DEPARTMENT OF THE ARMY
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO ATTENTION OF

HSHB-MR-HI (40)

24 MAY 1993

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, New England Division, ATTN: CENED-PD-L, 424 Trapelo Road, Waltham, MA 02254-9149

SUBJECT: Industrial Radiation Study No. 27-43-E352-93, Reactor License Termination Verification Study, Army Material Technology Laboratory, Watertown, MA, 1 October 1992 - 9 April 1993

1. Copies of subject report with Executive Summary are enclosed. Findings, recommendation, specific requests by the Army Material Technology Laboratory (AMTL) and the Corps of Engineers (COE) personnel were discussed throughout the project. In addition to findings and the recommendation, specific issues concerning the Nuclear Regulatory Commission license, regulations and decommissioning guidelines were staffed with AMTL and COE personnel to affect the release of Building 100 for unrestricted use.

2. The final laboratory analyses of wipe test samples, air and water samples were completed on 9 April 1993. Survey data and sample analysis results needed by AMTL to expedite the decommissioning operations were provided by telephonic consultations.

3. A copy of this report has been provided to the Nuclear Regulatory Commission as per your request.

FOR THE COMMANDER:

Harris Edge

Encl

HARRIS EDGE
Chief, Industrial Health Physics Branch
Health Physics Division

CF (w/encl):
HQDA (SAILE-ESOH/Mr. Lewis Walker)
CDR, CE, ATTN: DAEN-ECS-I
CDR, AMC, ATTN: AMCSG
CDR, AMC, ATTN: AMCSF-P
CDR, LABCOM, ATTN: AMSLC-MC
CDR, MTL, ATTN: SLCMT-DD
CDR, HSC, ATTN: HSCL-P
CDR, AMEDD CTR & SCHOOL
CDR, MEDDAC, FT DEVENS, ATTN: PVNTMED SVC
CDR, WRAMC, ATTN: HSHL-H-HP

USAEHA

U.S. Army Environmental Hygiene Agency

INDUSTRIAL RADIATION STUDY NO. 27-43-E352-93
REACTOR LICENSE TERMINATION
VERIFICATION STUDY
ARMY MATERIAL TECHNOLOGY LABORATORY
WATERTOWN, MASSACHUSETTS
1 October 1992 - 9 April 1993

Nationally Recognized as the Center of Matrixed Occupational and Environmental Health Excellence

DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO
ATTENTION OF

EXECUTIVE SUMMARY
INDUSTRIAL RADIATION STUDY NO. 27-43-E352-93
REACTOR LICENSE TERMINATION
VERIFICATION STUDY
ARMY MATERIAL TECHNOLOGY LABORATORY
WATERTOWN, MASSACHUSETTS
1 October 1992 - 9 April 1993

1. PURPOSE. This study was conducted to determine the presence and extent of health hazards after decommissioning of the Research Reactor (Building 100) operated by AMTL and to verify that any residual radioactivity is in compliance with the Nuclear Regulatory Commission regulations and guidelines for decontamination of facilities and equipment prior to release for unrestricted use.

2. CONCLUSION. A review of the survey results indicate that there were no radiological health hazards identified as a result of the decommissioning operations of Building 100. All areas were effectively remediated by AMTL to comply with the Nuclear Regulatory Commission regulations and guidelines.

3. RECOMMENDATION. Recommend Building 100, to exclude the grounds surrounding Building 100, be released for unrestricted use.

DEPARTMENT OF THE ARMY
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO ATTENTION OF

HSHB-MR-HI

24 MAY 1993

INDUSTRIAL RADIATION STUDY NO. 27-43-E352-93
REACTOR LICENSE TERMINATION
VERIFICATION STUDY
ARMY MATERIAL TECHNOLOGY LABORATORY
WATERTOWN, MASSACHUSETTS
1 October 1992 - 9 April 1993

I. REFERENCES. See Appendix A for a list of references.

II. AUTHORITY.

A. AEHA Form 250-R, CENED, 28 July 1992.

B. Memorandum, COE, CENED-PD-L, 19 September 1991, subject: Decommissioning and Demolition of Research Reactor, Base Closure, Army Material Technology Laboratory (MTL), Watertown, MA.

III. PURPOSE.

A. To assess radiological contamination remaining in Building 100 after decontamination was performed by AMTL.

B. To determine if any residual radioactivity remaining after decontamination is in compliance with the Nuclear Regulatory Commission (NRC) standards for clean-up of buildings potentially contaminated with residual radioactive materials.

IV. GENERAL.

A. Meetings and briefings were conducted with Mr. Peter Cornetta, Department of the Army Civilian (DAC), Radiation Protection Officer (RPO), AMTL; CPT Joy Howard, MS, Alternate RPO, AMTL; Mr. Dennis Waskiewicz, Project Engineer, Life Cycle Project Management Section, Corps of Engineers, New England Division (CENED); Mr. Francis Donovan, Assistant Area Engineer, Eastern Area Office, CENED; and Ms. Laura Brodman, Base Realignment and Closure Office (BRAC), to discuss findings and the recommendation.

B. The study was performed by Mr. Allen Hilsmeier, DAC, Team Leader; 2LT Scott Kaeppel, MS, Onsite Team Leader; SFC Scott Goodison, USA, Senior Technician; 1LT John Cuellar, MS; and CPT Robert Gibbons, MS, during the period 1 October 1992 - 9 April 1993.

C. The above mentioned survey personnel are qualified Health Physicists and have varied expertise in radiological health issues. Each individual was provided all occupational health and safety training at AEHA and at AMTL to effect a safe working environment.

D. Laboratory analyses were performed by the Radiochemistry Analysis Branch (RAB) of the Directorate of Laboratory Services (DLS) of USAEHA.

E. The verification study is a Quality Assurance/Quality Control (QA/QC) instrument. It is used to verify an NRC licensee's final termination survey or a close-out study of operations involving radioactive material. A verification study is an independent sampling of the licensee's or installation's more elaborate study (termination or close-out), and not a complete duplication. The study is intended to supplement the termination survey and collectively ensure compliance with all applicable Federal, State, and Local radiological regulations.

F. At the time of this study, the reactor grounds and the surrounding grounds on which the reactor building is located (Building 100, reactor ground) still had on going activities involving radioactive materials. The on going activities consisted of scabbling of concrete and radioactive waste storage. A verification study of the site grounds will be performed upon termination of the current on going operations and the completion of any further required decommissioning. Therefore only the decommissioning of the interior of building 100, which was decommissioned and evaluated so the structure could be dismantled and ultimately released for unrestricted use, is included in this report. The reactor grounds will be surveyed later and its release will be in conjunction with release of the facility grounds for unrestricted use.

G. This verification study does not include the surveys of the open excavated areas outside of the reactor building where Cistern 242, the Pipe Chase, and the Secondary Coolant Pumps had been removed. These locations are small isolated areas of the entire reactor grounds. However these areas will be included in the site decommissioning and a recommendation for release will be provided with the facility grounds.

V. BACKGROUND.

A. CHRONOLOGY.

1. The AMTL open pool materials research reactor, housed in Building 100, was built in the late 1950s. It was operational between June 1960 and March 1970. The AMTL NRC License Number R-65 allowed AMTL to study molecular and atomic material structures and solid state physics.

2. The reactor was deactivated in 1970 and a deactivation report submitted to the Atomic Energy Commission (AEC) in December 1970. All the reactor fuel, exhaust filters, the radioactive waste processing system, and many of the reactor components were removed from Building 100 and disposed in accordance with NRC and Army procedures.

3. Project management for final decommissioning of the facility was conducted through the U.S. Army Corps of Engineers, New England Division, which in turn contracted Morrison Knudsen Corporation (MK) as the prime contractor for the decommissioning. The MK contracted Scientific Ecological Group, Inc. (SEG) to provide radiation protection support.

4. The reactor building had a radiological characterization survey performed in 1990 to assess the residual radioactive waste. The physical decommissioning of the AMTL reactor commenced in June 1992.

5. The USAEHA started its document review and preliminary site investigation in October 1992.

6. Decommissioning of the reactor by the licensee was completed in January 1993. In January of 1993, USAEHA began reviewing SEG's working termination files of the reactor. These files were the raw data and field notes recorded by the termination survey teams.

7. In February and March 1993, USAEHA conducted a verification study. The verification study consisted of an independent survey of 10 percent of the grid system surveyed by SEG. In addition, a biased sampling was conducted of special areas where residual radioactivity could have accumulated.

8. The USAEHA provided preliminary results of the verification study to AMTL on 30 March 1993. This telephonic communication stated that all measurements and samples were below NRC guideline values.

B. SITE CONDITION AT TIME OF VERIFICATION STUDY.

1. Before MK began decommissioning Building 100, it housed the control room, the reactor vessel, a coolant system, a gamma well facility, two platforms above ground level to conduct experiments, the bioshield made of high density concrete impregnated with lead shot, the walls on each floor, floor areas and equipment (see Diagram 1a).

2. After decommissioning, the only remaining areas were the outer walls of Building 100, a basement, a gamma well, a sump, several excavated ditches in the floor of the basement, two airlocks, the newly constructed equipment shed, and the 10-ton rotatable crane (see Diagram 1b).

3. The walls and the crane were lined with scaffolding for easy access to all survey grids. The survey grids covered the entire surface of all walls and ceilings.

4. Every area within Building 100 was classified as an affected area as defined in the decommissioning plan approved by the NRC. An affected area is defined as an area that has potential or known radioactive contamination.

5. Building 100 is surrounded by grass and is connected to Building 97 through Airlock #1. Service piping from Building 100 to Building 97 was removed and the excavation, i.e., the pipe chase, was left open for future survey. Cistern 242, and the secondary coolant sump, with pumps and piping to the reactor, was also removed and the open excavation left uncovered for future surveys (see Diagram 2).

6. The survey data packets prepared by SEG of Building 100 and surrounding excavation sites showed that all residual radioactive contamination was below NRC guidelines.

C. IDENTITY OF POTENTIAL CONTAMINANTS/RELEASE GUIDELINES.

1. As a result of the characterization survey and the termination survey, the significant radiological contaminants were determined to be cesium-137, isotopes of europium, cobalt-60, and tritium. On the basis of this combination of contaminants, the surface contamination guideline values for the site are as stated in NRC Regulatory Guide 1.86 and Title 10 and Code of Federal Regulations (10 CFR), Part 20 (see Table 1a and 1b).

Table 1a.
Acceptable Surface Contamination Levels
Excerpt from NRC Regulatory Guide 1.86

NUCLIDE[a]	AVERAGE[b c]	MAXIMUM[b d]	REMOVABLE[b e]
Transuranics, Ra-226, Ra-228 and other Alpha Emitters	100 dpm/100cm^2	300 dpm/100cm^2	20 dpm/100cm^2
Beta-gamma emitters	5000 dpm/100cm^2	15000 dpm/100cm^2	1000 dpm/100cm^2

[a]Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists,the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

[b]As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c]Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

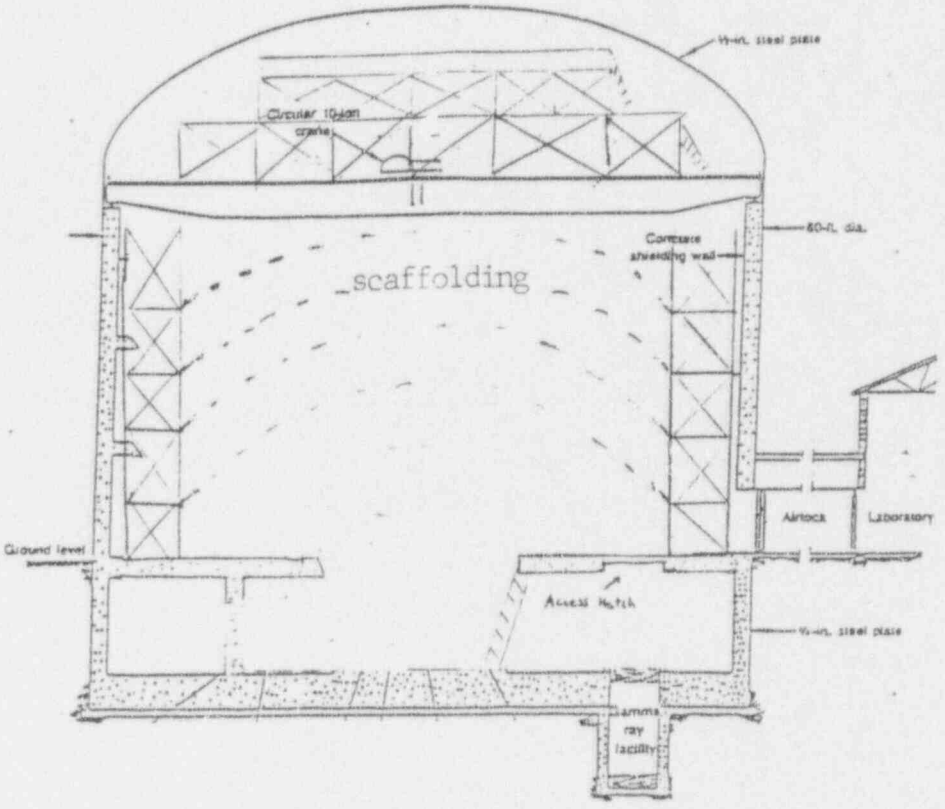
[d]The maximum contamination level applies to an area of not more than 100cm^2.

[e]The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

Table 1b.
Concentrations in Air and Water
Above Natural Background
Excerpt from 10 CFR Part 20 Appendix B Table 2

Isotope	uCi/ml in Air	uCi/ml in Water
Cesium 137	2×10^{-10}	1×10^{-6}
Cobalt 60	2×10^{-10}	3×10^{-6}
Tritium (Hydrogen 3)	1×10^{-7}	1×10^{-3}
Europium 154	3×10^{-11}	7×10^{-6}
Europium 152	3×10^{-11}	1×10^{-5}

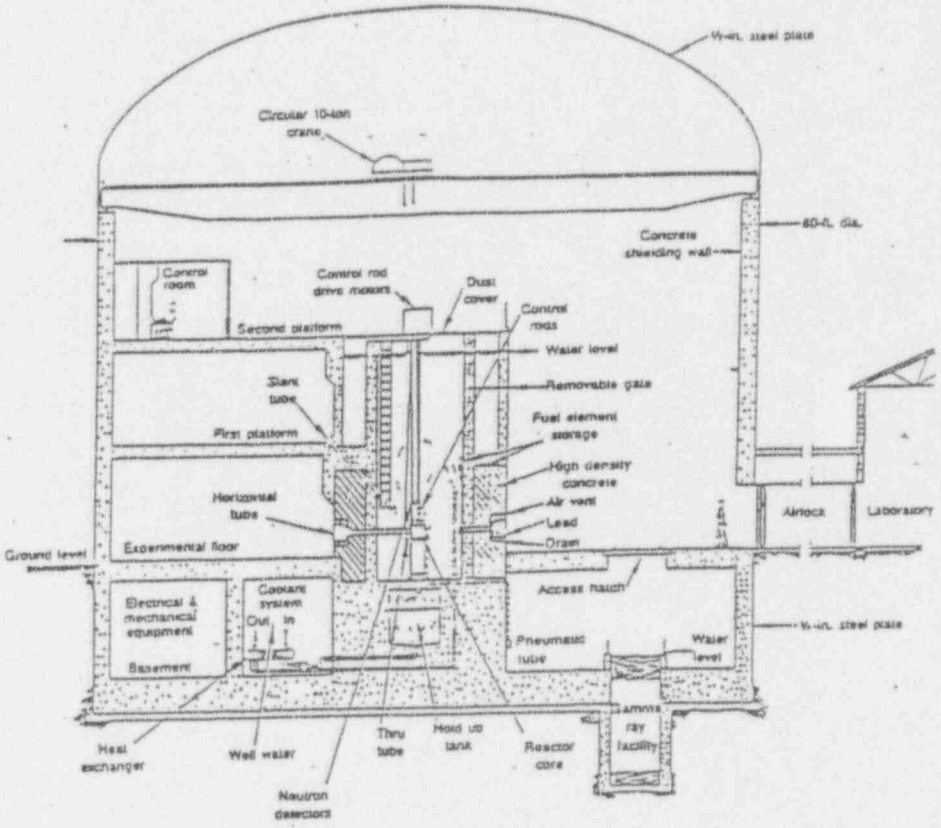
GRAPHICAL ILLUSTRATION



Building 100

Diagram 1b.	DATE 21 May 1993
	DRAWN SJK
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY	APPROVED HE
UNITED STATES ARMY MEDICAL DEPARTMENT	SCALE NTS
	PLATE

GRAPHICAL ILLUSTRATION



Building 100

Diagram 1a.

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

DATE 21 May 1993

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GRAPHICAL ILLUSTRATION

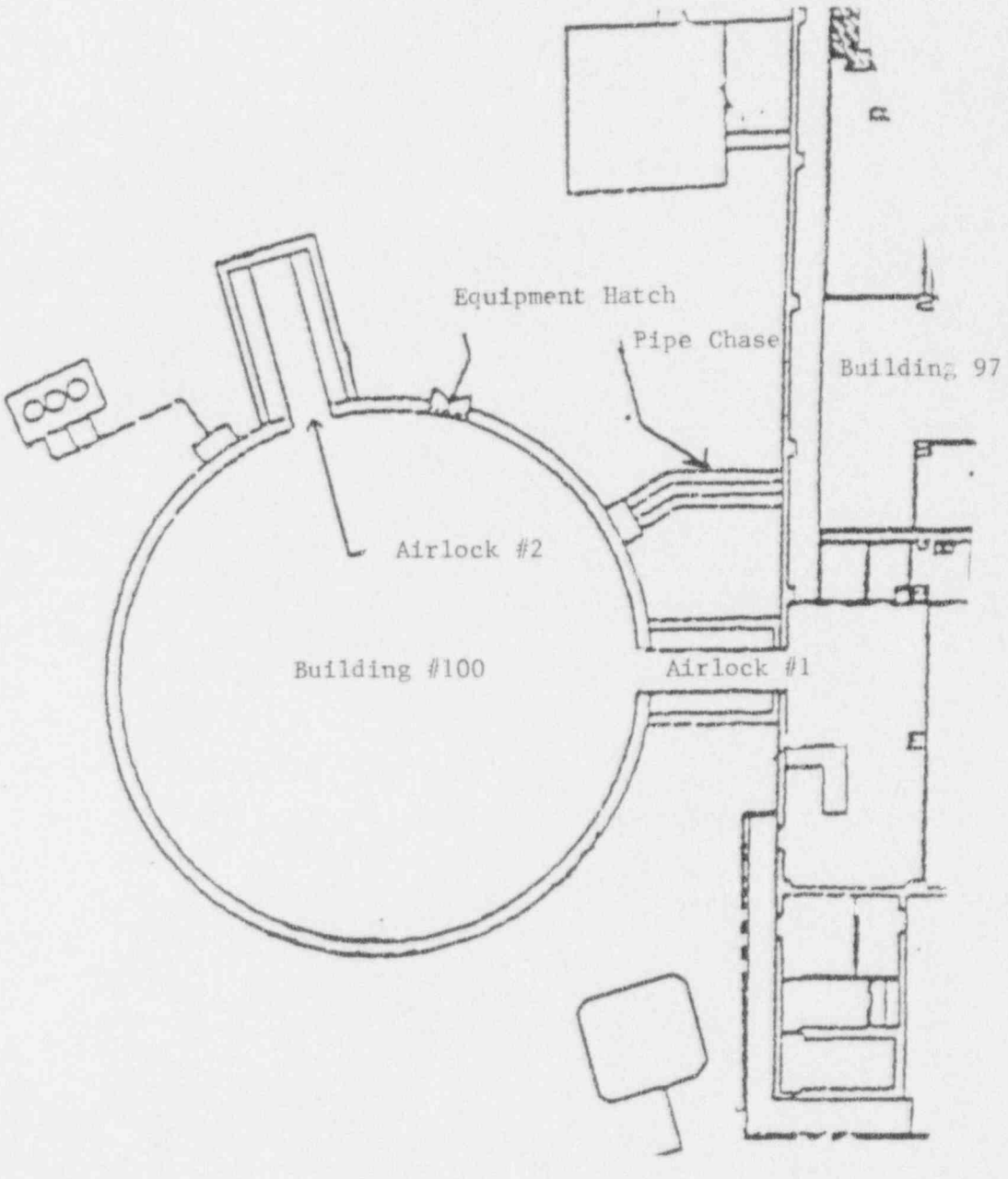

Diagram 2

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

DATE 21 May 93
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VI. RADIATION SURVEYS AND RESULTS.

A. INSTRUMENTATION/EQUIPMENT.

1. A list of instruments, parameters, efficiencies, and MDA are provided in Table 2. All survey meters were calibrated on a quarterly basis. Efficiencies were determined with a radioisotope traceable to National Institute of Standards and Technology (NIST) which had energies similar to the energies of the isotopes listed in paragraph V.C.1. above.

2. An efficiency factor was developed for alpha and beta instruments to correlate the meter reading to the actual radioactivity present.

