.01914 U	0.04683
Cs-134	0.01027 U	0.06354 U	0.02449 U	0.01095 U	-0.05894 U
Cs-137	0.5179	0.635	0.1907	0.1067 U	0.001901 U
Eu-152			-0.1868 U		
Fe-59	-0.164 U	0.1655 U	0.03452 U	-0.1196 U	0.01483 U
K-40	34.96	36.89	35.79	43.15	14.97
La-140					
Mn-54	-0.03853 U	0.01642 U	0.0324 U	-0.01141 U	-0.01878 U
Nb-95	0.06137 U	-0.08966 U	0.02982 U	-0.02046 U	0.02119 U
Np-239					
Pb-212	2.079	2.031	1.72	2.096	0.6518
Pb-214	1.222	1.421	1.389	1.36	0.3805
Ra-226	3.301	4.937		2.972	
Ru-103	-0.0703 U	-0.008551 U	-0.004932 U	-0.03696 U	0.004763 U
Ru-106	-0.1113 U	-0.1194 U	0.1995 U	0.2231 U	0.1748 U
Sb-124	0.002422 U	0.07942 U	-0.02308 U	-0.03586 U	-0.0383 U
Sb-125	-0.1115 U				
Te-129m					
Tl-208	1.475	1.714	1.814	1.829	0.6588
Y-88					0.02197 U
Zn-65	-0.09614 U	-0.2135 U	0.144 U	-0.3579 U	-0.0699 U
Zr-95	-0.02945 U	0 U	0.06237 U	0.06976 U	-0.02421 U
SOF	0.19	0.298	0.081	0.049	0.01

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	CC001.15 (3006)	CC001.9 (3015)	CC001.9 (3015)	CC001.9 (3015)	IXP01.1 (3016)
Sample ID	CC001.15B	CC001.9A	CC001.9B	CC001.9C	IXP01.1A
Date Sampled	3/3/1998	1/6/1998	1/6/1998	1/6/1998	7/30/1998
Ac-228	0.4735	0.8275	0.8309	0.8174	0.713
Ag-108m	0.04408	0.01274 U	0.000711 U	0.01041 U	0.01224 U
Ag-110m	0.02044 U	-0.007541 U	0.004535 U	-0.02261 U	-0.0397 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212		0.9762	0.7988	0.9988	0.6981
Bi-214	0.3744	0.4633	0.3893	0.448	0.3899
Ce-144	-0.1668 U	-0.06206 U	-0.07585 U	-0.08511 U	0.009112 U
Co-58	0.02587 U	-0.01021 U	0.00004156 U	-0.01251 U	0.0004751 U
Co-60	6.593	-0.02047 U	0.00235 U	-0.01417 U	-0.01198 U
Cs-134	0.1182	-0.03662 U	0.0554 U	0.04542 U	0.03458
Cs-137	1.03	-0.006143 U	-0.01549 U	-0.02416 U	-0.006663 U
Eu-152					
Fe-59	0.005471 U	0.01847 U	-0.04166 U	-0.05418 U	-0.07128 U
K-40	14.43	16.7	16.17	15.57	17.01
La-140					
Mn-54	0.006435 U	-0.003626 U	0.0147 U	0.003893 U	-0.01534 U
Nb-95	0.02418 U	0.0001993 U	-0.004878 U	0.01068 U	0.02915 U
Np-239		0.1312 U			-0.9801 U
Pb-212	0.4606	0.8138	0.8291	0.7777	0.7654
Pb-214	0.4667	0.439	0.4219	0.4809	0.5363
Ra-226		1.552		0.9757	0.8926 U
Ru-103	-0.02519 U	0.008368 U	-0.00875 U	-0.01259 U	-0.0005806 U
Ru-106	0.2007 U	-0.03418 U	-0.03426 U	0.04579 U	0.01864 U
Sb-124	0.008328 U	-0.02855 U	0.00623 U	0.008778 U	0 U
Sb-125					
Te-129m		0.6732 U			
Tl-208	0.5896	0.7226	0.7606	1.045	0.755
Y-88					
Zn-65	-0.1767 U	0.03594 U	-0.09992 U	-0.08791 U	0.008092 U
Zr-95	0.08962 U	0.00354 U	0 U	0.04794 U	0.01769 U
SOF	1.47				0.005

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IXP01.1 (3016)	IXP01.1 (3016)	IXP01.1 (3016)	IXP01.2 (3017)	IXP01.2 (3017)
Sample ID	IXP01.1B	IXP01.1C	IXP01.1D	IXP01.2A	IXP01.2B
Date Sampled	7/30/1998	7/30/1998	7/30/1998	8/6/1998	8/6/1998
Ac-228	0.8783	0.7249	0.7402	0.8621	0.9475
Ag-108m	0.1667	0.202	0.09807	5.179	1.228
Ag-110m	-0.002058 U	-0.02851 U	0.006098 U	-0.07441 U	0.001756 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212	0.6014	0.8504	0.5165	0.7816	0.8155
Bi-214	0.4827	0.4036	0.3793	0.4086	0.3972
Ce-144	-0.0572 U	0.02546 U	-0.0709 U	-0.3557 U	0.1042 U
Co-58	-0.01396 U	-0.001992 U	-0.001826 U	-0.01279 U	0.002973 U
Co-60	-0.02257 U	-0.01137 U	-0.00761 U	0.6709	0.1095
Cs-134	-0.01529 U	-0.02035 U	0.008753 U	-0.01065 U	0.05968 U
Cs-137	0.03395	0.0331 U	-0.008544 U	3.816	0.6418
Eu-152					0.6515 U
Fe-59	0.005435 U	0.02043 U	0.0158 U	0.02293 U	0.07837 U
K-40	17.44	17.5	16.36	17.11	17.07
La-140					1.649 U
Mn-54	0.01563 U	0.01877 U	-0.01409 U	-0.02513 U	-0.06303 U
Nb-95	-0.01354 U	-0.01449 U	-0.009567 U	-0.005937 U	-0.005027 U
Np-239			-2.441 U		
Pb-212	0.8201	0.6416	0.7148	0.668	0.7894
Pb-214	0.4544	0.393	0.4183	0.632	0.287
Ra-226		0.9503	1.054		
Ru-103	-0.007041 U	0.03949	0.01004 U	0.01963 U	0.01341 U
Ru-106	-0.05499 U	-0.1389 U	-0.2175 U	0.2703 U	0.1456 U
Sb-124	-0.02089 U	0.01192 U	-0.0003416 U	0.004697 U	-0.005629 U
Sb-125					
Te-129m					
Tl-208	0.8433	0.7536	0.7098		0.6811
Y-88					
Zn-65	-0.02956 U	-0.0772 U	0.06915 U	-0.09343 U	-0.06891 U
Zr-95	-0.02285 U	0.01901 U	0.01569 U	0.03489 U	0.06408
SOF	0.022	0.024	0.012	1.058	0.219

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IXP01.2 (3017)	IXP01.2 (3017)	IXP01.3 (3018)	IXP01.3 (3018)	IXP01.3 (3018)
Sample ID	IXP01.2C	IXP01.2D	IXP01.3A	IXP01.3B	IXP01.3C
Date Sampled	8/6/1998	8/6/1998	8/4/1998	8/4/1998	8/4/1998
Ac-228	0.7173	0.8046	0.9872	0.7605	0.9817
Ag-108m	0.5642	0.5108	-0.0003876 U	0.09162	0.04414 U
Ag-110m	0.0203 U	0.00906 U	0.007544 U	-0.01279 U	-0.02092 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212	0.7509	1.433	0.9252	0.5445	0.585 U
Bi-214	0.3856	0.4285	0.4834	0.4591	0.3964
Ce-144	0.009677 U	-0.1223 U	0.1402 U	0.02446 U	-0.02293 U
Co-58	0.01202 U	-0.0143 U	0.008185 U	-0.001978 U	-0.01876 U
Co-60	0.0406	0.006369 U	0.01162 U	0.00269 U	0.001534 U
Cs-134	0.00488 U	0.03053	0.0331 U	0.003357 U	0.02611 U
Cs-137	0.2044	0.09217	0.01344 U	-0.01556 U	-0.004593 U
Eu-152					
Fe-59	-0.03502 U	0.02109 U	-0.005557 U	0.005084 U	-0.0008065 U
K-40	15.96	18.21	16.84	17.05	17.25
La-140					
Mn-54	-0.009676 U	0.004959 U	-0.006035 U	-0.006549 U	-0.005164 U
Nb-95	0.02122 U	-0.035 U	-0.01445 U	0.008546 U	0.01854 U
Np-239					
Pb-212	0.6487	0.8748	0.8111	0.8122	1.116
Pb-214	0.2938	0.4079	0.4726	0.505	0.4372
Ra-226		1.287		1.086	1.311
Ru-103	0.008313 U	-0.009454 U	0.01275 U	-0.01077 U	-0.01356 U
Ru-106	0.1006 U	0.1836 U	-0.0711 U	-0.06616 U	0.1146 U
Sb-124	0.04613	-0.02271 U	0.01578 U	-0.0464 U	0.009868 U
Sb-125		-0.0252 U			
Te-129m					
Tl-208	0.7265	0.5531	0.7367	0.7848	0.9661
Y-88					
Zn-65	-0.02413 U	0.01735 U	0.1074 U	-0.09508 U	-0.01515 U
Zr-95	0.009406 U	0.04748 U	-0.02647 U	0.04608 U	0.02434 U
SOF	0.091	0.072		0.011	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	IXP01.3 (3018)	SB5 (3065)	SB5 (3065)	SB5 (3065)	SB5 (3065)	SB5 (3065)
Sample ID	IXP01.3D	SB5A	SB5B	SB5C	SB5D	SB5F
Date Sampled	8/4/1998	12/19/1997	12/19/1997	12/19/1997	12/19/1997	12/19/1997
Ac-228	0.734	1.834	2.587	1.751	1.679	1.997
Ag-108m	0.0913	1.539	3.302	1.093	0.4886	0.7635
Ag-110m	0.009004 U	-0.03484 U	0.05256 U	-0.02061 U	0.1616 U	-0.08018 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Bi-212	0.8764	1.6	2.36 U	1.825	0.9616	1.981
Bi-214	0.4646	1.27	1.171	1.217	0.8758	1.147
Ce-144	0.1856 U	0.2502 U	0.1785 U	0.1199 U	0.3189 U	0.5904
Co-58	0.001413 U	-0.1285 U	-0.2088 U	-0.001712 U	-0.0467 U	0.03989 U
Co-60	-0.0117 U	1.816	0.2699	0.1138	3.892	0.7253
Cs-134	-0.008253 U	0 U	0.2152	-0.005199 U	-0.01012 U	-0.04168 U
Cs-137	0.002014 U	0.6713	1.637	0.2468	0.197	0.193
Eu-152						
Fe-59	0.02992 U	-0.1018 U	0 U	-0.09929 U	0.05237 U	0.05573 U
K-40	15.68	33.31	50.31	38.6	33.3	32.29
La-140						
Mn-54	0.01413 U	0.01514 U	0.07029 U	-0.06938 U	-0.04213 U	0.04595 U
Nb-95	-0.0001643 U	0.08795 U	0.08079 U	0.03735 U	-0.1023 U	-0.01269 U
Np-239						
Pb-212	0.6355	2.193	2.75	1.783	2.054	1.771
Pb-214	0.4577	1.099	2.036	1.103	1.255	1.564
Ra-226						4.017
Ru-103	-0.003346 U	-0.03828 U	0.1796 U	-0.001047 U	-0.05501 U	-0.01522 U
Ru-106	0 U	-0.2421 U	-0.7304 U	-0.1588 U	-0.8748 U	-0.115 U
Sb-124	0.0009691 U	-0.03609 U	0 U	0.04356 U	-0.03708 U	-0.06822 U
Sb-125					0.09908 U	
Te-129m						
Tl-208	0.8055	1.791	2.149	1.748		1.633
Y-88						
Zn-65	0.001847 U	0.09983 U	0.05298 U	0.2064 U	-0.1117 U	-0.3392 U
Zr-95	0.01483 U	0.111 U	-0.1599 U	0.05694 U	-0.06442 U	-0.03441 U
SOF	0.011	0.611	0.609	0.172	0.878	0.255

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-02 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

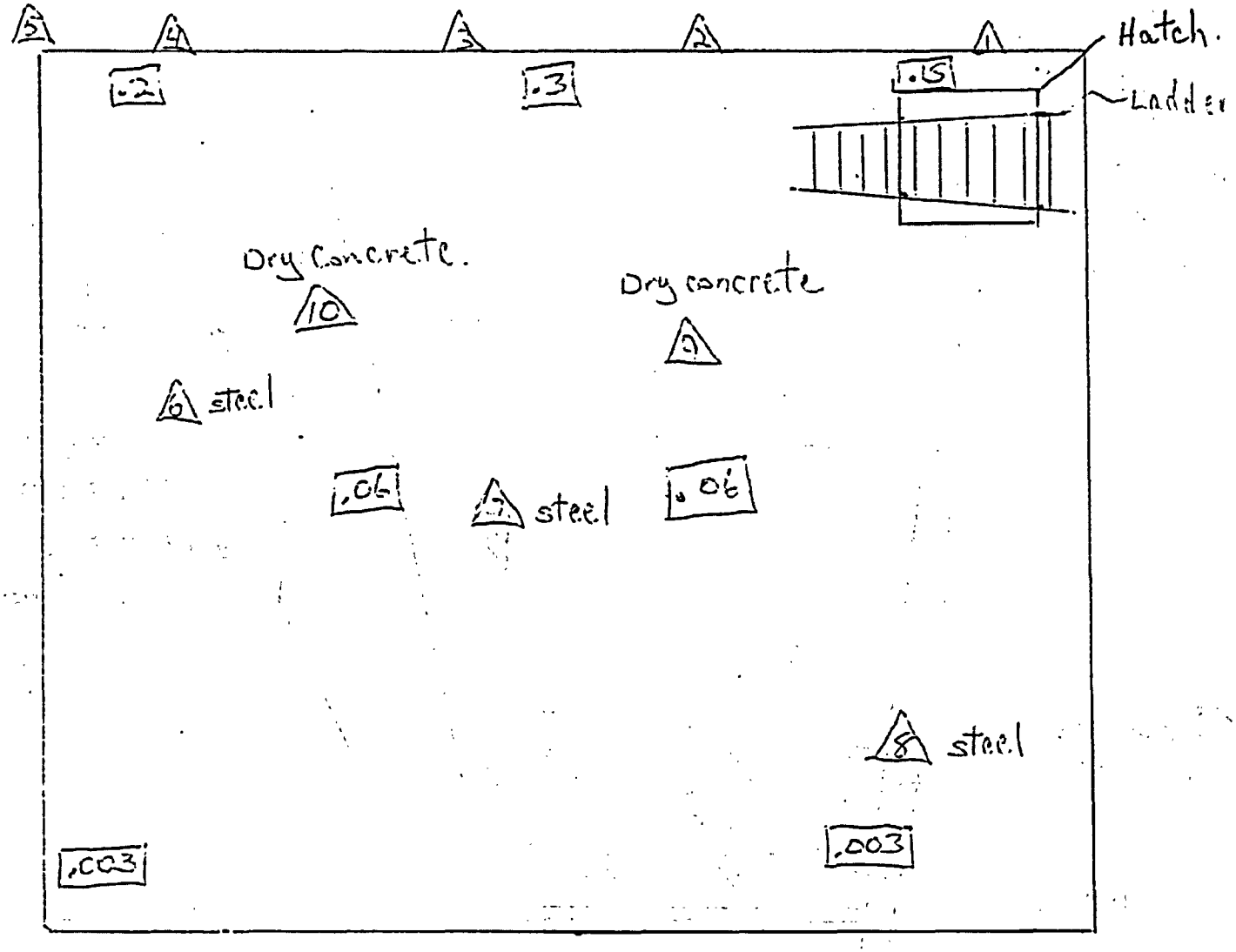
Station (Key)	SB5 (3065)	SB5 (3065)
Sample ID	SB5G	SB5H
Date Sampled	12/19/1997	12/19/1997
Ac-228	2.115	1.393
Ag-108m	0.359	0.2647
Ag-110m	0.01512 U	0.0241 U
Am-241	0 U	0 U
Bi-212	2.489	1.548
Bi-214	0.9545	1.169
Ce-144	-0.2616 U	-0.394 U
Co-58	0.0009908 U	-0.08827 U
Co-60	0.236	0.1337
Cs-134	0.05157 U	-0.03176 U
Cs-137	0.03766 U	0.09664
Eu-152		
Fe-59	-0.1548 U	0.0578 U
K-40	45.65	37.26
La-140		
Mn-54	0.03348 U	-0.002441 U
Nb-95	-0.02708 U	0.01012 U
Np-239	-2.121 U	
Pb-212	2.269	1.828
Pb-214	1.268	1.091
Ra-226	3.535	2.722
Ru-103	-0.02494 U	0.02933 U
Ru-106	0.05251 U	0.1126 U
Sb-124	0.02161 U	-0.05546 U
Sb-125	0.644 U	0.2182 U
Te-129m		
Tl-208	1.621	1.678
Y-88		
Zn-65	-0.03047 U	-0.1095 U
Zr-95	0.1752	0.1012 U
SOF	0.091	0.067

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

Smears 1-5 on N wall



DATE 6-10-03 TIME 1045

SURVEYOR R Shippee

INSTRUMENT/#	CAL DUE
Bicron /5550	11-9-03
PIC #2 No. 2	
5712	10/9/03

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER
- MASSLINN

(✓) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

(✓) CONTAMINATION

(✓) LESS THAN 1000 dpm/100cm² BETA-GAMMA UNLESS NOTED

(✓) LESS THAN 50 dpm/100cm² ALPHA UNLESS NOTED.

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: IX Pit inspect for LTP classification

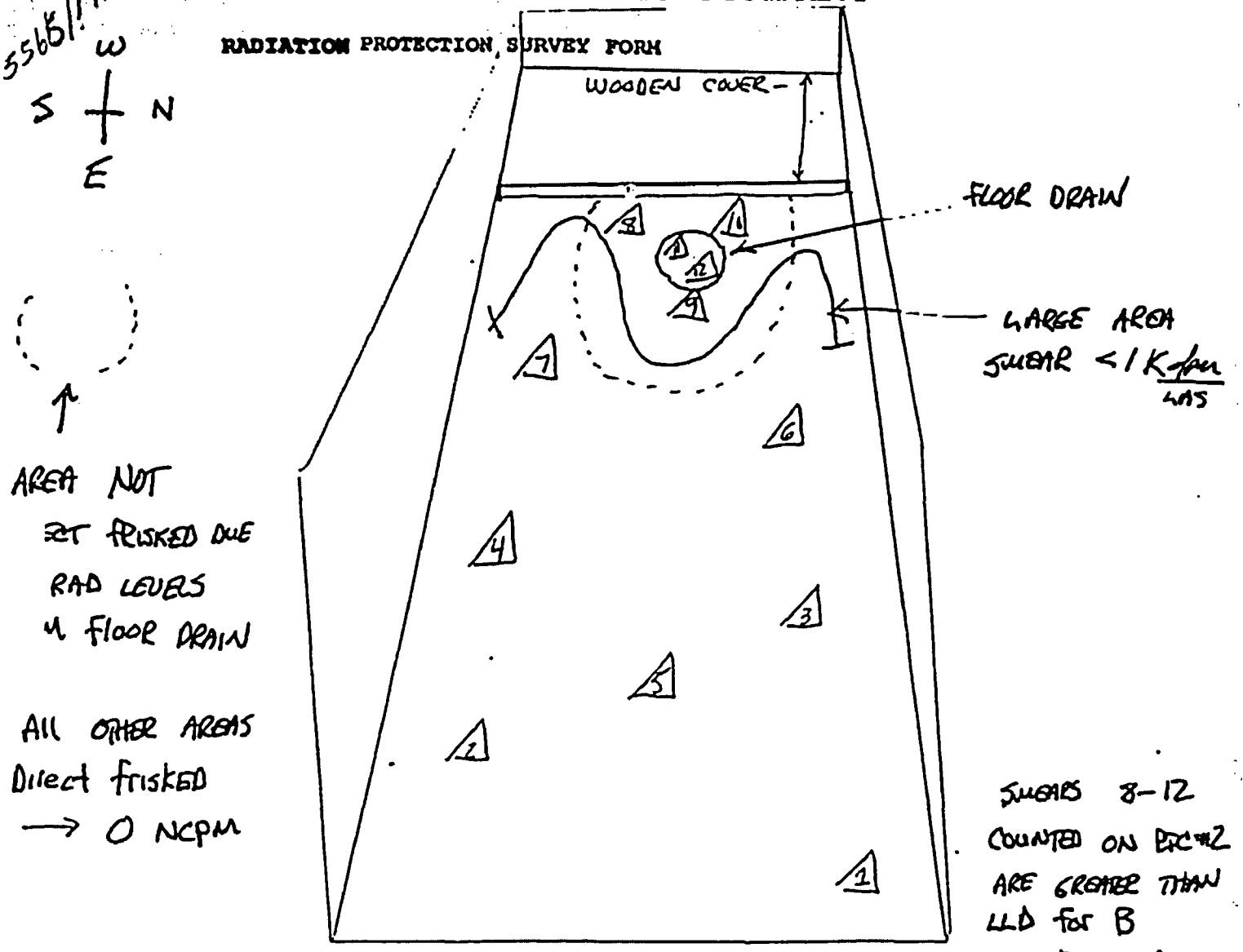
SPECIAL SURVEY FORM LOCATION or EQUIPMENT Ion Exchange Pit

3101.6 REV. 28

X/C
5565/191

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM



AREA NOT
ZT FRISKED DUE
RAD LEVELS
N FLOOR DRAIN

All OTHER AREAS
Direct frisked
→ 0 NCPM

SMEARS 8-12
COUNTED ON PIC #2
ARE GREATER THAN
LLD for B
-LESS THAN LLD
for α
LLD α 43.11
B 68.22

DATE 5-23-97 TIME 6215
SURVEYOR HOWANITZ
INSTRUMENT L-177 # 4526
CALIBRATION DUE DATE 5-8-98
INSTRUMENT PIC # 2
CALIBRATION DUE DATE 5-12-98

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- -x-x- BARRIER |—| MASSL..M
- (N/A) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.
- (X) CONTAMINATION
  - ( ) LESS THAN 1000 dpm/100 cm² BETA-GAMMA UNLESS NOTED
  - ( ) LESS THAN 50 dpm/100 cm² ALPHA UNLESS NOTED
- ( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NR: dpm/100 cm²

1 <1K	11 <1K	21
2 <1K	12 <1K	22
4 <1K	14	24
5 <1K	15	25
6 <1K	16	26
7 <1K	17	27
8 <1K	18	28
10 <1K	20	30

COMMENTS:

SPECIAL SURVEY FORM
LOCATION OF EQUIPMENT
8101.6 REV.23
IMS # V02 .03
RT # 10. .373

IXP / PIPE TRENCH : Survey of floor prior to covering w/ PLASTIC

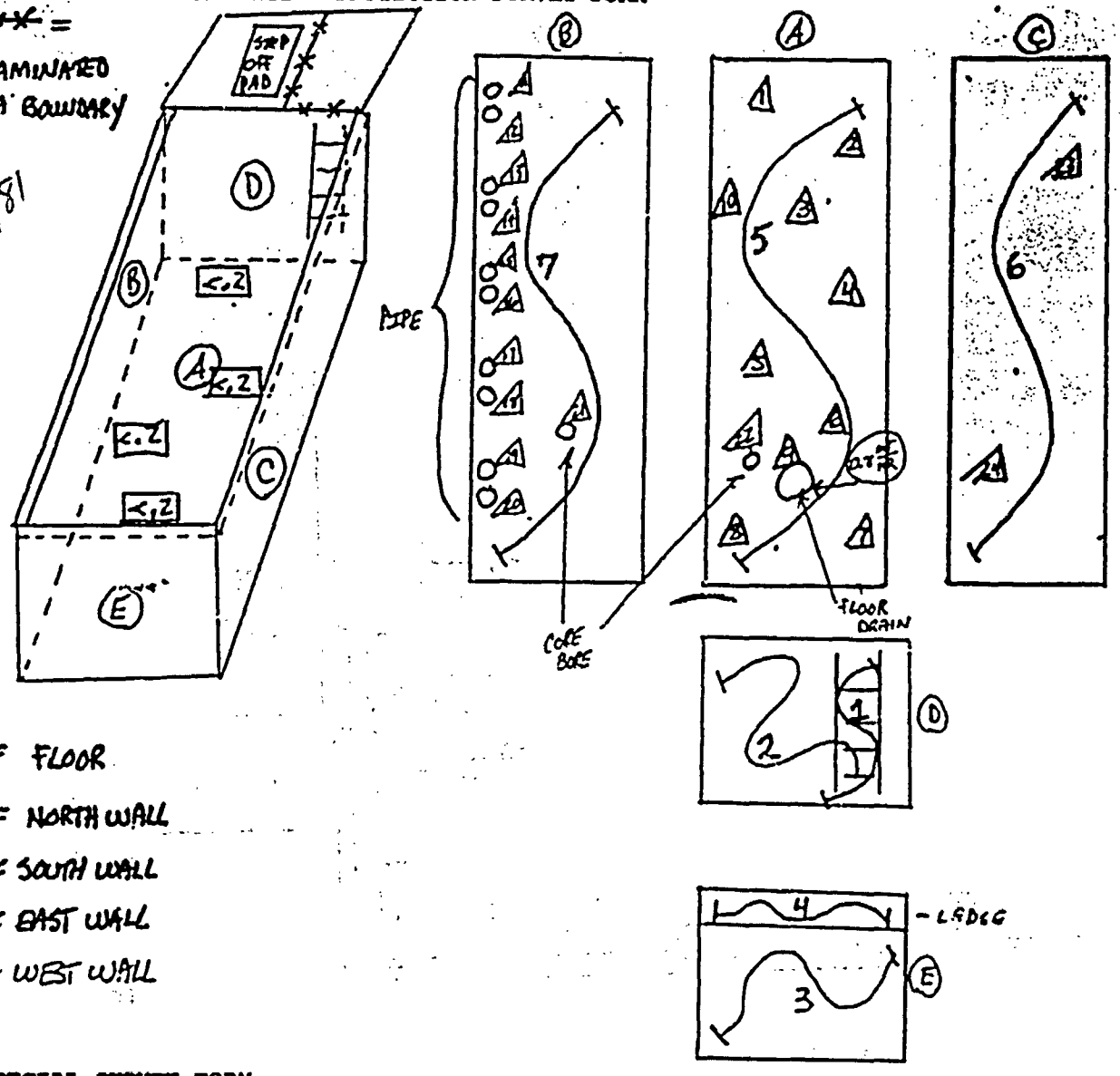
E
N + S
W

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

~~X~~ = CONTAMINATED AREA BOUNDARY

5565/81



A = FLOOR

B = NORTH WALL

C = SOUTH WALL

D = EAST WALL

E = WEST WALL

DATE 5-14-97 TIME 2245

SURVEYOR HOWANITZ

INSTRUMENT RM 14 # 4225

CALIBRATION DUE DATE 3-12-98

INSTRUMENT RO 2 # 5561

CALIBRATION DUE DATE 5-13-97

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SHEAR LOCATION
- ~~X~~ BARRIER |—| MASSLINN
- (X) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.
- (X) CONTAMINATION
  - (X) LESS THAN 1000 dpm/~~100 cm²~~ (AS NOTED) BETA-GAMMA UNLESS NOTED
  - (X) LESS THAN 50 dpm/~~100 cm²~~ (AS NOTED) ALPHA UNLESS NOTED
- (X) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/~~100 cm²~~ (AS NOTED)

1	<1K/LAS	~~11~~ 1: <1K/100cm²	~~21~~ 11: <1K/100cm²	
2	<1K/LAS	~~12~~ 2:	~~22~~ 12:	21: <1K/100cm²
3	<1K/LAS	~~13~~ 3:	~~23~~ 13:	22: (/100cm²
4	<1K/LAS	~~14~~ 4:	~~24~~ 14:	23: <1K/100cm²
5	3K/LAS	~~15~~ 5:	~~25~~ 15:	24: <1K/100cm²
6	<1K/LAS	~~16~~ 6:	~~26~~ 16:	
7	<1K/LAS	~~17~~ 7:	~~27~~ 17:	
8		~~18~~ 8:	~~28~~ 18:	
9		~~19~~ 9: 1K/100cm²	~~29~~ 19:	
10		~~20~~ 10: <1K/100cm²	~~30~~ 20:	

COMMENTS: ~~11~~ 13 20 – NO DET. ok

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT

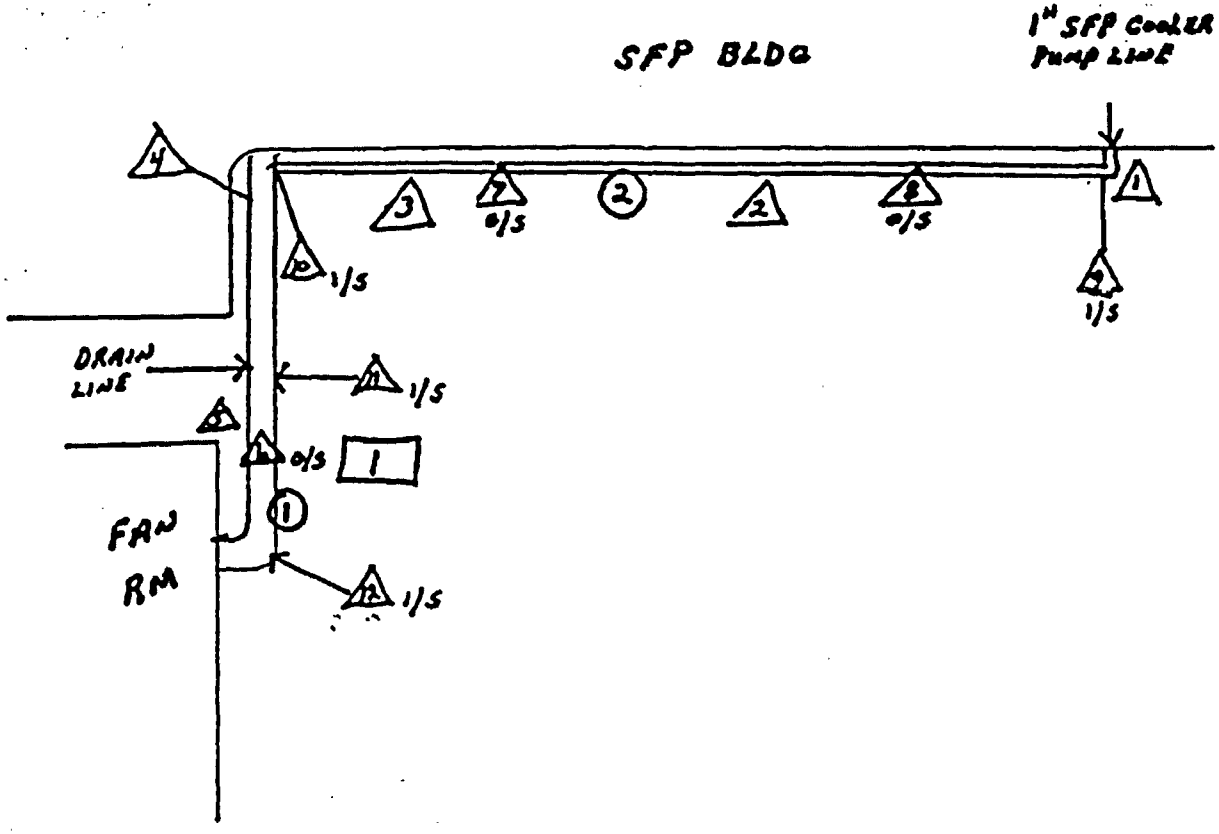
8101.6 REV.23
IMS # V02.09.03
RT # 10.811.373

POST DECON SURVEY OF PIPE TRENCH (IX PIT PRE TRENCH)

a LUD 1000

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM



SMEARS 1-5 WERE TAKEN ON THE GROUND AFTER PIPE WAS CUT, 6-8 WAS TAKEN ON THE OUTSIDE OF THE PIPE AND 9-12 WAS TAKEN ON THE INSIDE OF THE PIPE, THE PIPES WERE TAKEN TO THE PAB CUB CORR FOR CUT UP. SMEAR 9 & 10 COUNTED FOR α <500dpm.

DATE 5-13-97 TIME 1800

SURVEYOR E KLINE

INSTRUMENT Rm 14 A5506

CALIBRATION DUE DATE 7-11-97

INSTRUMENT Ro2 #4648

CALIBRATION DUE DATE 7-8-97

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- —x—x— BARRIER |—~—| MASSLINN
- (✓) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED
- (✓) CONTAMINATION
  - (✓) LESS THAN 1000 dpm/100 cm² BETA-GAMMA UNLESS NOTED
  - (✓) LESS THAN 50 dpm/100 cm² ALPHA UNLESS NOTED
- ( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	<1K	11	20K	21	N/A
2		12	20K	22	
3		13	N/A	23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8	<1K	18		28	
9	200K	19		29	
10	80K	20		30	

COMMENTS: i/s = INSIDE PIPE

o/s = OUT SIDE PIPE

SPECIAL SURVEY FORM

LOCATION or EQUIPMENT TOP OF ION EXCHANGE PIT AREA

8101.6 REV.23

IMS # V0? 09.03

RT # 10 1.373

5565/62

YANKEE ATOMIC ELECTRIC COMPA

RADIATION PROTECTION SURVEY FORM

DATE 5-13-97 T 2100

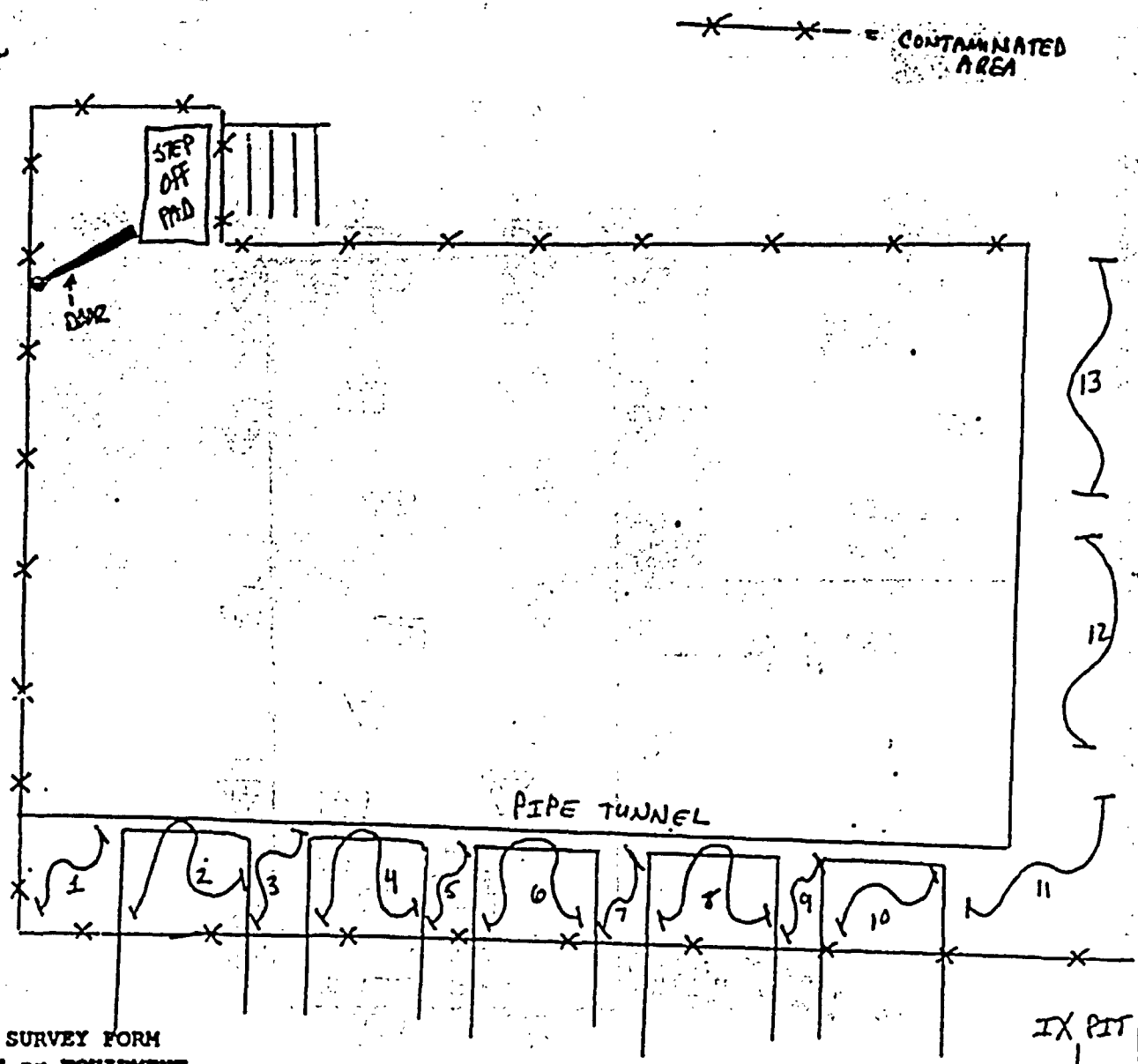
SURVEYOR HOWANITZ

INSTRUMENT RM-14 # 4225

CALIBRATION DUE DATE 3-12-98

INSTRUMENT N/A # N/A

CALIBRATION DUE DATE N/A



KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER — MASSLINN
- ( ) DIRECT RADIATION N/A READINGS IN MR/HR EXCEPT AS NOTED
- (X) CONTAMINATION
  - (X) LESS THAN 1000 dpm/~~100 cm²~~ LAS BETA-GAMMA UNLESS NOTED
  - (X) LESS THAN 50 dpm/~~100 cm²~~ LAS ALPHA UNLESS NOTED
- (X) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/~~100 cm²~~ LAS

1	<1K/LAS	11	<1K/LAS	21	
2	<1K/LAS	12	<1K/LAS	22	
3	<1K/LAS	13	<1K/LAS	23	
4	<1K/LAS	14		24	
5	<1K/LAS	15		25	
6	<1K/LAS	16		26	
7	<1K/LAS	17		27	
8	<1K/LAS	18		28	
9	<1K/LAS	19		29	
10	<1K/LAS	20		30	

COMMENTS: #3, #11: NO DET ∝

SPECIAL SURVEY FORM

LOCATION or EQUIPMENT

8101.6 REV.23

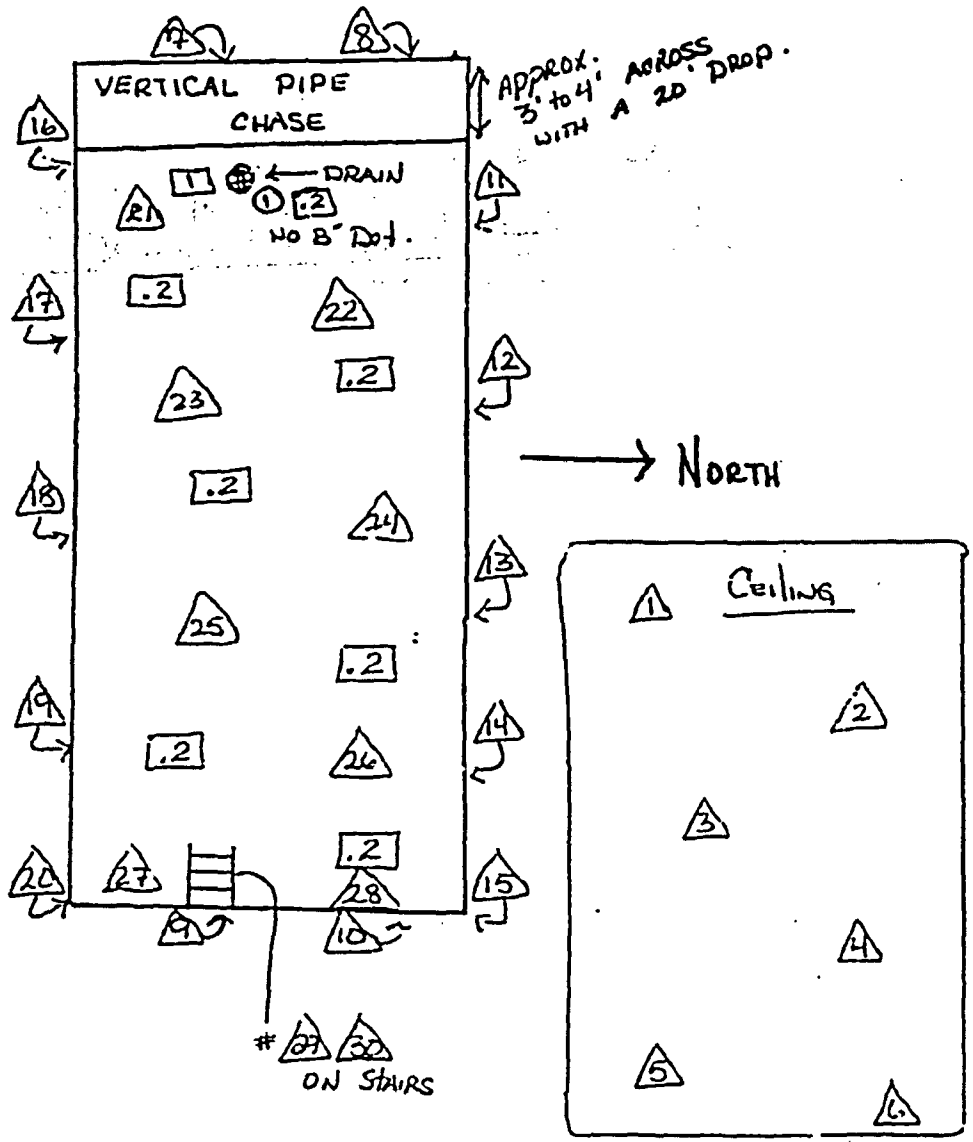
IHS # V02.09.03

RT # 10.511.373

SURVEY PERFORMED TO DEPOST CONTAMINATED AREA OUTSIDE OF PIPE TUNNEL ENCLOSURE. CONTAMINATED AREA BOUNDARIES ARE NOW PIPE TUNNEL ENCLOSURE itself, RAD ROPE AT STEP OFF PAD AND RAD ROPE AT WEST END OF PIPE ENCL (UNTIL WALL CONSTRUCTED)

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM



DATE 5-7-97 TIME 1530

SURVEYOR R Dodge & Sand

INSTRUMENT RM14SA # 5716

CALIBRATION DUE DATE 1-2-98

INSTRUMENT RO2 # 4222

CALIBRATION DUE DATE 11-6-97

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER — MASSLINN
- (✓) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.
- (✓) CONTAMINATION
  - (✓) LESS THAN 1000 dpm/100 cm² BETA-GAMMA UNLESS NOTED
  - ( ) LESS THAN 50 dpm/100 cm² ALPHA UNLESS NOTED
- ( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	Ceiling	11	N. Wall	21	2K
2		12		22	3K
3		13		23	4K
4		14		24	8K
5		15		25	4K
6		16	S. Wall	26	18K
7	East Wall	17		27	2K
8		18		28	2K
9	South Wall	19		29	STAIRS
10		20		30	

COMMENTS: All smears = <1K dpm/100cm² EXCEPT WHERE NOTED.

PECIAL SURVEY FORM

OCATION or EQUIPMENT Pipe Tunnel

101.6 REV.23

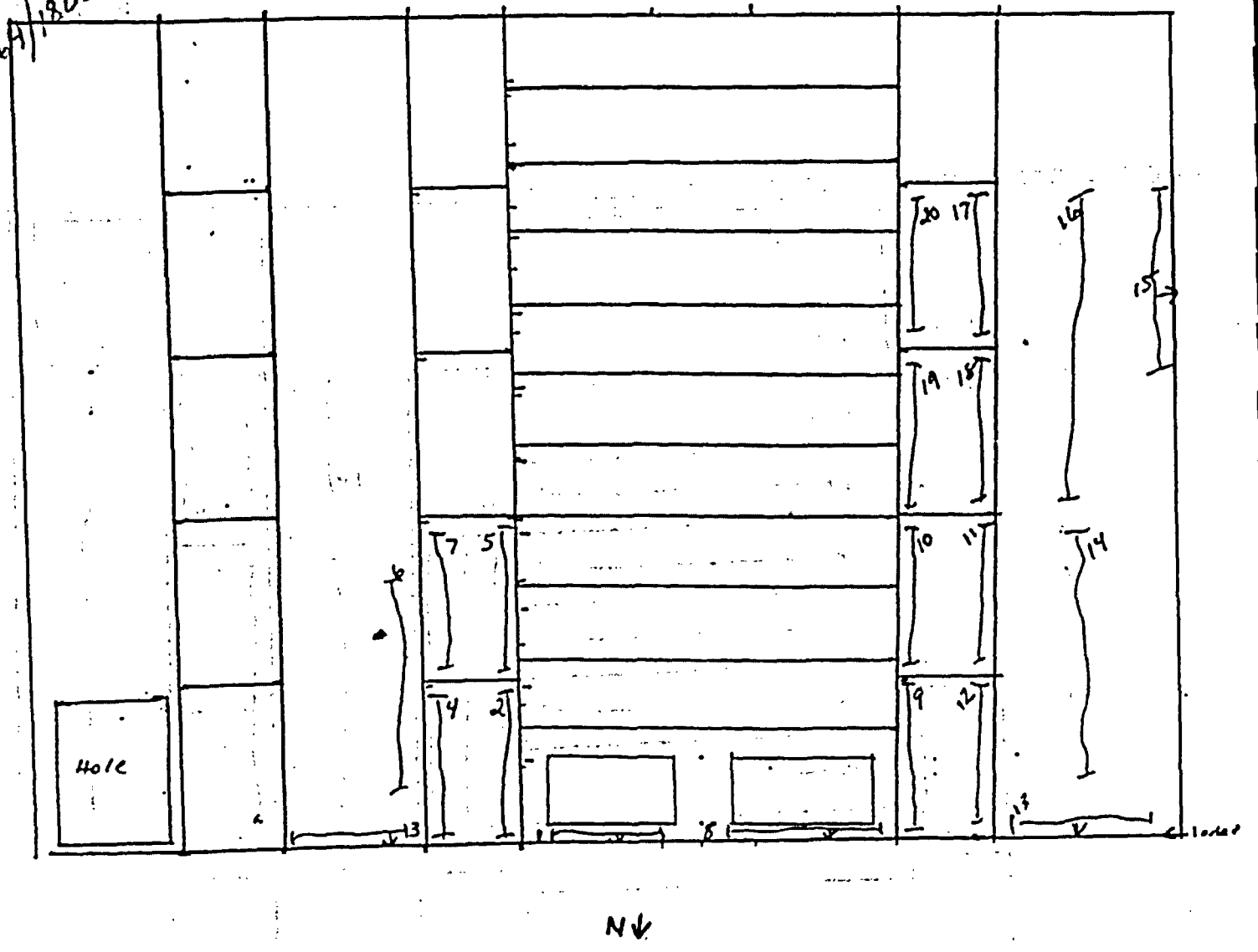
MS # V02.09.03

T # 10.S1 73

YANKEE ATOMIC ELECTRIC COMPANY

RPS
5564/1802

RADIATION PROTECTION SURVEY FORM



DATE 5-1-97 TIME 1030

SURVEYOR L. Dawkins

INSTRUMENT CM-7 # 5557

CALIBRATION DUE DATE 7-3-97

INSTRUMENT Pions # 2

CALIBRATION DUE DATE 9-11-97

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- —x—x— BARRIER |—~—| MASSLINN
- ( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.
- (x) CONTAMINATION
  - (x) LESS THAN 1000 dpm/100 cm² BETA-GAMMA UNLESS NOTED
  - (x) LESS THAN 50 dpm/100 cm² ALPHA UNLESS NOTED
- (x) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	<1K/LAS	11	<1K/LAS	21	N/A
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

COMMENTS: Smears #8, #16, #17 checked for Alpha - None found

LAS: Large Area Smear

SPECIAL SURVEY FORM

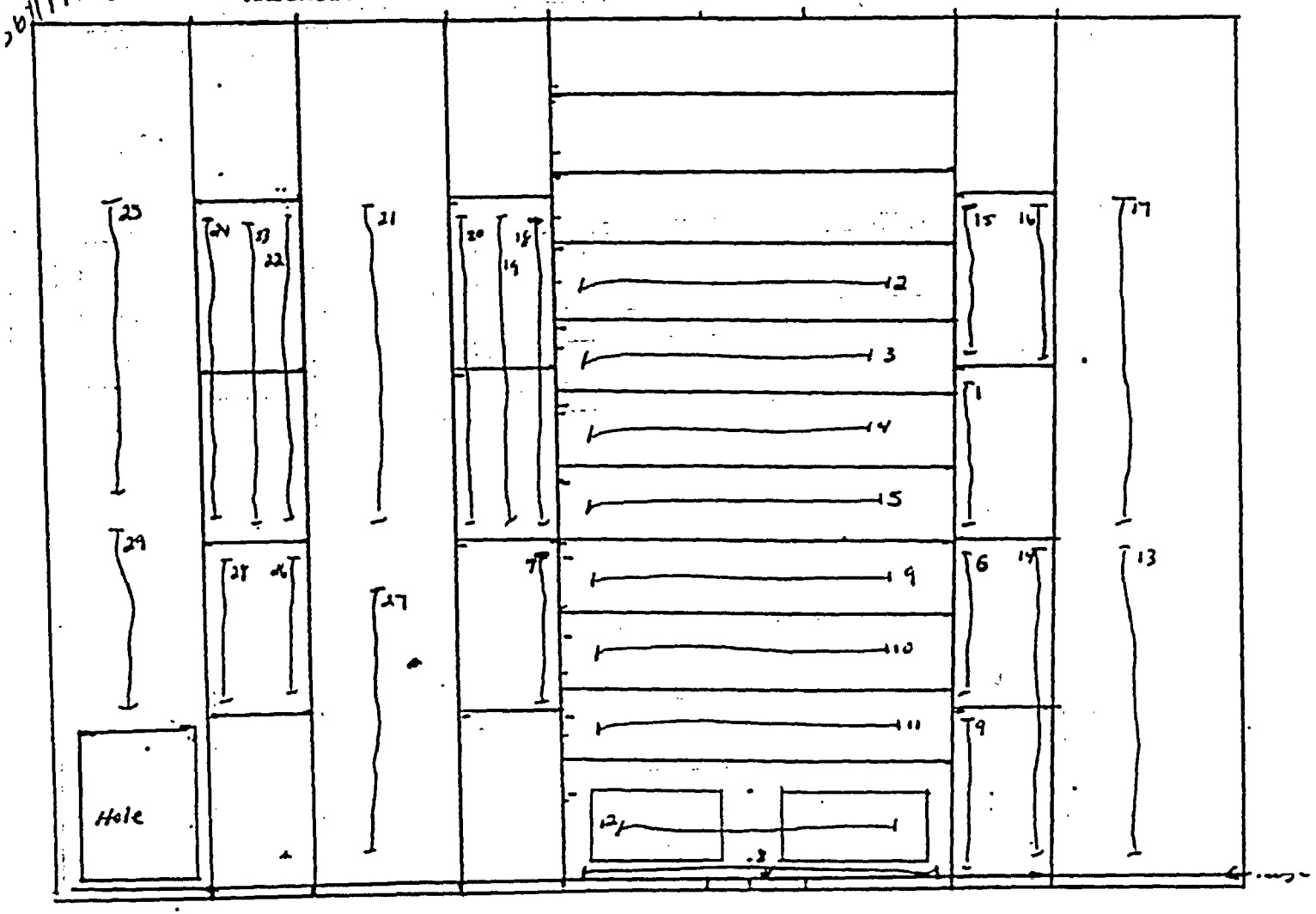
LOCATION or EQUIPMENT Ion Exchange Pit Ceiling, pipe & corners

8101.6 REV.23

IMS # V02.09.03

RT # 10.511.373

YANKEE ATOMIC ELECTRIC COMPANY



DATE 1-20-71 TIME 1400

CALIBRATION DUE DATE 3-12-98

INSTRUMENT DIODS # 2

DUE DATE 9-11-97

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- MASSLINN

( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.

( ) CONTAMINATION
(✓) LESS THAN 1000 dpm/100 cm² BETA-GAMMA UNLESS NOTED
(✓) LESS THAN 50 dpm/100 cm² ALPHA UNLESS NOTED

( ) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED

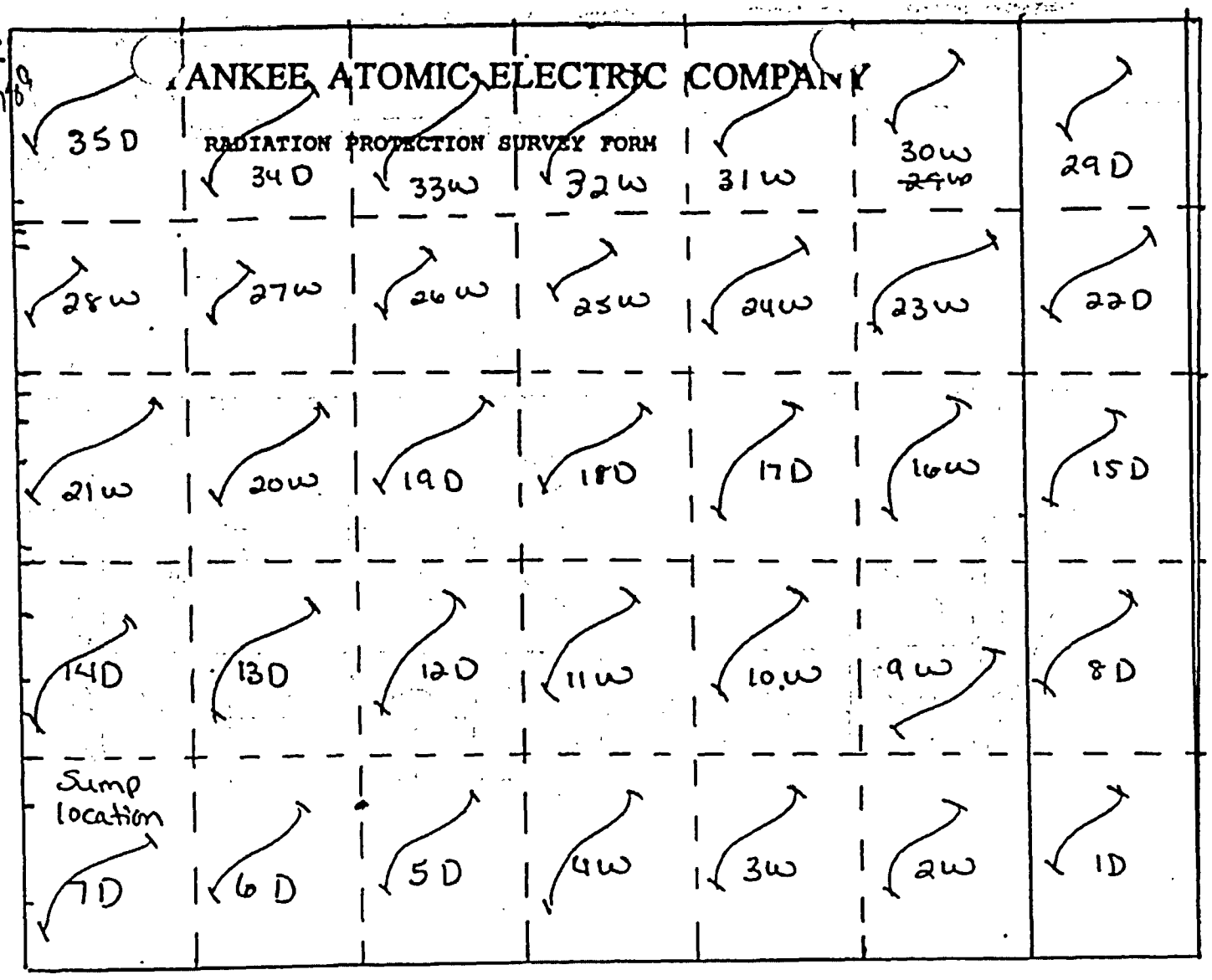
1	<1K/LAS	11	<1K/LAS	21	<1K/LAS
2		12		22	
3		13		23	
4		14		24	
5		15		25	1K
6		16		26	
7	1K	17	1K	27	
8	<1K/LAS	18	<1K/LAS	28	
9		19		29	
10		20			

COMMENTS

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT Ion Exchange Pit Ceiling prior to cleaning
8101.6 REV.23
IMS # V07 .03
RT # 10.__1.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM



D=Dry
w=wet

N

RM-14 Bkgd: 200cpm
PIOPS LLD: 113 dpm beta
18.3dpm alpha
Smears 31-35 <1K/LAS

DATE 4-30-97 TIME 1400
SURVEYOR R. Dodge
INSTRUMENT RM-14 # 4225
CALIBRATION DUE DATE 3-12-97
INSTRUMENT PIOPS # 2
CALIBRATION DUE DATE 9-11-97

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- —x—x— BARRIER |—| MASSLINN
- ( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.
- (x) CONTAMINATION
  - (x) LESS THAN 1000 dpm/100 cm² BETA-GAMMA UNLESS NOTED
  - (x) LESS THAN 50 dpm/100 cm² ALPHA UNLESS NOTED
- (x) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1 <1K/LAS	11 <1K/LAS	21 <1K/LAS
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

COMMENTS: Smears #7, #15, #34 Counted for alpha - None found
LAS = Large Area Smear

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT ION EXCHANGE PIT FLOOR SURVEY PRIOR TO COVERING
8101.6 REV.23
IMS # V02.09.03
RT # 10.811.373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

DATE 4-28-97 TIME 0930

SURVEYOR L. Dawkins

INSTRUMENT LM-7 # 5557

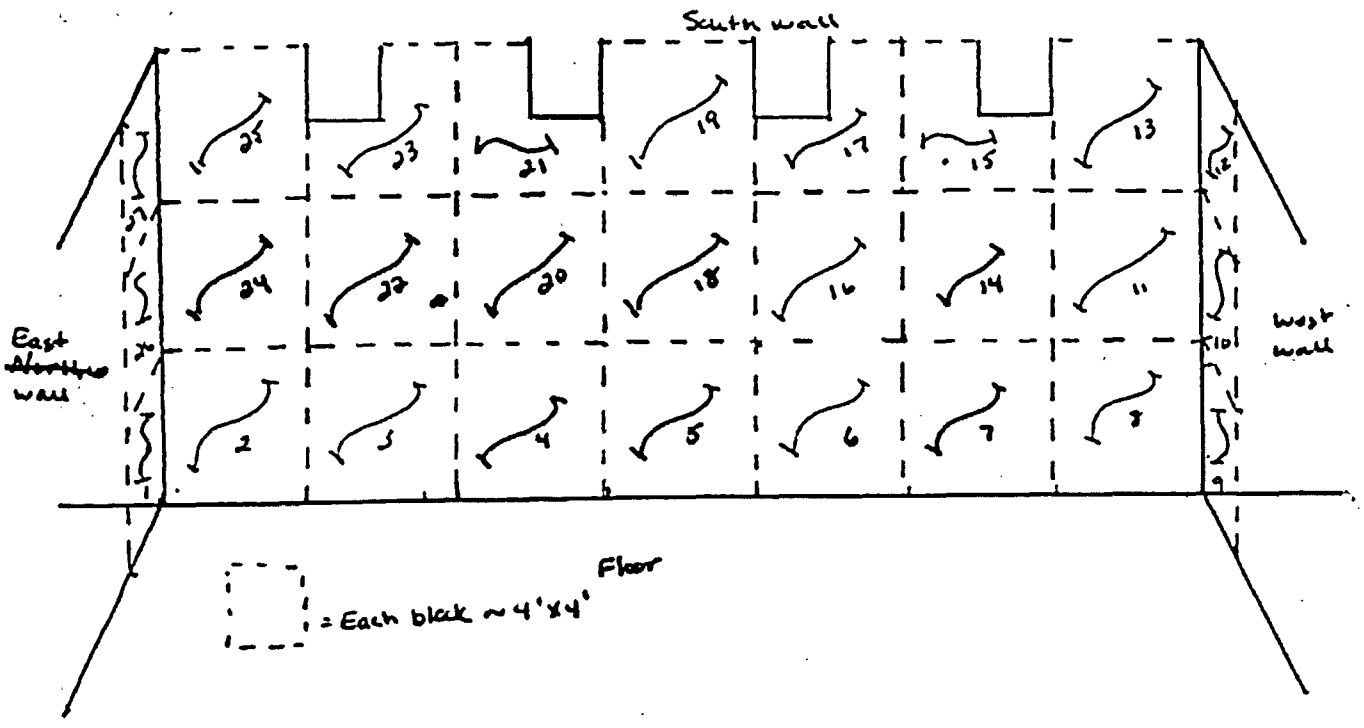
CALIBRATION DUE DATE 7-3-97

INSTRUMENT DIOPS # 2

CALIBRATION DUE DATE 7-11-97

KEY

- RADIATION GENERAL AREA
- RADIATION CONTACT
- SMEAR LOCATION
- BARRIER / MASSLINN
- ( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.
- (X) CONTAMINATION
  - (X) LESS THAN 1000 dpm/100 cm² BETA-GAMMA UNLESS NOTED
  - (X) LESS THAN 50 dpm/100 cm² ALPHA UNLESS NOTED
- (X) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.