3. A conversion factor was applied to extrapolate from the probe surface area to a normalized 100 square centimeter surface area.

4. The efficiency value of the instrument coupled with the surface area conversion factor was used to record the final reading into standardized regulatory criteria expressed in disintegrations per minute (dpm) per 100 square centimeters.

5. The sensitivity of the gamma survey meter was taken from NUREG/CR-5849, Table 5-6.

6. All portable survey meters were checked for operability prior to packaging and shipping to AMTL, upon arrival at the survey site, before each day of surveying, during the survey and after any malfunctions or repairs.

a. Alpha. Operational instrument checks were performed with a NIST traceable thorium-230 source with an activity of 6780 dpm verified on 3 June 1992. All operational checks were made on contact with the alpha source. The same procedures were used for each check to assure reproducability. Each operational check was 2850 cpm/probe area $\pm$ 16 %.

b. Beta. Operational instrument checks were performed with a NIST traceable technetium-99 source with an activity of 5990 dpm verified 4 June 1992. All operational checks were made at 1 cm from the beta source. Each operational check was 1200 cpm/probe area $\pm$10 %.

c. Gamma. Operational instrument checks were performed with a NIST traceable cesium-137 source with an activity of 1.1 μCi verified 12 June 1992. Each operational check was 320 μR/hr $\pm$10 %.

Table 2
INSTRUMENTATION

	ALPHA	BETA	GAMMA
Make	Eberline	Eberline	Eberline
Model	ESP-2	E-520	PRM-7
Serial Number	00358	315	435
Calibration Date	13 Jan 93	4 Dec 92	17 Nov 92
Efficiency	41.3%	20.0%	11.8%
Average Background < Background >	1 cpm	50 cpm	9 uR/hr
MDA[a]	74 dpm/100cm^2	2900 dpm/100cm^2	*

* The Eberline PRM-7 sensitivity is approximately 1 μR/hr (reference 1, page 5.14).

[a] The MDA of a ratemeter instrument for surface activity measurements can be approximated by taking twice the time constant of the meter as the counting time and using the relationship:

$$MDA = \frac{4.65 * (B_R/(2*t_c))^{1/2}}{E * (A / 100)}$$

MDA = activity level in disintegrations/minute/100cm2
B_R = background rate in counts/minute
t_c = meter time constant in minutes
E = detector efficiency in counts/disintegration
A = active probe area in cm^2

PROBES

Make	Eberline	Eberline	Internal
Model	AC-3	HP-210	1x1 NaI(Tl)

B. INSTRUMENTATION SURVEY.

1. The instrumentation survey was conducted in the pre-established area classification, as described by the decommissioning plan, and in the established grid system used by SEG in the Termination Survey. Building 100 was divided into smaller sections to allow easier manageability of data. The subsections are found in Appendix B with the survey results.

2. The AEHA reviewed SEG's data for each surveyed area, and evaluated elevated survey results in relationship to the survey grid system. The survey grid system used alpha numeric designator. Rows would be designated by a letter and columns designated by a number. The AEHA randomly selected 10 % of the grids surveyed by SEG and included some biased grids which had elevated readings during the review of data. Field survey packets were assembled to include background values, flag values, and grids to be surveyed for each type of radiation.

3. Flag values, or action levels, were established for each type of survey instrument used. Flag values were established by taking 70% of the guideline values found in Table 1a. If any instrument reading exceeded the flag values, then a more thorough investigation of that area would be conducted to determine if the detected radiation was above guidelines listed in Tables 1a and 1b.

4. Along with surveying 10% of the grids in Building 100, AEHA conducted independent surveys on areas where residual radioactivity would likely be found. The survey officers surveyed cracks in the floors, seams where walls met floors, holes in the walls, pipes entering Building 100, and other areas. All these independent surveys resulted in only background radiation being detected.

C. SURVEY RESULTS.

1. Background Results. Background measurements were taken from an unaffected area (as determined by the decommissioning plan approved by the NRC) of a building located on MTL. Five background measurements were taken for each type of radiation to be monitored. The average background values were established at a 95 % confidence level.

a. Alpha. Background instrumentation readings varied from 0 to 2 counts per minute (cpm). The average background alpha activity was 1 cpm/probe area. After correction for probe area and efficiency, the background was established at 2 dpm/100 cm^2. All alpha radiation measurements were taken at 1 centimeter (cm) or

less from the background surface.

b. Beta. Background instrumentation readings varied from 40 to 60 cpm. The average background beta activity was 50 cpm/probe area. After correction for probe area and efficiency, the background was established at 1600 dpm/100 cm^2. All measurements were taken at about 1 cm from the background surface.

c. Gamma. Background instrumentation readings varied from 7 to 10 μR/hr. The average background gamma exposure was 9 μR/hr. All gamma measurements were taken at 1 meter from the background surface.

2. Instrumentation Survey Results.

a. Alpha Instrumentation Results. The fixed alpha activity ranged from a low of less than MDA to a maximum of 208 dpm/100 cm^2 above background. The average of 5 points within a square meter around the 208 dpm/100cm^2 was less than 100 dpm/100cm^2. The MDA was determined to be 74 dpm/100 cm^2. All alpha activity results and locations of surveys are presented in Appendix B. All readings were taken at 1 cm or less from the surface for at least 4 seconds for each reading. One reading was taken in the center of the survey grid.

b. Beta Instrument Results. The beta activity ranged from a low of less than the MDA to a maximum of 2600 dpm/100 cm^2 above background. The average beta background was 1600 dpm/100cm^2. The MDA was determined to be 2900 dpm/100 cm^2. All beta-gamma survey results and locations are presented in Appendix B. A survey was first conducted over the survey grid to be monitored. Five meter readings were then taken at 1 cm from the surface. The instrument was held stationary for 4 seconds for each reading.

c. Gamma Instrument Results. Each grid was surveyed to identify any potential hot spots. A gamma reading was taken from the location in the grid with the highest activity. The results listed in Appendix B are the highest values recorded for the instrumentation survey. When the background of 9 μR/hr is subtracted from the highest value of 19 μR/hr at the surface, 10 μR/hr is the highest exposure above background. When the inverse square law is applied to the 10 μR/hr at 1 meter, the highest reading at 1 meter is well within the regulatory limits of 5 μR/hr above background. In addition to this more stringent analysis, exposure rate measurements were taken at 1 meter above the surface to verify that a uniformly distributed low level of contamination was not present on the surface. The instrumentation surveys indicated only background readings.

3. Wipe Test Surveys. Wipe test surveys were performed to determine the presence of removable contamination on surface areas. Wipe test surveys were performed in each grid surveyed in Building 100. All wipe test samples were collected and analyzed for gross alpha and gross beta activity. If any activity was found higher than 50 percent of the guideline values listed in the NRC Regulatory Guide 1.86, then a gamma spectral analysis was performed for that sample. Blank wipes were used to screen for cross contamination.

a. The gross alpha activity ranged from a low of less than 1 dpm/100cm^2 to a high of 1 $\pm$ 1 dpm/100cm^2. The lower limit of detection at 95 % confidence level was determined to be less than 2 dpm/100 cm^2. All gross alpha activity results and locations where wipe tests were taken are included in Appendix B.

b. The gross beta-gamma activity ranged from a low of less than 3 dpm/100cm^2 to a high of 6 $\pm$ 3 dpm/100 cm^2. The lower limit of detection at 95 % confidence level was determined to be less than 3 dpm/100 cm^2. All gross beta-gamma activity results and locations where wipe tests were taken are included in Appendix B.

4. Water Samples. The floor of Building 100 is all concrete. There is a gamma well and a sump well located in the basement. Both wells had water in them at the time of the survey. The water was first stirred and then a sample was collected. The water samples were analyzed for tritium, and by gamma spectral analysis to determine the presence of tritium or any gamma radiation emitters. The results of the tritium analysis and the gamma spectrum analysis are found in Table 3. The water sample results indicate that the activities for all interested isotopes were less than the minimum detectable activities.

5. Air Samples. Building 100 was one large open area after the contractors removed all contamination. The air sample was collected at breathing zone level from the center of the floor area in Building 100. The sample was analyzed for gross alpha and gross beta activity. The results indicated that the gross alpha and gross beta-gamma activities were less than the minimum detectable activities. The air sample results show that radioactivity in the air was lower than the most restrictive isotope listed in Table 1b.

TABLE 3
WATER SAMPLES RESULTS

	Liquid Scintillation Results	RESULTS OF GAMMA SPECTRAL ANALYSIS			
Sample Identification	Microcuries per Milliliter as of Collection Date at 95% confidence level				
	H-3	I-131	Cs-137	Eu-154	Co-60
# 2-Reactor Gamma Well	$< 4.7 \times 10^{-5}$	$< 3 \times 10^{-7}$	$< 2 \times 10^{-7}$	$< 6 \times 10^{-7}$	$< 2 \times 10^{-7}$
# 3-Reactor Sump	$< 4.8 \times 10^{-5}$	$< 3 \times 10^{-7}$	$< 2 \times 10^{-7}$	$< 5 \times 10^{-7}$	$< 2 \times 10^{-7}$

The < in the above results indicates < MDA. The values given are the MDA for that isotope for that type of analysis.

Table 4
RESULTS OF GROSS ALPHA AND GROSS BETA OF THE AIR FILTER ANALYSIS

Sample Identification	Microcuries per Milliliter of Air at 95 % confidence level	
#1-Reactor Air Sample	Gross Alpha $< 1.3 \times 10^{-13}$	Gross Beta $< 3 \times 10^{-13}$

The < in the above results indicates < MDA. The values given are the MDA for that isotope for that type of analysis.

VII. CONCLUSIONS. A review of the survey results indicate that there were no radiological health hazards identified as a result of the decommissioning operations involved with Building 100.

VIII. RECOMMENDATIONS. Recommend Building 100, to exclude the surrounding grounds, be released for unrestricted use and the surrounding grounds transferred over to one of the other facility licenses.

ALLEN E. HILSMEIER
Health Physicist
Health Physics Division

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Health Physics Division

SCOTT G. GOODISON
SFC, USA
Health Physics Specialist
Health Physics Division

APPROVED:

HARRIS EDGE
Chief, Industrial Health Physics
Branch
Health Physics Division

APPENDIX A

REFERENCES

1. NUREG/CR-5849, Manual for Conducting Radiological Surveys in Support of License Termination, Draft Report for Comment, June 1992.

2. NRC Regulatory Guide 1.86, Termination of Operating Licenses for Nuclear Reactors, June 1974.

3. U. S. Army Materials Technology Laboratory Research Reactor Decommissioning, Final Survey Report, Volume 1 of 1, March 1993.

4. The Health Physics and Radiological Health Handbook, Nucleon Lectern Associates, 1984.

5. Title 10, Code of Federal Regulations (CFR), 1992 Rev., Parts 30.36 and 70.38, Nuclear Regulatory Commission (NRC).

6. Title 40, CFR, 1991 Rev., Chapters 260 and 261, Environmental Protection Agency (EPA).

7. NUREG/CR-2082, Monitoring for Compliance with Decommissioning Termination Survey Criteria, June 1981.

8. AR 385-11, May 1980, Ionizing Radiation Protection (Licensing, Control, Transportation, Disposal, and Radiation Safety).

9. Federal Register, Part VI, Nuclear Regulatory Commission, 10 CFR Part 20 et. al., Standards for Protection Against Radiation; Final Rule, Tuesday May 21, 1991.

APPENDIX B

RADIOLOGICAL SURVEY RESULTS

Reactor Building 100
Interior of the Ceiling Dome
4 February 1993

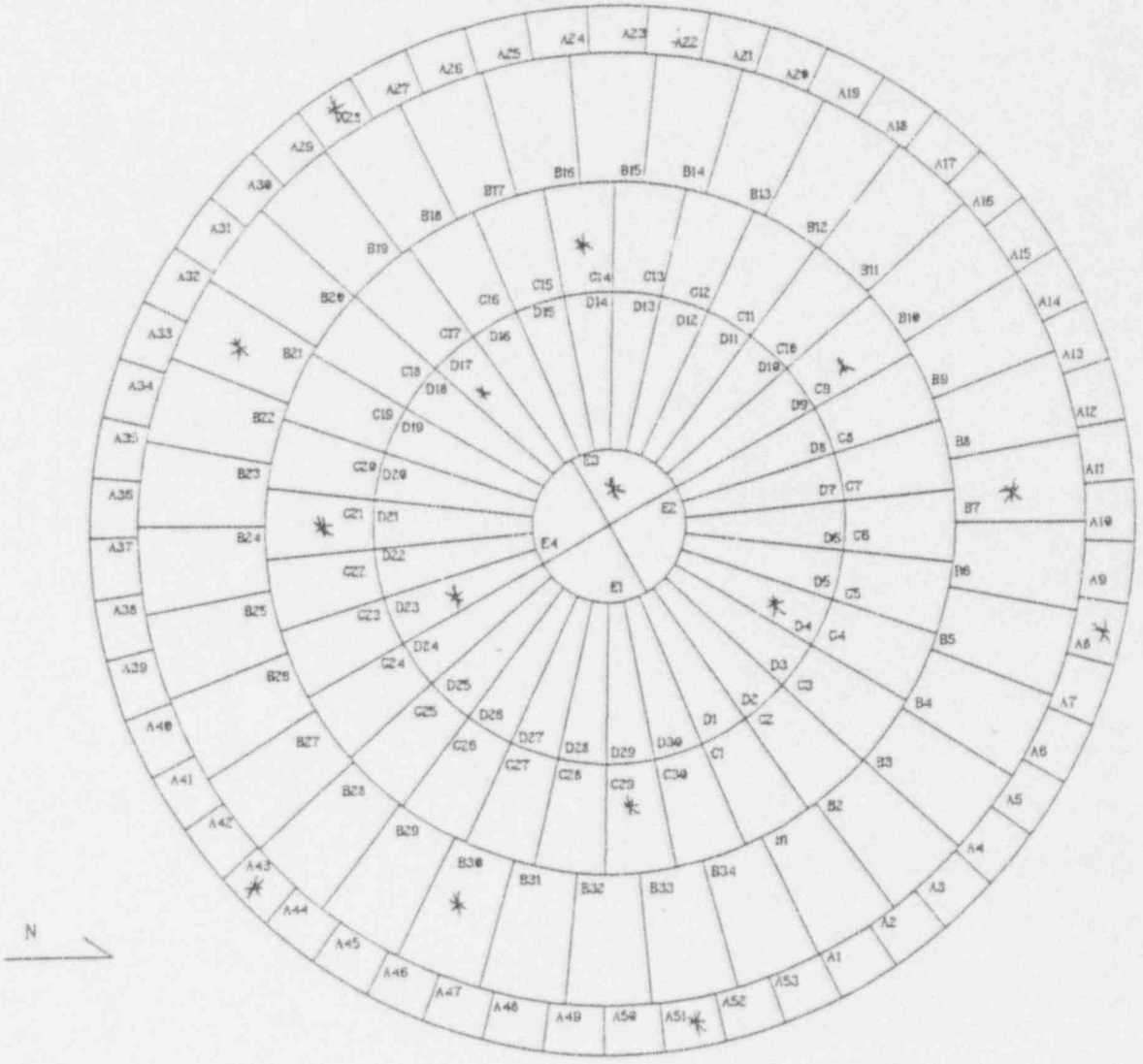
Location Code	Gross* alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm²]	uR/hr	[dpm/100cm²]					[dpm/100cm²]		
MDAs = = >	MDA = 79		MDA = 2900					± 2 standard deviations		
A43	<MDA	5	<MDA	<MDA	<MDA	<MDA	3200	< 1	< 3	70
E03	<MDA	4	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	57
D17	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	58
D23	<MDA	4	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	59
D04	<MDA	3	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	60
C09	<MDA	4	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	61
C29	<MDA	3	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	64
C14	<MDA	4	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	62
C21	100	3	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	63
A28	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	71
A08	<MDA	4	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	68
A51	<MDA	4	<MDA	3900	3500	3200	<MDA	< 1	< 3	69
B30	110	3	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	65
B21	<MDA	3	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	66
B07	<MDA	4	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	67

* Maximum in 1 square meter

Background was not subtracted from above data.

Alpha background = 2 dpm/100cm²
Beta background = 1600 dpm/100cm²
Gamma background = 9 uR/hr

GRAPHICAL ILLUSTRATION



REACTOR BUILDING CEILING - DOME

Interior of the Ceiling Dome

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

DATE 24 May 93

DRAWN JSB

APPROVED HE

SCALE NTS

PLATE

Reactor Building 100
Interior Retainment Wall
4 February 1993

Location Code	Gross* alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm²]	uR/hr	[dpm/100cm²]					[dpm/100cm²]		
MDAs = = >	MDA = 79		MDA = 2900					± 2 standard deviations		
A11	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	72
A26	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	73
A36	86	10	3200	<MDA	<MDA	<MDA	<MDA	< 1	< 3	74
A51	98	9	<MDA	<MDA	3200	<MDA	3200	< 1	< 3	75
A65	<MDA	9	<MDA	<MDA	3200	3200	3200	< 1	< 3	76
B3	78	9	<MDA	3200	<MDA	<MDA	<MDA	< 1	< 3	77
B23	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	78
B31	<MDA	8	<MDA	<MDA	3200	<MDA	<MDA	< 1	< 3	79
B44	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	80
B58	<MDA	10	<MDA	<MDA	<MDA	3200	<MDA	< 1	< 3	81
B71	<MDA	10	<MDA	<MDA	3200	<MDA	<MDA	< 1	< 3	82
C3	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	83
C6	<MDA	10	<MDA	<MDA	3200	<MDA	<MDA	< 1	< 3	84
C16	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	85
C23	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	86
D1	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	90
D9	<MDA	9	<MDA	<MDA	<MDA	3200	<MDA	< 1	< 3	89
D19	94	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	88
D21	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	87
D25	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	91
E5	<MDA	8	<MDA	<MDA	3200	<MDA	<MDA	1 ± 1	< 3	92
E13	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	93
E14	180	13	3200	<MDA	<MDA	<MDA	<MDA	< 1	< 3	94
E18	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	95
F2	130	9	<MDA	3200	<MDA	<MDA	<MDA	< 1	< 3	97

* Maximum in 1 square meter

Background was not subtracted from above data.

Alpha background = 2 dpm/100cm²
Beta background = 1600 dpm/100cm²
Gamma background = 9 uR/hr

Reactor Building 100
Interior Retainment Wall
4 February 1993

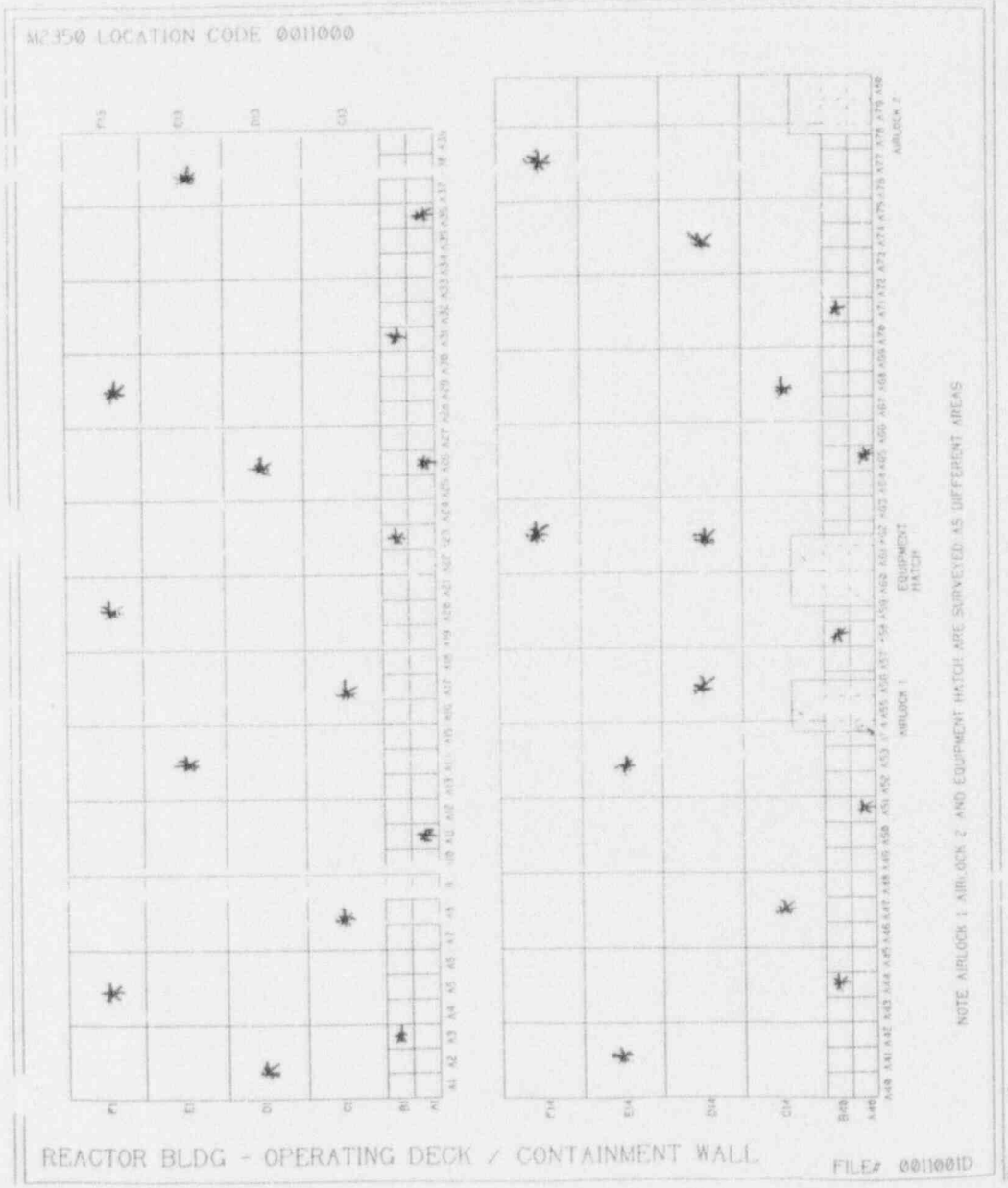
Location Code	Gross* alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm²]	uR/hr	[dpm/100cm²]					[dpm/100cm²]		
MDAs = = >	MDA = 79		MDA = 2900					± 2 standard deviation		
F7	94	17	<MDA	3500	<MDA	3500	<MDA	< 1	< 3	98
F10	<MDA	17	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	99
F21	<MDA	19	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	100
F26	<MDA	9	<MDA	<MDA	3200	<MDA	<MDA	< 1	< 3	96

* Maximum in 1 square meter

Background was not subtracted from above data

Alpha background = 2 dpm/100cm²
Beta background = 1600 dpm/100cm²
Gamma background = 9 uR/hr

GRAPHICAL ILLUSTRATION



Interior Retainment Wall

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

DATE 24 May 93

DRAWN JSB

APPROVED HE

SCALE NTS

PLATE

Reactor Building 100
Interior Operation Deck Floors 1 and 2
9 February 1993

Location Code	Gross[a] alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm^2]	uR/hr	[dpm/100cm^2]					[dpm/100cm^2]		
MDAs = = >	MDA = 79		MDA = 2900					± 2 standard deviations		
F01-C2	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	111
F01-A5	<MDA	9	<MDA	3200	<MDA	<MDA	<MDA	< 2	< 3	110
F01-D4	<MDA	9	<MDA	3200	<MDA	<MDA	<MDA	< 2	< 3	109
F01-F3	<MDA	8	3200	<MDA	<MDA	<MDA	<MDA	< 2	< 3	108
F01-F6	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	107
F01-G8	<MDA	9	<MDA	<MDA	3200	<MDA	<MDA	< 2	< 3	106
F01-I7	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	105
F01-J10	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	103
F01-K8	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	104
F01-L11	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	102
F01-M13	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	101
F02-M2	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	112
F02-J3	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	113
F02-I5	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	115
F02-I7	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	116
F02-G10	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	117
F02-F4	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	118
F02-F7	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	119
F02-D6	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	120
F02-D12	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	114
F02-C13	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	121
F02-A9	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	122

[a] Maximum in 1 square meter

Background was not subtracted from above data.

Alpha background = 2 dpm/100cm^2
Beta background = 1600 dpm/100cm^2
Gamma background = 9 uR/hr

Reactor Building 100
Interior Operation Deck Floors 3 and 4
9 February 1993

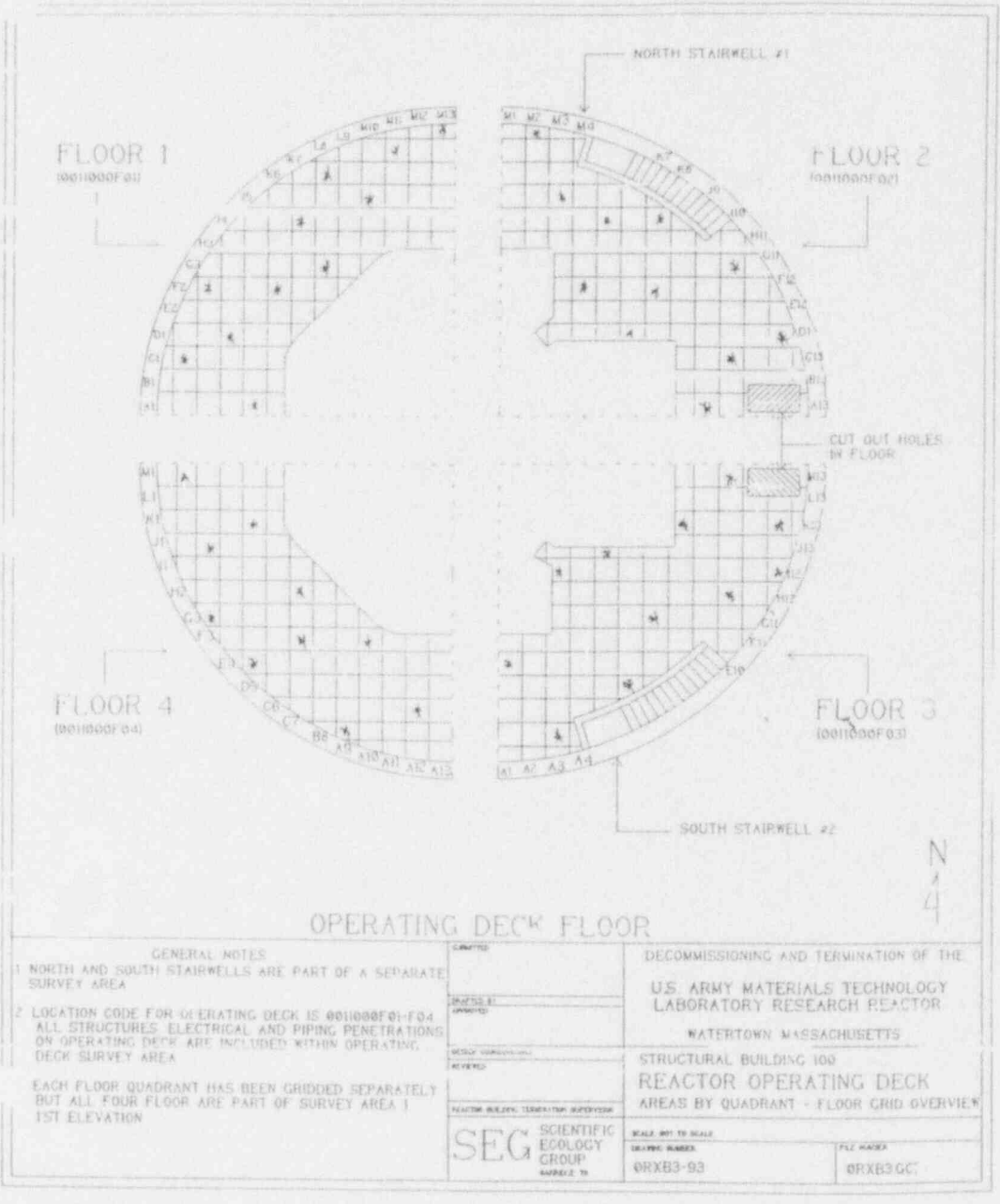
Location Code	Gross* alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm²]	uR/hr	[dpm/100cm²]					[dpm/100cm²]		
MDAs= = >	MDA = 79		MDA = 2900					± 2 standard deviations		
F03-E1	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	138
F03-B3	<MDA	9	<MDA	<MDA	4200	<MDA	<MDA	< 2	< 3	139
F03-D6	120	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	140
F03-G7	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	137
F03-H10	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	136
F03-I3	<MDA	8	<MDA	<MDA	<MDA	<MDA	3200	< 2	< 3	135
F03-J5	<MDA	9	<MDA	<MDA	<MDA	<MDA	3200	< 2	< 3	134
F03-I12	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	133
F03-K8	<MDA	8	<MDA	3200	<MDA	<MDA	<MDA	< 2	< 3	132
F03-K12	<MDA	9	<MDA	<MDA	<MDA	3200	<MDA	< 2	< 3	131
F03-M10	140	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	130
F04-M2	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	150
F04-J3	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	149
F04-G3	210	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	148
F04-E4	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	147
F04-K5	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	146
F04-K5	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	145
F04-H6	<MDA	7	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	144
F04-F6	<MDA	9	<MDA	<MDA	<MDA	3900	3200	< 2	< 3	143
F04-F10	<MDA	9	<MDA	3900	3200	<MDA	<MDA	< 2	< 3	142
F04-B9	120	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	141

* Maximum in 1 square meter

Background was not subtracted from above data.

Alpha background = 2 dpm/100cm²
Beta background = 1600 dpm/100cm²
Gamma background = 9 uR/hr

GRAPHICAL ILLUSTRATION



Interior Operation Deck Floors 1,2,3, and 4

DATE 24 May 93
DRAWN JSB
APPROVED HE
SCALE NTS
PLATE

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

Reactor Building 100
Basement Area 1
9 February 1993

Location Code	Gross* alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm²]	uR/hr	[dpm/100cm²]					[dpm/100cm²]		
MDAs = = >	MDA = 79		MDA = 2900					± 2 standard deviations		
F01-A2	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	123
F01-B4	<MDA	12	<MDA	3900	<MDA	<MDA	<MDA	< 2	< 3	124
F01-C6	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	125
F01-D8	<MDA	7	3200	<MDA	<MDA	<MDA	<MDA	< 2	< 3	126
F01-E11	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	127
F01-F13	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	128
F01-G12	<MDA	10	3200	3900	<MDA	<MDA	<MDA	< 2	< 3	129
F01-L13	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	150
F01-K11	<MDA	8	<MDA	<MDA	3200	<MDA	3200	< 2	< 3	151
F01-J9	<MDA	9	3900	<MDA	<MDA	<MDA	<MDA	< 2	< 3	152
F01-H9	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	153
F01-I7	<MDA	10	<MDA	<MDA	3200	3200	<MDA	< 2	< 3	154
F01-F4	<MDA	8	3200	3200	<MDA	<MDA	<MDA	< 2	< 3	155
W01-A1	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	156
W01-D3	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	184
W01-E5	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	185
W01-A6	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	157
W01-C8	<MDA	12	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	161
W01-E10	<MDA	10	<MDA	<MDA	<MDA	3200	<MDA	< 2	< 3	179
W01-A12	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	158
W01-C14	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	160

* Maximum in 1 square meter

Background was not subtracted from above data.

Alpha background = 2 dpm/100cm²
Beta background = 1600 dpm/100cm²
Gamma background = 9 uR/hr

Reactor Building 100
Basement Area 1
9 February 1993

Location Code	Gross* alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm²]	uR/hr	[dpm/100cm²]					[dpm/100cm²]		
MDAs= = >	MDA = 79		MDA = 2900					± standard deviation		
W01-E16	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	178
W01-C18	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	162
W01-A21	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	159
W01-E09	<MDA	10	<MDA	*	*	*	*	< 2	< 3	171
W01-P16	<MDA	10	<MDA	*	*	*	*	< 2	< 3	180
W01-E02	<MDA	9	<MDA	*	*	*	*	< 2	< 3	170
W01-P02	<MDA	9	<MDA	*	*	*	*	< 2	< 3	183
W02-B2	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	175
W02-B6	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	176
W02-12	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	182
W03-A2	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	172
W03-B6	<MDA	10	<MDA	<MDA	<MDA	3200	3200	< 2	< 3	173
W03-A11	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	174
W04-C2	<MDA	9	<MDA	<MDA	<MDA	<MDA	3200	< 2	< 3	166
W04-A4	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	165
W05-A1	120	12	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	163
W05-C4	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	164
C1-B2	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	181
C1-A8	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	177
F01-S07	210	12	3200	*	*	*	*	< 2	< 3	167
F01-S10	<MDA	11	<MDA	*	*	*	*	< 2	< 3	168
F01-S01	<MDA	12	<MDA	*	*	*	*	< 2	< 3	169

* Maximum in 1 square meter

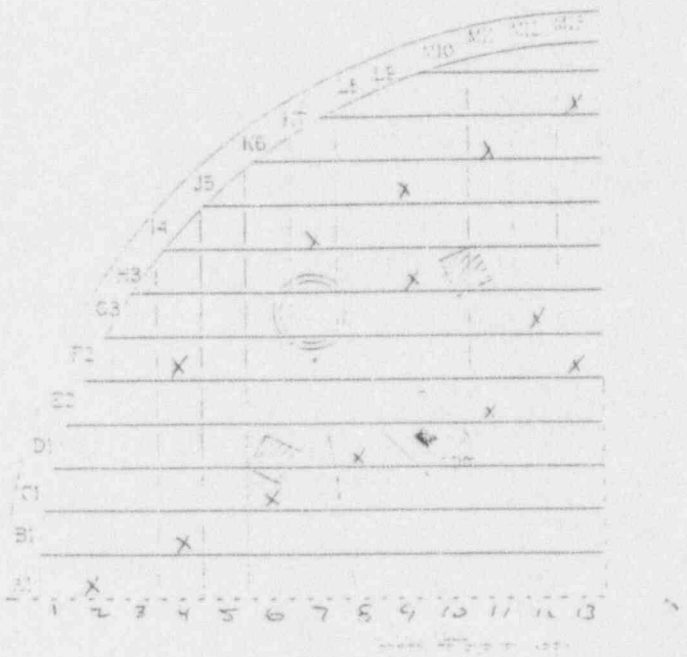
Background was not subtracted from above data.

Alpha background = 2 dpm/100cm²
Beta background = 1600 dpm/100cm²
Gamma background = 9 uR/hr

* Structure surveyed not large enough for five readings.
The structure was surveyed and the highest value recorded.

GRAPHICAL ILLUSTRATION

Survey Unit ID _____



M2350 LOCATION CODE - 0010000

REACTOR BUILDING BASEMENT
AREA 1 - FLOOR

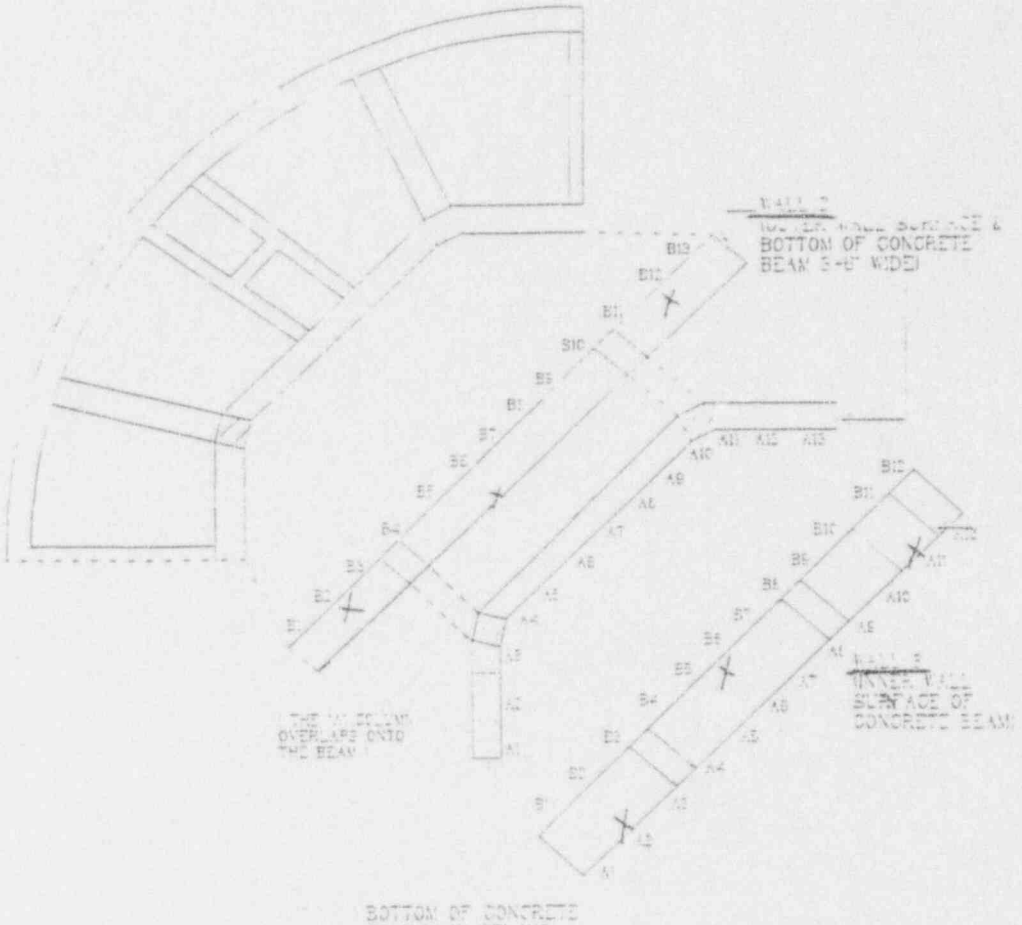
N

FILE= 000RXB1

Basement Area 1	DATE 24 May 93 DRAWN JSB
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY UNITED STATES ARMY MEDICAL DEPARTMENT	APPROVED HE SCALE NTS PLATE

GRAPHICAL ILLUSTRATION

Survey Unit ID _____



M2350 LOCATION CODE - 0010000

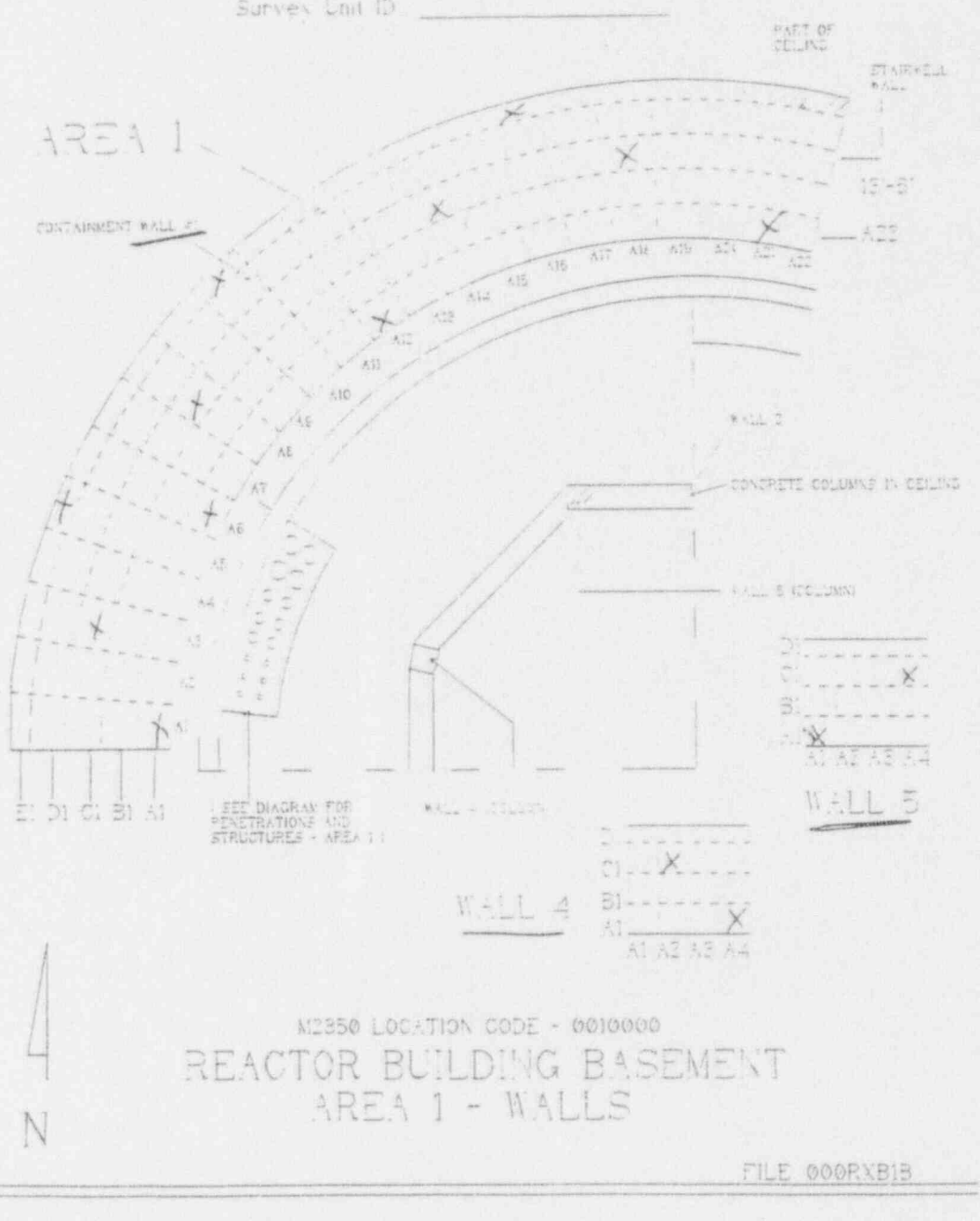
REACTOR BUILDING BASEMENT
AREA 1 - WALLS