SMEAR LOCATION & NET dpm/100 cm²

1 <1 K/LAS	11 <1K/LAS	21 <1K/LAS
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28 NA
9	19	29 NA
10	20	30 NA

COMMENTS: LAS: Large Area Smear
Smears #2, #16, #13 picked for alpha - none found

SPECIAL SURVEY FORM

LOCATION or EQUIPMENT 1XP - South Wall prior to covering with Plastic

1101.6 REV.23

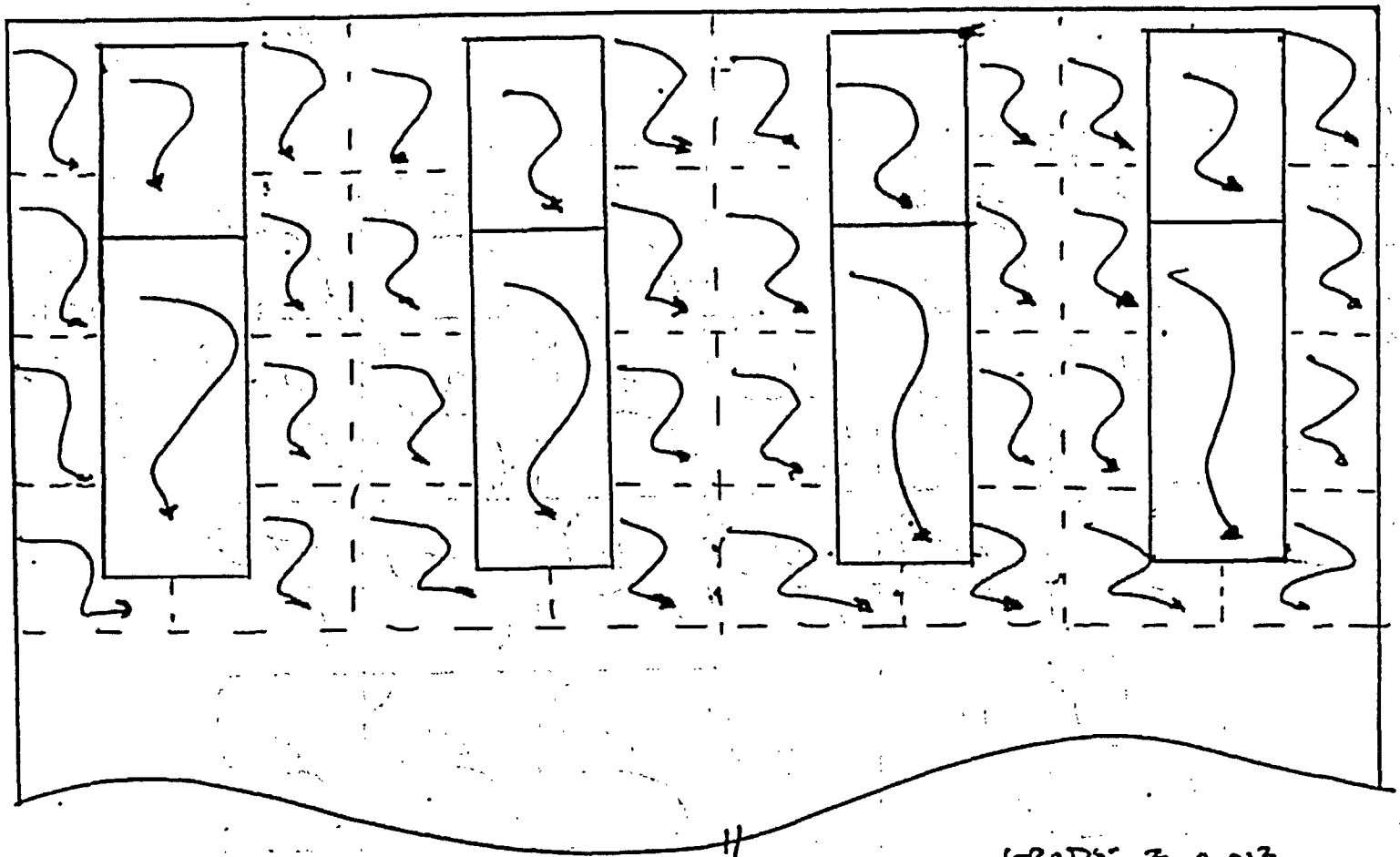
MS # V02.0 73

T # 10.S1 373

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM

- SOUTH WALL -



ALL LAS. SMEARS
< 100 NCPM/LAS

GRIDS: ≈ 4 ft²

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT IX - PIT SOUTH WALL (RAFTERS AREA)
8101.6 REV.23
IMS # V02.09.03
RT # 10.S11.373

DATE 4/28/97 TIME 2215
SURVEYOR MOYERS/[illegible]
INSTRUMENT RM-14 # 4628
CALIBRATION DUE DATE 8/1/97
INSTRUMENT N/A
CALIBRATION DUE DATE

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- —x x— BARRIER |—~—| MASSLINN
- ( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.
- (✓) CONTAMINATION
  - ( ) LESS THAN 1000 dpm/100 cm² BETA-GAMMA UNLESS NOTED
  - ( ) LESS THAN 50 dpm/100 cm² ALPHA UNLESS NOTED
- (✓) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	11	21
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30

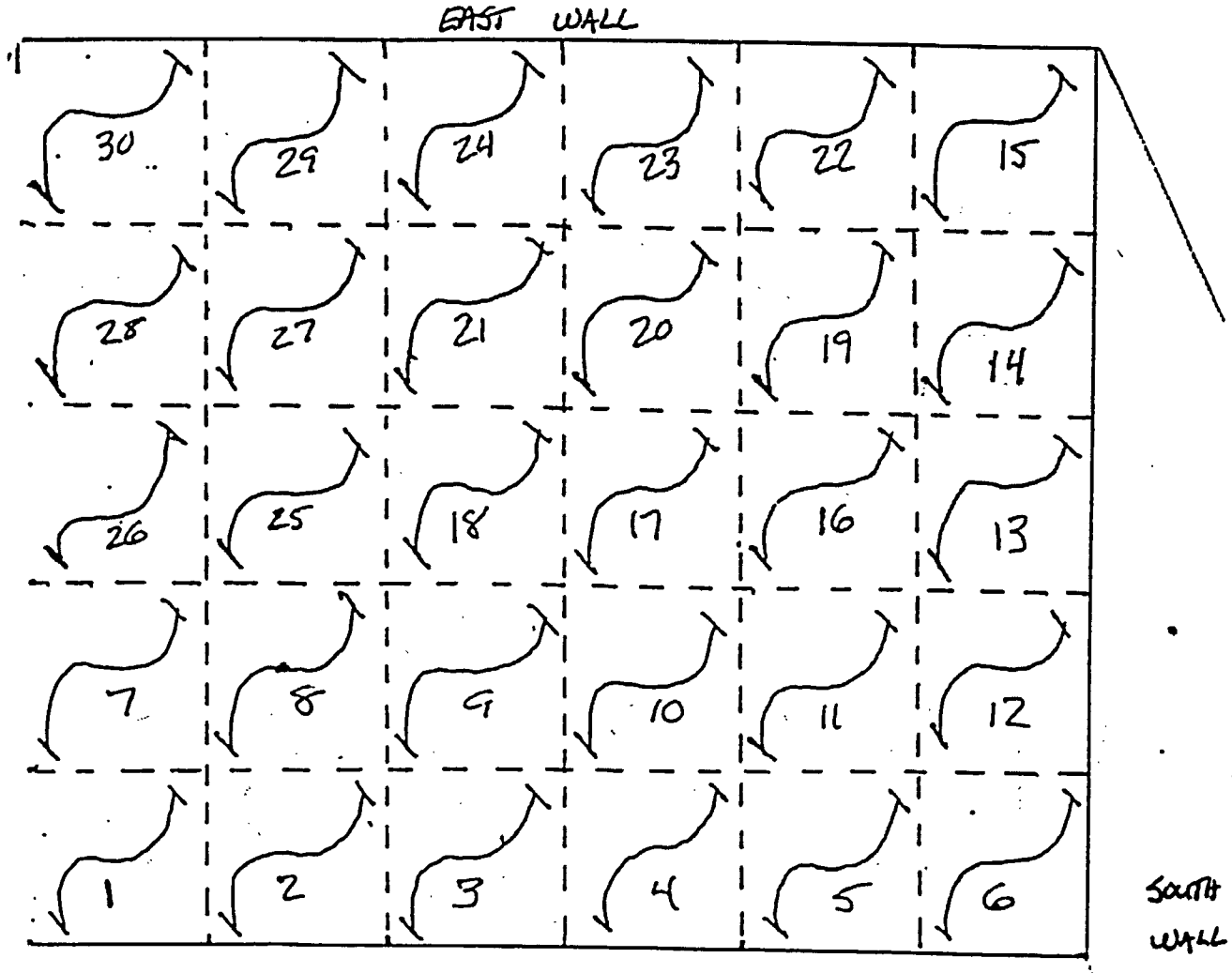
N/A

COMMENTS:

5564/1739

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM



FLOOR

SPECIAL SURVEY FORM
LOCATION or EQUIPMENT

8101.6 REV.23
IMS # V02.09.03
RT # 10.S11.373

IAP - EAST WALL - Survey Prior to Covering EAST. WALL with PLASTIC

DATE 4-24-97 TIME 0200

SURVEYOR [illegible]

INSTRUMENT RM-14 # 3030

CALIBRATION DUE DATE 10-22-97

INSTRUMENT N/A # N/A

CALIBRATION DUE DATE N/A

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- —x—x— BARRIER |—— MASSLINN
- (N/A) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED
- (X) CONTAMINATION
  - (X) LESS THAN 1000 dpm/100 cm² BETA-GAMMA UNLESS NOTED
  - (X) LESS THAN 50 dpm/100 cm² ALPHA UNLESS NOTED
- (X) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	<1K/LAS	11	<1K/LAS	21	<1K/LAS
2	<1K/LAS	12	<1K/LAS	22	<1K/LAS
3	<1K/LAS	13	<1K/LAS	23	<1K/LAS
4	<1K/LAS	14	<1K/LAS	24	<1K/LAS
5	<1K/LAS	15	<1K/LAS	25	<1K/LAS
6	<1K/LAS	16	<1K/LAS	26	<1K/LAS
7	<1K/LAS	17	<1K/LAS	27	<1K/LAS
8	<1K/LAS	18	<1K/LAS	28	<1K/LAS
9					
10	<1K/LAS	20	<1K/LAS	30	<1K/LAS

COMMENTS:

LAS = LARGE AREA SMEAR

12,241 27 - NO DET

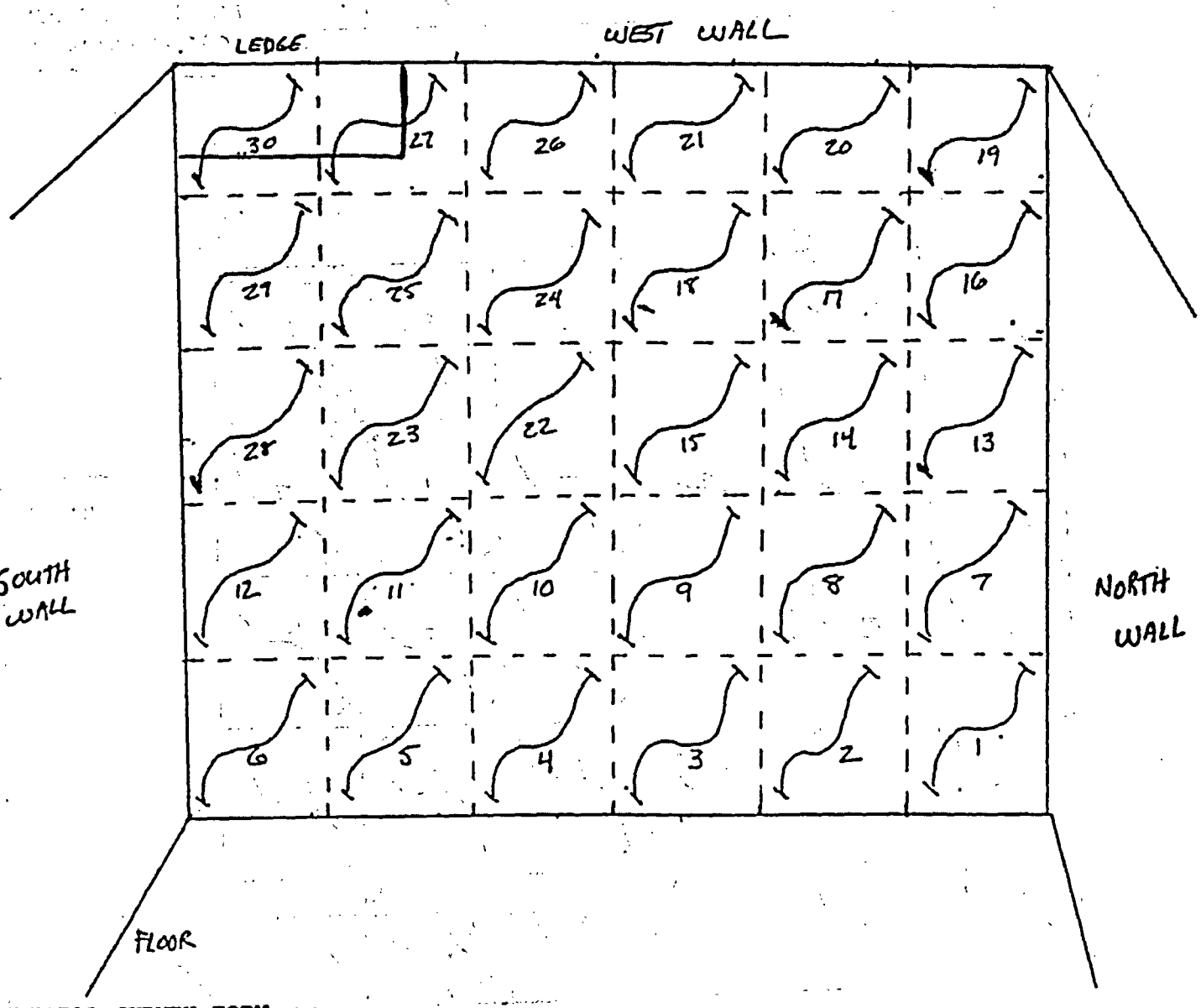
LD 4522 3/3/9

180

5564/1713

YANKEE ATOMIC ELECTRIC COMPANY

RADIATION PROTECTION SURVEY FORM



DATE 4-23-97 TIME 1900

SURVEYOR [illegible]

INSTRUMENT RM 14 # 3030

CALIBRATION DUE DATE 10-22-97

INSTRUMENT _____ # _____

CALIBRATION DUE DATE _____

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SHEAR LOCATION
- —x x— BARRIER |—~—| HASSLINN
- ( ) DIRECT RADIATION NA READINGS IN MR/HR EXCE AS NOTED.
- (X) CONTAMINATION
  - (X) LESS THAN 1000 dpm/~~100 cm²~~ BETA-GAMMA UNLESS NOTED
  - (X) LESS THAN 50 dpm/~~100 cm²~~ ALPHA UNLESS NOTED
- (X) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SHEAR LOCATION & NET dpm/100 cm²

1	<1K/LAS	11	<1K/LAS	21	<1K/LAS
2	<1K/LAS	12	<1K/LAS	22	<1K/LAS
3	<1K/LAS	13	<1K/LAS	23	<1K/LAS
4	<1K/LAS	14	<1K/LAS	24	<1K/LAS
5	<1K/LAS	15	<1K/LAS	25	<1K/LAS
6	<1K/LAS	16	<1K/LAS	26	<1K/LAS
7	<1K/LAS	17	<1K/LAS	27	<1K/LAS
8	<1K/LAS	18	<1K/LAS	28	<1K/LAS
9	<1K/LAS	19	<1K/LAS	29	<1K/LAS
10	<1K/LAS	20	<1K/LAS	30	<1K/LAS

COMMENTS: LAS = LARGE AREA SMEAR

#5, 8, +18: NO DETα

SPECIAL SURVEY FORM

LOCATION or EQUIPMENT _____

8101.6 REV.23

IMS # V02.09.03

RT # 10.811.373

IX PIT - WEST WALL

- Survey Performed prior to covering WEST WALL with PLASTIC

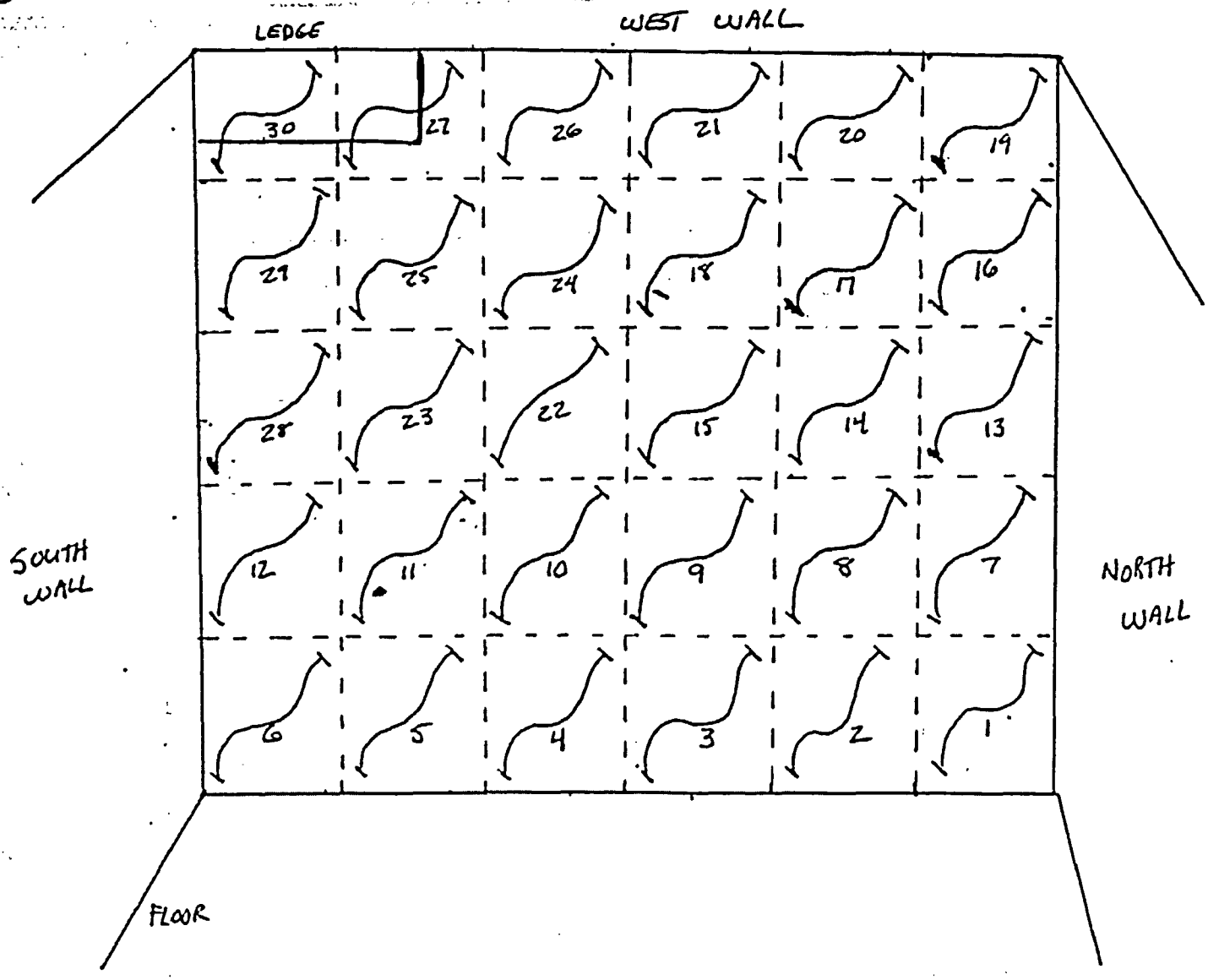
- EACH ≈ 4ft x 4ft

180

5564/1713

YANKEE A

RADIATION PROTECTION SURVEY FORM



DATE 4-23-97 TIME 1900

SURVEYOR [illegible]

INSTRUMENT RM 14 # 3030

CALIBRATION DUE DATE 10-22-97

INSTRUMENT _____ # _____

CALIBRATION DUE DATE _____

KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- —x—x— BARRIER |—~—| MASSLINN
- ( ) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED. (NA)
- (X) CONTAMINATION
  - (X) LESS THAN 1000 dpm/~~100 cm²~~ BETA-GAMMA UNLESS NOTED
  - (X) LESS THAN 50 dpm/~~100 cm²~~ ALPHA UNLESS NOTED
- (X) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	<1K/LAS	11	<1K/LAS	21	<1K/LAS
2	<1K/LAS	12	<1K/LAS	22	<1K/LAS
3	<1K/LAS	13	<1K/LAS	23	<1K/LAS
4	<1K/LAS	14	<1K/LAS	24	<1K/LAS
5	<1K/LAS	15	<1K/LAS	25	<1K/LAS
6	<1K/LAS	16	<1K/LAS	26	<1K/LAS
7	<1K/LAS	17	<1K/LAS	27	<1K/LAS
8	<1K/LAS	18	<1K/LAS	28	<1K/LAS
9	<1K/LAS	19	<1K/LAS	29	<1K/LAS
10	<1K/LAS	20	<1K/LAS	30	<1K/LAS

COMMENTS: LAS = LARGE AREA SMEAR

#5, 8, +18: NO DET α

SPECIAL SURVEY FORM

LOCATION or EQUIPMENT IX PIT - WEST WALL

- Survey Performed prior to covering WEST WALL with PLASTIC

8101.6 REV.23

IMS # V02.09.03

RT # 10.S11.373

▭ - EACH ≈ 4ft x 4ft

Y ELECTRI

RADIATION PROTECTION SURVEY FORM

3564/1712

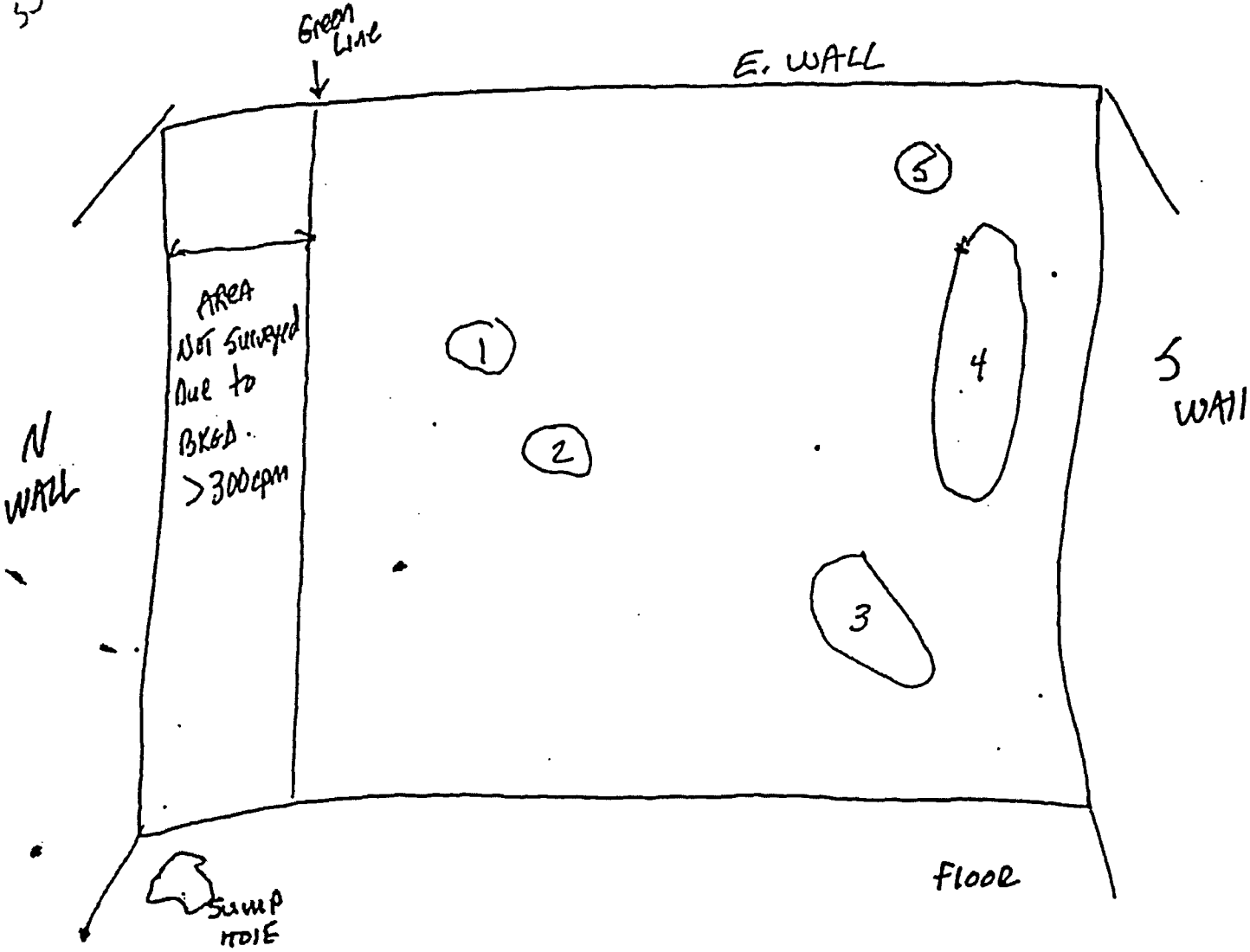
SURVEYOR Howarth / Jacky

INSTRUMENT RM-14 # 4385

CALIBRATION DUE DATE 2/25/98

INSTRUMENT RM-14 # 3030

CALIBRATION DUE DATE 10/22/97



KEY

- ▭ RADIATION GENERAL AREA
- ○ RADIATION CONTACT
- △ SMEAR LOCATION
- —x—x— BARRIER |—~—| MASSLINN
- (W/A) DIRECT RADIATION READINGS IN MR/HR EXCEPT AS NOTED.
- (X) CONTAMINATION
  - (X) LESS THAN 1000 dpm/100 cm² BETA-GAMMA UNLESS NOTED
  - ( ) LESS THAN 50 dpm/100 cm² ALPHA UNLESS NOTED
- (X) HOT PARTICLE SURVEY NO HOT PARTICLES FOUND UNLESS NOTED.

SMEAR LOCATION & NET dpm/100 cm²

1	<1K/LAS	11		21	
2	<1K/LAS	12		22	
3	<1K/LAS	13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

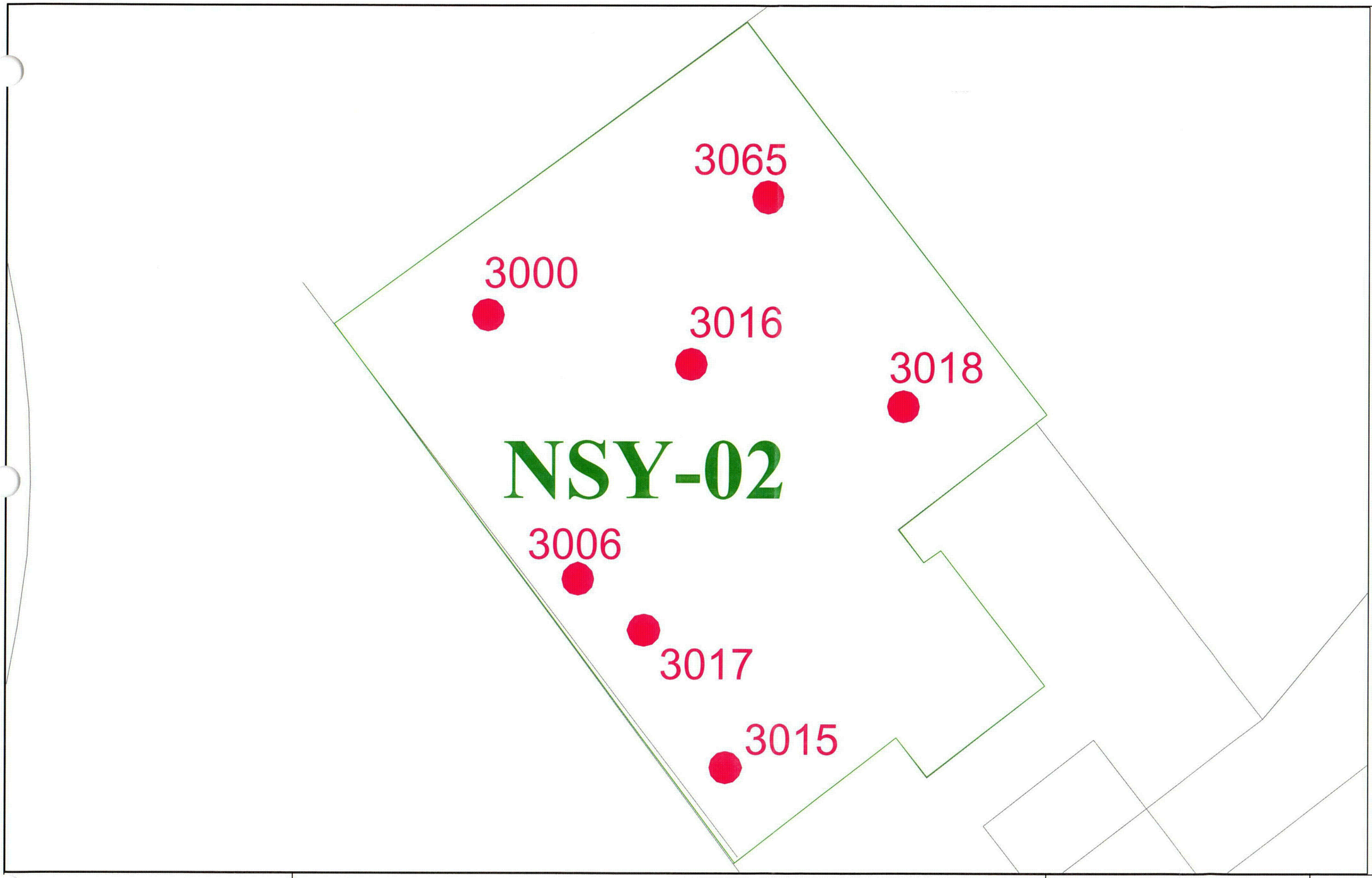
COMMENTS:

SPECIAL SURVEY FORM LOCATION or EQUIPMENT IAP - E. WALL.