FILE# 000RXB6A

N

Basement Area 1	DATE 24 May 93 DRAWN JSB APPROVED HE SCALE NTS PLATE
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY UNITED STATES ARMY MEDICAL DEPARTMENT	

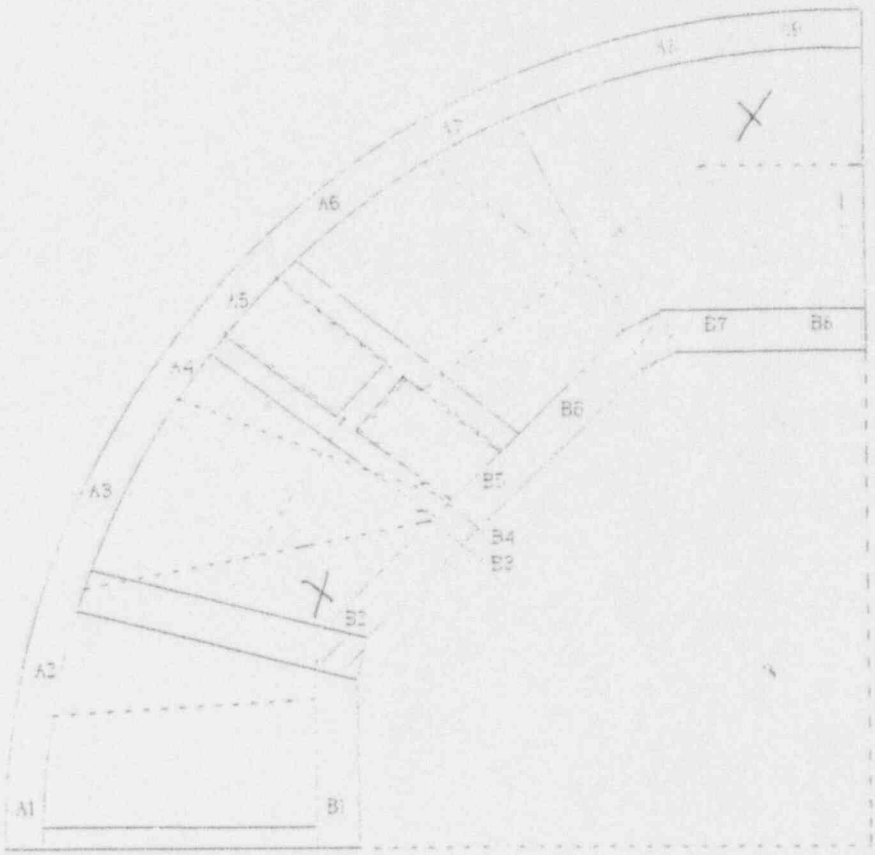
GRAPHICAL ILLUSTRATION



Basement Area 1	DATE 24 May 93
	DRAWN JSB
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY	APPROVED HE
UNITED STATES ARMY MEDICAL DEPARTMENT	SCALE NTS
	PLATE

GRAPHICAL ILLUSTRATION

Survey Unit ID _____



N

M2350 LOCATION CODE - 0010000

REACTOR BUILDING
AREA 1 - CEILING

FILE= 000RXB7

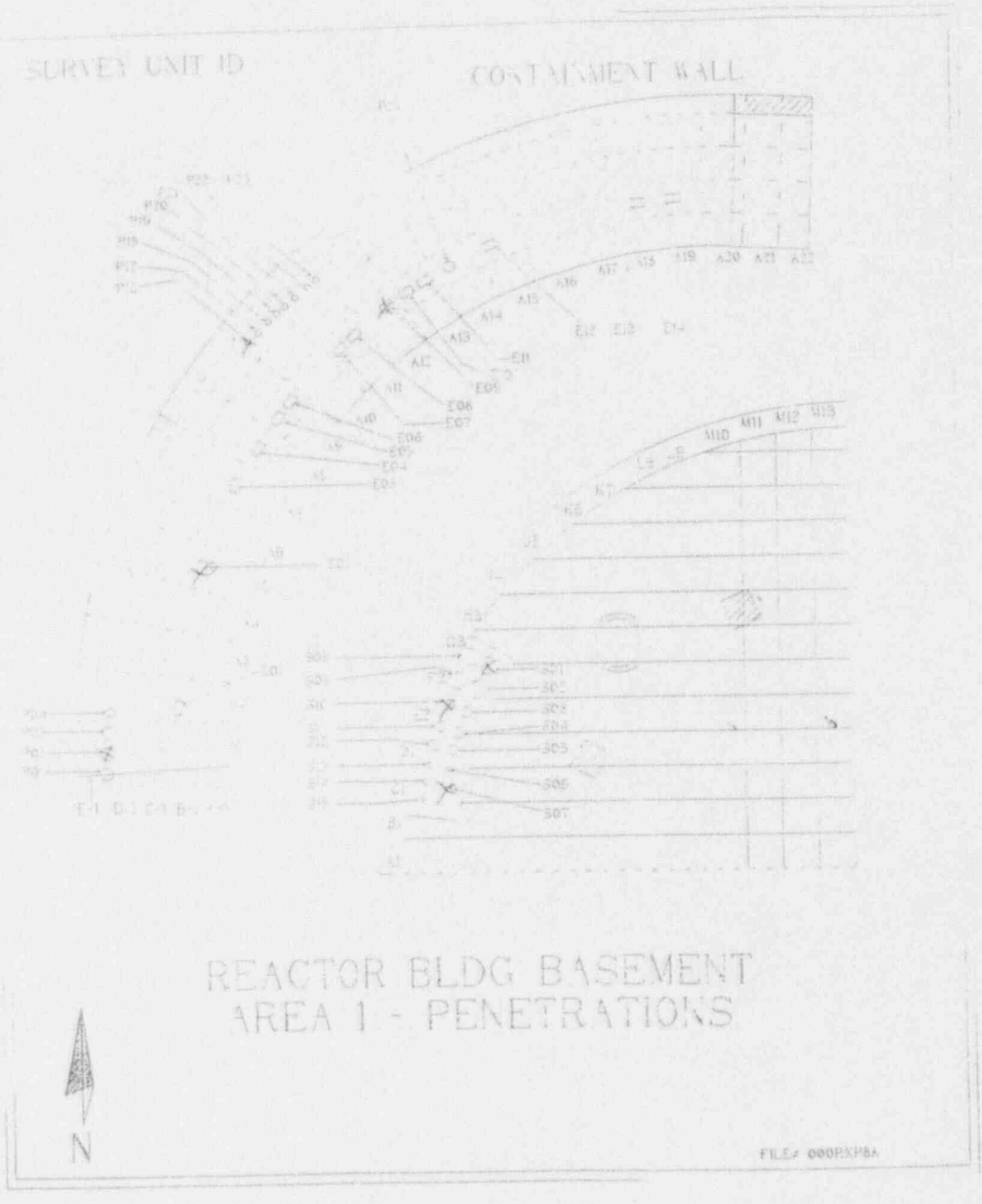
Basement Area 1

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

DATE 24 May 93
DRAWN JSB
APPROVED HE
SCALE NTS
PLATE

GRAPHICAL ILLUSTRATION



Basement Area 1

DATE 24 May 93
DRAWN JSB
APPROVED HE
SCALE NTS
PLATE

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY
UNITED STATES ARMY MEDICAL DEPARTMENT

Reactor Building 100
Basement Area 2
9 February 1993

Location Code	Gross* alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm²]	uR/hr	[dpm/100cm²]							
MDAs = = >	MDA = 79		MDA = 2900							
F01-A4	82	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	198
F01-B13	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	199
F01-C1	<MDA	9	3900	<MDA	<MDA	<MDA	<MDA	< 1	< 3	207
F01-D9	<MDA	12	3200	<MDA	<MDA	<MDA	<MDA	< 1	< 3	208
F01-E3	<MDA	10	3200	<MDA	<MDA	<MDA	<MDA	< 1	< 3	209
F01-E5	<MDA	13	<MDA	<MDA	<MDA	<MDA	3900	< 1	< 3	210
F01-E12	<MDA	11	<MDA	<MDA	<MDA	3200	<MDA	< 1	< 3	211
F01-F1	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	214
F01-G6	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	217
F01-G11	<MDA	10	3200	<MDA	<MDA	<MDA	<MDA	< 1	< 3	212
F01-I3	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	213
F01-I7	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	216
F01-K1	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	215
F01-L5	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	218
W01-B1	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	219
W01-D3	<MDA	9	<MDA	3200	<MDA	<MDA	<MDA	< 2	< 3	195
W01-C5	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	194
W01-A6	<MDA	9	<MDA	3200	<MDA	<MDA	<MDA	< 1	< 3	220
W01-A9	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	221
W01-B12	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	222
W01-D14	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	368

* Maximum in 1 square meter

Background was not subtracted from above data.

Alpha background = 2 dpm/100cm²
Beta background = 1600 dpm/100cm²
Gamma background = 9 uR/hr

Reactor Building 100
Basement Area 2
9 February 1993

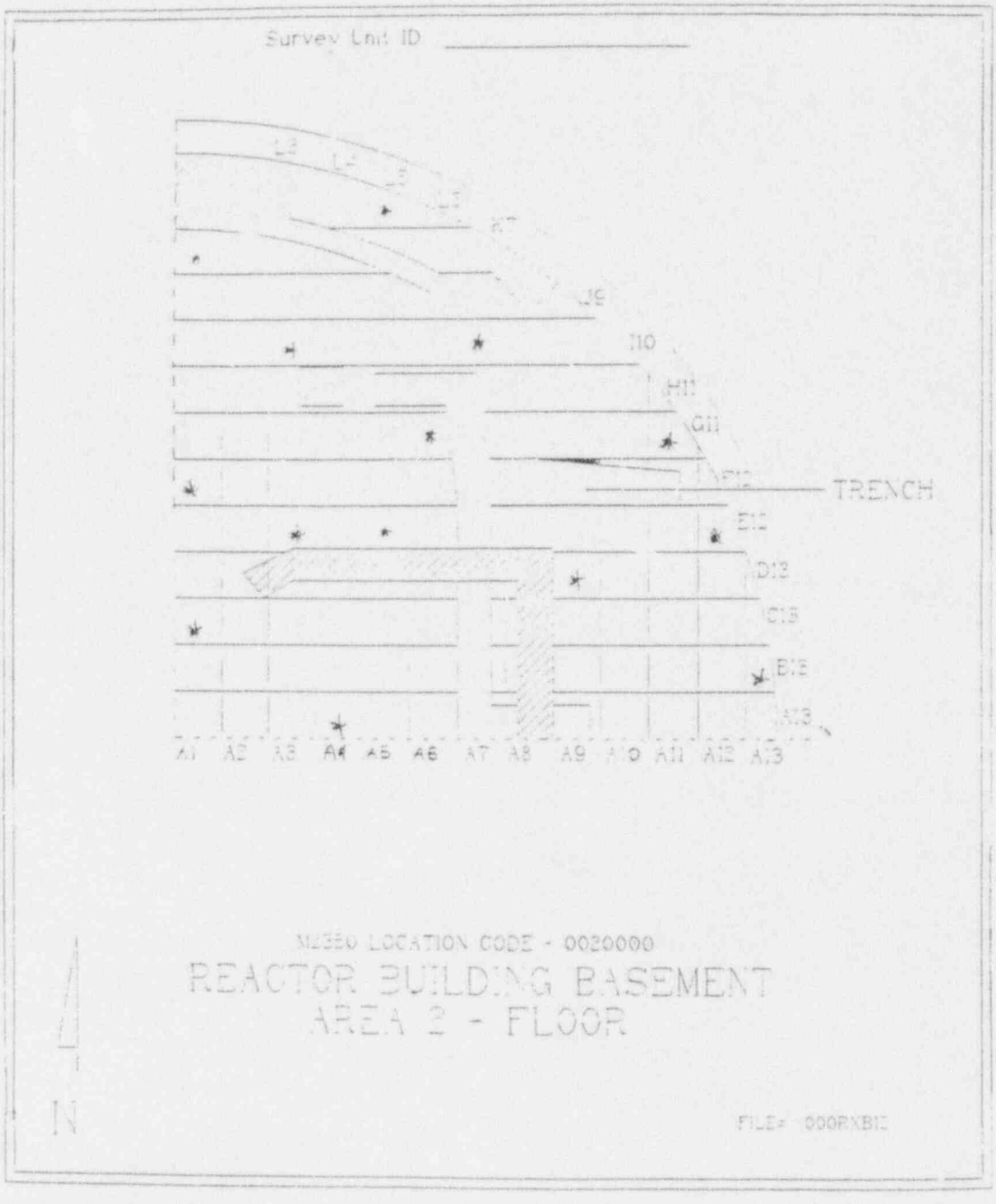
Location Code	Gross* alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm²]	uR/hr	[dpm/100cm²]					[dpm/100cm²]		
MDAs = = >	MDA = 79		MDA = 2900					± 2 standard deviations		
W01-B17	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	223
W02-A8	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	224
W02-C9	<MDA	12	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	225
W03-A3	<MDA	13	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	228
W03-A13	<MDA	10	<MDA	<MDA	<MDA	3500	<MDA	< 1	3 ± 2	229
W03-A17	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	230
W03-B5	<MDA	10	<MDA	<MDA	<MDA	3500	<MDA	< 1	< 3	232
W03-B18	<MDA	10	<MDA	3200	<MDA	<MDA	<MDA	< 1	< 3	231
W03-D1	120	10	<MDA	<MDA	3200	<MDA	<MDA	< 1	< 3	251
W03-D9	82	10	<MDA	<MDA	3500	<MDA	<MDA	< 2	< 3	189
W03-D15	86	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	188
W04-A1	<MDA	12	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	227
W05-B1	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	226
W05-D4	<MDA	12	3500	<MDA	<MDA	<MDA	<MDA	< 2	< 3	369
W06-A5	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	192
W06-B8	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	191
W07-A10	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	250
W07-B3	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	190
W08-A9	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	186
W08-A13	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	187
C02-A2	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	193
C01-A1	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	197
C03-B2	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	196

* Maximum in 1 square meter

Background was not subtracted from above data.

Alpha background = 2 dpm/100cm²
Beta background = 1600 dpm/100cm²
Gamma background = 9 uR/hr

GRAPHICAL ILLUSTRATION



Basement Area 2

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

DATE 24 May 93

DRAWN JSB

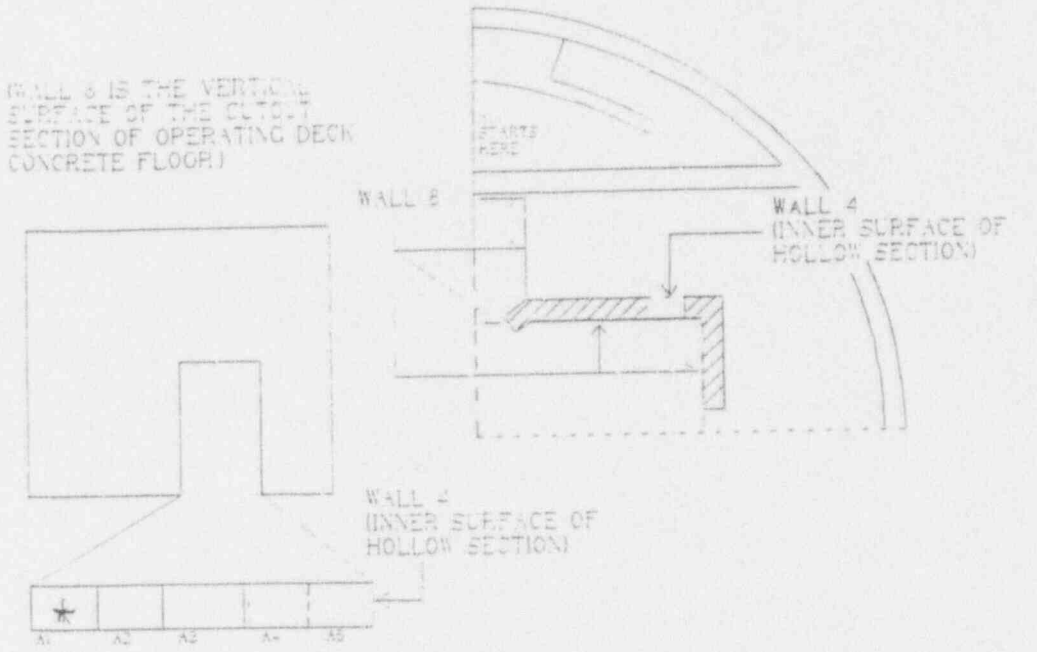
APPROVED HE

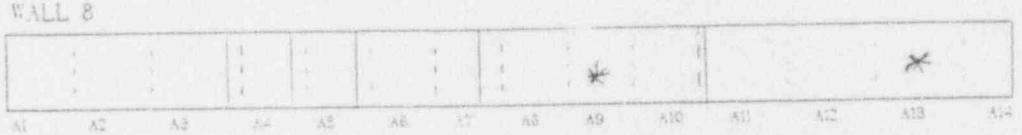
SCALE NTS

PLATE

GRAPHICAL ILLUSTRATION

Survey Unit ID _____





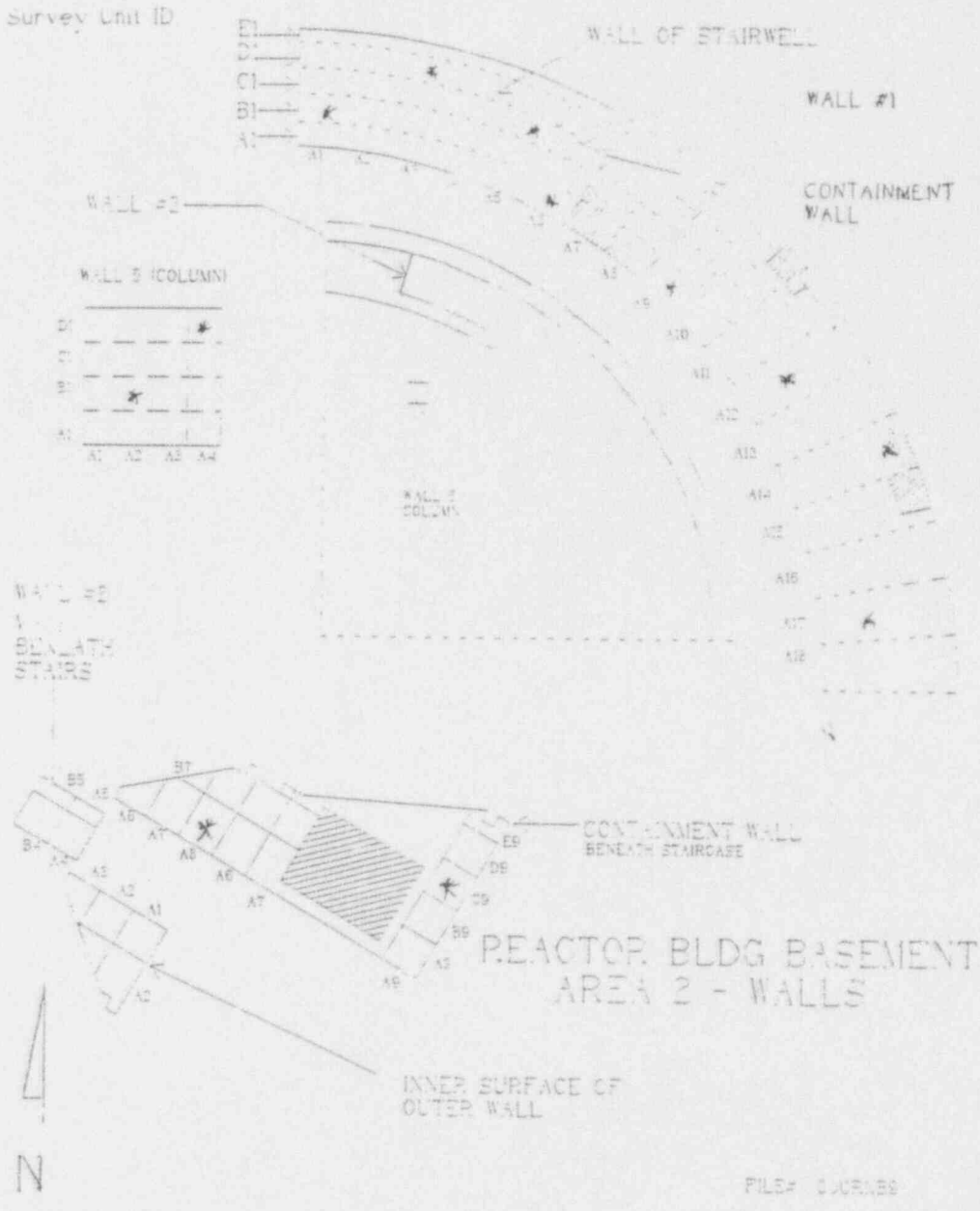
N

REACTOR BUILDING BASEMENT
AREA 2 - WALLS

FILE= 00JRNB10

Basement Area 2	DATE 24 May 93 DRAWN JSB APPROVED HE SCALE NTS PLATE
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY UNITED STATES ARMY MEDICAL DEPARTMENT	

GRAPHICAL ILLUSTRATION



Basement Area 2

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

DATE 24 May 93

DRAWN JSB

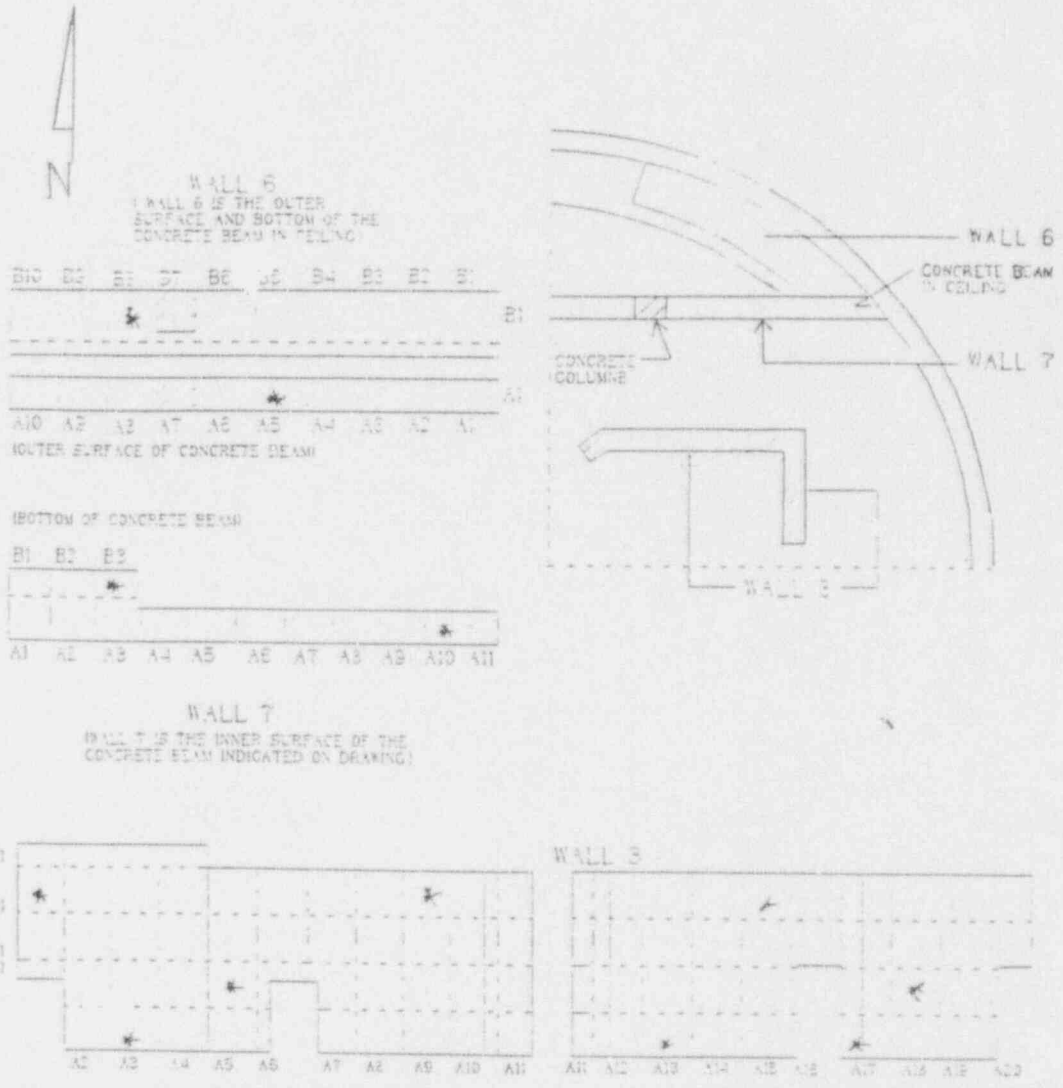
APPROVED HE

SCALE NTS

PLATE

GRAPHICAL ILLUSTRATION

Survey Unit ID _____



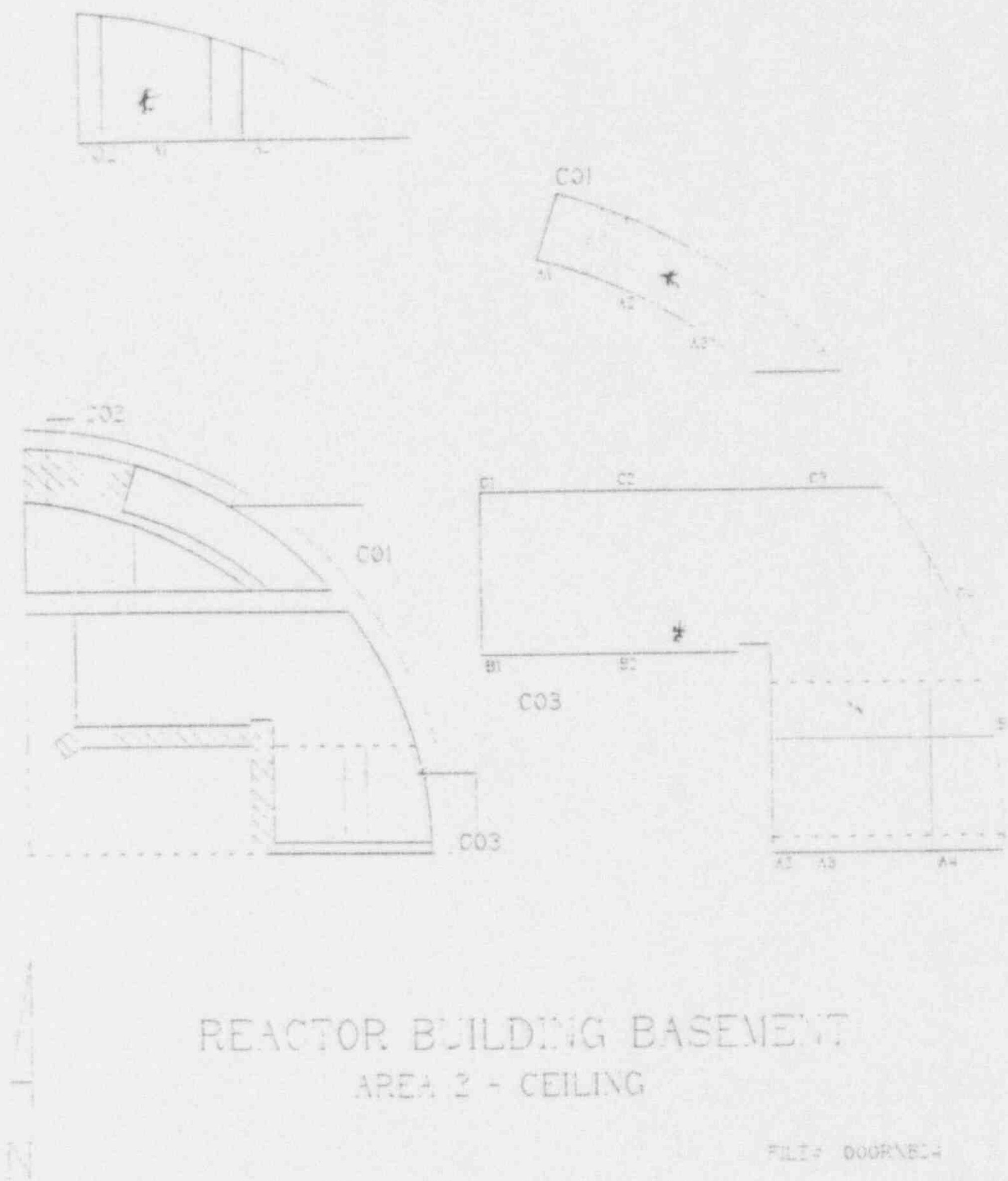
REACTOR BUILDING BASEMENT
AREA 2 - WALLS

FILE# 000RSBII

Basement Area 2	DATE 24 May 93
	DRAWN JSB
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY	APPROVED HE
UNITED STATES ARMY MEDICAL DEPARTMENT	SCALE NTS
	PLATE

GRAPHICAL ILLUSTRATION

Survey Unit ID ______________



Basement Area 2	DATE 24 May 93
	DRAWN JSB
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY	APPROVED HE
	SCALE NTS
UNITED STATES ARMY MEDICAL DEPARTMENT	PLATE

Reactor Building 100
Basement Area 3
10 February 1993

Location Code	Gross* alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm²]	uR/hr	[dpm/100cm²]					[dpm/100cm²]		
MDAs = = >	MDA = 79		MDA = 2900					± 2 standard deviations		
F01-B6	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	240
F01-C2	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	241
F01-D7	<MDA	12	<MDA	<MDA	<MDA	3200	<MDA	< 1	< 3	239
F01-E1	<MDA	12	<MDA	<MDA	<MDA	<MDA	3200	< 1	< 3	242
F01-E6	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	237
F01-F11	<MDA	11	<MDA	<MDA	<MDA	<MDA	3200	< 1	< 3	236
F01-G4	<MDA	12	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	238
F01-H10	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	235
F01-I1	<MDA	12	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	243
F01-J9	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	233
F01-K2	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	244
F01-L11	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	234
F01-M3	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	245
W01-A2	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	246
W01-B4	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	247
W01-D6	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	254
W01-C8	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	248
W01-E10	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	255
W01-D12	<MDA	12	<MDA	<MDA	<MDA	4200	<MDA	< 1	< 3	257
W01-C14	<MDA	14	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	249
W01-B16	<MDA	14	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	263
W01-A18	<MDA	12	3200	<MDA	<MDA	<MDA	<MDA	< 1	< 3	264
W02-A8	<MDA	13	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	265

* Maximum in 1 square meter

Background was not subtracted from above data.

Alpha background = 2 dpm/100cm²
Beta background = 1600 dpm/100cm²
Gamma background = 9 uR/hr

Reactor Building 100
Basement Area 3
10 February 1993

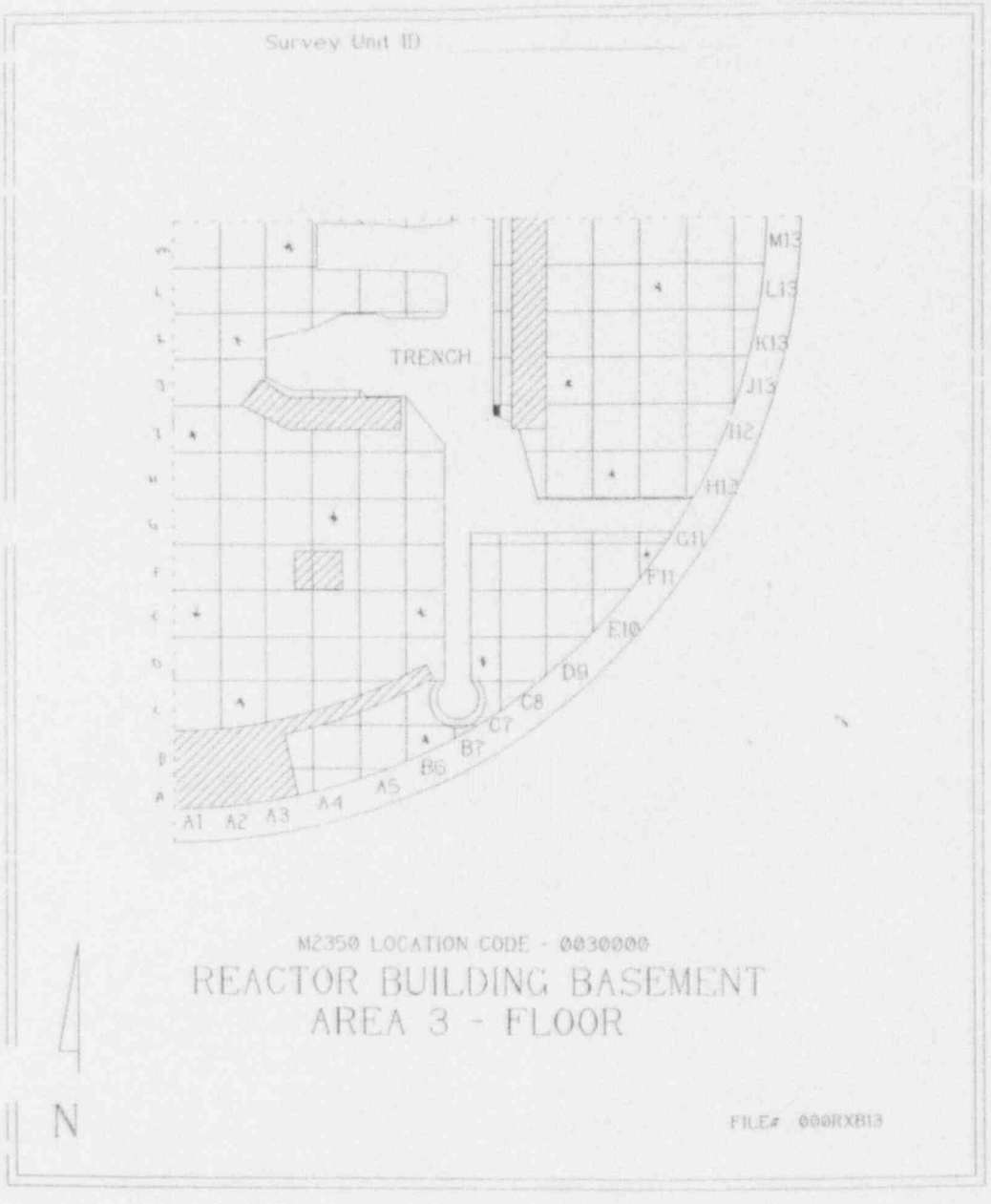
Location Code	Gross[a] alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm²]	uR/hr	[dpm/100cm2]					[dpm/100cm²]		
MDAs = = >	MDA = 79		MDA = 2900					± 2 standard deviations		
W02-B12	<MDA	12	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	267
W02-B2	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	268
W03-D1	<MDA	10	<MDA	3200	<MDA	<MDA	<MDA	< 1	< 3	262
W03-B6	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	269
W03-A2	<MDA	11	3200	<MDA	<MDA	<MDA	<MDA	< 1	< 3	270
W04-C2	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	271
W04-D4	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	260
W05-C3	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	273
W05-A6	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	272
W05-E7	<MDA	10	3900	<MDA	<MDA	<MDA	<MDA	< 1	< 3	252
W06-A3	<MDA	11	3200	<MDA	<MDA	<MDA	<MDA	< 1	< 3	274
W06-A7	<MDA	12	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	258
W08-A3	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	256
W08-A9	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	261
C01-A2	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 1	< 3	266
C02-A1	<MDA	10	<MDA	<MDA	3200	<MDA	<MDA	< 1	< 3	259
C03-B3	<MDA	10	<MDA	<MDA	<MDA	3200	<MDA	< 1	< 3	253

[a] Maximum in 1 square meter

Background was not subtracted from above data.

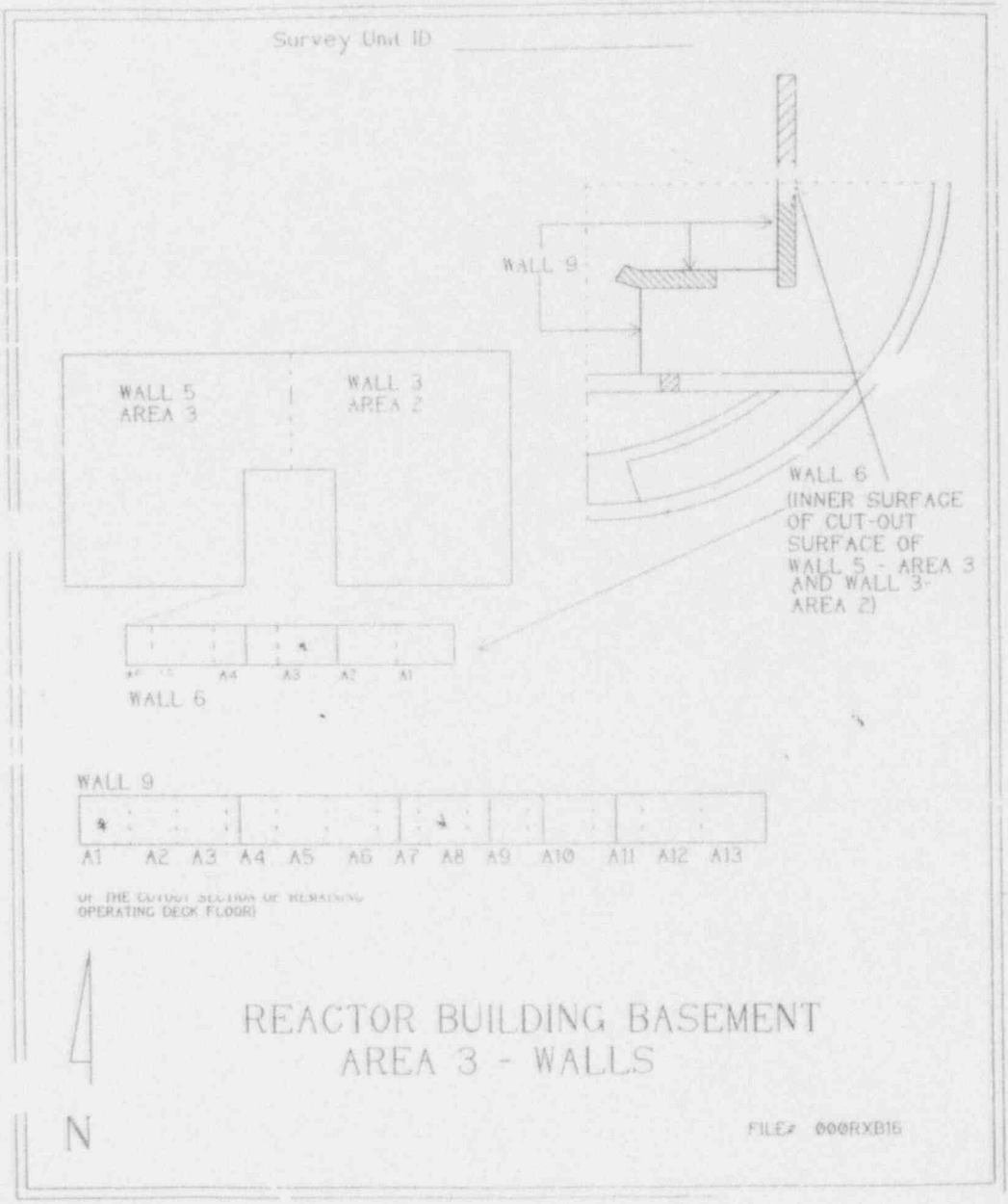
Alpha background = 2 dpm/100cm²
Beta background = 1600 dpm/100cm²
Gamma background = 9 uR/hr

GRAPHICAL ILLUSTRATION



Basement Area 3	DATE 24 May 93
	DRAWN JSB
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY	APPROVED HE
UNITED STATES ARMY MEDICAL DEPARTMENT	SCALE NTS
	PLATE