8101.6 REV.23
IMS # V02.09.03
RT # 10.811.373

→ 3 AREAS Surveyed are After JACK HAMMERING. AREAS NOTED ARE CONTAMINATED - FIXED. AREAS 4+5 were NOT WORKED ON DUE TO LOCATION

RANGE: 200 NCPM — 1500 NCPM



N

Legend

= Survey Area Boundary

Notes

Yankee Atomic Power Company Soil Sample Locations - NSY-02	YANKEE	Date: October 2003 Revision: 4	Figure: 27

C31

Survey Area Name: Safety Injection Diesel Building Designator: **NSY-03**

Survey Area Description

Survey Area NSY-03 consists of the reinforced concrete floors, foundations wall, and sub-surface structures that comprise the Safety Injection and Diesel Generator Building (SIDGB) (Ref 1) and additions that remain after demolition of the structure. The structural steel, roof structure and concrete block walls of the SIDGB have been removed. The SIDGB and additions footprint includes the footprints of the former #3 Battery Room and Motor Control Center #4 (PIC Building) (Ref 2), Electrical Manhole three, the SI Accumulator Tank room, and the material storage cage.

Floor surface area of the SIDGB and additions is approximately 332 square meters. The interior surface area of the remaining walls is approximately 21 square meters. Most of the exterior surface of these remaining walls is below grade. There is approximately 96 linear meters of foundation and footings that extends to a depth of 1.5 meters below grade associated with the SIDGB. The total exposed surface area of the SIDGB is approximately 353 square meters.

There are 2 electrical conduit duct banks that connect to the SIDGB footprint. One is located adjacent to the former #3 electrical manhole and the other is located along the north wall of the former #3 battery room. A third electrical conduit duct bank runs under the SIDGB connecting to the Waste Disposal Building. That portion of this duct bank that lies under SIDGB footprint is included in survey area NSY-03.

Survey Area History

NSY-03, Safety Injection and Diesel Generator Building was constructed as a plant modification in 1970.

The Battery Room #3 and Motor Control Center was constructed as a plant modification shortly thereafter.

The RCA yard area surface and sub-surface soils at the SIDGB and additions location are suspected of being contaminated prior to the construction of the structure. Residual radioactivity not removed with the construction spoils may still be present within the footprint of the SIDGB and additions.

The present location of the construction spoils generated by the SIDGB and additions is thought to be within the SE Construction Fill area (OOL-009) of the site. (Ref 3)

NSY-03 was surveyed on a routine basis and generally maintained as a non-contaminated area. The Safety Injection Pump bases were maintained as contaminated areas due to pump leakage.

Scoping/Characterization

This structure was among the first to be demolished under the decommissioning plan. A full characterization survey effort was conducted in October 1996 under the guidance of NUREG/CR-5849 followed by remediations (see below) (Ref 4). The building was turned over to FSS and FSS surveys were conducted successfully prior to June of 1999 again under the guidance of NUREG/CR-5849.

Remediations

One portion of NSY-03 required remediation (floor drain area outside accumulator room) and deeper areas within manhole #3 required mitigation. A summary of the results of "as found" soil sample data, results of samples taken during the process of the remediation.
Results of "as left" soil sample data are included on the *remediated areas* sheet and accompanying diagrams attached to this section.

Decommissioning Activities

Decommissioning activities performed in NSY-03 include those described in the following Decommissioning Work Packages. (DWPs):

- SI-01 Emergency Core Cooling System Removal of SI Piping Outside VC (Ref 5).
- SI-02 SI Nitrogen Bottles (Ref 6).
- SIBA-01 EDG/SI Building Clean Out – Mechanical (Ref 7).
- SIBA-02 Removal of Battery No. 3 / DC System Realignment (Ref 8).
- SIBA-03 SI Building Electrical Component Removals (Ref 9).
- SIBA-04EDG/SI Room Decon (Ref 10).

- SI/EDG-01 (Ref 11).

Decommissioning activities performed in NSY-03 have removed all systems and components from the SIDGB and additions. These include the 3 diesel generator sets, the motor control center, the 3 high pressure and 3 lower pressure safety injection pumps, safety injection piping, the PIC motor control center and the #3 battery. The pump base drain and floor drain system including sub-floor piping, drain sump and soil around the sub-floor portions of the drain system were removed

The SIDGB was demolished down to elevation 1022. Portions of the south and west walls were left in place to function as retaining walls for soil.

Findings

The history of NYS-03 indicates that this structure is radiologically impacted as a result of plant operations. The soils within the footprint of NSY-03 were impacted by previous plant operations.

The radionuclide mix for the NSY-03 includes all radionuclides identified in the reactor radioactive systems of the plant (Ref 12). The primary radionuclides of concern for NSY-03 are Co-60, Cs-137, Ag-108m, Sr-90, and tritium.

These radionuclides were distributed in media including concrete, painted steel, sub-floor soil.

Current Status

Currently NSY-03 consists of the reinforced concrete foundations floors walls and subsurface structures.

A soil sample location map (Figure 28) has been prepared to show the distribution of sampling locations in NSY-03. Only samples representative of soils still present are included on the map (samples of soils representative of soils removed during remediation activities are not presented). Two survey media were assessed in NSY-03, Asphalt and Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL. There are separate sets of Tables 1-4 for each survey media. All are evaluated as fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for NSY-03 is presented at the end of Table 1 for each survey medium. The results are summarized below.

Asphalt: Mean SOF is none detectable.
Maximum SOF for a single asphalt sample is none detectable.
Minimum SOF for a single asphalt sample is none detectable.

Soil: Mean SOF is 0.141.
Maximum SOF for a single soil sample is 0.801. (key# 3282)
Minimum SOF for a single soil sample is 0.001. (key# 3099)

Following collection of these samples, winter maintenance activities performed during the winter of 2002/2003 resulted in an accumulation of RCA yard area snow being deposited on the remnants of the SIDGB. This resulted in an accumulation of residual winter sand on the concrete floor surface area. This represents a possible recontamination of this area and will require additional surface preparation prior to FSS.

Subsequent to the deposition of snow piles originating from all areas of the RCA in 2003, drilling spoils from nearby deep groundwater monitoring wells were deposited in the footprint of this survey area. Samples of the soil column for this set of wells did not contain detectable radioactive material.

Classification Statement

Based upon the radiological condition of this survey area identified in the operating history and as a result of the decommissioning activities performed to date, survey area NSY-03 is identified as a Class 1 Area.

Survey Area Name: Safety Injection Diesel Building Designator: **NSY-03**

Drawings

9699-FA-19A
9699-FA-20A
9699-FC-63B
9699-FC-63C
SPD81081-U1-1

References

1.	Engineering Design Change Request (EDCR) SIDGB, "Diesel Generator Building," dated 1970.
2.	Engineering Design Change Request (EDCR) PIC Building, "Building and Ductig for Electrical Backfit," dated April 16, 1982.
3.	Summary of Excavation Volumes for YNPS Construction Performed During the Time Period of Plant Operations Projects
4.	Turnover survey results (see attachments to summary report)
5.	Decommissioning Work Package (DWP) SI-01, "Emergency Core Cooling System Removal of SI Piping Outside VC".
6.	DWP SI-02, "SI Nitrogen Bottles."
7.	DWP SIBA-01, "Safety Injection Building – Mechanical"
8.	DWP SIBA-02, "Station Battery Realignment and Removal of Battery Nos. 2 & 3 and Associated Equipment."
9.	DWP SIBA-03, "SI Building Electrical Component Removals"
10.	DWP SIBA-04, "Safety Injection Building Demolition."
11.	DWP SI/EDG-01, "Safety Injection/Emergency Diesel Generator (SI/DG) Building Removal."
12.	Radionuclides for Building Surfaces and Soil DCGL Determinations YA-REPT-00-001-03

NSY-03

Remediated Areas								
Location	Sample #	Date	GLV SOF	Disposition	Nuclide	Conc. (pCi/gm)	Fraction of DCGL	DCGL SOF
Floor drain outside Accumulator room composite 0" - 6"	SI001.6A	11-Nov-97	0.550		Co-60	4.246E-01	0.088	0.323
					Cs-134	1.059E-01	0.016	
					Cs-137	2.691E+00	0.220	
Floor drain outside Accumulator room composite 12" - 18"	SI001.6B	11-Nov-97	10.399		Co-60	5.615E+00	1.161	6.258
					Cs-134	2.064E+00	0.308	
					Cs-137	5.863E+01	4.790	
Floor drain outside Accumulator room composite 18" - 30"	SI001.6C	12-Nov-97	0.290		Co-60	1.470E-01	0.030	0.176
					Cs-137	1.781E+00	0.146	
Floor drain outside Accumulator room composite 30" - 42"	SI001.6D	12-Nov-97	ND					
Floor drain outside Accumulator room composite 30" - 36"	TS-533	11-Aug-98	ND	ALAR				
Floor drain outside Accumulator room composite 30" - 36"	TS-534	11-Aug-98	ND	ALAR				
SI manhole #3 concrete composite	CT-98-34A	20-Aug-98	ND	ABC				
SI manhole #3 concrete composite	CT-98-34B	20-Aug-98	ND	ABC				
SI manhole #3 concrete composite	CT-98-34C	20-Aug-98	ND	ABC				
SI manhole #3 composite	S-98-33A	18-Aug-98	ND	AB				
SI manhole #3 composite	S-98-33B	18-Aug-98	ND	AB				
SI manhole #3 composite	S-98-33C	18-Aug-98	ND	AB				
SI manhole #3 floor composite	TS-550	27-Aug-98	ND	ALAR				
SI manhole #3 walls composite	TS-551	27-Aug-98	ND	ALAR				
SI manhole #3 composite	TS-572	1-Oct-98	1.570	FR	Co-60	3.380E+00	0.699	0.801
					Cs-134	6.400E-02	0.010	
					Cs-137	1.140E+00	0.093	
SI manhole #3 composite	TS-573	1-Oct-98	1.470	FR	Co-60	3.200E+00	0.661	0.748
					Cs-137	1.060E+00	0.087	
SI manhole #3 composite	TS-577	5-Oct-98	0.370	ALAR	Co-60	8.783E-01	0.182	0.182
SI manhole #3 composite	TS-578	5-Oct-98	0.390	ALAR	Co-60	9.412E-01	0.195	0.195

UNK - unknown
AB - as area backfill
ABC - ABC storage area
AL - as left
ALAR - as left after remediation
FR - further remediation
RD - rad disposal
TS - temporary storage tk

DCGL (pCi/gm)		
Nuclide	25 mrem/yr	10 mrem/yr
Ag-108m	8.521E+00	3.408E+00
Co-60	4.838E+00	1.935E+00
Cs-134	6.706E+00	2.682E+00
Cs-137	1.224E+01	4.896E+00

Underground Systems

NSY-03				
Structure / System	Component	Description	Location	Impacted?
Electrical	duct trays depth=0"-48"	from NOL-06 S, from NOL-06 W and from NOL-06 N to manhole E3	E3 - ~20' N of SE corner of SI building	

Table 2
Statistical Data Summary – NSY-03 – Asphalt
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	3	3	0.463	0.019	0.443	0.480	0.465
Ag-108m	pCi/g	0	3	0.000				
Ag-110m	pCi/g	0	3	0.000				
Am-241	pCi/g	0	3	0.000				
Bi-212	pCi/g	1	1	0.784		0.784	0.784	0.784
Bi-214	pCi/g	3	3	0.423	0.081	0.345	0.506	0.418
Ce-144	pCi/g	0	3	0.000				
Co-58	pCi/g	0	3	0.000				
Co-60	pCi/g	0	3	0.000				
Cs-134	pCi/g	0	3	0.000				
Cs-137	pCi/g	0	3	0.000				
Fe-59	pCi/g	1	3	0.086		0.086	0.086	0.086
K-40	pCi/g	3	3	10.231	0.969	9.234	11.170	10.290
Kr-85	pCi/g	0	1	0.000				
Mn-54	pCi/g	0	3	0.000				
Nb-95	pCi/g	0	3	0.000				
Np-239	pCi/g	0	2	0.000				
Pb-212	pCi/g	3	3	0.528	0.052	0.474	0.579	0.531
Pb-214	pCi/g	3	3	0.444	0.026	0.414	0.461	0.458
Ra-226	pCi/g	1	2	1.415		1.415	1.415	1.415
Ru-103	pCi/g	0	3	0.000				
Ru-106	pCi/g	0	3	0.000				
Sb-124	pCi/g	0	3	0.000				
Tl-208	pCi/g	2	2	0.498	0.051	0.462	0.535	0.498
Zn-65	pCi/g	0	3	0.000				
Zr-95	pCi/g	0	3	0.000				

Table 1
Sum of Fractions
NSY-03 -- Asphalt
Yankee Nuclear Power Station Rowe, MA

Radionuclides for which SOF is calculated were not present in samples.

Table 3
Summary of Detected Results Above Criteria
NSY-03 -- Asphalt
Yankee Nuclear Power Station Rowe, MA
DCGL_Asphalt

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	3	3		pCi/g	0	0.48
Ag-108m	0	3	8.52	pCi/g	0	
Ag-110m	0	3		pCi/g	0	
Am-241	0	3	44.35	pCi/g	0	
Bi-212	1	1		pCi/g	0	0.78
Bi-214	3	3		pCi/g	0	0.51
Ce-144	0	3		pCi/g	0	
Co-58	0	3		pCi/g	0	
Co-60	0	3	4.84	pCi/g	0	
Cs-134	0	3	6.71	pCi/g	0	
Cs-137	0	3	12.24	pCi/g	0	
Fe-59	1	3		pCi/g	0	0.09
K-40	3	3		pCi/g	0	11.17
Kr-85	0	1		pCi/g	0	
Mn-54	0	3	21.66	pCi/g	0	
Nb-95	0	3		pCi/g	0	
Np-239	0	2		pCi/g	0	
Pb-212	3	3		pCi/g	0	0.58
Pb-214	3	3		pCi/g	0	0.46
Ra-226	1	2		pCi/g	0	1.42
Ru-103	0	3		pCi/g	0	
Ru-106	0	3	68.21	pCi/g	0	
Sb-124	0	3		pCi/g	0	
Tl-208	2	2		pCi/g	0	0.53
Zn-65	0	3		pCi/g	0	
Zr-95	0	3		pCi/g	0	

Table 4
Rad
NSY-03 -- Asphalt (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	AS98.32 (2993)	AS98.32 (2993)	AS98.32 (2993)
Sample ID	AS98.32A	AS98.32B	AS98.32C
Date Sampled	8/17/1998	8/17/1998	8/17/1998
Ac-228	0.4804	0.443	0.4649
Ag-108m	-0.005838 U	-0.008223 U	0.01176 U
Ag-110m	-0.01664 U	0.01796 U	-0.01547 U
Am-241	0 U	0 U	0 U
Bi-212		0.7836	
Bi-214	0.4181	0.3452	0.5063
Ce-144	-0.007705 U	-0.1056 U	-0.1258 U
Co-58	-0.009937 U	0.0198 U	-0.00713 U
Co-60	-0.02021 U	-0.004944 U	-0.01767 U
Cs-134	-0.1335 U	-0.1837 U	0.06287 U
Cs-137	-0.0003097 U	0.0341 U	-0.01024 U
Fe-59	0.02388 U	0.08571	0.02276 U
K-40	9.234	11.17	10.29
Kr-85	5.7 U		
Mn-54	-0.00387 U	0.008001 U	0.02604 U
Nb-95	-0.008631 U	0.01609 U	-0.001693 U
Np-239	2.893 U		0.02957 U
Pb-212	0.4741	0.5785	0.5306
Pb-214	0.4138	0.4577	0.4613
Ra-226		0.9296 U	1.415
Ru-103	-0.0006066 U	0.01089 U	-0.01608 U
Ru-106	0.06504 U	0.1418 U	0 U
Sb-124	0 U	-0.05411 U	0 U
Tl-208	0.5346	0.4621	
Zn-65	-0.06793 U	-0.03493 U	0.007518 U
Zr-95	0.04428 U	0.01973 U	0.0327 U

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed

Table 1
Sum of Fractions
NSY-03 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID	Sum Of Fractions
3121	SI001.8	SI001.8A	0.014
3098	SI001.11	SI001.11D	0.070
3099	SI001.12	SI001.12A	0.001
3096	SI001.1	SI001.1A	0.004
3115	SI001.28	SI001.28A	0.003
3118	SI001.5	SI001.5A	0.158
3119	SI001.6	SI001.6A	0.325
3119	SI001.6	SI001.6C	0.185
3119	SI001.6	SI001.6D	0.004
3098	SI001.11	SI001.11C	0.111
3120	SI001.7	SI001.7C	0.083
3303	TS98.50	TS98.50C	0.004
3282	TS572	TS572	0.801
3283	TS573	TS573	0.749
3284	TS577	TS577	0.182
3285	TS578	TS578	0.197
3293	TS98.37	TS98.37A	0.010
3293	TS98.37	TS98.37C	0.002
3295	TS98.39	TS98.39A	0.003
3295	TS98.39	TS98.39B	0.005
3120	SI001.7	SI001.7A	0.048
		Min	0.001
		Max	0.801
		Mean	0.141

Table 2
Statistical Data Summary -- NSY-03 -- Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	52	52	0.817	0.198	0.215	1.562	0.822
Ag-108m	pCi/g	4	52	0.040	0.020	0.029	0.070	0.030
Ag-110m	pCi/g	1	52	0.053		0.053	0.053	0.053
Am-241	pCi/g	0	52	0.000				
Ba-133	pCi/g	0	2	0.000				
Ba-140	pCi/g	0	1	0.000				
Bi-212	pCi/g	45	47	0.964	0.280	0.464	1.767	0.924
Bi-214	pCi/g	52	52	0.480	0.083	0.237	0.753	0.483
Ce-144	pCi/g	1	52	0.181		0.181	0.181	0.181
Co-58	pCi/g	0	52	0.000				
Co-60	pCi/g	11	52	0.956	1.190	0.147	3.378	0.425
Cs-134	pCi/g	4	52	0.063	0.034	0.023	0.106	0.062
Cs-137	pCi/g	11	52	0.773	0.844	0.036	2.691	0.449
Eu-152	pCi/g	2	5	0.131	0.062	0.087	0.175	0.131
Fe-59	pCi/g	1	52	0.093		0.093	0.093	0.093
I-132	pCi/g	1	1	7.858		7.858	7.858	7.858
I-133	pCi/g	0	1	0.000				
K-40	pCi/g	52	52	16.840	2.710	11.340	27.470	17.125
Kr-85	pCi/g	0	1	0.000				
Mn-54	pCi/g	5	52	0.038	0.006	0.029	0.043	0.040
Mo-99	pCi/g	0	1	0.000				
Nb-95	pCi/g	2	52	0.054	0.018	0.042	0.066	0.054
Np-239	pCi/g	0	5	0.000				
Pb-212	pCi/g	52	52	0.829	0.169	0.202	1.291	0.842
Pb-214	pCi/g	52	52	0.528	0.106	0.268	0.939	0.529
Ra-226	pCi/g	29	35	1.382	0.378	0.658	2.548	1.267
Ru-103	pCi/g	0	52	0.000				
Ru-106	pCi/g	1	52	0.281		0.281	0.281	0.281
Sb-124	pCi/g	2	52	0.051	0.017	0.040	0.063	0.051
Sb-125	pCi/g	0	4	0.000				
Sc-75	pCi/g	0	1	0.000				
Tl-208	pCi/g	50	50	0.831	0.141	0.273	1.138	0.853
Zn-65	pCi/g	0	52	0.000				
Zr-95	pCi/g	2	52	0.068	0.011	0.060	0.076	0.068

Table 3
Summary of Detected Results Above Criteria
NSY-03 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	52	52		pCi/g	0	1.56
Ag-108m	4	52	8.52	pCi/g	0	0.07
Ag-110m	1	52		pCi/g	0	0.05
Am-241	0	52	44.35	pCi/g	0	
Ba-133	0	2		pCi/g	0	
Ba-140	0	1		pCi/g	0	
Bi-212	45	47		pCi/g	0	1.77
Bi-214	52	52		pCi/g	0	0.75
Ce-144	1	52		pCi/g	0	0.18
Co-58	0	52		pCi/g	0	
Co-60	11	52	4.84	pCi/g	0	3.38
Cs-134	4	52	6.71	pCi/g	0	0.11
Cs-137	11	52	12.24	pCi/g	0	2.69
Eu-152	2	5	12.06	pCi/g	0	0.17
Fe-59	1	52		pCi/g	0	0.09
I-132	1	1		pCi/g	0	7.86
I-133	0	1		pCi/g	0	
K-40	52	52		pCi/g	0	27.47
Kr-85	0	1		pCi/g	0	
Mn-54	5	52	21.66	pCi/g	0	0.04
Mo-99	0	1		pCi/g	0	
Nb-95	2	52		pCi/g	0	0.07
Np-239	0	5		pCi/g	0	
Pb-212	52	52		pCi/g	0	1.29
Pb-214	52	52		pCi/g	0	0.94
Ra-226	29	35		pCi/g	0	2.55
Ru-103	0	52		pCi/g	0	
Ru-106	1	52	68.21	pCi/g	0	0.28
Sb-124	2	52		pCi/g	0	0.06
Sb-125	0	4	37.73	pCi/g	0	
Se-75	0	1		pCi/g	0	
Tl-208	50	50		pCi/g	0	1.14
Zn-65	0	52		pCi/g	0	
Zr-95	2	52		pCi/g	0	0.08

Table 4
Rad
NSY-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SI001.10 (3097)	SI001.10 (3097)	SI001.11 (3098)	SI001.11 (3098)	SI001.11 (3098)
Sample ID	SI001.10A	SI001.10B	SI001.11A	SI001.11B	SI001.11C
Date Sampled	11/12/1997	11/12/1997	11/12/1997	11/12/1997	11/17/1997
Ac-228	0.885	0.8609	0.8785	0.7273	0.9014
Ag-108m	0.01403 U	-0.0212 U	0.01142 U	0.01317 U	0.009335 U
Ag-110m	0.01376 U	0.005176 U	0.03556 U	0.00851 U	-0.004942 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Ba-140					
Bi-212	1.001	0.8287	0.4866 U	0.4022 U	1.222
Bi-214	0.4867	0.4683	0.5372	0.4182	0.5001
Ce-144	-0.1412 U	0.009725 U	-0.003687 U	-0.15 U	0.1004 U
Co-58	0.01956 U	0.01293 U	-0.02189 U	-0.01496 U	-0.01877 U
Co-60	0.0004693 U	0.01053 U	-0.00272 U	-0.03103 U	0.2741
Cs-134	-0.01905 U	-0.088 U	0.07983 U	0.001944 U	0.02886 U
Cs-137	0.0207 U	0.01304 U	0.007446 U	-0.004752 U	0.6596
Eu-152		0.3758 U			
Fe-59	-0.02481 U	-0.006284 U	0.0934	-0.03416 U	-0.02479 U
I-132					
I-133					
K-40	16.05	19.33	17.2	16.71	19.06
Kr-85					
Mn-54	0.02068 U	0.02071 U	0.01624 U	0.01588 U	-0.0002574 U
Mo-99				0.7112 U	
Nb-95	-0.005999 U	0.01851 U	0.01177 U	0.06635	-0.01482 U
Np-239		-1.21 U			
Pb-212	0.8539	0.8935	0.9225	0.8347	0.9125
Pb-214	0.5026	0.552	0.477	0.4914	0.5059
Ra-226	1.457	1.446	0.9221 U	1.257	1.258
Ru-103	-0.01253 U	-0.02099 U	-0.01542 U	0.0008005 U	0.007767 U
Ru-106	-0.2813 U	0.01752 U	-0.1038 U	-0.07949 U	-0.07849 U
Sb-124	-0.006686 U	0.01354 U	-0.00583 U	0.004463 U	0 U
Sb-125					
Se-75					
Tl-208	0.7741	0.8904	0.7425	0.9304	0.897
Zn-65	-0.04983 U	0.06218 U	-0.07218 U	-0.04663 U	-0.09488 U
Zr-95	-0.0177 U	0.06053 U	-0.03932 U	0.04191 U	0.06026
SOF					0.111

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SI001.11 (3098)	SI001.12 (3099)	SI001.12 (3099)	SI001.13 (3100)	SI001.1 (3096)
Sample ID	SI001.11D	SI001.12A	SI001.12B	SI001.13	SI001.1A
Date Sampled	11/17/1997	12/10/1997	12/10/1997	12/11/1997	10/23/1997
Ac-228	0.7978	0.8543	0.7238	1.562	0.9981
Ag-108m	0.0002196 U	0.01168 U	0.00206 U	-0.008511 U	0.005727 U
Ag-110m	-0.005151 U	-0.03409 U	-0.01484 U	0.01271 U	-0.04676 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Ba-140					
Bi-212	0.987	0.6056	0.9235	1.767	1.227
Bi-214	0.4357	0.3732	0.3755	0.7533	0.5193
Ce-144	0.0244 U	0.07778 U	-0.02553 U	0.1322 U	-0.2098 U
Co-58	-0.008933 U	-0.01337 U	0.01198 U	-0.03137 U	-0.009838 U
Co-60	0.1633	0.02517 U	-0.00657 U	-0.0187 U	-0.0228 U
Cs-134	-0.005898 U	-0.07074 U	0.03649 U	-0.1138 U	-0.0673 U
Cs-137	0.4488	0.02317 U	0.01087 U	0.008595 U	0.04737
Eu-152					
Fe-59	-0.01152 U	-0.02356 U	-0.01934 U	-0.04076 U	0.06297 U
I-132					
I-133					
K-40	17.86	15.34	14.15	27.47	19.99
Kr-85					
Mn-54	0.01273 U	0.02912	0.002872 U	0.003525 U	-0.026 U
Mo-99					
Nb-95	0.002662 U	0.008929 U	0.009993 U	0.009548 U	0.008649 U
Np-239					0.736 U
Pb-212	0.82	0.7479	0.802	1.291	1.013
Pb-214	0.5383	0.4419	0.4747	0.9386	0.5711
Ra-226	0.9381 U	0.6581		1.681 U	
Ru-103	0.01667 U	0.007053 U	0.005665 U	-0.0003577 U	-0.02323 U
Ru-106	0 U	0.1933 U	-0.09572 U	-0.04846 U	-0.08915 U
Sb-124	-0.03554 U	0.0226 U	-0.004831 U	0.006008 U	-0.01767 U
Sb-125	-0.08266 U				
Se-75					
Tl-208	0.6587	0.7739	0.7413	1.138	0.974
Zn-65	0.03531 U	0.06427 U	-0.1396 U	-0.1146 U	0.09354 U
Zr-95	0.04934 U	-0.01847 U	0.01337 U	-0.0238 U	0.05655 U
SOF	0.07	0.001			0.004

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SI001.1 (3096)	SI001.27 (3114)	SI001.27 (3114)	SI001.28 (3115)	SI001.28 (3115)
Sample ID	SI001.1B	SI001.27A	SI001.27B	SI001.28A	SI001.28B
Date Sampled	10/23/1997	11/9/1999	11/9/1999	11/12/1999	11/12/1999
Ac-228	0.9233	0.2153	0.24	0.6651	0.673
Ag-108m	-0.001594 U	0.007573 U	0.01682 U	0.02977	0.001173 U
Ag-110m	0.01711 U	0.02383 U	-0.01791 U	0.002037 U	-0.02356 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Ba-140			0.418 U		
Bi-212	1.357			0.6068	0.7579
Bi-214	0.5474	0.2838	0.2373	0.5818	0.4101
Ce-144	-0.03066 U	0.04244 U	0.1809	0.006135 U	0.05996 U
Co-58	0.02895 U	-0.008594 U	-0.02357 U	-0.00957 U	-0.004355 U
Co-60	0.02671 U	-0.003556 U	-0.0175 U	0.04249 U	0.03158 U
Cs-134	-0.008076 U	0.04916 U	0 U	-0.06719 U	0.01776 U
Cs-137	0.03215 U	-0.005496 U	0.01865 U	0.000000005316 U	0.02179 U
Eu-152		0.2762 U			
Fe-59	-0.05157 U	-0.006182 U	0.02346 U	0.006175 U	0.04784 U
I-132					
I-133					
K-40	19.78	15.17	12.74	15.55	17.74
Kr-85					
Mn-54	0.02325 U	-0.01734 U	-0.007589 U	0.01683 U	-0.02657 U
Mo-99					
Nb-95	0.03013 U	0.02767 U	-0.0227 U	0.008527 U	0.03144 U
Np-239		0.2871 U			
Pb-212	0.8906	0.2019	0.2435	0.7233	0.744
Pb-214	0.5452	0.268	0.2994	0.7755	0.5853
Ra-226	1.267			1.935	1.222
Ru-103	-0.0009079 U	-0.01004 U	-0.006235 U	-0.003816 U	0.009658 U
Ru-106	-0.3118 U	0 U	0.01886 U	-0.1901 U	-0.02258 U
Sb-124	0.02771 U	0 U	-0.007796 U	-0.01143 U	0 U
Sb-125					
Se-75					
Tl-208	0.8426		0.2733	0.6422	0.7455
Zn-65	-0.04438 U	0.07744 U	-0.0808 U	-0.02747 U	-0.08486 U
Zr-95	0.0437 U	0.01188 U	-0.05165 U	0.04275 U	0.02925 U
SOF				0.003	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SI001.29 (3116)	SI001.29 (3116)	SI001.2 (3106)	SI001.2 (3106)	SI001.4 (3117)
Sample ID	SI001.29A	SI001.29B	SI001.2A	SI001.2B	SI001.4A
Date Sampled	11/12/1999	11/12/1999	10/28/1997	10/28/1997	11/11/1997
Ac-228	0.8404	0.9028	0.9065	0.7946	0.7055
Ag-108m	0.01179 U	0.008882 U	0.01398 U	0.0184 U	-0.005071 U
Ag-110m	0.05254	0.003826 U	-0.01369 U	-0.01015 U	-0.01969 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Ba-140					
Bi-212	1.281	1.013	1.341	0.6825	0.877
Bi-214	0.6257	0.5329	0.551	0.5232	0.4603
Ce-144	-0.06253 U	-0.08796 U	-0.07309 U	-0.06504 U	-0.01083 U
Co-58	-0.003355 U	-0.02859 U	-0.01136 U	-0.001713 U	-0.01422 U
Co-60	0.01871 U	0.003602 U	0.007356 U	0.02932 U	-0.007112 U
Cs-134	-0.006312 U	0.01462 U	-0.01572 U	0.0002678 U	-0.01968 U
Cs-137	0.005682 U	-0.002578 U	0.002751 U	-0.01335 U	-0.009813 U
Eu-152					0.0435 U
Fe-59	-0.06294 U	0.04569 U	0.03167 U	-0.02609 U	0 U
I-132					
I-133					
K-40	17.11	13.48	20.11	18.36	15.11
Kr-85					
Mn-54	-0.005509 U	-0.001309 U	0.003615 U	0.006019 U	-0.01249 U
Mo-99					
Nb-95	0.01378 U	-0.01179 U	0.02836 U	0.007501 U	0.0416
Np-239			0.2214 U		
Pb-212	0.7979	0.8135	1.077	0.8189	0.761
Pb-214	0.7311	0.5616	0.5338	0.5158	0.5612
Ra-226		1.322	0.8743 U	1.258	1.801
Ru-103	-0.00277 U	-0.01887 U	0.007973 U	-0.0101 U	-0.01674 U
Ru-106	-0.2007 U	0 U	0.1454 U	0 U	-0.1833 U
Sb-124	-0.002003 U	-0.03999 U	0.008153 U	-0.05052 U	0.02969 U
Sb-125				-0.1032 U	-0.07024 U
Se-75					
Tl-208	0.9576	0.8519	0.83	0.8536	0.6085
Zn-65	-0.04608 U	-0.03643 U	0.1055 U	0.01784 U	0.03282 U
Zr-95	0.02465 U	-0.005273 U	0.05538 U	-0.02057 U	0.02113 U
SOF					

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SI001.4 (3117)	SI001.5 (3118)	SI001.5 (3118)	SI001.6 (3119)	SI001.6 (3119)
Sample ID	SI001.4B	SI001.5A	SI001.5B	SI001.66	SI001.6A
Date Sampled	11/11/1997	10/29/1997	10/29/1997	11/11/1997	11/11/1997
Ac-228	0.7307	0.9477	1.097	0.8141	0.9362
Ag-108m	-0.009723 U	0.06988	0.01044 U	0.01809 U	0.0194 U
Ag-110m	-0.02528 U	-0.02032 U	-0.003629 U	-0.005358 U	-0.01243 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Ba-140					
Bi-212	1.436	1.515	0.6583	1.042	0.803
Bi-214	0.4962	0.4624	0.4625	0.4801	0.5447
Ce-144	0.08907 U	0.07574 U	0.0264 U	0.07977 U	0.1375 U
Co-58	-0.0007116 U	-0.0006901 U	-0.002504 U	0.01125 U	0.004909 U
Co-60	0.02045 U	0.7243	-0.006306 U	0.005718 U	0.4246
Cs-134	-0.02315 U	-0.03128 U	0.01412 U	-0.00199 U	0.1059
Cs-137	-0.02855 U	0.03851 U	-0.01975 U	0.01599 U	2.691
Eu-152					
Fe-59	-0.01058 U	-0.0318 U	-0.03917 U	0.01087 U	-0.03165 U
I-132					
I-133					
K-40	16.3	17.76	19.46	17.14	16.47
Kr-85					
Mn-54	-0.01939 U	0.0224 U	-0.02671 U	0.00819 U	0.04338
Mo-99					
Nb-95	-0.002284 U	0.01325 U	0.01955 U	0.01474 U	-0.003407 U
Np-239					
Pb-212	0.8198	0.8421	0.9449	0.8666	0.7886
Pb-214	0.4459	0.6206	0.5642	0.4656	0.4088
Ra-226		0.9691 U	1.447		
Ru-103	-0.002507 U	-0.02077 U	0.001437 U	-0.0001513 U	0.007941 U
Ru-106	0.1663 U	-0.2974 U	0.0000000392 U	-0.006917 U	0.02752 U
Sb-124	0 U	-0.01611 U	-0.00668 U	0.0038 U	0.006957 U
Sb-125					
Se-75					
Tl-208	0.8762	0.8697	0.8035	0.9179	0.8816
Zn-65	0.01528 U	-0.02325 U	-0.09202 U	0.04856 U	-0.04735 U
Zr-95	0.03969 U	-0.03739 U	0.04534 U	0.01169 U	0.004053 U
SOF		0.158			0.325

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SI001.6 (3119)	SI001.6 (3119)	SI001.7 (3120)	SI001.7 (3120)	SI001.7 (3120)
Sample ID	SI001.6C	SI001.6D	SI001.7A	SI001.7B	SI001.7C
Date Sampled	11/12/1997	11/12/1997	11/4/1997	11/4/1997	11/4/1997
Ac-228	0.7498	0.7975	0.7481	0.8958	0.7645
Ag-108m	0.01404 U	0.009557 U	-0.009592 U	-0.001924 U	0.003548 U
Ag-110m	-0.006248 U	-0.002233 U	-0.01827 U	-0.003266 U	-0.0005576 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Ba-140					
Bi-212	1.272	0.7809	1.266	0.763	0.6919
Bi-214	0.4647	0.4249	0.4749	0.4669	0.5529
Ce-144	-0.1836 U	-0.04796 U	-0.1079 U	-0.05738 U	0.105 U
Co-58	-0.001934 U	-0.004341 U	-0.02669 U	-0.007522 U	0.024 U
Co-60	0.147	-0.015 U	0.1626	0.009709 U	0.2228
Cs-134	0.06079	0.0148 U	0.01089 U	0.00364 U	0.02251
Cs-137	1.781	0.031 U	0.1782	0.0134 U	0.4142
Eu-152					
Fe-59	0.01262 U	-0.0183 U	0.01484 U	-0.06945 U	-0.0203 U
I-132					
I-133					
K-40	16.77	16.21	17.91	19.48	18.33
Kr-85					
Mn-54	-0.01702 U	-0.004245 U	0.03364 U	0.02659 U	-0.02023 U
Mo-99					
Nb-95	-0.01498 U	0.003813 U	0.005124 U	0.01153 U	0.02385 U
Np-239					
Pb-212	0.8183	0.8412	0.8975	0.94	0.5702
Pb-214	0.4348	0.5125	0.5378	0.6099	0.4674
Ra-226	2.548	1.484	2.05	1.362	
Ru-103	0.002663 U	-0.02617 U	0.002755 U	0.00328 U	-0.01448 U
Ru-106	0.06601 U	0.2809	-0.02154 U	-0.07406 U	-0.1328 U
Sb-124	0 U	0 U	0.03956	0.008924 U	0.00203 U
Sb-125					-0.05961 U
Se-75					
Tl-208	0.9683	0.8255	0.9721	0.914	0.7795
Zn-65	-0.03449 U	-0.04047 U	0.06296 U	-0.1569 U	-0.07482 U
Zr-95	0.02417 U	0.01582 U	0.01559 U	0.01563 U	0.02771 U
SOF	0.185	0.004	0.048		0.083

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-03 – Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	SI001.8 (3121)	SI001.8 (3121)	TS533 (3261)	TS534 (3262)	TS550 (3268)	TS551 (3269)
Sample ID	SI001.8A	SI001.8B	TS533	TS534	TS550	TS551
Date Sampled	10/29/1997	10/29/1997	8/11/1998	8/11/1998	8/27/1998	8/27/1998
Ac-228	0.8171	0.8276	0.8338	0.7856	0.7764	0.7392
Ag-108m	0.01073 U	-0.0009047 U	-0.0002552 U	0.007448 U	0.004599 U	-0.0131 U
Ag-110m	0 U	0.008026 U	0.02712 U	0.01122 U	0.008337 U	0.004058 U
Am-241	0 U	0 U	0 U	0 U	0 U	0 U
Ba-133						
Ba-140						
Bi-212	0.8038	0.6701	1.003	0.9785	0.93	0.8104
Bi-214	0.5853	0.4735	0.5231	0.5254	0.5016	0.5384
Ce-144	0.08763 U	-0.1913 U	-0.2468 U	0.1638 U	0.01334 U	-0.007332 U
Co-58	-0.03978 U	-0.01515 U	-0.04801 U	-0.03684 U	0.006219 U	0.004452 U
Co-60	0.008029 U	0.01523 U	-0.02576 U	0 U	-0.004035 U	0.001571 U
Cs-134	-0.01129 U	0.002142 U	-0.04943 U	-0.02046 U	-0.06825 U	-0.01874 U
Cs-137	-0.03323 U	0.002626 U	0.01481 U	-0.01395 U	-0.01842 U	0.004437 U
Eu-152	0.1748					
Fe-59	0.02503 U	0.03421 U	-0.05679 U	-0.03564 U	-0.009538 U	0.0198 U
I-132						
I-133						
K-40	18.71	15.22	15.15	15.52	19.72	20.06
Kr-85						
Mn-54	0.01929 U	-0.007223 U	-0.01489 U	0.006151 U	0.0282 U	0.01941 U
Mo-99						
Nb-95	-0.01702 U	-0.02671 U	0.004527 U	-0.02958 U	0.01254 U	-0.004009 U
Np-239						
Pb-212	0.8151	0.8005	0.8064	0.9398	0.8113	0.8539
Pb-214	0.5109	0.5539	0.4277	0.5971	0.5395	0.6171
Ra-226	1.409	1.166		1.402	1.17	1.119
Ru-103	-0.003616 U	0.008843 U	0.0004576 U	0.01228 U	0.00548 U	0.01982 U
Ru-106	-0.207 U	-0.06544 U	-0.2456 U	0.1619 U	0.05342 U	0.0552 U
Sb-124	-0.02677 U	0 U	0.0631	-0.03467 U	0.03237 U	-0.03063 U
Sb-125						
Se-75						
Tl-208	0.7577	0.8167	0.7729	0.8133	0.6336	0.8737
Zn-65	-0.0815 U	-0.05916 U	0.05514 U	0.03674 U	0.1209 U	-0.006794 U
Zr-95	-0.02919 U	-0.00866 U	-0.02376 U	0.02381 U	-0.007686 U	-0.005889 U
SOF	0.014					

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS572 (3282)	TS573 (3283)	TS577 (3284)	TS578 (3285)	TS98.37 (3293)
Sample ID	TS572	TS573	TS577	TS578	TS98.37A
Date Sampled	10/1/1998	10/1/1998	10/5/1998	10/5/1998	9/23/1998
Ac-228	0.5063	0.5998	0.5855	0.6221	0.9712
Ag-108m	0.005213 U	-0.01473 U	0.01488 U	0.002806 U	-0.01428 U
Ag-110m	-0.01555 U	0.00302 U	0.00899 U	-0.002268 U	-0.006399 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133	0.04498 U				
Ba-140					
Bi-212			0.7624	0.6192	1.107
Bi-214	0.3863	0.2913	0.4902	0.4968	0.4754
Ce-144	-0.1638 U	0.1173 U	-0.1739 U	0.09135 U	-0.1095 U
Co-58	0.0305 U	0.0228 U	-0.02707 U	-0.01931 U	-0.01079 U
Co-60	3.378	3.202	0.8783	0.9412	0.003496 U
Cs-134	0.06401	-0.01903 U	-0.05225 U	-0.05491 U	-0.04297 U
Cs-137	1.142	1.064	0 U	0.006981 U	0.03592
Eu-152					0.08711
Fe-59	0.0333 U	0.01649 U	0.03623 U	0.07223 U	0.00000001172 U
I-132					
I-133					
K-40	11.79	11.34	11.73	11.39	15.49
Kr-85					
Mn-54	0.01742 U	-0.005037 U	0.01209 U	0.04291	-0.02471 U
Mo-99					
Nb-95	0.02463 U	-0.01159 U	-0.01934 U	0.02908 U	-0.003702 U
Np-239					
Pb-212	0.6544	0.722	0.6152	0.6419	0.9359
Pb-214	0.4034	0.4099	0.4543	0.4095	0.5905
Ra-226			1.996	1.069	1.242
Ru-103	0.03501 U	0.03756 U	-0.01476 U	-0.004308 U	-0.01342 U
Ru-106	0.0627 U	-0.3082 U	0.09674 U	-0.1885 U	-0.2749 U
Sb-124	-0.02706 U	-0.01209 U	-0.02898 U	0.03405 U	0.02148 U
Sb-125					
Se-75					
Tl-208	0.6707	0.8876	0.5422		0.8105
Zn-65	-0.1612 U	0.1121 U	-0.04568 U	-0.09288 U	-0.07389 U
Zr-95	0.03827 U	-0.05918 U	0.01135 U	0.03861 U	0.03399 U
SOF	0.801	0.749	0.182	0.197	0.01

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS98.37 (3293)	TS98.37 (3293)	TS98.38 (3294)	TS98.38 (3294)	TS98.38 (3294)
Sample ID	TS98.37B	TS98.37C	TS98.38A	TS98.38B	TS98.38C
Date Sampled	9/23/1998	9/23/1998	9/23/1998	9/23/1998	9/23/1998
Ac-228	0.912	0.9782	0.7683	0.9782	0.8447
Ag-108m	-0.008888 U	-0.006986 U	-0.005469 U	-0.01793 U	-0.02926 U
Ag-110m	0.003289 U	-0.002871 U	0.008366 U	-0.01403 U	-0.01986 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133	0.1548 U				
Ba-140					
Bi-212	0.7681	1.044	1.144	0.8947	
Bi-214	0.4595	0.4999	0.5226	0.4236	0.385
Ce-144	-0.2603 U	-0.07685 U	0.05979 U	0.04325 U	-0.2758 U
Co-58	-0.01537 U	-0.02439 U	-0.0158 U	-0.0118 U	0.006383 U
Co-60	0.01917 U	0.003792 U	-0.01523 U	-0.001702 U	-0.01909 U
Cs-134	-0.1338 U	-0.1282 U	0.01366 U	-0.08533 U	-0.01631 U
Cs-137	0.002646 U	-0.002894 U	-0.01576 U	0.007306 U	-0.01327 U
Eu-152					
Fe-59	0.01765 U	-0.0466 U	0.01754 U	0.0402 U	0.05317 U
I-132					7.858
I-133					
K-40	17.3	17.34	17.64	16.28	17.36
Kr-85					
Mn-54	0.01828 U	0.03983	-0.001665 U	-0.02221 U	0.01052 U
Mo-99					
Nb-95	-0.01081 U	0.01556 U	-0.0115 U	0.01416 U	-0.009922 U
Np-239					
Pb-212	0.82	0.9181	0.8961	0.9715	0.8687
Pb-214	0.5245	0.5911	0.5134	0.5556	0.5758
Ra-226	1.076		1.098		
Ru-103	-0.001228 U	-0.01906 U	-0.01832 U	-0.01316 U	-0.01193 U
Ru-106	0 U	-0.1832 U	0.1604 U	0 U	0.119 U
Sb-124	-0.007053 U	-0.03084 U	0.02921 U	-0.002436 U	-0.006491 U
Sb-125					
Se-75					
Tl-208	0.8841	0.8911	0.8944	0.9127	0.8417
Zn-65	0.07364 U	-0.02495 U	-0.07869 U	-0.04554 U	-0.1723 U
Zr-95	-0.02152 U	0.07607	0.003244 U	-0.02436 U	0.03086 U
SOF		0.002			

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

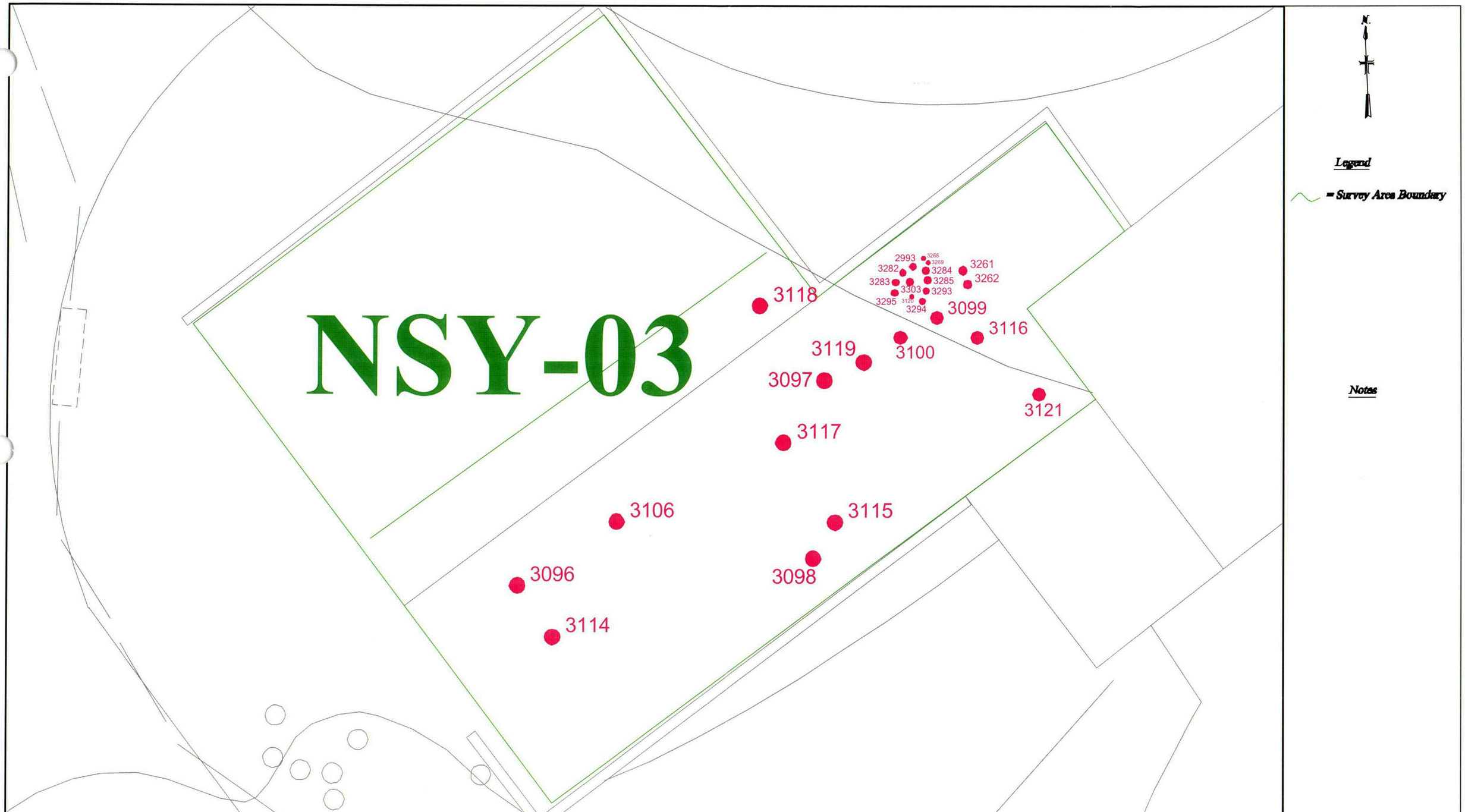
Station (Key)	TS98.39 (3295)	TS98.39 (3295)	TS98.39 (3295)	TS98.50 (3303)	TS98.50 (3303)
Sample ID	TS98.39A	TS98.39B	TS98.39C	TS98.50A	TS98.50B
Date Sampled	9/23/1998	9/23/1998	9/23/1998	10/27/1998	10/27/1998
Ac-228	0.7948	0.7424	0.835	0.9824	1.027
Ag-108m	0.02912	0.002201 U	-0.01113 U	0.01015 U	0.0309 U
Ag-110m	-0.01933 U	0.006851 U	-0.004326 U	0.008631 U	0.01868 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Ba-140					
Bi-212	1.096	0.4637	0.6744	0.8868	1.245
Bi-214	0.4337	0.5189	0.4742	0.5137	0.4748
Ce-144	-0.1095 U	0.0272 U	0.09911 U	0.1145 U	0.06691 U
Co-58	0.007466 U	0.007161 U	-0.02061 U	-0.009534 U	-0.0007971 U
Co-60	-0.003861 U	0.02222 U	-0.01469 U	0.01547 U	-0.02294 U
Cs-134	-0.005028 U	0.002082 U	-0.01802 U	0.00427 U	-0.0802 U
Cs-137	-0.007993 U	0.04345	-0.006589 U	-0.007856 U	-0.008091 U
Eu-152					
Fe-59	0.03156 U	-0.01135 U	0.02213 U	0.01175 U	0.04143 U
I-132					
I-133				0.04177 U	
K-40	17.77	15.19	15.24	17.47	17.71
Kr-85					4.747 U
Mn-54	0.0268 U	0.03324	0.01185 U	0.007808 U	0.02821 U
Mo-99					
Nb-95	0.001783 U	0.008061 U	-0.01486 U	-0.002789 U	0.01303 U
Np-239				-0.2644 U	
Pb-212	0.9489	0.8725	0.8648	0.9404	0.9853
Pb-214	0.4719	0.5516	0.4807	0.6205	0.6253
Ra-226			1.494	1.044	1.023
Ru-103	0.00792 U	-0.0026 U	-0.009623 U	-0.002661 U	-0.004125 U
Ru-106	0.08834 U	-0.08474 U	0.1261 U	0.02173 U	-0.1314 U
Sb-124	-0.002366 U	-0.01588 U	0.01014 U	-0.03279 U	0 U
Sb-125					
Se-75	0.191 U				
Tl-208	0.9266	0.9738	0.9329	1.02	0.7351
Zn-65	0.0728 U	-0.1318 U	-0.0778 U	0.05197 U	-0.02641 U
Zr-95	0.05244 U	0.02443 U	0.03596 U	-0.03692 U	0.05748 U
SOF	0.003	0.005			

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-03 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	TS98.50 (3303)
Sample ID	TS98.50C
Date Sampled	10/27/1998
Ac-228	1.035
Ag-108m	0.03079
Ag-110m	0.02118 U
Am-241	0 U
Ba-133	
Ba-140	
Bi-212	0.7519
Bi-214	0.4996
Ce-144	0.05902 U
Co-58	0.004693 U
Co-60	-0.02253 U
Cs-134	-0.04421 U
Cs-137	-0.0259 U
Eu-152	
Fe-59	-0.04645 U
I-132	
I-133	
K-40	16.11
Kr-85	
Mn-54	0.0005271 U
Mo-99	
Nb-95	-0.003758 U
Np-239	
Pb-212	0.9391
Pb-214	0.4889
Ra-226	1.088 U
Ru-103	0.02569 U
Ru-106	-0.258 U
Sb-124	0 U
Sb-125	
Se-75	
Tl-208	1.027
Zn-65	-0.1048 U
Zr-95	-0.01115 U
SOF	0.004

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed



	Yankee Atomic Power Company *Soil Sample Locations - NSY-03*	YANKEE	*Date: October 2003* *Revision: 4*	*Figure: 28*

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Survey Area Name: Safe Shutdown System Building Designator: **NSY-04**

Survey Area Description

Survey Area NSY-04 consists of the reinforced concrete foundations, floor, and subsurface structures that comprise the Safe Shutdown System Building (SSS) expected to remain after demolition of the above-grade structures is complete.

Further division of this survey area into survey units is dependent upon the decommissioning end state configuration of these structures.

Survey Area Name: Safe Shutdown System Building Designator: **NSY-04**

Survey Area History

NSY-04, Safe Shutdown System Building was constructed as a plant modification in the early1980's (Ref 1).

The Safe Shutdown System Building is located in the RCA yard area (within NOL-05) southwest of the PAB and adjacent to the Diesel Fire Pump House.

The RCA yard area surface and sub-surface soils at the SSS Building location are suspected of being contaminated prior to construction of the building. Residual radioactivity not removed with the construction spoils may still be present within the footprint of the SSS Building.

The present location of the construction spoils generated by the SSS Building is thought to be within the SE Construction Fill area (OOL-009) of the site (Ref 2)

During a hydro-test of CH-V-773 and SI-V-646 a spill of radioactive liquid occurred resulting in contamination of the SSS Building (Ref 3).

Scoping/Characterization

Scoping and characterization surveys identified contamination in the concrete slab construction joint in October of 1996. The area was turned over to FSS and the FSS activities were performed prior to June of 1999 (Ref 4). These activities were conducted under the guidance of NUREG/CR-5849.

Decommissioning Activities

Decommissioning activities performed in NSY-04 include those described in the following Decommissioning Work Packages. (DWPs):

- SSS-01 Removal of Heat Trace & Power Supply for SSS Piping (Ref 5)
- SSS-02 Safe Shutdown Bldg Decontamination (Ref 6)

Decommissioning activities have removed all systems and components from the SSS building. Also a portion of the floor along the construction joint between the middle and north room was removed to facilitate removal of contaminated soil from under this portion of the building.

Findings

The history of NYS-04 indicates that this structure and soil within the footprint of the NSY-04 is radiologically impacted as a result of plant operations. The soils within the footprint of NSY-04 were impacted by previous plant operations.

The radionuclide mix for the NSY-04 includes all radionuclides identified in the reactor radioactive systems of the plant (Ref 7). The HSA for NSY-04 identifies the primary radionuclides of concern to be Co-60, Cs-137, Ag-108m, Sr-90 and tritium.

These radionuclides were distributed in media including concrete and sub-floor soil.

Current Status

Currently NSY-04 consists of the original reinforced concrete structure that has been decommissioned including decontamination.

The former diesel generator room of the SSS Building is currently the location of the Firewater Storage Tank heating system.

The former motor control room of the SSS Building is currently in use as a radioactive material storage area.

A soil sample location map (Figure 29) has been prepared to show the distribution of sampling locations in NSY-04. Only samples representative of soils still present are included on the map (samples of soils representative of soils removed during remediation activities are not presented). One survey media was assessed in NSY-04, Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for NSY-04 is presented at the end of Table 1 for each survey medium. The results are summarized below.

Soil: Mean SOF is 0.089.
Maximum SOF for a single soil sample is 0.533. (key# 3422)
Minimum SOF for a single soil sample is 0.002. (key# 3425)

Due to its present condition additional characterization will be required prior to demolition.

Building Historical Site Assessment and Classification Summary

Survey Area Name: Safe Shutdown System Building Designator: **NSY-04**

Classification Statement

Based upon the radiological condition of this survey area identified in the operating history and as a result of the decommissioning activities performed to date, survey area NSY-04 is identified as a Class 1 Area.