GRAPHICAL ILLUSTRATION



Basement Area 3

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

DATE 24 May 93

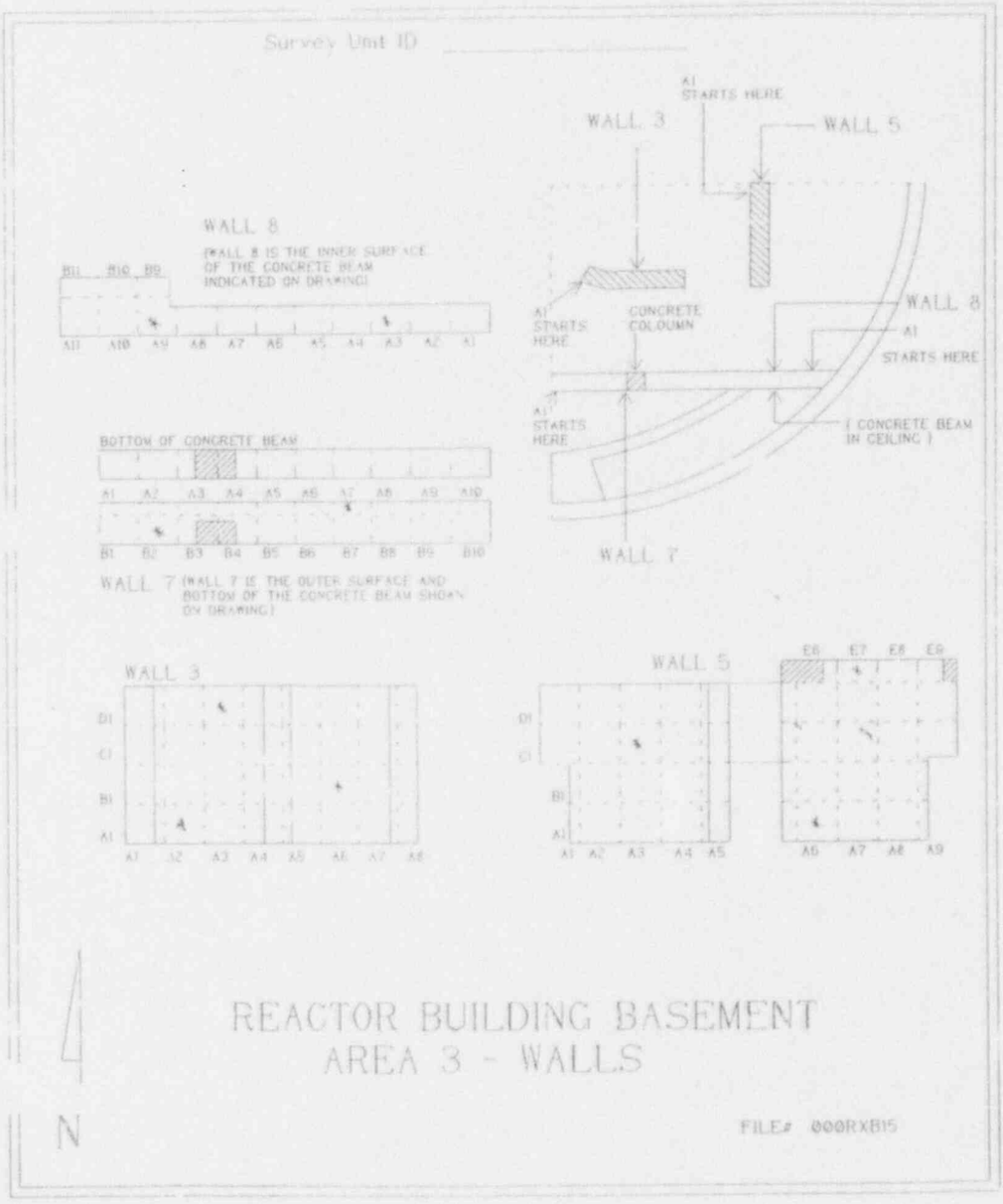
DRAWN JSB

APPROVED HE

SCALE NTS

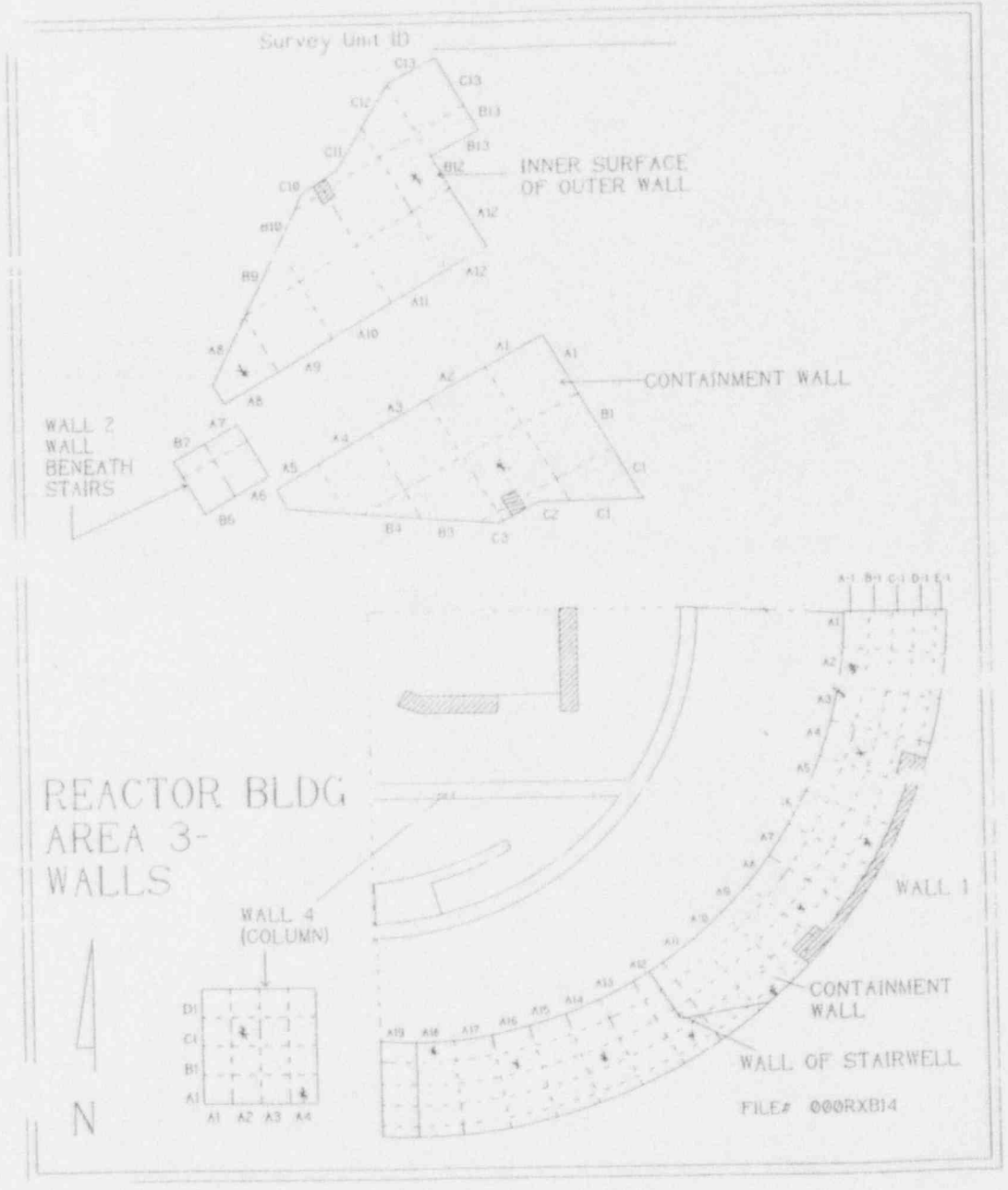
PLATE

GRAPHICAL ILLUSTRATION



Basement Area 3	DATE 24 May 93
	DRAWN JSB
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY	APPROVED HE
UNITED STATES ARMY MEDICAL DEPARTMENT	SCALE NTS
	PLATE

GRAPHICAL ILLUSTRATION



Basement Area 3

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

DATE 24 May 93

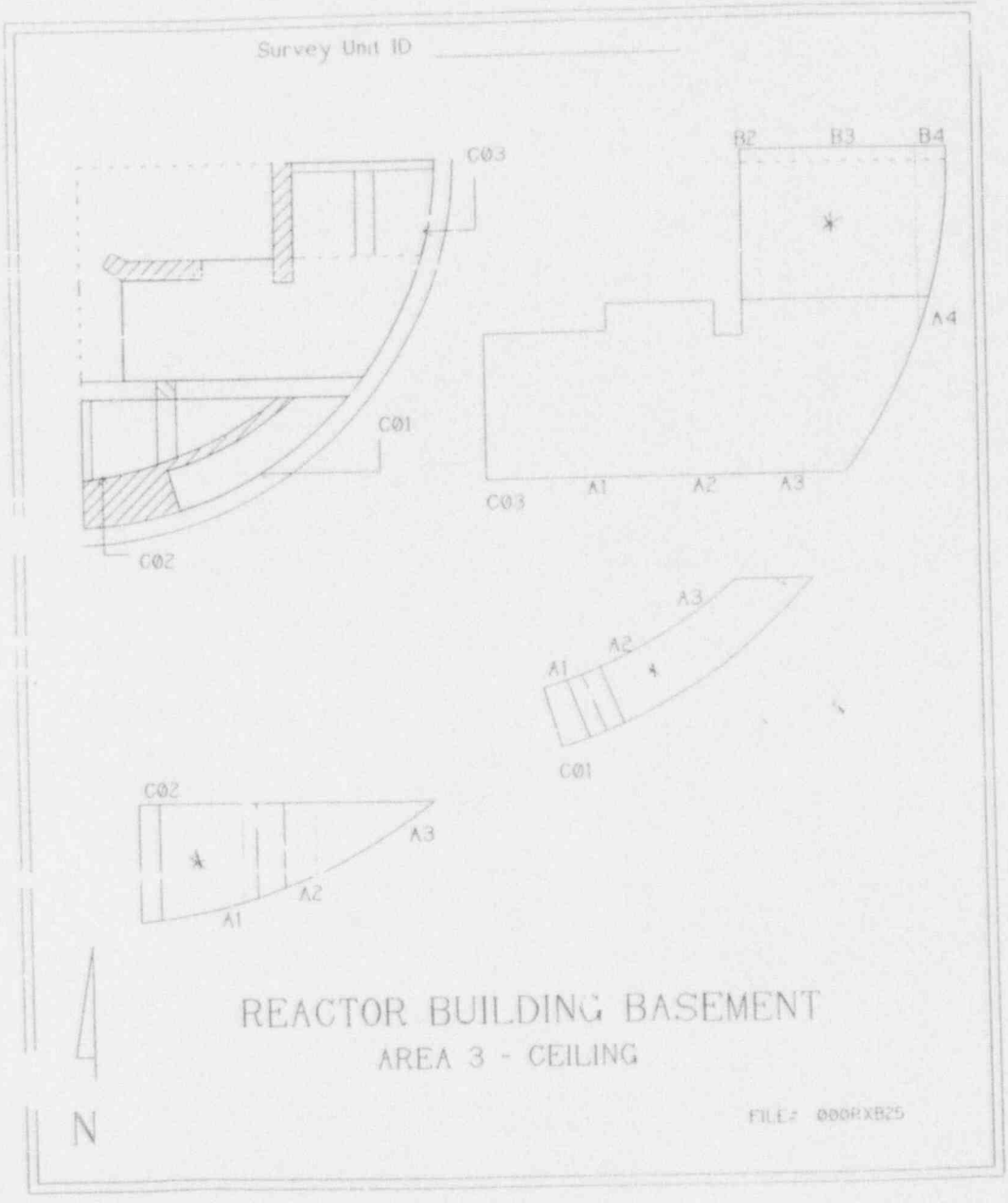
DRAWN JSB

APPROVED HE

SCALE NTS

PLATE

GRAPHICAL ILLUSTRATION



Basement Area 3	DATE 24 May 93
	DRAWN JSB
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY	APPROVED HE
UNITED STATES ARMY MEDICAL DEPARTMENT	SCALE NTS
	PLATE

Reactor Building 100
Basement Area 4
10 February 1993

Location Code	Gross* alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm²]	uR/hr	[dpm/100cm²]					[dpm/100cm²]		
MDAs= = >	MDA = 79		MDA = 2900					± 2 standard deviations		
C01-A6	<MDA	12	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	275
C01-B1	<MDA	9	<MDA	3200	<MDA	<MDA	<MDA	< 2	< 3	279
W01-A1	<MDA	10	3200	<MDA	<MDA	<MDA	<MDA	< 2	< 3	287
W01-D3	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	280
W01-B5	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	290
W01-A7	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	291
W01-A14	<MDA	9	<MDA	<MDA	3200	<MDA	<MDA	< 2	< 3	302
W01-D9	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	282
W01-B12	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	303
W01-D16	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	281
W01-A18	<MDA	9	<MDA	<MDA	<MDA	3200	3500	< 2	< 3	304
W01-C20	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	283
W01-A22	<MDA	8	<MDA	<MDA	<MDA	3200	3200	< 2	< 3	305
W05-A4	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	293
W05-B1	<MDA	10	<MDA	<MDA	<MDA	<MDA	3200	< 2	< 3	294
W04-A2	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	301
W04-C4	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	286
W02-A2	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	276
W02-B7	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	4 ± 2	277
W02-A10	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	278

* Maximum in 1 square meter

Background was not subtracted from above data.

Alpha background = 2 dpm/100cm²
Beta background = 1600 dpm/100cm²
Gamma background = 9 uR/hr

Reactor Building 100
Basement Area 4
10 February 1993

Location Code	Gross* alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm²]	uR/hr	[dpm/100cm²]					[dpm/100cm²]		
MDAs= = >	MDA = 79		MDA = 2900					± 2 standard deviations		
W03-A6	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	284
W03-B10	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	285
F01-A13	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	288
F01-C9	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	289
F01-D7	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	292
F01-F4	<MDA	10	3200	<MDA	3200	<MDA	<MDA	< 2	< 3	309
F01-F12	<MDA	10	<MDA	<MDA	<MDA	<MDA	3900	< 2	< 3	296
F01-G8	<MDA	9	3200	<MDA	3200	<MDA	<MDA	< 2	< 3	300
F01-H6	<MDA	10	<MDA	<MDA	3200	3200	<MDA	< 2	< 3	307
F01-H11	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	295
F01-I2	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	308
F01-J13	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	297
F01-L3	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	306
F01-L8	<MDA	8	<MDA	3200	<MDA	<MDA	<MDA	< 2	< 3	299
F01-L12	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	298

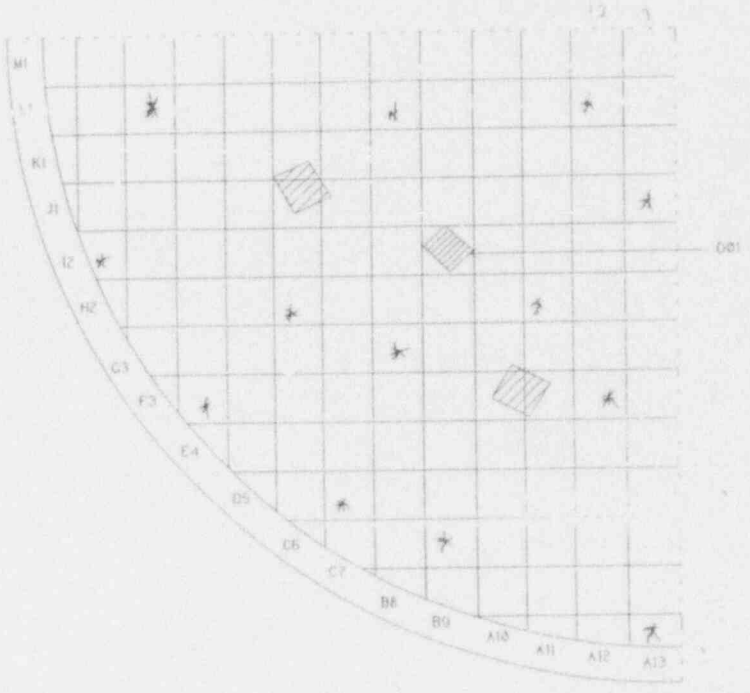
* Maximum in 1 square meter

Background was not subtracted from above data.

Alpha background = 2 dpm/100cm²
Beta background = 1600 dpm/100cm²
Gamma background = 9 uR/hr