Survey Area Name: Safe Shutdown System Building Designator: **NSY-04**

Drawings

85005-F-1001
A8525-1
A8525-2
A8525-3
A8525-4

References

1.	Engineering Design Change Request (EDCR) # 84-310, "Safe Shutdown System Building," dated 1984.
2.	"Summary of Excavation Volumes for YNPS Construction Performed During the Time Period of Plant Operation," dated October 1997.
3.	Plant Information Report (PIR) 85-012, "Liquid Spill in the Safe Shutdown System Building While Performing OP-2120 "Pressure Leak Test of CH-V-773 and SI-V-646," dated January 10, 1986
4.	Turnover survey results (see attachments to summary report).
5.	Decommissioning Work Package (DWP) SSS-01, "Removal of Heat Trace & Power Supply for SSS Piping."
6.	DWP SSS-02, "Safe Shutdown Building Decontamination"
7.	"Radionuclides for Building Surfaces and Soil DCGL Determinations," YA-REPT-00-001-03

NSY-04

Remediated Areas								
Location	Sample #	Date	GLV SOF	Disposition	Nuclide	Conc. (pCi/gm)	Fraction of DCGL	DCGL SOF
SSS construction joint 0" - 6"	YS003.3	15-Dec-98	0.864		Co-60	3.646E-01	0.075	0.529
					Cs-137	5.556E+00	0.454	
SSS construction joint 0" - 6"	YS003.3B	28-Dec-98	1.690		Co-60	6.074E-01	0.126	1.041
					Cs-137	1.121E+01	0.916	
SSS construction joint 18" - 24"	YS003.3C	4-Jan-99	0.054		Cs-137	4.242E-01	0.035	0.035
SSS construction joint 18" - 24"	YS003.3D	4-Jan-99	0.131		Cs-137	1.023E+00	0.084	0.084
SSS construction joint 0" - 6"	YS003.3E	4-Jan-99	0.122		Cs-137	9.510E-01	0.078	0.078

UNK - unknown
AB - as area backfill
ABC - ABC storage area
AL - as left
ALAR - as left after remediation
FR - further remediation
RD - rad disposal
TS - temporary storage tk

DCGL (pCi/gm)		
Nuclide	25 mrem/yr	10 mrem/yr
Ag-108m	8.521E+00	3.408E+00
Co-60	4.838E+00	1.935E+00
Cs-134	6.706E+00	2.682E+00
Cs-137	1.224E+01	4.896E+00

Table 1
Sum of Fractions
NSY-04 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
3425	YS004.3	YS004.3A		0.002
3424	YS004.2	YS004.2B		0.014
3422	YS003.3	YS003.3E		0.078
3422	YS003.3	YS003.3D		0.095
3422	YS003.3	YS003.3C		0.035
3422	YS003.3	YS003.3		0.533
3421	YS003.2	YS003.2A		0.003
3420	YS003.1	YS003.1B		0.006
3420	YS003.1	YS003.1A		0.032
			Min	0.002
			Max	0.533
			Mean	0.089

Table 2
Statistical Data Summary – NSY-04 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	17	17	0.755	0.110	0.477	0.889	0.786
Ag-108m	pCi/g	1	17	0.024		0.024	0.024	0.024
Ag-110m	pCi/g	0	17	0.000				
Am-241	pCi/g	0	17	0.000				
Ba-133	pCi/g	0	2	0.000				
Bi-212	pCi/g	8	11	0.895	0.211	0.641	1.244	0.907
Bi-214	pCi/g	17	17	0.471	0.051	0.338	0.538	0.477
Ce-144	pCi/g	0	17	0.000				
Co-58	pCi/g	0	17	0.000				
Co-60	pCi/g	3	17	0.155	0.181	0.048	0.365	0.053
Cs-134	pCi/g	2	17	0.060	0.047	0.027	0.093	0.060
Cs-136	pCi/g	0	1	0.000				
Cs-137	pCi/g	6	17	1.378	2.082	0.073	5.556	0.688
Eu-152	pCi/g	0	2	0.000				
Fe-59	pCi/g	0	17	0.000				
I-132	pCi/g	1	1	1.773		1.773	1.773	1.773
I-133	pCi/g	0	1	0.000				
K-40	pCi/g	17	17	13.559	1.311	10.600	15.830	13.530
Kr-85	pCi/g	0	3	0.000				
Mn-54	pCi/g	1	17	0.043		0.043	0.043	0.043
Nb-95	pCi/g	0	17	0.000				
Np-239	pCi/g	1	4	0.138		0.138	0.138	0.138
Pb-212	pCi/g	17	17	0.794	0.112	0.486	0.920	0.818
Pb-214	pCi/g	17	17	0.505	0.055	0.354	0.611	0.518
Ra-226	pCi/g	9	12	1.236	0.261	0.790	1.602	1.213
Ru-103	pCi/g	1	17	0.038		0.038	0.038	0.038
Ru-106	pCi/g	0	17	0.000				
Sb-124	pCi/g	0	17	0.000				
Sb-125	pCi/g	1	2	0.102		0.102	0.102	0.102
Te-129m	pCi/g	1	1	0.992		0.992	0.992	0.992
Tl-208	pCi/g	17	17	0.735	0.136	0.319	0.917	0.753
Zn-65	pCi/g	1	17	0.061		0.061	0.061	0.061
Zr-95	pCi/g	2	17	0.075	0.011	0.067	0.083	0.075

Table 3
Summary of Detected Results Above Criteria
NSY-04 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	17	17		pCi/g	0	0.89
Ag-108m	1	17	8.52	pCi/g	0	0.02
Ag-110m	0	17		pCi/g	0	
Am-241	0	17	44.35	pCi/g	0	
Ba-133	0	2		pCi/g	0	
Bi-212	8	11		pCi/g	0	1.24
Bi-214	17	17		pCi/g	0	0.54
Ce-144	0	17		pCi/g	0	
Co-58	0	17		pCi/g	0	
Co-60	3	17	4.84	pCi/g	0	0.36
Cs-134	2	17	6.71	pCi/g	0	0.09
Cs-136	0	1		pCi/g	0	
Cs-137	6	17	12.24	pCi/g	0	5.56
Eu-152	0	2	12.06	pCi/g	0	
Fe-59	0	17		pCi/g	0	
I-132	1	1		pCi/g	0	1.77
I-133	0	1		pCi/g	0	
K-40	17	17		pCi/g	0	15.83
Kr-85	0	3		pCi/g	0	
Mn-54	1	17	21.66	pCi/g	0	0.04
Nb-95	0	17		pCi/g	0	
Np-239	1	4		pCi/g	0	0.14
Pb-212	17	17		pCi/g	0	0.92
Pb-214	17	17		pCi/g	0	0.61
Ra-226	9	12		pCi/g	0	1.60
Ru-103	1	17		pCi/g	0	0.04
Ru-106	0	17	68.21	pCi/g	0	
Sb-124	0	17		pCi/g	0	
Sb-125	1	2	37.73	pCi/g	0	0.10
Te-129m	1	1		pCi/g	0	0.99
Tl-208	17	17		pCi/g	0	0.92
Zn-65	1	17		pCi/g	0	0.06
Zr-95	2	17		pCi/g	0	0.08

Table 4
Rad
NSY-04 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	YS002.1 (3418)	YS002.1 (3418)	YS002.2 (3419)	YS003.1 (3420)	YS003.1 (3420)
Sample ID	YS002.1A	YS002.1B	YS002.2	YS003.1A	YS003.1B
Date Sampled	12/22/1998	12/22/1998	12/22/1998	12/8/1998	12/8/1998
Ac-228	0.749	0.8752	0.646	0.69	0.7915
Ag-108m	0.003946 U	-0.002241 U	0.003851 U	-0.02106 U	0.005279 U
Ag-110m	-0.006478 U	-0.01775 U	0.001185 U	0.03379 U	0.0153 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					
Bi-212		0.6657	0.3824 U		1.008
Bi-214	0.4624	0.4868	0.3383	0.4774	0.4087
Ce-144	-0.01103 U	0.1775 U	0.001785 U	0.04533 U	-0.2586 U
Co-58	0.003698 U	-0.02184 U	0.001197 U	-0.03484 U	-0.03334 U
Co-60	0.0134 U	-0.01885 U	0.02115 U	0.0481	-0.00366 U
Cs-134	-0.0113 U	0 U	-0.007926 U	0.03837 U	-0.05625 U
Cs-136					
Cs-137	-0.01156 U	0.002601 U	-0.009729 U	0.242	0.07325
Eu-152					
Fe-59	-0.005126 U	0.01154 U	0.03236 U	0.02796 U	-0.01681 U
I-132				1.773	
I-133		1.473 U			
K-40	11.92	13.53	13.39	14.36	13.72
Kr-85		3.116 U	3.741 U		
Mn-54	0.001879 U	-0.0111 U	0.0007412 U	-0.003842 U	0.01463 U
Nb-95	0.002572 U	-0.02814 U	0.01176 U	0.01155 U	0.001928 U
Np-239				-0.1076 U	
Pb-212	0.7141	0.8785	0.79	0.8692	0.8754
Pb-214	0.4924	0.522	0.4327	0.5062	0.4694
Ra-226			0.7018 U	1.213	1.161
Ru-103	0.003388 U	-0.0004743 U	0.003828 U	-0.01362 U	0.02066 U
Ru-106	-0.1341 U	0.1294 U	0.2016 U	0.209 U	-0.1663 U
Sb-124	-0.002563 U	0.01984 U	-0.0426 U	0.001118 U	-0.005601 U
Sb-125				0.102	
Te-129m	0.9924				
Tl-208	0.7036	0.8263	0.6897	0.7157	0.9172
Zn-65	-0.0519 U	0.03245 U	0.06067	-0.01778 U	-0.03004 U
Zr-95	0.03942 U	-0.01331 U	0.005417 U	-0.01204 U	0.02337 U
SOF				0.032	0.006

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed

Table 4
Rad
NSY-04 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	YS003.2 (3421)	YS003.2 (3421)	YS003.3 (3422)	YS003.3 (3422)	YS003.3 (3422)
Sample ID	YS003.2A	YS003.2B	YS003.3	YS003.3C	YS003.3D
Date Sampled	12/21/1998	12/21/1998	12/15/1998	1/4/1999	1/4/1999
Ac-228	0.7369	0.8203	0.8126	0.7858	0.8888
Ag-108m	0.02399	-0.006246 U	-0.03071 U	0.00522 U	-0.005198 U
Ag-110m	-0.003809 U	0.0008843 U	-0.04787 U	0.0006422 U	0.0004326 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					-0.06157 U
Bi-212	0.7242	0.9357			
Bi-214	0.5378	0.5328	0.5001	0.4936	0.5247
Ce-144	-0.02581 U	-0.1012 U	0.05443 U	-0.1373 U	-0.01107 U
Co-58	-0.005743 U	-0.01491 U	0.01639 U	-0.03375 U	-0.01043 U
Co-60	-0.003157 U	-0.007007 U	0.3646	0.01145 U	0.05322
Cs-134	0.01061 U	-0.009851 U	0.0271	0.003978 U	-0.02276 U
Cs-136					
Cs-137	-0.01302 U	-0.02388 U	5.556	0.4242	1.023
Eu-152	0.7196 U				
Fe-59	-0.0696 U	0.01617 U	-0.03107 U	-0.02341 U	-0.03047 U
I-132					
I-133					
K-40	14.45	12.71	12.85	15.66	13.42
Kr-85					
Mn-54	0.0203 U	0.00488 U	0.02194 U	0.02142 U	0.01079 U
Nb-95	-0.00681 U	-0.003888 U	-0.02024 U	0.02455 U	0.00186 U
Np-239				-0.197 U	
Pb-212	0.7958	0.7532	0.7887	0.8921	0.9199
Pb-214	0.5336	0.5135	0.611	0.5281	0.5269
Ra-226	0.7815 U	0.6222 U		1.325	1.468
Ru-103	-0.02362 U	0.01957 U	-0.03553 U	0.03809	-0.005089 U
Ru-106	-0.1727 U	-0.08019 U	-0.09347 U	-0.1244 U	-0.3764 U
Sb-124	0.002703 U	0.009685 U	0.002885 U	0 U	0.02436 U
Sb-125					
Te-129m					
Tl-208	0.8106	0.753	0.8053	0.7791	0.8559
Zn-65	0.1051 U	-0.03001 U	-0.1524 U	0.02063 U	-0.1447 U
Zr-95	0.03118 U	0.02069 U	0.01198 U	-0.0135 U	0.08296
SOF	0.003		0.533	0.035	0.095

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-04 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	YS003.3 (3422)	YS004.1 (3423)	YS004.1 (3423)	YS004.2 (3424)	YS004.2 (3424)
Sample ID	YS003.3E	YS004.1A	YS004.1B	YS004.2A	YS004.2B
Date Sampled	1/4/1999	12/16/1998	12/16/1998	12/16/1998	12/16/1998
Ac-228	0.7759	0.856	0.8442	0.4771	0.5622
Ag-108m	0.003671 U	-0.006343 U	-0.006256 U	0.01372 U	0.008377 U
Ag-110m	0 U	0.02537 U	0.02197 U	-0.03262 U	-0.03293 U
Am-241	0 U	0 U	0 U	0 U	0 U
Ba-133					-0.04131 U
Bi-212	1.063	1.244	0.8785	0.338 U	
Bi-214	0.4533	0.4537	0.4708	0.41	0.5216
Ce-144	0.1858 U	0.07175 U	-0.06892 U	-0.07198 U	-0.2344 U
Co-58	0.009705 U	-0.016 U	-0.02253 U	-0.01777 U	-0.02354 U
Co-60	0.0193 U	0.007599 U	-0.0005656 U	0.002903 U	0.01187 U
Cs-134	0.02531 U	-0.003811 U	0.004081 U	0.003761 U	0.09335
Cs-136					
Cs-137	0.951	0.007619 U	0.01152 U	-0.009232 U	0.004095 U
Eu-152	0.1463 U				
Fe-59	-0.005918 U	-0.02765 U	-0.03887 U	0.005119 U	-0.05449 U
I-132					
I-133					
K-40	13.73	15.83	14.3	13.04	14.7
Kr-85		0.2549 U			
Mn-54	-0.006677 U	-0.004644 U	0.01374 U	0.008207 U	-0.02276 U
Nb-95	-0.0002547 U	0.01347 U	0.01983 U	0.01171 U	0.02166 U
Np-239					-0.1289 U
Pb-212	0.8484	0.8337	0.7971	0.4858	0.5845
Pb-214	0.5386	0.5526	0.4864	0.3542	0.5233
Ra-226	1.169	1.602	0.9367	0.7895	
Ru-103	-0.01091 U	0.02528 U	0.00792 U	0.007373 U	0.007582 U
Ru-106	0.04417 U	-0.08027 U	-0.06227 U	-0.153 U	0.06789 U
Sb-124	0 U	-0.00413 U	0.004442 U	0 U	0.01453 U
Sb-125				-0.01435 U	
Te-129m					
Tl-208	0.7966	0.7404	0.7814	0.3187	0.5283
Zn-65	-0.06513 U	-0.01196 U	-0.02322 U	0.04271 U	-0.05778 U
Zr-95	0.03093 U	-0.0001733 U	0.06705	0.02165 U	0.0169 U
SOF	0.078				0.014

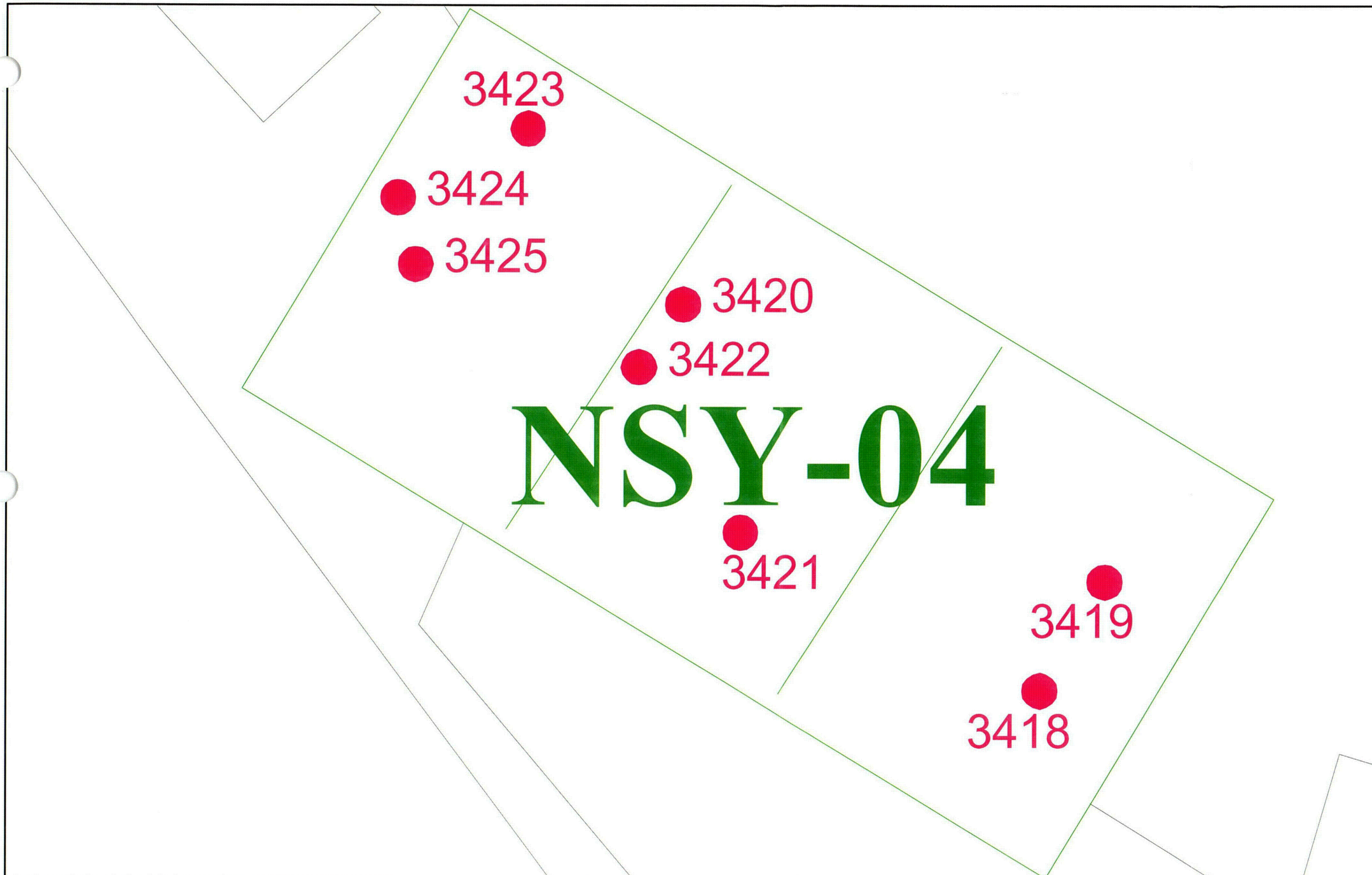
U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed

Table 4
Rad
NSY-04 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	**YS004.3 (3425)**	**YS004.3 (3425)**
Sample ID	**YS004.3A**	**YS004.3B**
Date Sampled	**12/17/1998**	**12/17/1998**
Ac-228	0.7314	0.7936
Ag-108m	-0.0004412 U	0.006819 U
Ag-110m	0.02117 U	-0.0236 U
Am-241	0 U	0 U
Ba-133		
Bi-212	0.4827 U	0.6406
Bi-214	0.4447	0.4895
Ce-144	0.1301 U	-0.1202 U
Co-58	0.002115 U	-0.005983 U
Co-60	-0.03062 U	-0.03811 U
Cs-134	-0.0537 U	0.05236 U
Cs-136		0.1017 U
Cs-137	-0.002348 U	-0.03149 U
Eu-152		
Fe-59	0.005217 U	-0.03843 U
I-132		
I-133		
K-40	10.6	12.29
Kr-85		
Mn-54	0.04344	0.02388 U
Nb-95	0.004716 U	-0.02607 U
Np-239	0.1382	
Pb-212	0.8522	0.8177
Pb-214	0.4753	0.5176
Ra-226		1.459
Ru-103	-0.01129 U	-0.02163 U
Ru-106	0.07785 U	0.1585 U
Sb-124	-0.006777 U	-0.01487 U
Sb-125		
Te-129m		
Tl-208	0.7371	0.7325
Zn-65	0.06402 U	-0.0903 U
Zr-95	0.0401 U	0.03656 U
SOF	0.002	

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed



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Legend

= Survey Area Boundary

Notes

	Yankee Atomic Power Company *Soil Sample Locations - NSY-04*	YANKEE	*Date: October 2003* *Revision: 4*	*Figure: 29*

C33

Survey Area Name: Firewater Tank and Diesel Pump House Designator: **NSY-05**

Survey Area Description

Survey Area NSY-05 consists of the reinforced concrete foundations, floor, and subsurface structures that comprise the Firewater Storage Tank and Diesel Pump House expected to remain after demolition of the above-grade structures is complete.

Further division of this survey area into survey units is dependent upon the decommissioning end state configuration of these structures.

Survey Area Name: Firewater Tank and Diesel Pump House Designator: **NSY-05**

Survey Area History

NSY-05, Firewater Storage Tank and Diesel Pump House was constructed as a plant modification EDCR #79-24 in 1979 (Ref 1).

The Firewater Storage Tank and Diesel Pump House are located in the RCA yard area south of and adjacent to the Safe Shutdown System Building.

The RCA yard area surface and sub-surface soils in NSY-05 were potentially impacted by radioactive waste storage and translocation activities. The RCA yard area surface and sub-surface soils beneath NSY-05 are suspected of being contaminated prior to construction of the tank and pump house. Residual radioactivity not removed with the construction spoils may still be present within the footprint of the Firewater Storage Tank and Diesel Pump House.

The present location of the construction spoils generated by the Firewater Storage Tank and Diesel Pump House is reported to be within the SE Construction Fill area (OOL-09) of the site (Ref 2)

Scoping/Characterization

Radiological survey of the Diesel Fire Pump House is not routinely performed. There is no scoping or characterization survey data is available for NSY-05.

Decommissioning Activities

No decommissioning activities have been performed in NSY-05.

Survey Area Name: Firewater Tank and Diesel Pump House Designator: **NSY-05**

Findings

The soils within the footprint of NSY-05 were impacted by previous plant operations. Access to NSY-05 is through a radiation control area.

The radionuclide mix for the NSY-05 includes all radionuclides identified in the reactor radioactive systems of the plant (Ref 3). The primary radionuclides of concern for NSY-05 are Co-60, Cs-137, Ag-108m, Sr-90, and tritium.

Current Status

The Firewater Storage Tank and Diesel Pump House are still in service. Characterization of this survey area is required prior to demolition.

A soil sample location map (Figure 30) has been prepared to show the distribution of sampling locations in NSY-05. Only samples representative of soils still present are included on the map (samples of soils representative of soils removed during remediation activities are not presented). One survey media was assessed in NSY-05, Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for NSY-05 is presented at the end of Table 1 for each survey medium. The results are summarized below.

Soil: Mean SOF is 0.004.
Maximum SOF for a single soil sample is 0.005. (key# 3413)
Minimum SOF for a single soil sample is 0.002. (key# 3414)

Classification Statement

Based upon the radiological condition of area surrounding this survey area NSY-05 is identified as a Class 1 Area.

Survey Area Name: Firewater Tank and Diesel Pump House Designator: **NSY-05**

Drawings

YR-70-31
YR-70-32

References

1.	Engineering Design Change Request (EDCR) #79-24, "Diesel Drive Fire Pump," dated 1979.
2.	"Summary of Excavation Volumes for YNPS Construction Performed During the Time Period of Plant Operation," dated October 1997.
3.	"Radionuclides for Building Surfaces and Soil DCGL Determinations," YA-REPT-00-001-03

Table 1
Sum of Fractions
NSY-05 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
3414	YS001.2	YS001.2A		0.002
3413	YS001.1	YS001.1A		0.005
			Min	0.002
			Max	0.005
			Mean	0.004

Table 2
Statistical Data Summary – NSY-05 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	7	7	0.804	0.164	0.640	1.017	0.716
Ag-108m	pCi/g	0	7	0.000				
Ag-110m	pCi/g	0	7	0.000				
Am-241	pCi/g	0	7	0.000				
Bi-212	pCi/g	6	6	1.031	0.195	0.775	1.271	1.068
Bi-214	pCi/g	7	7	0.493	0.052	0.433	0.579	0.512
Ce-144	pCi/g	0	7	0.000				
Co-58	pCi/g	0	7	0.000				
Co-60	pCi/g	0	7	0.000				
Cs-134	pCi/g	0	7	0.000				
Cs-137	pCi/g	1	7	0.061		0.061	0.061	0.061
Eu-152	pCi/g	0	1	0.000				
Fe-59	pCi/g	0	7	0.000				
I-132	pCi/g	0	1	0.000				
K-40	pCi/g	7	7	18.530	0.590	17.350	19.160	18.690
Mn-54	pCi/g	1	7	0.048		0.048	0.048	0.048
Mo-99	pCi/g	0	1	0.000				
Nb-95	pCi/g	0	7	0.000				
Pb-212	pCi/g	7	7	0.871	0.158	0.543	0.977	0.940
Pb-214	pCi/g	7	7	0.563	0.063	0.498	0.657	0.536
Ra-226	pCi/g	3	5	1.329	0.038	1.290	1.366	1.330
Ru-103	pCi/g	1	7	0.049		0.049	0.049	0.049
Ru-106	pCi/g	0	7	0.000				
Sb-124	pCi/g	0	7	0.000				
Sb-125	pCi/g	0	1	0.000				
Tl-208	pCi/g	7	7	0.844	0.149	0.672	1.084	0.812
Zn-65	pCi/g	0	7	0.000				
Zr-95	pCi/g	0	7	0.000				

Table 3
Summary of Detected Results Above Criteria
NSY-05 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	7	7		pCi/g	0	1.02
Ag-108m	0	7	8.52	pCi/g	0	
Ag-110m	0	7		pCi/g	0	
Am-241	0	7	44.35	pCi/g	0	
Bi-212	6	6		pCi/g	0	1.27
Bi-214	7	7		pCi/g	0	0.58
Ce-144	0	7		pCi/g	0	
Co-58	0	7		pCi/g	0	
Co-60	0	7	4.84	pCi/g	0	
Cs-134	0	7	6.71	pCi/g	0	
Cs-137	1	7	12.24	pCi/g	0	0.06
Eu-152	0	1	12.06	pCi/g	0	
Fe-59	0	7		pCi/g	0	
I-132	0	1		pCi/g	0	
K-40	7	7		pCi/g	0	19.16
Mn-54	1	7	21.66	pCi/g	0	0.05
Mo-99	0	1		pCi/g	0	
Nb-95	0	7		pCi/g	0	
Pb-212	7	7		pCi/g	0	0.98
Pb-214	7	7		pCi/g	0	0.66
Ra-226	3	5		pCi/g	0	1.37
Ru-103	1	7		pCi/g	0	0.05
Ru-106	0	7	68.21	pCi/g	0	
Sb-124	0	7		pCi/g	0	
Sb-125	0	1	37.73	pCi/g	0	
Tl-208	7	7		pCi/g	0	1.08
Zn-65	0	7		pCi/g	0	
Zr-95	0	7		pCi/g	0	

Table 4
Rad
NSY-05 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	YS001.1 (3413)	YS001.1 (3413)	YS001.2 (3414)	YS001.3 (3415)	YS001.3 (3415)
Sample ID	YS001.1A	YS001.1B	YS001.2A	YS001.3A	YS001.3B
Date Sampled	12/29/1998	12/29/1998	12/29/1998	12/29/1998	12/29/1998
Ac-228	0.9388	0.7161	1.017	0.972	0.6644
Ag-108m	0.01134 U	-0.02634 U	-0.005045 U	0.009027 U	-0.007459 U
Ag-110m	0.01612 U	-0.01432 U	0.002284 U	0.005041 U	0.004038 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212	1.12	0.7751	1.015	0.834	1.171
Bi-214	0.5128	0.4415	0.5794	0.4578	0.4327
Ce-144	0.03302 U	0.01274 U	0.08193 U	0.09412 U	0.05799 U
Co-58	-0.02304 U	-0.03873 U	-0.002238 U	-0.01435 U	0.01098 U
Co-60	0.04602 U	-0.007236 U	-0.004158 U	0.001028 U	-0.003448 U
Cs-134	-0.006055 U	-0.02329 U	0.004302 U	-0.205 U	0.005561 U
Cs-137	0.06087	0 U	0.01953 U	-0.01931 U	-0.004664 U
Eu-152				0.4348 U	
Fe-59	-0.01763 U	-0.01185 U	-0.006215 U	0.04285 U	0.01135 U
I-132					
K-40	18.69	18.74	18.48	18.96	18.33
Mn-54	0.0008067 U	0.02431 U	0.04792	-0.002522 U	0.006132 U
Mo-99					
Nb-95	0.002529 U	-0.01585 U	0.02211 U	-0.003383 U	0.01736 U
Pb-212	0.9402	0.9773	0.9195	0.962	0.5431
Pb-214	0.6446	0.5356	0.6568	0.5122	0.5293
Ra-226	1.33	0.9138 U	0.8973 U		
Ru-103	-0.001022 U	0.01959 U	0.04912	-0.005964 U	0.003556 U
Ru-106	-0.1316 U	0 U	0.1619 U	0.04572 U	0.1267 U
Sb-124	0.006108 U	-0.009479 U	0.02297 U	0.01958 U	-0.01077 U
Sb-125					
Tl-208	0.8121	0.9572	1.084	0.7852	0.6849
Zn-65	-0.01861 U	0.1177 U	0.03843 U	0.05435 U	-0.01672 U
Zr-95	0.04698 U	0.01823 U	0.03229 U	-0.05648 U	0.02631 U
SOF	0.005		0.002		

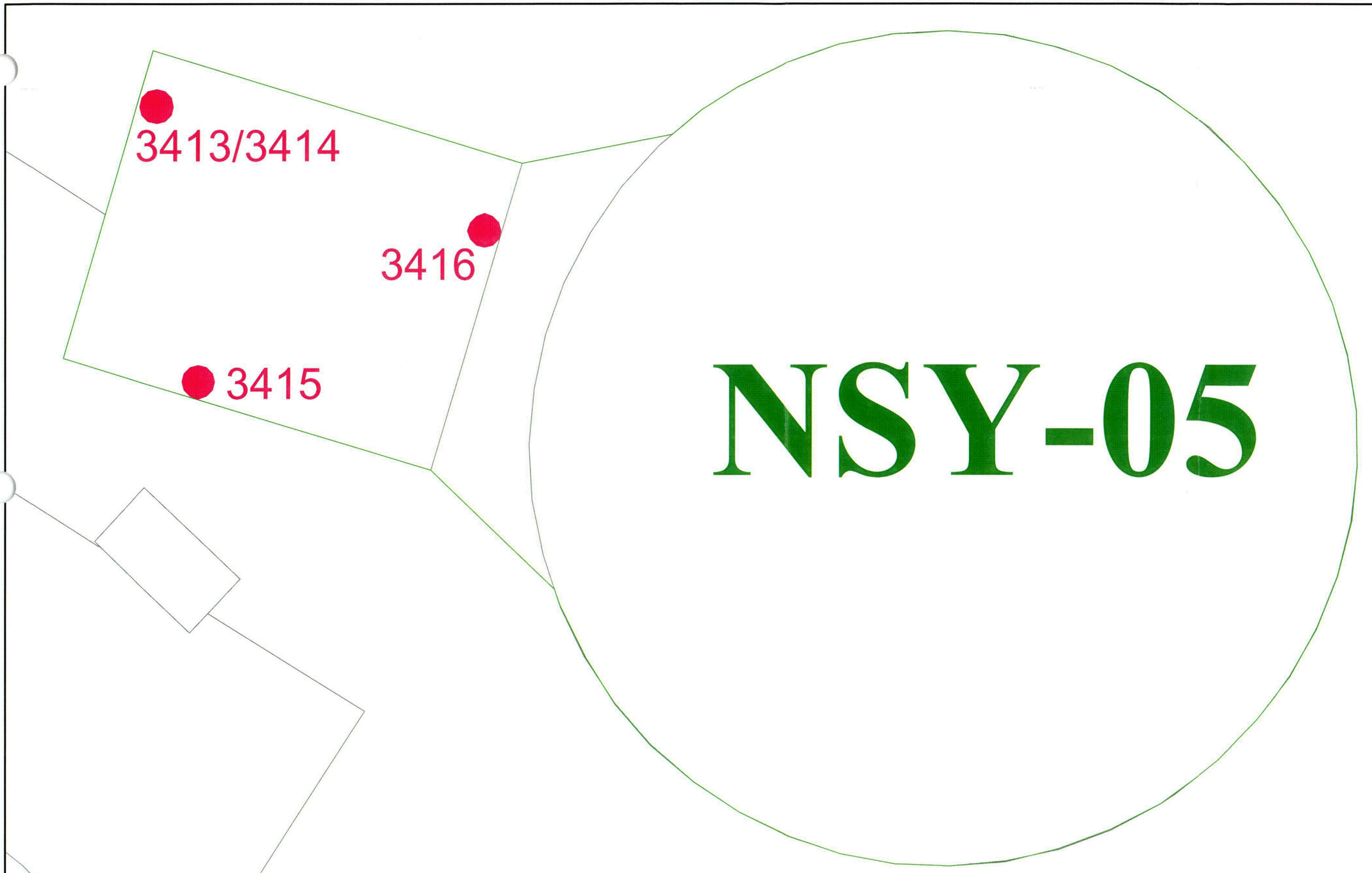
U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)

Blank results indicate chemical not analyzed

Table 4
Rad
NSY-05 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	YS001.4 (3416)	YS001.4 (3416)
Sample ID	YS001.4A	YS001.4B
Date Sampled	12/29/1998	12/29/1998
Ac-228	0.6806	0.6396
Ag-108m	0.01314 U	0.01333 U
Ag-110m	-0.01312 U	0.0138 U
Am-241	0 U	0 U
Bi-212	1.271	
Bi-214	0.5119	0.5147
Ce-144	0.11 U	-0.0802 U
Co-58	0.008471 U	-0.01634 U
Co-60	0.0127 U	-0.02183 U
Cs-134	0.001237 U	-0.03094 U
Cs-137	0.01614 U	0.0329 U
Eu-152		
Fe-59	0 U	0.01008 U
I-132	16.19 U	
K-40	17.35	19.16
Mn-54	-0.02491 U	0.01676 U
Mo-99		0.4799 U
Nb-95	0.006383 U	0.008316 U
Pb-212	0.9649	0.7912
Pb-214	0.4982	0.5649
Ra-226	1.29	1.366
Ru-103	-0.02221 U	0.002616 U
Ru-106	-0.01614 U	-0.1588 U
Sb-124	0.01936 U	-0.009507 U
Sb-125	-0.06404 U	
Tl-208	0.9097	0.6724
Zn-65	0.04104 U	-0.02716 U
Zr-95	0.01708 U	0.04688 U
SOF		

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed



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Legend

= Survey Area Boundary

Notes

Yankee Atomic Power Company
Soil Sample Locations - NSY-05

YANKEE

Date: October 2003

Revision: 4

Figure: 30

C34

Survey Area Name: New PCA Storage Designator: **NSY-06**

Survey Area Description

Survey Area NSY-06 consists of the reinforced concrete foundations and floor that comprise the New PCA Storage Building expected to remain after demolition of the above-grade structures is complete.