GRAPHICAL ILLUSTRATION

Survey Unit ID _____



M2350 LOCATION CODE - 0040000

REACTOR BUILDING BASEMENT
AREA 4 - FLOOR

FILE# 000RXB4B

N

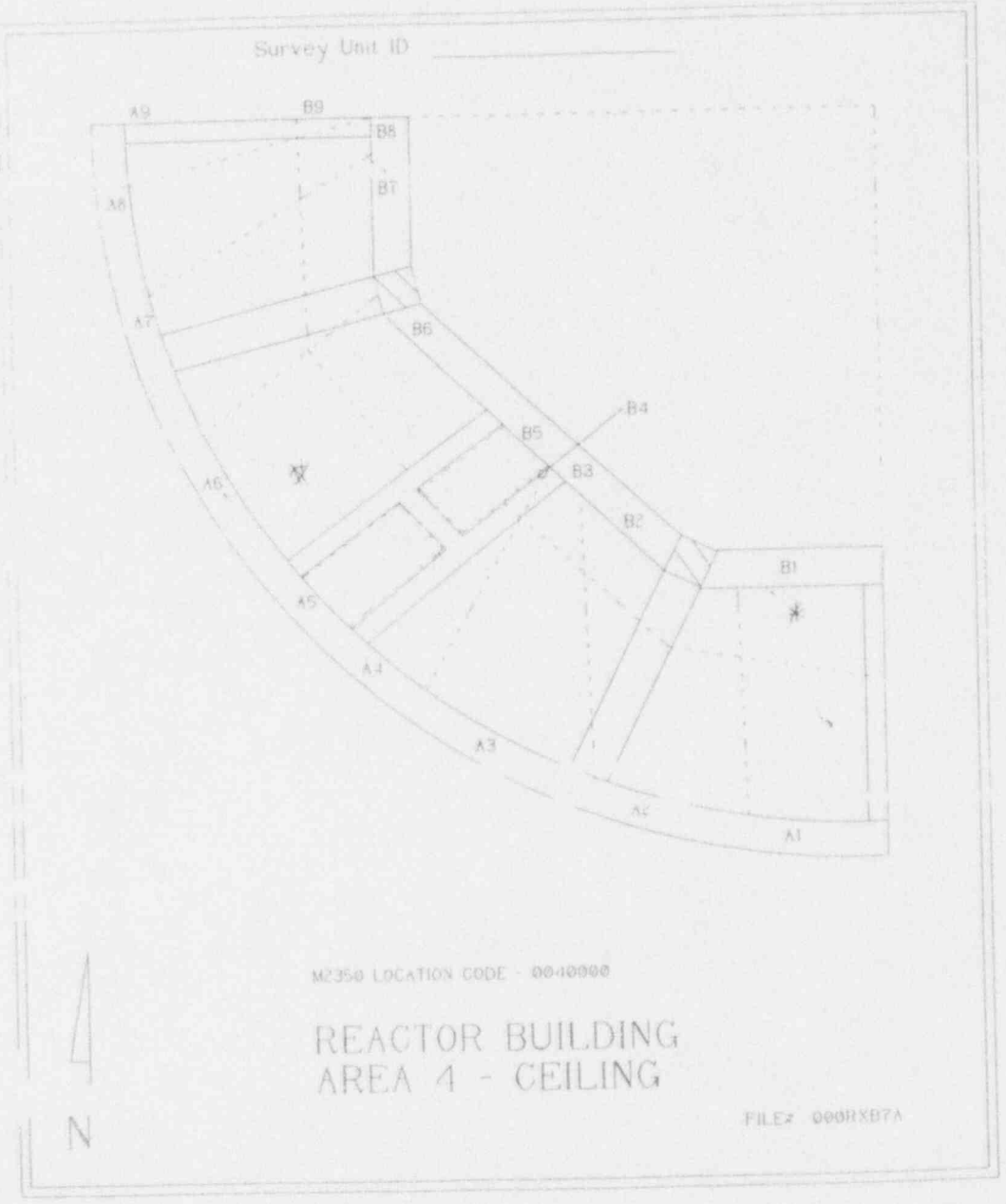
Basement Area 4

DATE 24 May 93
DRAWN JSB
APPROVED HE
SCALE NTS
PLATE

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

GRAPHICAL ILLUSTRATION



Basement Area 4

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

DATE 24 May 93

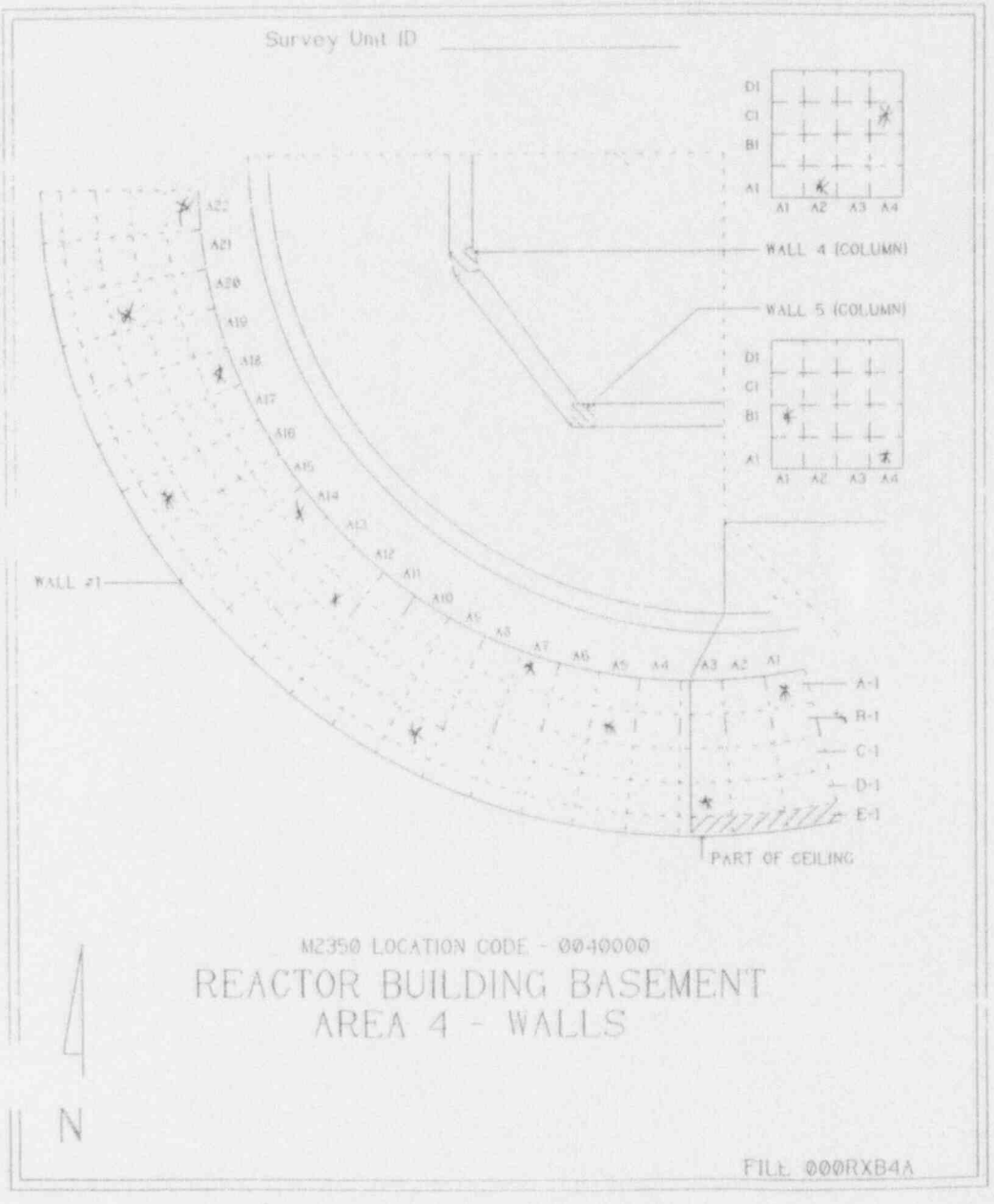
DRAWN JSB

APPROVED HE

SCALE NTS

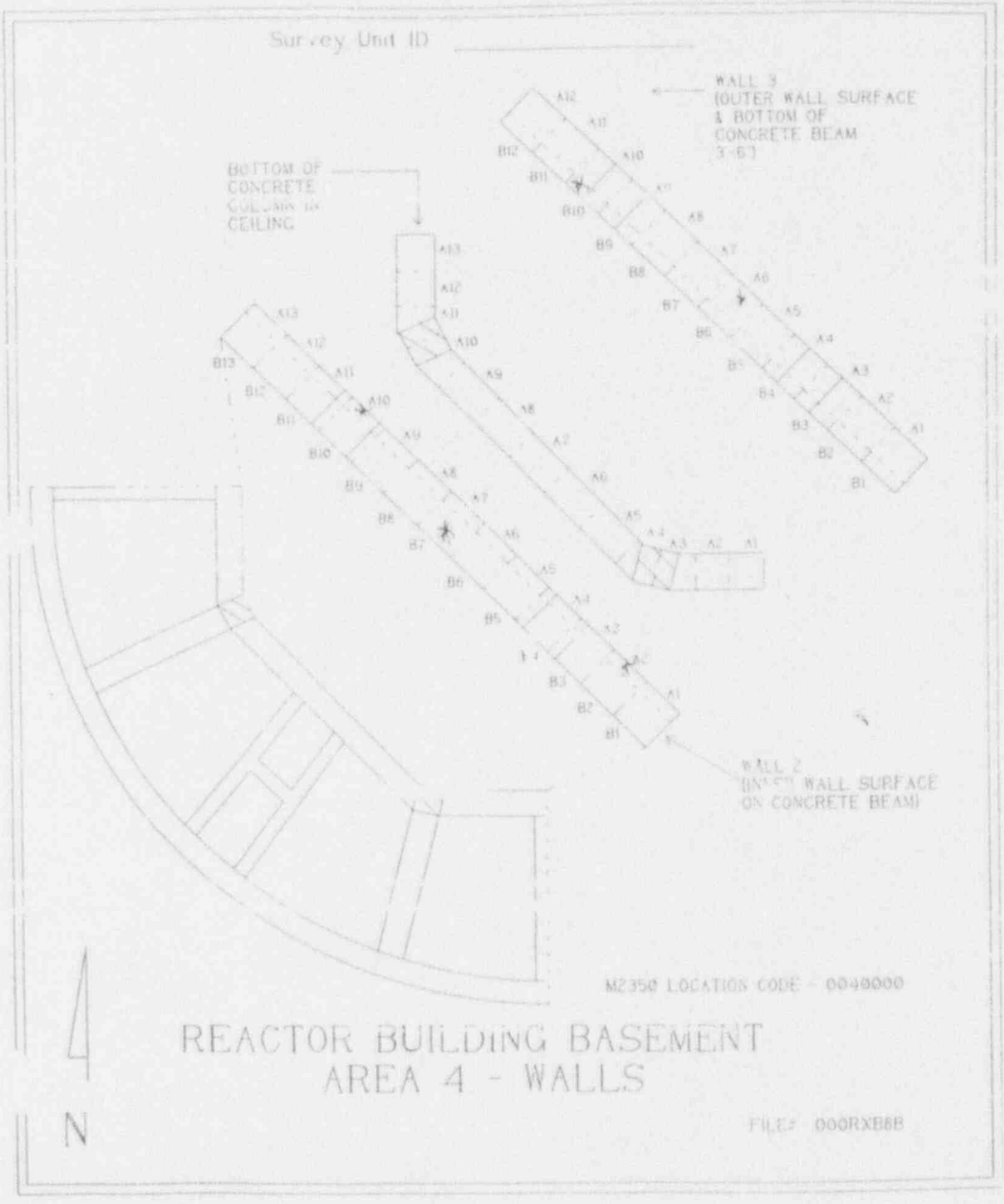
PLATE

GRAPHICAL ILLUSTRATION



Basement Area 4	DATE 24 May 93
	DRAWN JSB
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY	APPROVED HE
UNITED STATES ARMY MEDICAL DEPARTMENT	SCALE NTS
	PLATE

GRAPHICAL ILLUSTRATION



Basement Area 4	DATE 24 May 93 DRAWN JSB APPROVED HE SCALE NTS PLATE
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY UNITED STATES ARMY MEDICAL DEPARTMENT	

Reactor Building 100
Basement
Stairwells 1 and 2
10 February 1993

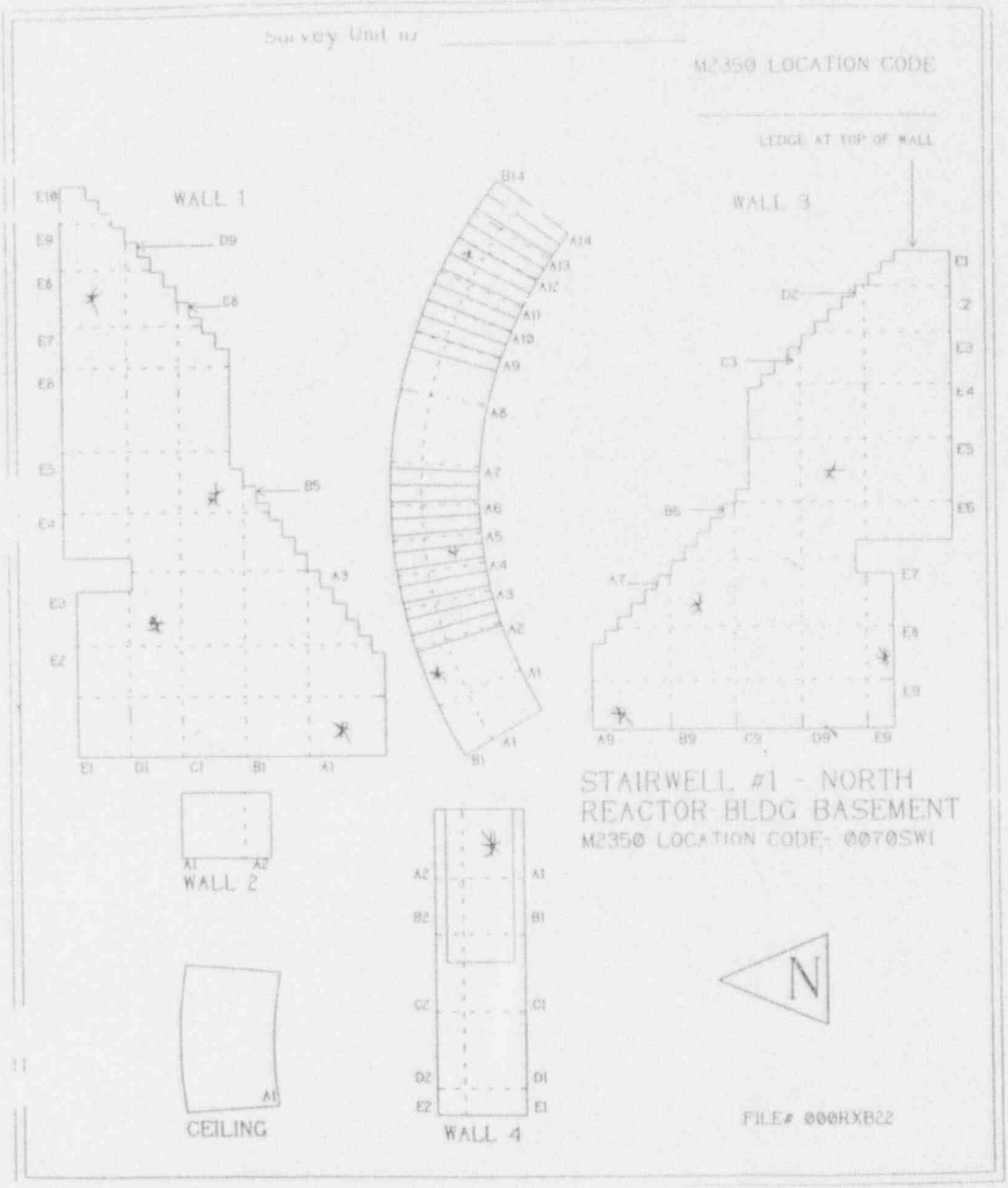
Location Code	Gross* alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm^2]	uR/hr	[dpm/100cm^2]					[dpm/100cm^2]		
MDAs = = >	MDA = 79		MDA = 2900					± 2 standard deviations		
Stairwell # 1										
W01-A1	<MDA	8	<MDA	<MDA	<MDA	3200	<MDA	< 2	< 3	311
W01-D3	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	310
W01-C5	<MDA	7	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	312
W01-E8	120	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	313
F01-B12	<MDA	8	<MDA	<MDA	3200	3200	<MDA	< 2	< 3	314
F01-A5	140	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	315
F01-B2	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	316
W04-A1	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	317
W03-D5	<MDA	10	3200	<MDA	<MDA	<MDA	<MDA	< 2	< 3	318
W03-B7	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	319
W03-A9	<MDA	10	<MDA	<MDA	<MDA	3200	3200	< 2	< 3	320
W03-C8	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	321
Stairwell # 2										
W01-D4	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	327
W01-C6	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	329
W01-E8	<MDA	10	<MDA	<MDA	3200	<MDA	<MDA	< 2	< 3	332
W01-A9	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	3 ± 2	323
W04-D1	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	331
F01-A2	<MDA	11	3200	<MDA	<MDA	<MDA	<MDA	< 2	< 3	324
F01-B8	82	9	<MDA	<MDA	3200	<MDA	<MDA	< 2	< 3	325
F01-A13	<MDA	9	3200	<MDA	<MDA	<MDA	<MDA	< 2	< 3	326
W03-E2	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	330
W03-A1	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	333
W03-C5	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	334
W01-E7	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	328

* Maximum in 1 square meter

Background was not subtracted from above data.

Alpha background = 2 dpm/100cm^2
Beta background = 1600 dpm/100cm^2
Gamma background = 9 uR/hr

GRAPHICAL ILLUSTRATION



Basement Stairwell 1

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

DATE 24 May 93

DRAWN JSB

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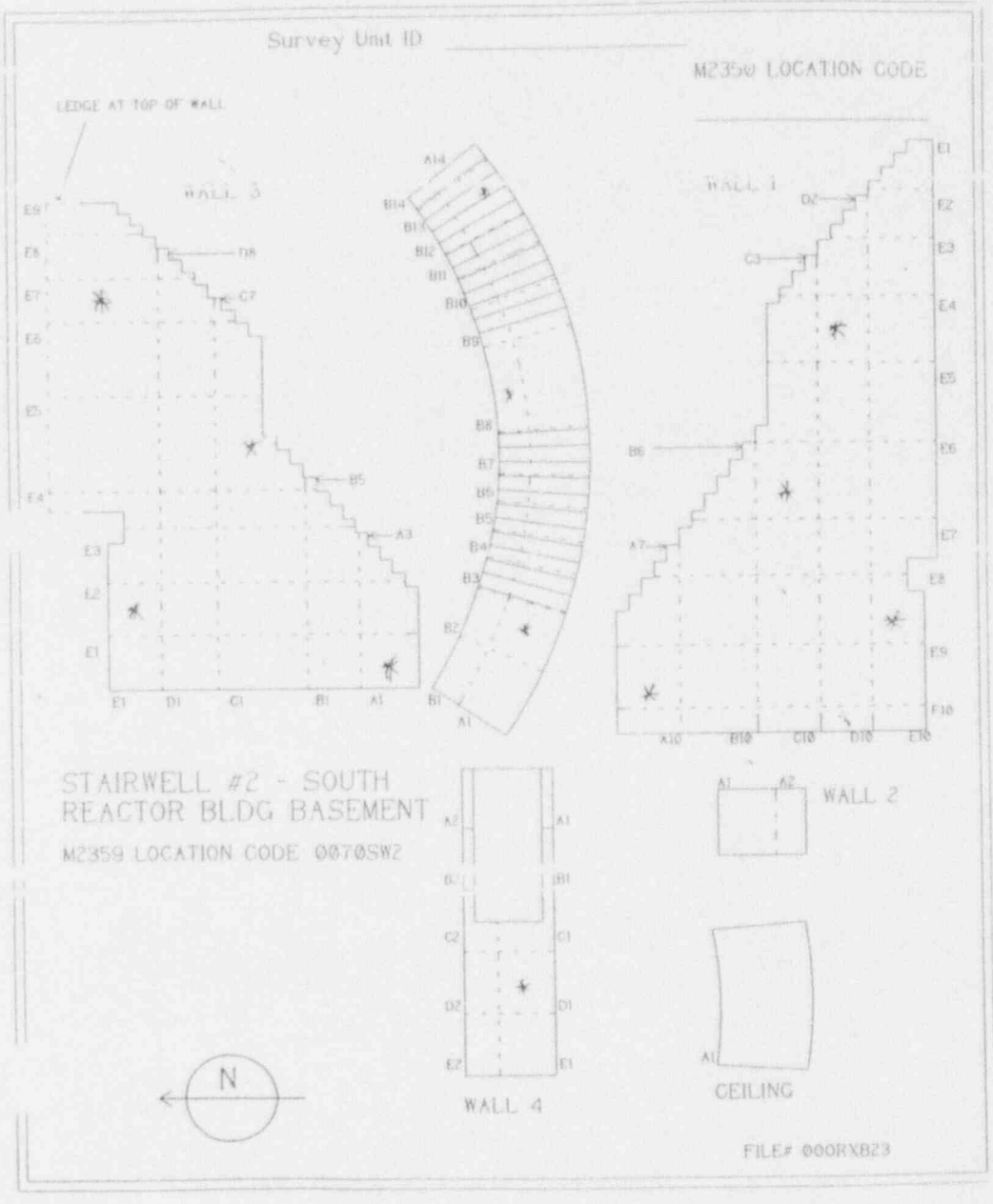
SCALE NTS

PLATE

GRAPHICAL ILLUSTRATION



Basement Stairwell 2

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

DATE 24 May 93

DRAWN JSB

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SCALE NTS

PLATE

Reactor Building 100
Basement
Trenches, Equipment Hatch, and Airlock 1
10 February 1993

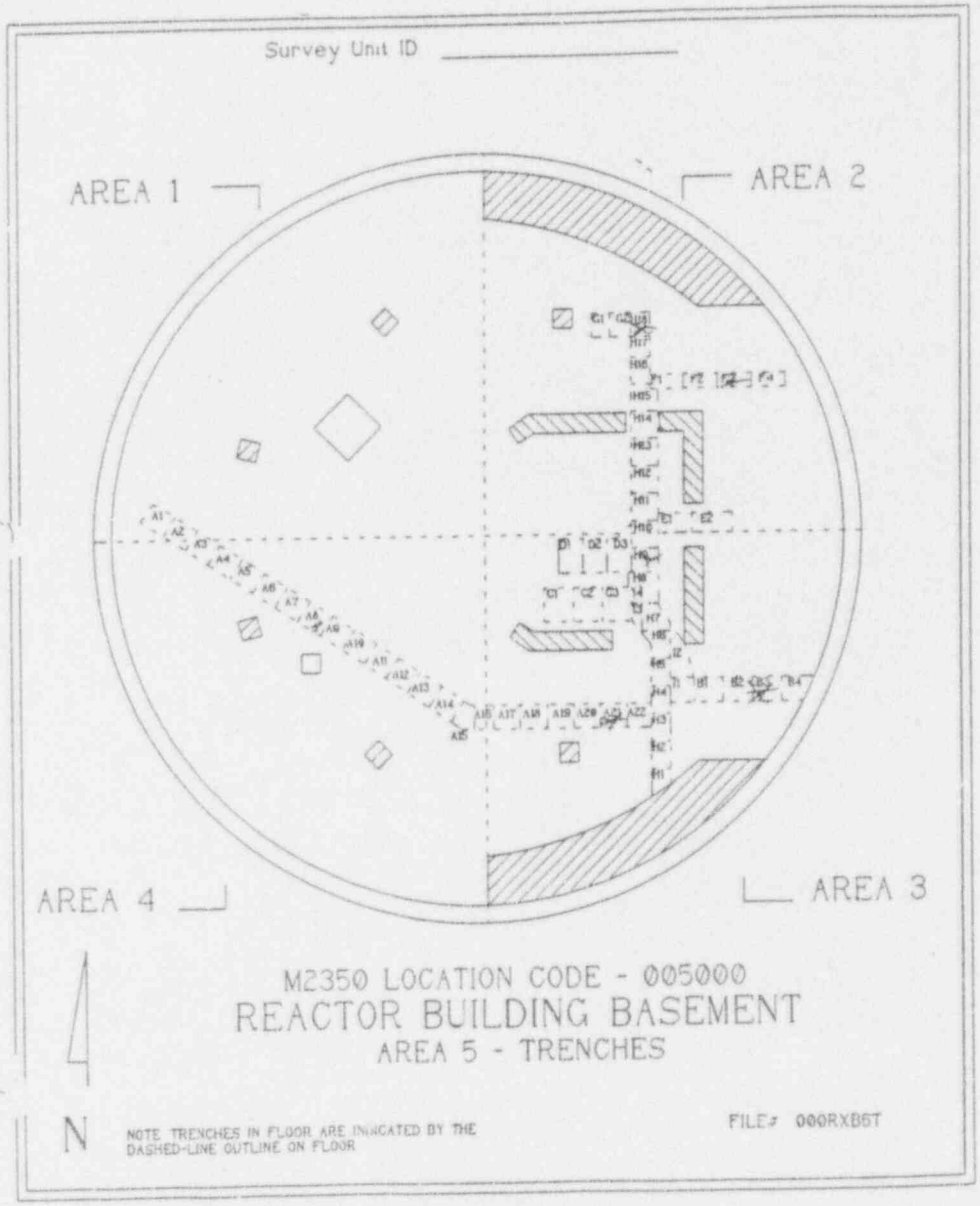
Location Code	Gross* alpha	Gross Gamma	Gross Beta				Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm²]	uR/hr	[dpm/100cm²]				[dpm/100cm²]		
MDAs = = >	MDA = 79		MDA = 2900				± 2 standard deviation		
Trenches in Basement Floor									
A8	<MDA	8	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	336
A21	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	335
H9	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	337
B3	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	338
H18	<MDA	11	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	339
F3	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	340
Equipment Hatch 1										
W01-A1	<MDA	7	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	354
F01-B3	<MDA	11	<MDA	3500	<MDA	<MDA	<MDA	< 2	< 3	353
F01-C1	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	352
W03-A3	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	355
W04-B1	<MDA	7	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	356
W05-A3	<MDA	7	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	357
Air Lock 1										
C01-B7	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	358
W04-A1	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	360
W04-B7	<MDA	6	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	359
W06-A2	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	363
F01-B4	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	361
F01-A1	<MDA	6	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	362
W01-A5	<MDA	6	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	364
W01-B8	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	365
W03-A2	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	366
W02-B1	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	367
W02-A1	<MDA	6	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	341

* Maximum in 1 square meter

Background was not subtracted from above data.

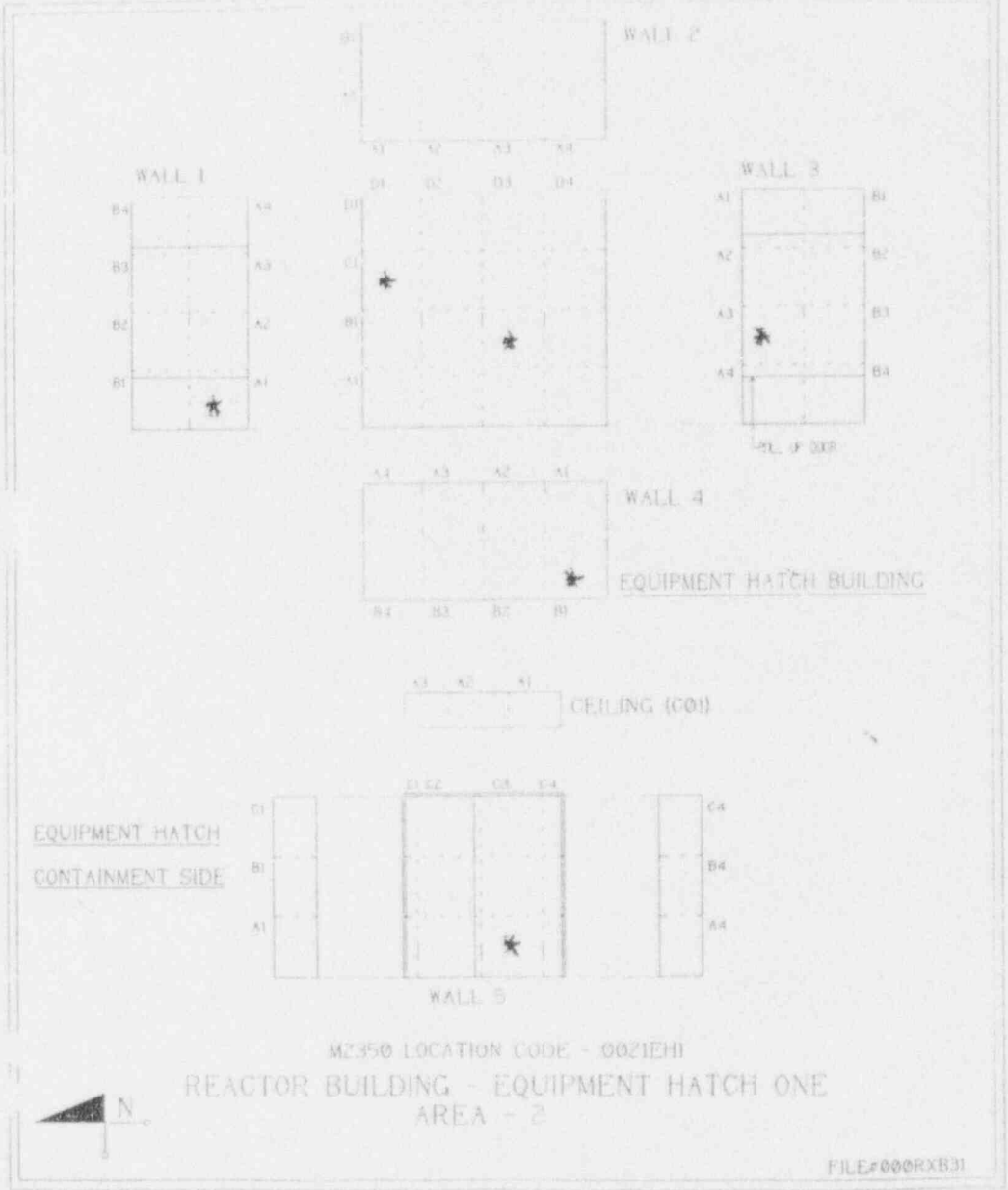
Alpha background = 2 dpm/100cm²
Beta background = 1600 dpm/100cm²
Gamma background = 9 uR/hr

GRAPHICAL ILLUSTRATION



Basement Trenches	DATE 24 May 93 DRAWN JSB APPROVED HE SCALE NTS PLATE
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY UNITED STATES ARMY MEDICAL DEPARTMENT	

GRAPHICAL ILLUSTRATION



Basement Equipment Hatch 1

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

DATE 24 May 93

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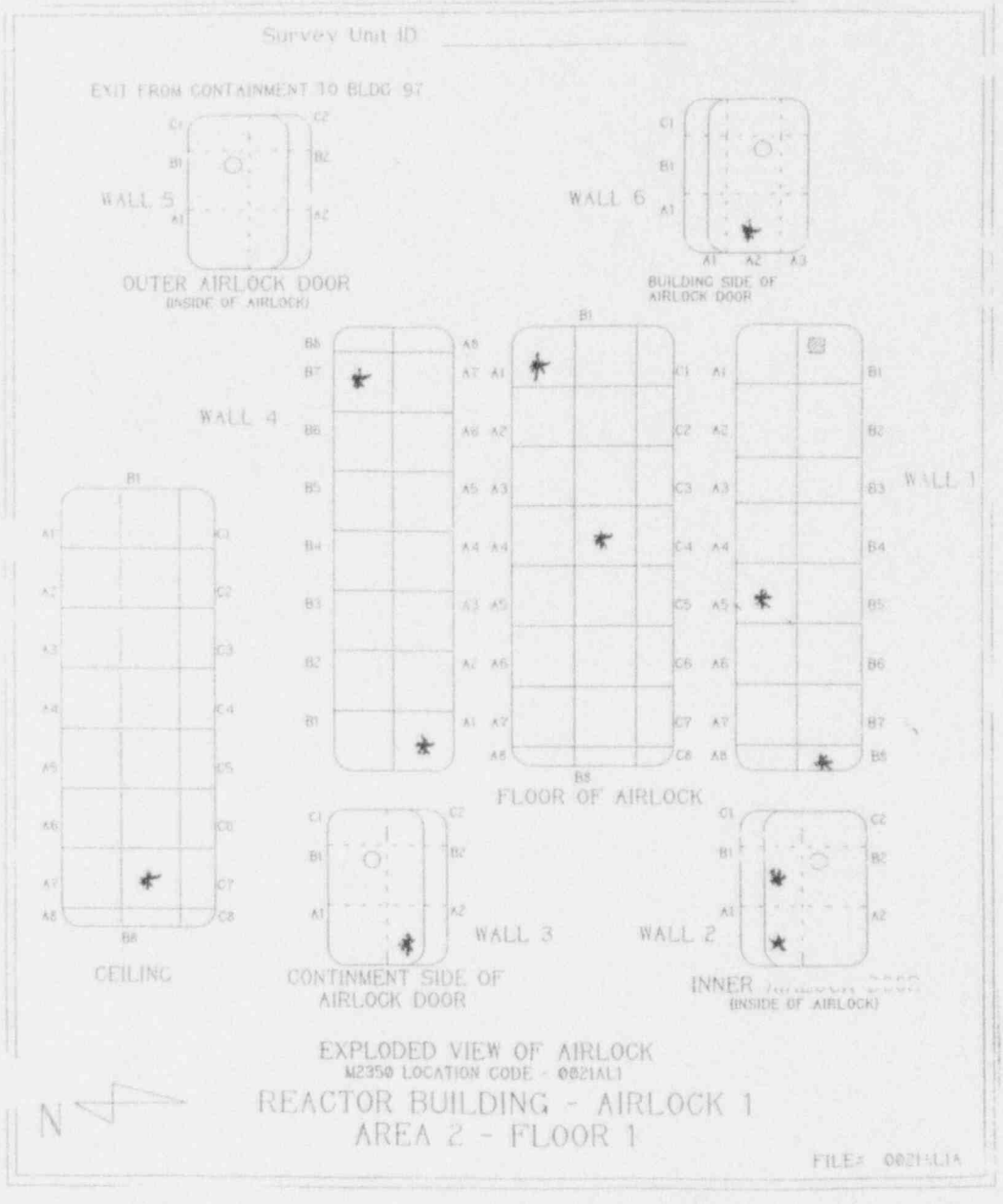
PLATE

GRAPHICAL ILLUSTRATION



Basement Airlock 1

DATE 24 May 93
DRAWN JSB
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PLATE

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

Reactor Building 100
Basement
Airlock 2, Gamma Well, and Basement Sump
11 February 1993

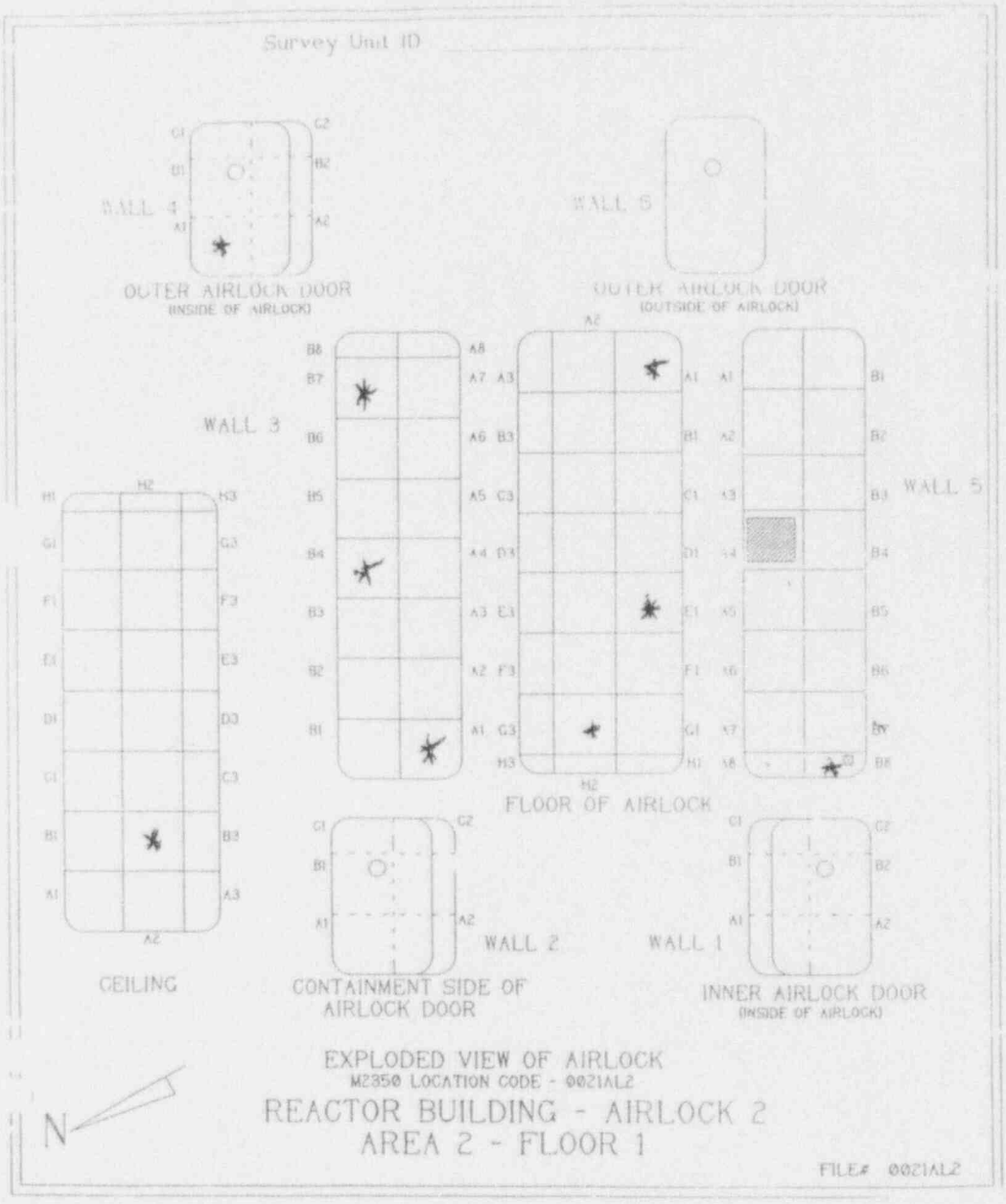
Location Code	Gross alpha	Gross Gamma	Gross Beta					Removable Gross Alpha	Removable Gross Beta	Smear #
Units = = >	[dpm/100cm²]	uR/hr	[dpm/100cm²]					[dpm/100cm²]		
MDAs = = >	MDA = 79		MDA = 2900					± 2 standard deviations		
Airlock # 2										
C01-B2	<MDA	6	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	345
W04-A1	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	346
F01-E1	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	347
W05-B8	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	351
W05-A5	<MDA	6	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	350
F01-G2	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	348
F01-A1	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	344
W03-A1	<MDA	5	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	342
W03-B7	<MDA	6	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	343
W03-B4	<MDA	6	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	349
Basement Gamma Well										
W01-A5	<MDA	10	<MDA	<MDA	<MDA	4200	<MDA	< 2	< 3	372
W02-D1	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	373
W02-A5	<MDA	9	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	376
W02-E7	<MDA	10	<MDA	<MDA	<MDA	<MDA	3200	< 2	< 3	371
W02-B3	<MDA	11	<MDA	<MDA	3200	3200	<MDA	< 2	< 3	377
W02-E4	<MDA	10	<MDA	<MDA	<MDA	<MDA	<MDA	< 2	< 3	370
Basement Sump										
Top Rim	<MDA	12	<MDA					< 2	< 3	378
1 Meter down	<MDA	12	<MDA					< 2	< 3	379
15 feet down	<MDA	13	<MDA					< 2	< 3	380

* Maximum in 1 square meter

Background was not subtracted from above data.

Alpha background = 2 dpm/100cm²
Beta background = 1600 dpm/100cm²
Gamma background = 9 uR/hr

GRAPHICAL ILLUSTRATION



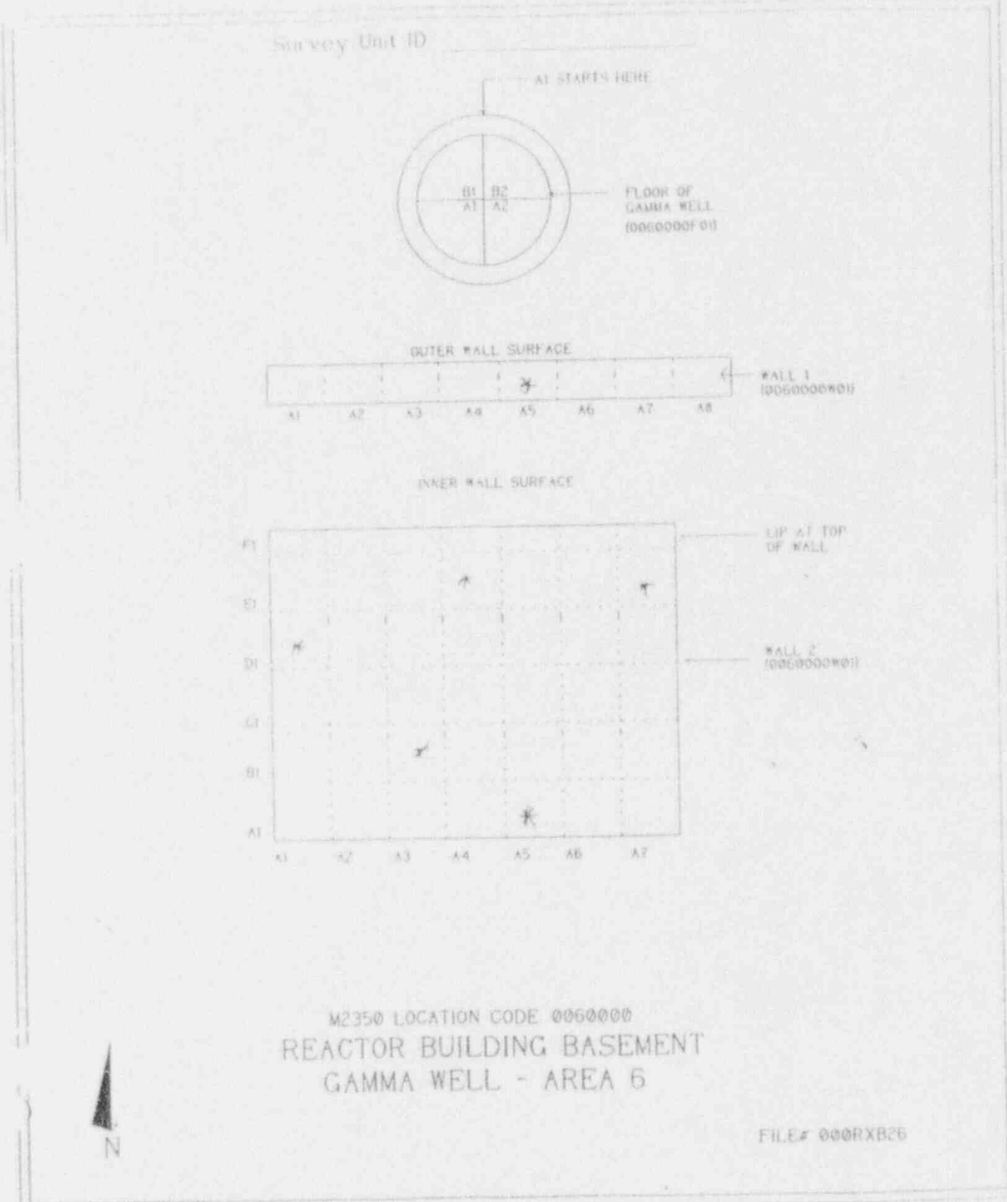
Basement Airlock 2

DATE 24 May 93
DRAWN JSB
APPROVED HE
SCALE NTS
PLATE

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

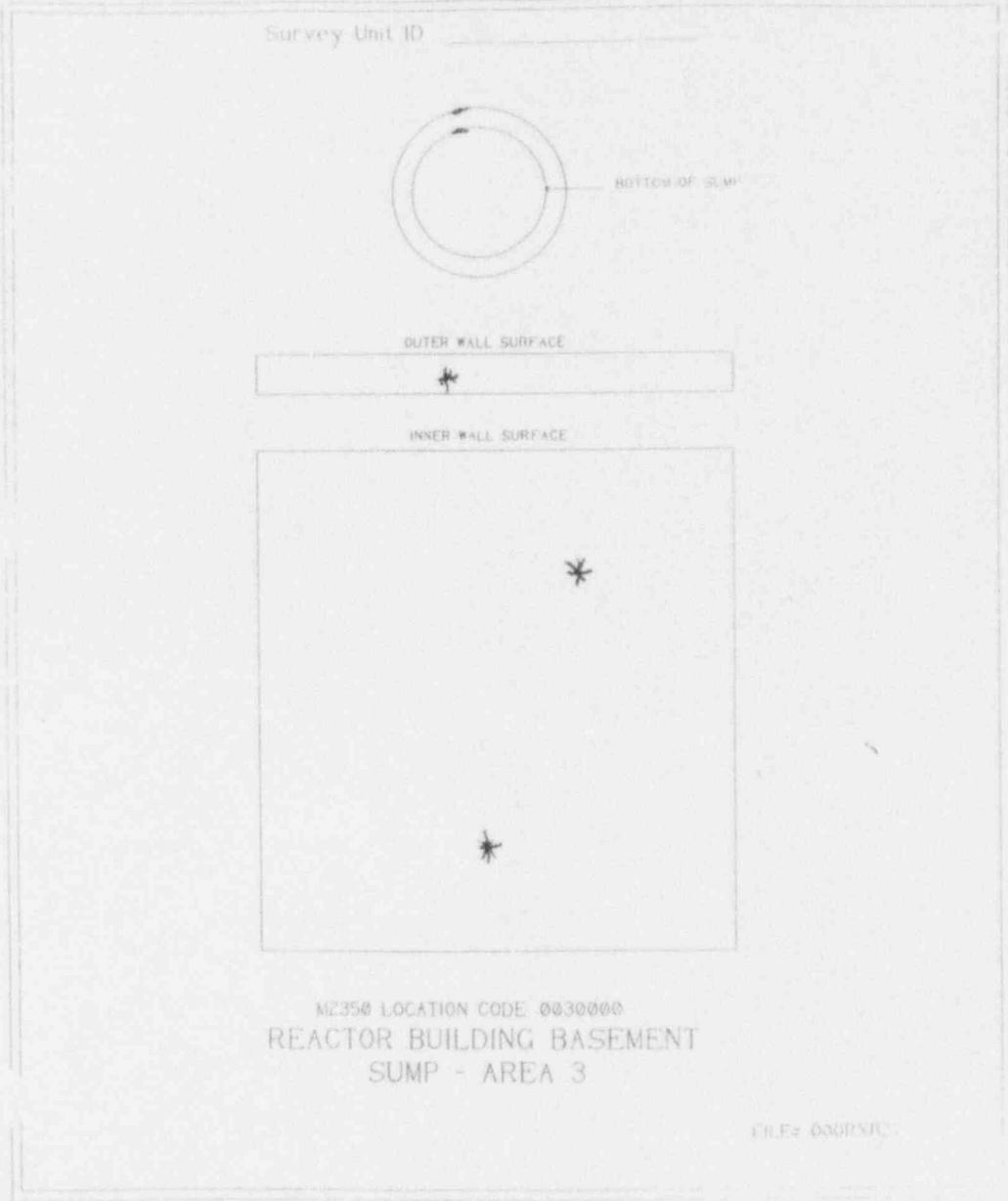
UNITED STATES ARMY MEDICAL DEPARTMENT

GRAPHICAL ILLUSTRATION



Basement Gamma Well	DATE 24 May 93
	DRAWN JSB
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY	APPROVED HE
UNITED STATES ARMY MEDICAL DEPARTMENT	SCALE NTS
	PLATE

GRAPHICAL ILLUSTRATION



Basement Sump

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL DEPARTMENT

DATE 24 May 93
DRAWN JSB
APPROVED HE
SCALE NTS
PLATE