Further division of this survey area into survey units is dependent upon the decommissioning end state configuration of this structure.

Survey Area Name: New PCA Storage Designator: **NSY-06**

Survey Area History

NSY-06, New PCA Storage Building was constructed under Plant Alteration (PA) #75-19 in 1975.

The New PCA Storage Building was used to store packaged radioactive material. The New PCA Storage Building was not designed to contain radioactive material with loose contamination. The survey history of the New PCA Storage Building documents conditions of loose contamination present in the New PCA Storage Building. When identified as contaminated the New PCA Storage Building was decontaminated. This structure was historically maintained as a non-contaminated RMA storage area.

The RCA yard area surface and sub-surface soils at the New PCA Storage Building location are suspected of being contaminated prior to construction of the structure. Residual radioactivity not removed with the construction spoils may still be present within the footprint of the New PCA Storage Building under the slab and foundation.

The present location of the construction spoils generated by the New PCA Storage Building is thought to be within the SE Construction Fill area (OOL-09) of the site (Ref 1).

Decommissioning Activities

No decommissioning activities associated with at the New PCA Storage Building have been performed.

Survey Area Name: New PCA Storage Designator: **NSY-06**

Findings

The history of NYS-06 indicates that this structure is radiologically impacted as a result of plant operations. The soils within the footprint of NSY-06 were likely impacted by previous plant operations. Access to NSY-06 is through a radiation control area.

The radionuclide mix for the NSY-06 includes all radionuclides identified in the reactor radioactive systems of the plant (Ref 2). The primary radionuclides of concern for NSY-06 are Co-60, Cs-137, Ag-108m, Sr-90, and tritium.

Current Status

New PCA Storage Building is still in service. Additional investigation surveys of this survey area may be required prior to demolition. No sampling was conducted in this area.

Classification Statement

Based upon the historical use and radiological condition of the New PCA Storage Building and area surrounding survey area NSY-06 is identified as a Class 1 Area.

Building Historical Site Assessment and Classification Summary

Survey Area Name: New PCA Storage Designator: **NSY-06**

Drawings

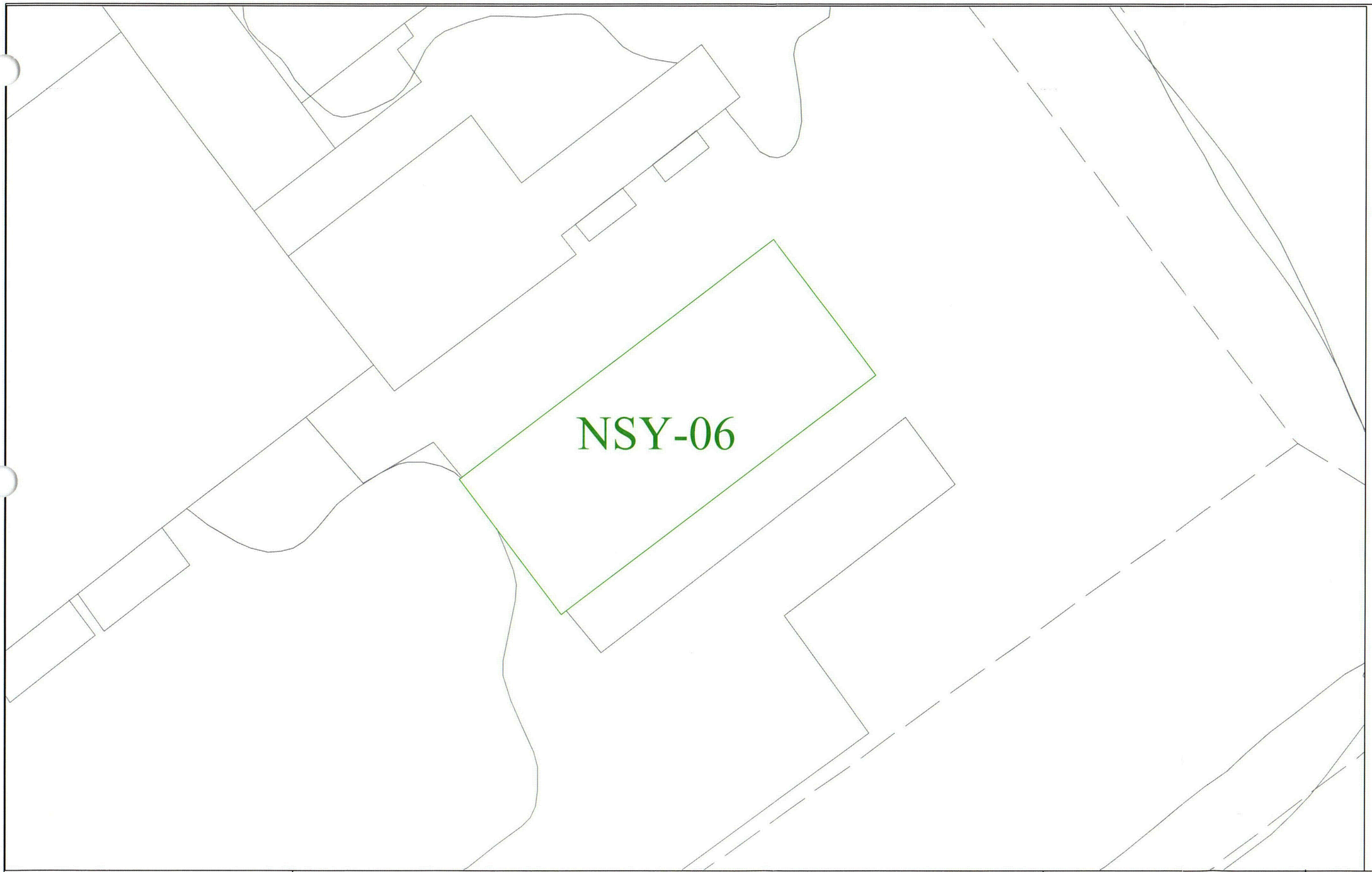
None available

References

1.	"Summary of Excavation Volumes for YNPS Construction Performed During the Time Period of Plant Operation," October 1997.
2.	Radionuclides for Building Surfaces and Soil DCGL Determinations YA-REPT-00-001-03

Underground Systems

NSY-06				
Structure / System	Component	Description	Location	Impacted?
Electrical	duct trays	from ~25' E and ~35' E of SW corner of TB on S wall going S ~25' to merge then going S ~110' to manhole E3 in SI bldg; from E3 going E ~15' and ~30' then S into N wall of PAB		



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= Survey Area Boundary

Notes

	Yankee Atomic Power Company Soil Sample Locations - NSY-06	YANKEE	Date: October 2003 Revision: 4	Figure: 31

C35

Survey Area Name: WHT/ADD Moat and Tank Farm Designator: **NSY-07**

Survey Area Description

Survey Area NSY-07 consists of the reinforced concrete wall foundations, tank support pedestals and floor slabs that comprise the area generally referred to as the "tank farm" that remain after demolition of the above-grade structures is complete. The tank farm is made up of Waste Hold-Up Tank (WHT) and moat, the Activity Dilution/Decay Tank (ADD) and moat, and the Waste Gas Surge Drum (WGSD) and the Waste Gas Decay Tanks (WGDT) shield walls. The WGSD area does not have a floor slab but in does have two, tank support pedestals that are set on foundations. The WGDT area has a floor recently installed

Floor surface area of NSY-07 is approximately 130 square meters. There is approximately 125 linear meters of foundation and footings that extends to a depth of 1.5 meters below grade associated with the NSY-07.

Further division of this survey area into survey units is dependent upon the decommissioning end state configuration of this structure.

Survey Area Name: WHT/ADD Moat and Tank Farm Designator: **NSY-07**

Survey Area History

The WH and ADD tanks stored liquid radioactive waste while waiting processing. These tanks were enclosed within a moat designed to provide shielding and a secondary containment of the liquids in the event of a spill. The moats were equipped with drain valves that allowed accumulated rainwater and snowmelt to be released to the east storm drain system as necessary.

One of the liquid waste system valves within the moat area developed a leak that resulted in contamination of the moat area. (Ref. 1)

The WGSD and WGDTs were used to manage the waste gas produced during plant operations. The enclosure around the WGSD and WGDTs consisted of shield walls only. There are support pedestals for the WGSD that are set on foundations that span the distance between the east and west shield walls. The area within the WGSD area was intermittently used for storing radioactive material.

The WGDTs enclosure has three bases that supported the WGDTs. The WGDTs saw only limited use over the first few years of plant operations (Ref. 2). EDCR 87-30 added a 15" thick concrete floor within the WGDT enclosure in order to convert this space into a lockable High Radiation, Radioactive Material Storage Area (Ref 3).

All of the structures found within NSY-07 are of original plant construction with the exception of the floor slab within the Waste Gas Decay Tank area.

Decommissioning Activities

Decommissioning activities performed in NSY-07 removed the WHT and ADD tanks and associated piping. The WGSD and WGD tanks and piping were also removed.

The WHT and ADD moat areas have been converted to a radioactive material storage area. Access to the moat areas was created by cutting away sections of the moat walls. A roof was constructed over the ADD moat area to create a covered storage area.

Survey Area Name: WHT/ADD Moat and Tank Farm Designator: **NSY-07**

Findings

The operational history of NYS-07 indicates that this structure is radiologically impacted as a result of plant operations. Both the WGSD and WGDT areas were used for radioactive material storage the potential for soil contamination in these areas must also be considered. Access to NSY-07 is through a radiation control area.

The radionuclide mix for the NSY-07 includes all radionuclides identified in the reactor radioactive systems of the plant (Ref 4). The primary radionuclides of concern for NSY-07 are Co-60, Cs-137, Ag-108m, Sr-90, and tritium.

Current Status

NSY-07 area is still in service as a radioactive material storage area. Additional investigation surveys of this survey area may be required prior to demolition.

A soil sample location map (Figure 32) has been prepared to show the distribution of sampling locations in NSY-07. Only samples representative of soils still present are included on the map (samples of soils representative of soils removed during remediation activities are not presented). One survey media was assessed in NSY-07, Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for NSY-07 is presented at the end of Table 1 for each survey medium. The results are summarized below.

Soil: Mean SOF is 0.015.
Maximum SOF for a single soil sample is 0.018. (key# 3052)
Minimum SOF for a single soil sample is 0.009. (key# 3052)

Classification Statement

Based upon the historical use and radiological condition of the New PCA Storage Building and area surrounding survey area NSY-07 is identified as a Class 1 Area.

Survey Area Name: WHT/ADD Moat and Tank Farm Designator: **NSY-07**

Drawings

9699-FC-34 A
9699-FC-35 A
9699-FC-35 B
9699-FC-35 C

References

1.	Abnormal Occurrence Report (AOR) 68-01, "Waste Hold-Up Tank Moat Spill," dated February 2, 1968.
2.	YNPS Systems Training Manual, Revision 18, dated December 23, 1991.
3.	Engineering Design Change Request (EDCR) 87-308, "Water Cleanup System," dated May 9, 1989, as revised on July 12, 1989,
4.	"Radionuclides for Building Surfaces and Soil DCGL Determinations," YA-REPT-00-001-03

Table 1
Sum of Fractions
NSY-07 -- Soil
Yankee Nuclear Power Station Rowe, MA

Station Key	Station	Sample ID		Sum Of Fractions
3052	S98.31	S98.31C		0.017
3052	S98.31	S98.31B		0.018
3052	S98.31	S98.31A		0.009
			Min	0.009
			Max	0.018
			Mean	0.015

Table 2
Statistical Data Summary – NSY-07 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	5	5	0.748	0.064	0.656	0.811	0.767
Ag-108m	pCi/g	1	5	0.026		0.026	0.026	0.026
Ag-110m	pCi/g	0	5	0.000				
Am-241	pCi/g	0	5	0.000				
Bi-212	pCi/g	4	4	0.801	0.169	0.580	0.965	0.830
Bi-214	pCi/g	4	4	0.387	0.026	0.367	0.424	0.379
Ce-144	pCi/g	0	5	0.000				
Co-58	pCi/g	0	5	0.000				
Co-60	pCi/g	2	5	0.063	0.013	0.054	0.072	0.063
Cs-134	pCi/g	0	5	0.000				
Cs-137	pCi/g	2	5	0.077	0.012	0.069	0.085	0.077
Fe-59	pCi/g	0	5	0.000				
I-133	pCi/g	0	1	0.000				
K-40	pCi/g	4	5	15.613	0.712	14.760	16.480	15.605
Mn-54	pCi/g	1	5	0.040		0.040	0.040	0.040
Nb-95	pCi/g	0	5	0.000				
Pb-212	pCi/g	5	5	0.722	0.075	0.637	0.826	0.696
Pb-214	pCi/g	5	5	0.452	0.072	0.361	0.535	0.474
Ra-226	pCi/g	1	2	1.113		1.113	1.113	1.113
Ru-103	pCi/g	0	5	0.000				
Ru-106	pCi/g	0	5	0.000				
Sb-124	pCi/g	0	5	0.000				
Sb-125	pCi/g	0	1	0.000				
Tl-208	pCi/g	5	5	0.601	0.063	0.526	0.689	0.600
Zn-65	pCi/g	0	5	0.000				
Zr-95	pCi/g	0	5	0.000				

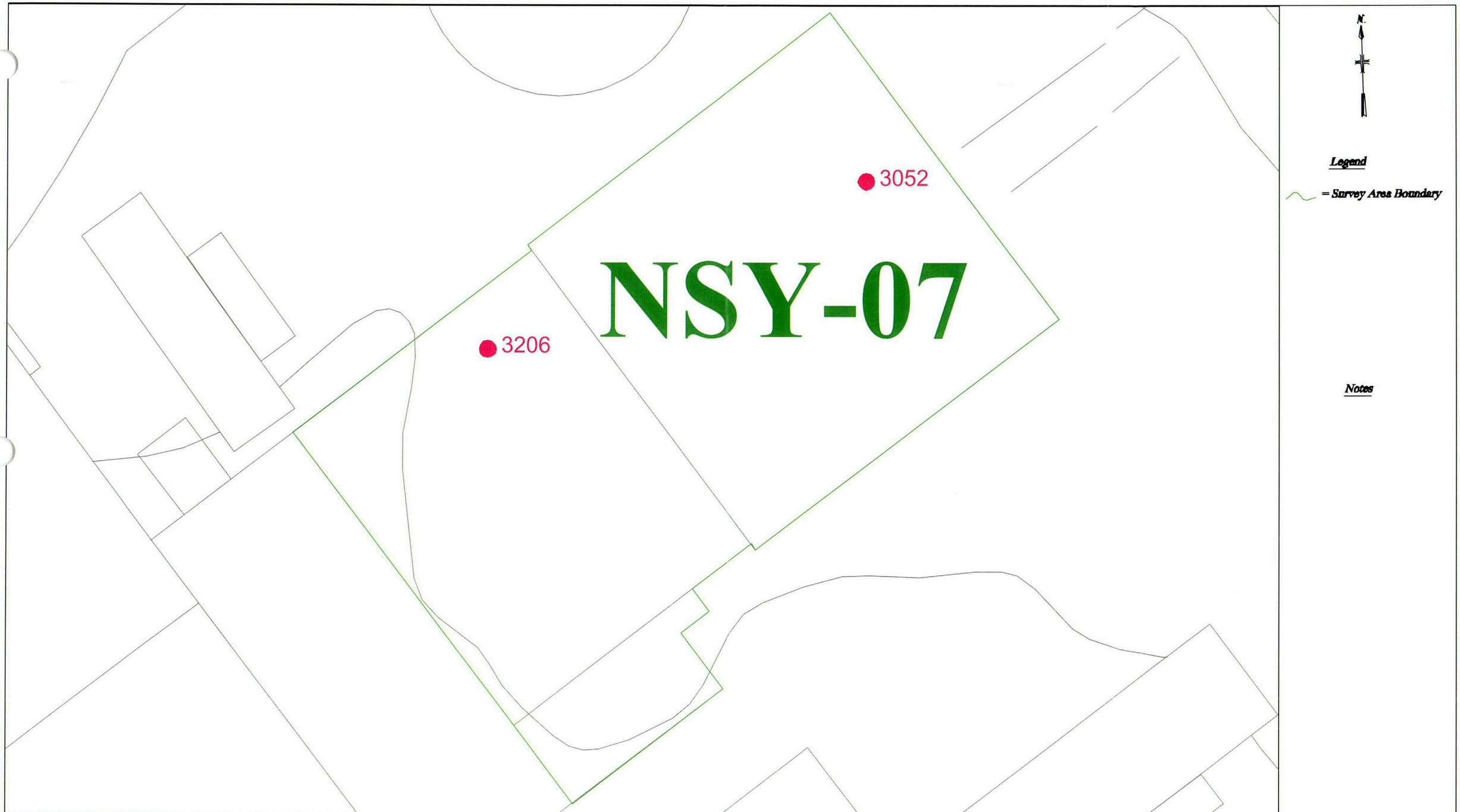
Table 3
Summary of Detected Results Above Criteria
NSY-07 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	5	5		pCi/g	0	0.81
Ag-108m	1	5	8.52	pCi/g	0	0.03
Ag-110m	0	5		pCi/g	0	
Am-241	0	5	44.35	pCi/g	0	
Bi-212	4	4		pCi/g	0	0.96
Bi-214	4	4		pCi/g	0	0.42
Ce-144	0	5		pCi/g	0	
Co-58	0	5		pCi/g	0	
Co-60	2	5	4.84	pCi/g	0	0.07
Cs-134	0	5	6.71	pCi/g	0	
Cs-137	2	5	12.24	pCi/g	0	0.09
Fe-59	0	5		pCi/g	0	
I-133	0	1		pCi/g	0	
K-40	4	5		pCi/g	0	16.48
Mn-54	1	5	21.66	pCi/g	0	0.04
Nb-95	0	5		pCi/g	0	
Pb-212	5	5		pCi/g	0	0.83
Pb-214	5	5		pCi/g	0	0.53
Ra-226	1	2		pCi/g	0	1.11
Ru-103	0	5		pCi/g	0	
Ru-106	0	5	68.21	pCi/g	0	
Sb-124	0	5		pCi/g	0	
Sb-125	0	1	37.73	pCi/g	0	
Tl-208	5	5		pCi/g	0	0.69
Zn-65	0	5		pCi/g	0	
Zr-95	0	5		pCi/g	0	

Table 4
Rad
NSY-07 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	S98.31 (3052)	S98.31 (3052)	S98.31 (3052)	TS473 (3206)	TS473 (3206)
Sample ID	S98.31A	S98.31B	S98.31C	TS473A	TS473B
Date Sampled	7/27/1998	7/27/1998	7/27/1998	12/15/1997	12/15/1997
Ac-228	0.8113	0.6561	0.7935	0.7106	0.7668
Ag-108m	-0.01787 U	0.02619	-0.01159 U	-0.004837 U	-0.01422 U
Ag-110m	0.02742 U	-0.02646 U	0.0176 U	0.01897 U	-0.02022 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212	0.58	0.9646	0.7676		0.8932
Bi-214		0.4241	0.3848	0.3669	0.3726
Ce-144	0.1395 U	0.07758 U	-0.06094 U	0.0952 U	-0.0654 U
Co-58	0.0009965 U	-0.02912 U	0.004714 U	0.01041 U	-0.007472 U
Co-60	-0.004691 U	0.07246	0.0539	-0.003131 U	-0.003148 U
Cs-134	0.004349 U	0.02903 U	0.002085 U	-0.002584 U	-0.002773 U
Cs-137	0.08527	0.02494 U	0.06858	-0.006481 U	-0.01052 U
Fe-59	-0.0244 U	-0.05087 U	-0.04535 U	-0.02437 U	-0.02422 U
I-133					0.02306 U
K-40	0 U	15.46	15.75	14.76	16.48
Mn-54	0.0397	-0.03771 U	0.01382 U	-0.01567 U	0.01391 U
Nb-95	-0.00868 U	0.03013 U	-0.008979 U	-0.004985 U	-0.009184 U
Pb-212	0.7681	0.6964	0.683	0.6371	0.8258
Pb-214	0.4735	0.5347	0.4947	0.396	0.3609
Ra-226				1.113	0.6758 U
Ru-103	0.02536 U	0.004283 U	0.009418 U	0.00386 U	0.01181 U
Ru-106	0.1108 U	-0.04202 U	0.2354 U	-0.1792 U	-0.1982 U
Sb-124	-0.009679 U	-0.01962 U	0.02061 U	-0.005774 U	0 U
Sb-125				-0.1122 U	
Tl-208	0.5996	0.6307	0.5258	0.5619	0.6888
Zn-65	-0.06017 U	-0.01552 U	-0.01707 U	0.05047 U	0.03815 U
Zr-95	-0.02323 U	0.008436 U	0.006786 U	0.04322 U	-0.01421 U
SOF	0.009	0.018	0.017		

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed



	Yankee Atomic Power Company Soil Sample Locations - NSY-07	YANKEE	Date: October 2003 Revision: 4	Figure: 32

C36

Survey Area Name: New SI Tank Pad

Designator: **NSY-08**

Survey Area Description

Survey Area NSY-08 consists of the reinforced concrete pad, pipe trench and subsurface structures that comprise the base New Safety Injection Tank remaining after demolition of the tank and related system piping is complete.

Further division of this survey area into survey units is dependent upon the decommissioning end state configuration of these structures.

Survey Area Name: New SI Tank Pad Designator: **NSY-08**

Survey Area History

NSY-08, New Safety Injection Tank was constructed as plant modification EDCR #90-301 in 1990 (Ref 1).

The New Safety Injection Tank is located in the RCA yard area west of and adjacent to the RCA Warehouse, WST-02.

The RCA yard area surface and sub-surface soils in NSY-08 were impacted by radioactive waste storage and translocation activities. Residual radioactivity not removed with the construction spoils may still be present within the footprint of the New Safety Injection Tank.

The construction spoils generated by construction of the New Safety Injection Tank were disposed of as radioactive waste (Ref 2).

The New Safety Injection Tank developed a leak at a temperature detector well that resulted in contamination of a portion of the outside of the tank, tank base and adjacent concrete (Ref. 3).

Scoping/Characterization

Radiological contamination survey of the New Safety Injection Tank base is not routinely performed.

Decommissioning Activities

Decommissioning activities performed in NSY-08 have removed the New Safety Injection Tank and associated piping (Ref 4).

The remaining concrete tank base has been intermittently used as a radioactive material storage area.

Survey Area Name: New SI Tank Pad Designator: **NSY-08**

Findings

Survey area NSY-08 was impacted by plant operations. Access to NSY-08 is through a radiation control area.

The radionuclide mix for the NSY-08 includes all radionuclides identified in the reactor radioactive systems of the plant (Ref 5). The primary radionuclides of concern for NSY-08 are Co-60, Cs-137, Ag-108m, Sr-90, and tritium.

Current Status

The New Safety Injection Tank base is currently used as a radioactive material storage area. No sampling was conducted in this area.

Classification Statement

Based upon the radiological condition of area surrounding this survey area NSY-08 is identified as a Class 1 Area.

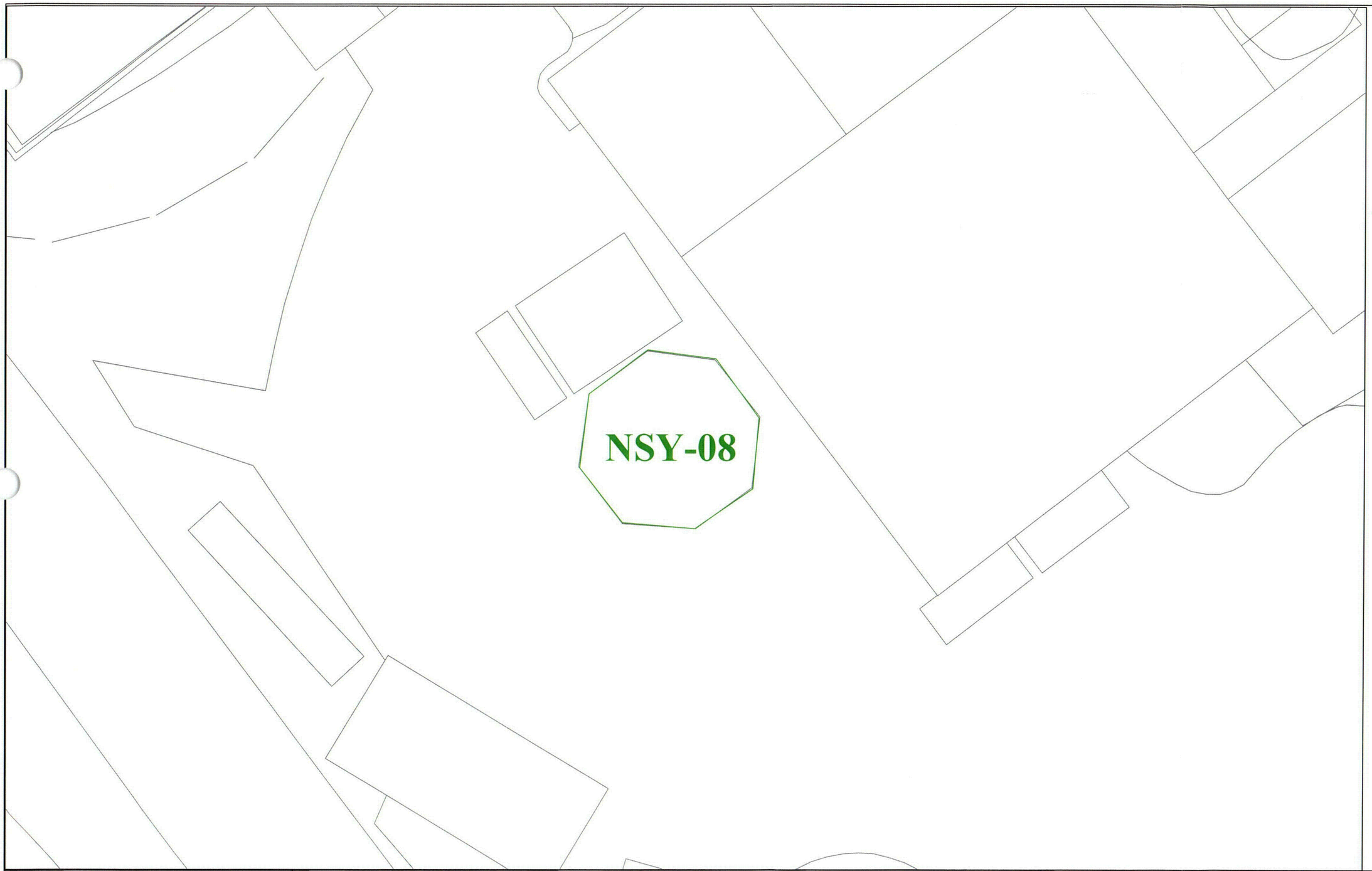
Survey Area Name: New SI Tank Pad Designator: **NSY-08**

Drawings

9699 -FC-50 E

References

1.	Engineering Design Change Request (EDCR) #90-301, "Safety Injection Tank Replacement," dated June 8, 1990.
2.	"Summary of Excavation Volumes for YNPS Construction Performed During the Time Period of Plant Operation," dated October 1997.
3.	Decommissioning Work Package (DWP) SIT-02, New Safety Injection Tank (TK-28) Removal."
4.	"Radionuclides for Building Surfaces and Soil DCGL Determinations," YA-REPT-00-001-03



N

Legend

= Survey Area Boundary

Notes

	Yankee Atomic Power Company Soil Sample Locations - NSY-08	YANKEE	Date: October 2003 Revision: 4	Figure: 33

C37

Building Historical Site Assessment and Classification Summary

Survey Area Name: VC Elevator Structure Designator: **NSY-09**

Survey Area Description

Survey Area NSY-09 consists of the reinforced concrete floor, foundations, column supports and subsurface structures of the Vapor Container (VC) access, elevator and stairway expected to remain after demolition of the above-grade structure is complete.

The NSY-09 footprint includes the floor areas of various elevations. The floor area of the elevator pit at elevation 1017' 2" is 6.5 square meters, the landing in front of the elevator at elevation 1022' 8" is 4.74 square meters. The interior walls of the elevator pit represent 17.25 square meters of surface area. The foundations of the VC access elevator structure extend down to the same depth as those of the Spent Fuel Pit. The exterior surface of sub-grade structures and foundation will be investigated for possible contamination. The total surface area in square meters for NSY-09 may not be determined until demolition activities are complete. Survey Area NSY-09 will be divided into survey units as necessary.

NSY-09 is abuts the Spent Fuel Pit (SFP-01) and Ion Exchange Pit (NSY-02) on the east such that it straddles the construction joint in the concrete where the IX Pit attaches to the SFP structure. (This is the location of the IX Pit leak) NSY-09 also abuts NOL-01 on the south, west and north

There are no sub-grade systems associated with NSY-09.

Survey Area Name: VC Elevator Structure Designator: **NSY-09**

Survey Area History

There are no radioactive operating systems present in NSY-09. The exterior of the NSY-09 structure is suspected of being contaminated as a result of the IX Pit leak. The interior of the elevator pit was likely contaminated as a result of leaks/spills from contaminated material transported in the elevator car that was redistributed down into the elevator pit.

Events that resulted in the introduction of radioactivity into survey area NSY-09 include those described in Abnormal Occurrence Report (AOR) 64-13 (Ref. 1). This event is suspected of contaminating the adjacent concrete and soil in the immediate area of the leak and along a migration pathway that is yet to be identified.

Scoping/Characterization

No scoping or characterization data is available for NSY-09.

Decommissioning Activities

No decommissioning activities have been performed in NSY-09.

Survey Area Name: VC Elevator Structure Designator: **NSY-09**

Findings

The history of the NSY-09 indicates that this structure is possibly radiologically impacted as a result of plant operations.

These radionuclides are likely distributed in media including reinforced concrete, paint and soil. The exterior surface of the VC access, elevator and stairway foundation and support structure below grade and sub floor/foundation soil will require further investigation.

The radionuclide mix for survey area NSY-09 includes all radionuclides identified in the radioactive systems of the plant (Ref 2). The primary radionuclides of concern for NSY-09 are Co-60, Cs-137, Ag-108m, Sr-90, and tritium.

Current Status

Survey Area NSY-09 the VC access, elevator and stairway is still in service. No decommissioning activities have been performed in NSY-09.

Classification Statement

Based upon the radiological conditions identified in the operating history, survey area NSY-09 is identified as a Class 1 Area.

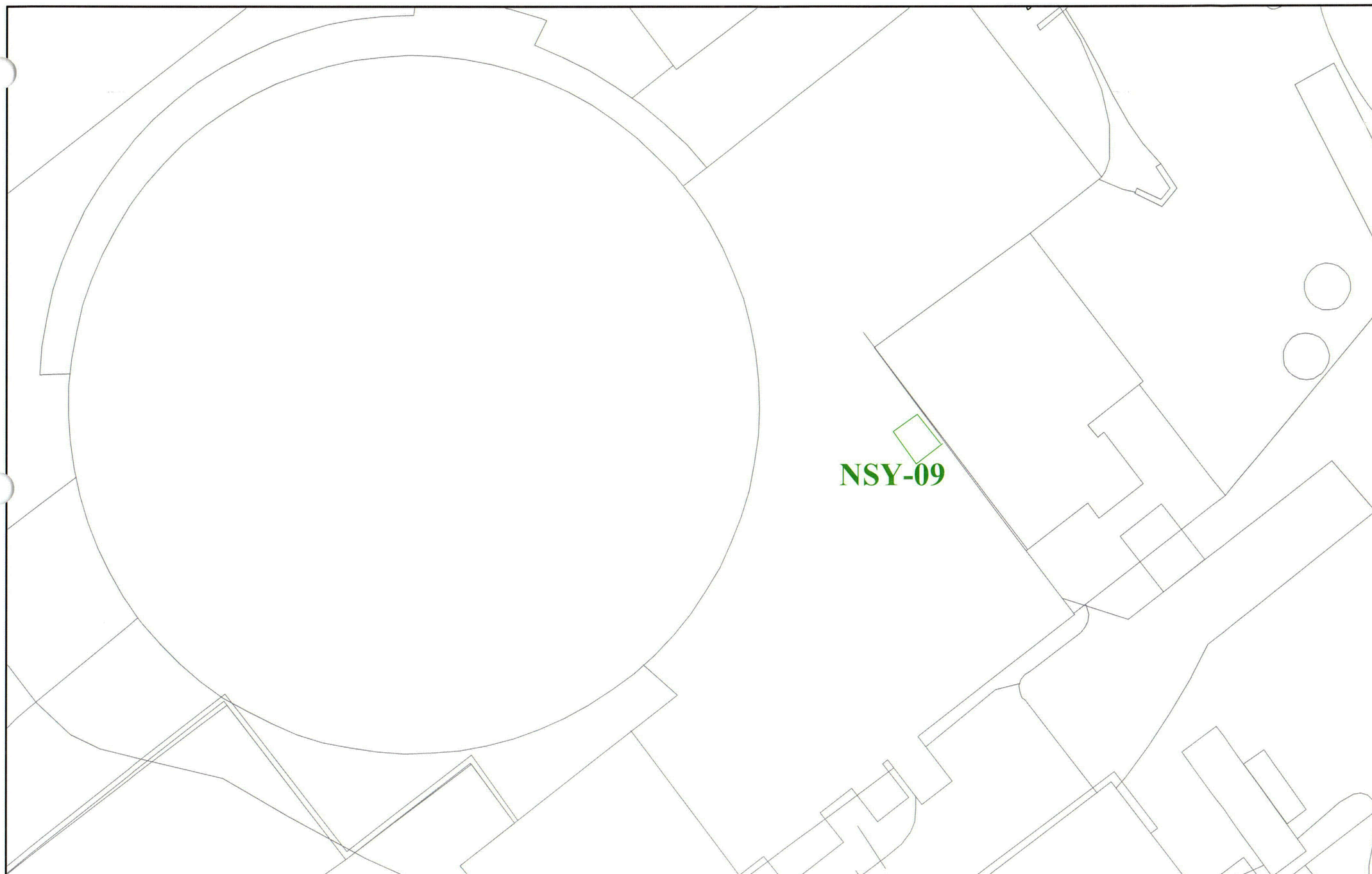
Survey Area Name: VC Elevator Structure Designator: **NSY-09**

Drawings

9699-FC-43 A

References

1.	Abnormal Occurrence Report (AOR) 64-13, "High Level in the IX Pit Resulting in Leakage Coming Up Through the Blacktop," dated October 13, 1964.
2.	"Radionuclides for Building Surfaces and Soil DCGL Determinations," YA-REPT-00-001-03



N

Legend

= Survey Area Boundary

Notes

	Yankee Atomic Power Company Soil Sample Locations - NSY-09	YANKEE	Date: October 2003 Revision: 4	Figure: 34

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Building Historical Site Assessment and Classification Summary

Survey Area Name: ISFSI Pad Designator: **NSY-10**

Survey Area Description

Survey Area NSY-10 consists of the reinforced concrete pad of the ISFSI. The footprint of NSY-10 is about 985 square meters.

NSY-10 is located in the RCA within the bounds of NOL-07.

Further division of this survey area into survey units as necessary is dependent upon the decommissioning end state configuration.

Survey Area Name: ISFSI Pad Designator: **NSY-10**

Survey Area History

NSY-10, the Independent Spent Storage Installation (ISFSI), was constructed as plant modification EDCR #99-302. (Ref 1) The ISFSI was constructed on the former location of the Pole Barn, a wood frame and metal panel structure used for storage of miscellaneous materials.

A radiological assessment survey of the ISFSI is performed on a routine basis. There have been no documented occurrences of radiological contamination of the ISFSI or ISFSI RCA yard area. The primary radiological concern relative to the ISFSI RCA is direct radiation emitted from the loaded VCCs.

Scoping/Characterization

No scoping or characterization data is available for NSY-10.

Decommissioning Activities

No decommissioning activities have been performed in NSY-10.

Survey Area Name: ISFSI Pad Designator: **NSY-10**

Finding

The history of the NSY-10 indicates that this structure is potentially impacted as a result of spent fuel storage operations.

The radionuclide mix likely to be present in NSY-10 includes all radionuclides identified in the radioactive systems of the plant (Ref 2). The primary radionuclides of concern for survey area NSY-10 are Co-60, Cs-137, Ag-108m, Sr-90, and tritium.

The design of the dry spent fuel storage system should prevent the dispersal of loose surface contamination onto the ISFSI pad.

Current Status

Survey Area NSY-10 will remain in service until such time as the spent fuel is removed from the site. No decommissioning activities have been performed in NSY-10.

A soil sample location map (Figure 35) has been prepared to show the distribution of sampling locations in NSY-10. Only samples representative of soils still present are included on the map (samples of soils representative of soils removed during remediation activities are not presented). One survey media was assessed in NSY-10, Soil. The results and analyses (Tables 1-4 in this section) of the samples plotted as "key numbers" on the map represent the radiological status at the time of sampling (a period spanning several years) as sums of fractions of the soil DCGL.

Only those samples with detectable results of the radionuclides of concern appear in Table 1. For this reason the number listed as minimum does not include samples that did not have detectable quantities of the radiological substances of concern. An assessment of the maximum, minimum and mean sum of fractions (SOF) for NSY-10 is presented at the end of Table 1 for each survey medium. The results are summarized below.

Soil: Mean SOF is 0.017.
Maximum SOF for a single soil sample is 0.052. (key# 3033)
Minimum SOF for a single soil sample is 0.001. (key# 3025)

Classification Statement

Based upon the historical use and radiological conditions associated with this survey area NSY-10 is identified as a Class 3 Area.

Survey Area Name: ISFSI Pad Designator: **NSY-10**

Drawings

ISFSI-FC-18
ISFSI-FY-2

References

1.	Engineering Design Change Request (EDCR) #99-302, "Independent Spent Fuel Storage Installation Facility Design and Construction," dated June 23, 2000.
2.	"Radionuclides for Building Surfaces and Soil DCGL Determinations," YA-REPT-00-001-03

Table 1
Sum of Fractions
NSY-10 -- Soil
Yankee Nuclear Power Station Rowe, MA

Radionuclides for which SOF is calculated were not present in samples.

Table 2
Statistical Data Summary – NSY-10 – Soil
Yankee Nuclear Power Station Rowe, MA

Parameter	Units	# Detects	# Sample Results	Mean	Std. Dev	Minimum	Maximum	Median
Ac-228	pCi/g	9	9	0.673	0.214	0.304	0.999	0.683
Ag-108m	pCi/g	0	9	0.000				
Ag-110m	pCi/g	1	9	0.076		0.076	0.076	0.076
Am-241	pCi/g	0	9	0.000				
Bi-212	pCi/g	6	6	0.773	0.149	0.516	0.920	0.783
Bi-214	pCi/g	9	9	0.438	0.087	0.310	0.571	0.420
Ce-144	pCi/g	0	9	0.000				
Co-58	pCi/g	0	9	0.000				
Co-60	pCi/g	0	9	0.000				
Cs-134	pCi/g	0	9	0.000				
Cs-137	pCi/g	0	9	0.000				
Fe-59	pCi/g	0	9	0.000				
K-40	pCi/g	9	9	16.378	3.062	11.270	19.610	17.090
Mn-54	pCi/g	0	9	0.000				
Nb-95	pCi/g	2	9	0.042	0.001	0.042	0.043	0.042
Np-239	pCi/g	0	1	0.000				
Pb-212	pCi/g	9	9	0.624	0.186	0.320	0.890	0.656
Pb-214	pCi/g	9	9	0.468	0.105	0.279	0.589	0.495
Ra-226	pCi/g	6	8	1.557	0.358	1.113	2.198	1.486
Ru-103	pCi/g	2	9	0.040	0.000	0.040	0.040	0.040
Ru-106	pCi/g	0	9	0.000				
Sb-124	pCi/g	1	9	0.044		0.044	0.044	0.044
Sn-113	pCi/g	0	1	0.000				
Tl-208	pCi/g	7	7	0.705	0.101	0.563	0.809	0.734
Zn-65	pCi/g	0	9	0.000				
Zr-95	pCi/g	0	9	0.000				

Table 3
Summary of Detected Results Above Criteria
NSY-10 -- Soil
Yankee Nuclear Power Station Rowe, MA
DCGL_Soil

Parameter	# Detects	# Sample Results	Criterion Concentration	Units	# Detects Above Criterion	Maximum Detected
Ac-228	9	9		pCi/g	0	1.00
Ag-108m	0	9	8.52	pCi/g	0	
Ag-110m	1	9		pCi/g	0	0.08
Am-241	0	9	44.35	pCi/g	0	
Bi-212	6	6		pCi/g	0	0.92
Bi-214	9	9		pCi/g	0	0.57
Ce-144	0	9		pCi/g	0	
Co-58	0	9		pCi/g	0	
Co-60	0	9	4.84	pCi/g	0	
Cs-134	0	9	6.71	pCi/g	0	
Cs-137	0	9	12.24	pCi/g	0	
Fe-59	0	9		pCi/g	0	
K-40	9	9		pCi/g	0	19.61
Mn-54	0	9	21.66	pCi/g	0	
Nb-95	2	9		pCi/g	0	0.04
Np-239	0	1		pCi/g	0	
Pb-212	9	9		pCi/g	0	0.89
Pb-214	9	9		pCi/g	0	0.59
Ra-226	6	8		pCi/g	0	2.20
Ru-103	2	9		pCi/g	0	0.04
Ru-106	0	9	68.21	pCi/g	0	
Sb-124	1	9		pCi/g	0	0.04
Sn-113	0	1		pCi/g	0	
Tl-208	7	7		pCi/g	0	0.81
Zn-65	0	9		pCi/g	0	
Zr-95	0	9		pCi/g	0	

Table 4
Rad
NSY-10 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

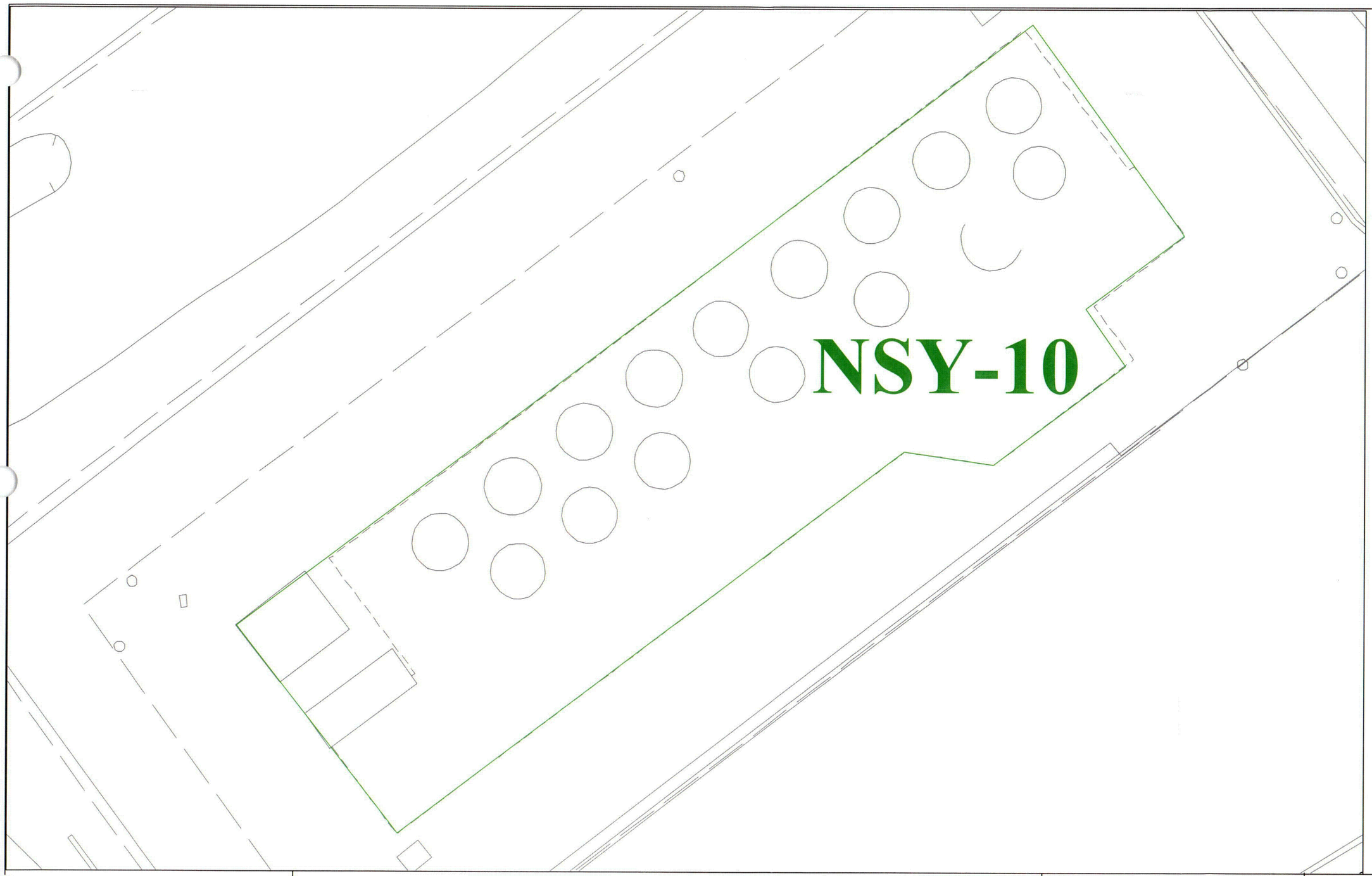
Station (Key)	OB001.12 (3028)	OB001.12 (3028)	OB001.12 (3028)	OB001.12 (3028)
Sample ID	OB001.12A	OB001.12B	OB001.12C	OB001.12D
Date Sampled	8/10/1999	8/10/1999	8/10/1999	8/10/1999
Ac-228	0.4763	0.6829	0.6532	0.3035
Ag-108m	0.01029 U	-0.01086 U	0.000504 U	0.0008895 U
Ag-110m	-0.02533 U	0.07618	0.01783 U	-0.001716 U
Am-241	0 U	0 U	0 U	0 U
Bi-212	0.7651	0.8	0.516	
Bi-214	0.4819	0.4333	0.4203	0.3098
Ce-144	-0.09025 U	-0.09122 U	0.01404 U	-0.1741 U
Co-58	0.01182 U	-0.01431 U	-0.008616 U	-0.01418 U
Co-60	-0.01019 U	0.01219 U	-0.00651 U	0.0002377 U
Cs-134	-0.009552 U	-0.01926 U	-0.009156 U	0.004214 U
Cs-137	0.01406 U	0.0237 U	0.0004159 U	-0.002582 U
Fe-59	-0.03693 U	-0.01064 U	0.007166 U	0.03191 U
K-40	17.09	16.38	18.08	11.39
Mn-54	0.01026 U	-0.008273 U	-0.02263 U	0.002896 U
Nb-95	-0.01071 U	0.03638 U	-0.0115 U	0.01097 U
Np-239			-0.3306 U	
Pb-212	0.583	0.5529	0.656	0.3795
Pb-214	0.3936	0.4926	0.509	0.2786
Ra-226	1.113	1.429		0.6183 U
Ru-103	0.01618 U	-0.01502 U	-0.008465 U	0.00678 U
Ru-106	0.08701 U	-0.0833 U	0.1492 U	0.1718 U
Sb-124	0 U	-0.02278 U	0.04366	0.01792 U
Sn-113				0.03232 U
Tl-208	0.5633	0.586	0.6653	
Zn-65	-0.103 U	-0.0008598 U	0.06508 U	0.02743 U
Zr-95	0.006461 U	-0.02525 U	0.004646 U	0.03063 U

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed

Table 4
Rad
NSY-10 -- Soil (pCi/g)
Yankee Nuclear Power Station Rowe, MA

Station (Key)	OB001.12 (3028)	OB001.2 (3030)	OB001.6 (3034)	OB001.6 (3034)	OB001.6 (3034)
Sample ID	OB001.12E	OB001.2A	OB001.6A	OB001.6B	OB001.6C
Date Sampled	8/10/1999	7/21/1999	7/21/1999	7/22/1999	7/22/1999
Ac-228	0.511	0.8197	0.7726	0.9987	0.8373
Ag-108m	0.005803 U	-0.004089 U	-0.0124 U	-0.002496 U	0.01333 U
Ag-110m	-0.0002845 U	-0.03976 U	-0.01398 U	0.01269 U	-0.01844 U
Am-241	0 U	0 U	0 U	0 U	0 U
Bi-212			0.7212	0.9168	0.9196
Bi-214	0.3865	0.5712	0.3792	0.5666	0.3936
Ce-144	-0.04207 U	-0.01027 U	-0.04202 U	-0.2563 U	-0.08569 U
Co-58	-0.00774 U	-0.02596 U	-0.003879 U	-0.005806 U	0.00484 U
Co-60	0.0007438 U	0.01171 U	0.001331 U	-0.02864 U	0.01577 U
Cs-134	0.00948 U	0.004554 U	-0.08688 U	0.01952 U	-0.14 U
Cs-137	0.002324 U	-0.01396 U	0.02141 U	0.01436 U	-0.01315 U
Fe-59	-0.06885 U	0.01465 U	-0.006838 U	0.02524 U	-0.02597 U
K-40	11.27	19.61	17.35	19.38	16.85
Mn-54	0.01212 U	-0.01222 U	0.001743 U	0 U	-0.007808 U
Nb-95	0.0264 U	0.0416	-0.02351 U	0.04297	-0.01683 U
Np-239					
Pb-212	0.3204	0.7349	0.725	0.8896	0.7785
Pb-214	0.3567	0.5871	0.5888	0.5104	0.4947
Ra-226	1.518	0.9941 U	1.633	1.453	2.198
Ru-103	-0.007397 U	-0.003283 U	0.0402	0.02699 U	0.04035
Ru-106	0.05796 U	-0.02871 U	0.00000004511 U	0.1102 U	-0.04542 U
Sb-124	-0.005784 U	0 U	0.02451 U	-0.005566 U	0.00382 U
Sn-113					
Tl-208		0.7785	0.8087	0.7343	0.7961
Zn-65	0.128 U	-0.04898 U	0.05511 U	0.09839 U	0.06243 U
Zr-95	-0.0202 U	0.01443 U	0 U	-0.009481 U	0.0008913 U

U-not detected (value is not greater than 2 sigma); UM-nondetect (value is equal to MDA)
Blank results indicate chemical not analyzed



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Legend

= Survey Area Boundary

Notes

	Yankee Atomic Power Company Soil Sample Locations - NSY-10	YANKEE	Date: October 2003 Revision: 4	Figure: 35

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Building Historical Site Assessment and Classification Summary

Survey Area Name: Chem-Waste Transfer Pump Pit Designator: **NSY-11**

Survey Area Description

Survey Area NSY-11 consists of the below grade reinforced concrete structure of the Chem. Waste Transfer Pump Pit.

The NSY-11 is consists of a below grade room approximately 4 meters by 3 meters by 3.5 meters deep. There is a drain sump located in the northeast corner of the floor area, which is 0.3 meters by 0.3 meters by 1 meter deep. The interior surfaces of NSY-11 include the bottom and sides of the sump, the floor area, walls and ceiling of the room. The floor area surface is at elevation 1010' 6" and is approximately 12 square meters. The interior walls represent a total of 49 square meters of surface area. The ceiling is approximately the same size as the floor minus the manhole access. The exterior surface of the structure will be investigated for possible contamination. The total surface area in square meters for NSY-11 may not be determined until demolition activities are complete.

NSY-11 is located in NOL-01 just east of the FTE (NSY-01)

Survey Area Name: Chem-Waste Transfer Pump Pit Designator: **NSY-11**

Survey Area History

The radioactive operating systems present in NSY-11 are still in service. They include the radioactive drain system piping from the hot side chemistry lab, the personnel decontamination showers, the control point sinks, floor drains and the drain from the north decon room sump pit. The liquid waste is collected in one of two 300-gallon capacity sump tank and pump combinations that pump the liquid to the temporary liquid waste storage tank.

There are no documented contaminating events associated with NSY-11, however NSY-11 is posted as a contaminated area.

Scoping/Characterization

No scoping or characterization data is available for NSY-11.

Decommissioning Activities

No decommissioning activities have been performed in NSY-11.

Survey Area Name: Chem-Waste Transfer Pump Pit Designator: **NSY-11**

Findings

The history of the NSY-11 indicates that this structure is impacted as a result of plant operations.

These radionuclides are likely distributed in media including reinforced concrete and soil. The exterior surface of the NSY-11 and surrounding soil will require further investigation.

The radionuclide mix for survey area NSY-11 includes all radionuclides identified in the radioactive systems of the plant (Ref. 1). The primary radionuclides of concern for NSY-11 are Co-60, Cs-137, Ag-108m, Sr-90, Ni-59, Ni-63 and tritium.

Current Status

Survey Area NSY-11 is still in service. No decommissioning activities have been performed in NSY-11. No sampling was conducted in this area.

Classification Statement

Based upon the radiological conditions identified in the operating history, survey area NSY-11 is identified as a Class 1 Area.

Building Historical Site Assessment and Classification Summary

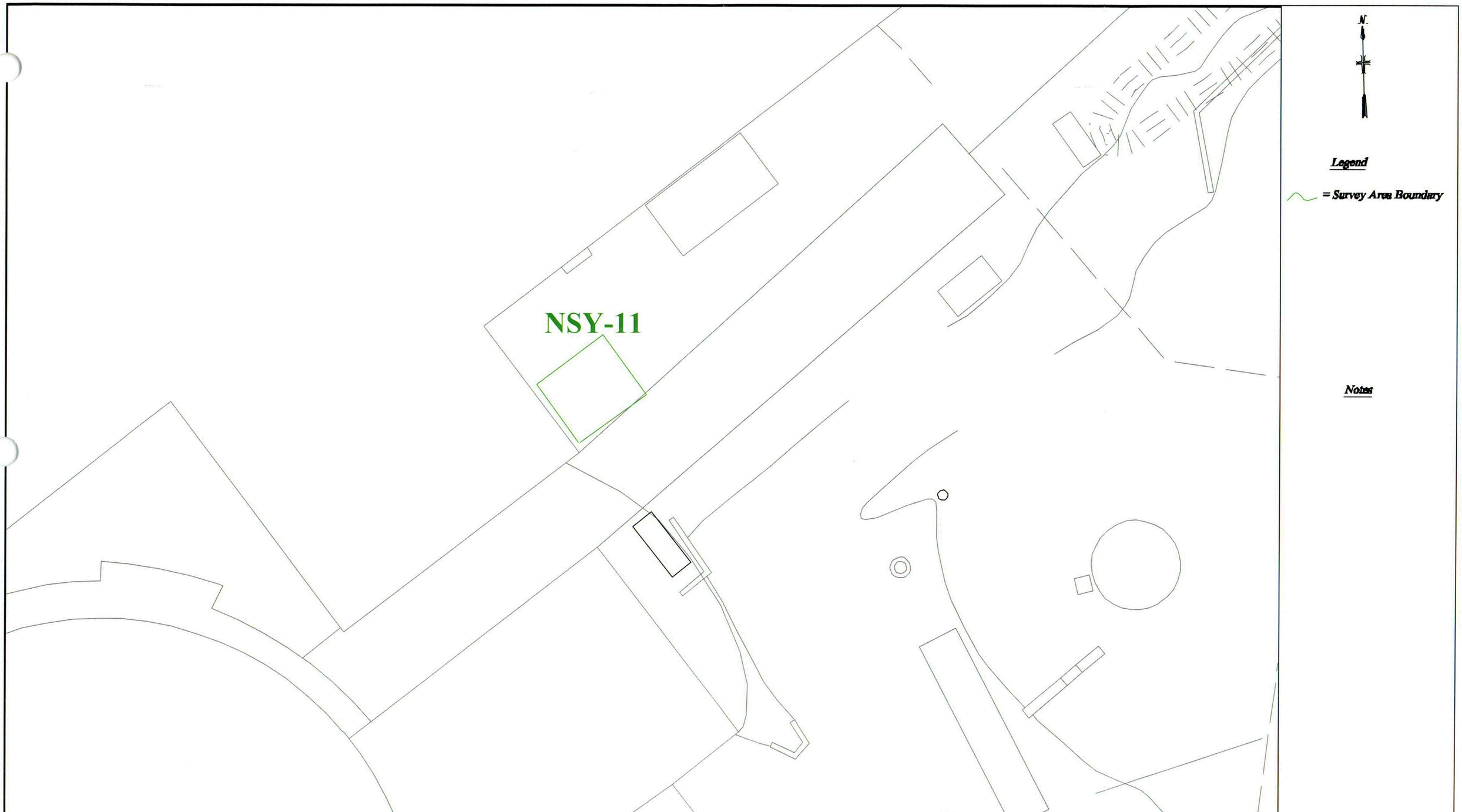
Survey Area Name: Chem-Waste Transfer Pump Pit Designator: **NSY-11**

Drawings

9699-FC-50 C

References

1.	"Radionuclides for Building Surfaces and Soil DCGL Determinations," YA-REPT-00-001-03



	Yankee Atomic Power Company *Soil Sample Locations - NSY-11*	YANKEE	*Date: October 2003* *Revision: 4*	*Figure: 36*

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