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NAVAL NUCLEAR PROPULSION PROGRAM (NNPP) RADIOLOGICAL FINAL REPORT FOR THE DECOMMISSIONING VOLUME II SECTION B CNC CHARLESTON SC

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RADIOLOGICAL ENGINEERING DIVISION

NAVAL NUCLEAR PROPULSION PROGRAM (NNPP) RADIOLOGICAL FINAL REPORT FOR THE DECOMMISSIONING OF CHARLESTON NAVAL SHIPYARD

(VOLUME II)
SECTION B

Prepared by
Radiological Engineering Division
Charleston Naval Shipyard
Charleston, South Carolina

April 1, 1996

NAVAL NUCLEAR PROPULSION PROGRAM (NNPP)

RADIOLOGICAL FINAL REPORT

FOR THE DECOMMISSIONING OF

CHARLESTON NAVAL SHIPYARD

(VOLUME II)

SECTION B

Prepared by
Radiological Engineering Division
Charleston Naval Shipyard
Charleston, South Carolina
April 1, 1996

TABLE OF CONTENTS

SECTION	TITLE	PAGE
A.	**Repair Facility 79/79A**	
1.	Overall Report	1
	Introduction	
	Use	
	Radiological History	
	Items Removed	
	Survey Requirements	
	Areas Remediated	
2.	Building 79, Groups 1 & 2	8
	Central Bay Area and Offices	
	Clean Room	
	Machine Shop Center Offices	
	Machine Shop North Offices	
3.	Building 79, Groups 3 & 6	47
	Old Radioactive Waste Storage Area	
	Source Storage Areas	
	Machine Shop	
4.	Building 79, Groups 4 & 6	86
	Anti-Contamination Clothing Laundry	
5.	Building 79A, Transition Group 2	92
	Mezzanine Stairs	
	RC Mock-up	
	Temporary Services Shop Office	
	Restroom	
	Vault	
6.	Building 79A, Transition Group 3	112
	Control Point	
	Locker Room	
	Mezzanine	
7.	Building 79A, Transition Groups 4 & 6	130
	Control Point Approach and Frisk Area	
	Decontamination Shower	
	Instrument Storage Room	
	Radiological Control Office	
8.	Building 79A, Groups 3 & 4	147
	Low Bay	
	High Bay	
	Refueling Training Cell Pit	
	North Bay East General Area	
	Shredder Room	
9.	Building 79A, Group 5	241
	Decontamination Room	
	Waste Packer Room	
	Contaminated Work Room	

TABLE OF CONTENTS

SECTION	TITLE	PAGE
A.	**Repair Facility 79/79A (cont'd)**	
	10. Building 79A, Adjacent Areas Groups 2 & 3	275
	20' Perimeter	
	Fenced Area	
	High Rad Fort	
	11. Building 79A, Trenches	327
	Interior RLW Trenches	
	RLW Discharge Line Core Sample Trench	
	Anticontamination Laundry Trenches	
	Outside RLW Trenches	

TABLE OF CONTENTS

SECTION	TITLE	PAGE
B.	**Repair Facility Building 222**	
1.	Overall Report	1
	Introduction	
	Use	
	Radiological History	
	Items Removed	
	Survey Requirements	
2.	Third Floor - Groups 1 & 2	8
	Third Floor	
	Third Floor Office Area 1	
	Third Floor Office Area 2	
	Third Floor Office Area 3	
3.	Second Floor - Groups 1 & 2	20
	Room 203/204, Tool Room	
	Room 205	
	Room 206, RadCon Refueling Office	
	Room 207	
	Corridor 212	
	Room 217	
4.	Second Floor - Groups 3 & 6	47
	Room 201, Control Point	
	Room 202, Locker Room	
	Room 211, RadCon Office	
	Room 213, Mechanical Room	
5.	Second Floor - Group 4	75
	Room 201, Frisk Area and Approach	
	Room 215	
	Room 219/220, Decontamination Shower	
6.	First Floor - Group 3	94
	Dry Dock #1 and #2 Access Tunnels	
7.	First Floor - Group 4	124
	Room 101	
	Room 102	
	Room 103	
	Room 104	
	Room 106	
	Room 111, Corridors and Storage	
	Room 112, North End	
	Room 115	
	Room 116	
	Room 118, Staging and Storage	
	HVAC Duct Shaft	
	First to Second Floor Stairwell	

TABLE OF CONTENTS

SECTION	TITLE	PAGE
B.	**Repair Facility Building 222 (cont'd)**	
	8. First Floor - Group 5	206
	Room 105	
	Room 112, South End	
	9. Basement - Group 2	222
	Fire Exit Stairs	
	10. Basement - Group 4	227
	Room 001, Basement General Area	
	Room 002, Effluent Tank Area	
	Room 006, Waste Packer Annex	
	Room 011, Under Stairs Storage	
	High Rad Fort	
	Basement to First Floor Stairs	
	11. Basement - Group 5	280
	Room 004, Decontamination Room	
	Room 005, Waste Packer	
	Elevator Shaft	
	12. Miscellaneous Area - Group 2	296
	20' Perimeter Area	
	13. Miscellaneous Areas - Group 3 & RLW Pipe Trench	308
	Tank House Fenced Area	
	Rool Up Door Area	
	Fenced Area (RLW Piping Trench)	
	14. Miscellaneous Areas - Group 4	335
	Refueling Slab	

TABLE OF CONTENTS

SECTION	TITLE	
C.	**Building 13/13A**	
1.	Overall Report	1
	Introduction	
	Use	
	Radiological History	
	Survey Requirements	
2.	Building 13 Groups 1 and 2	1
	20' Perimeter	
3.	Building 13 Group 3	24
	Non-Destructive Test Area	
	Radiography Room 1	
	Radiography Room 2	
	Radiography Room 5	
	Microscope Room	
	Room 119	
4.	Building 13A Groups 1 and 2	62
	Third Floor	
	Polographic Room	
	Third Floor Annex, General Area	
5.	Building 13A Group 3	68
	Present X-Ray Room	
	Counting Room	
	Water Room	
	First Floor Annex	
6.	Building 13A Radiochemistry Laboratory, Third Floor Annex	89
7.	Building 13A Radiochemistry Laboratory Mezzanine, Third Floor Annex	99
D.	**Buildings 101 and 1426**	
1.	Overall Report	1
	Introduction	
	Use	
	Radiological History	
	Survey Requirements	
2.	Building 101, Center Area	4
3.	Building 101, Covered Storage Area	11
4.	Building 101, East End	27
5.	Building 101, Fenced Area & 20' Perimeter	43
6.	Building 101, North Storage Room	58
7.	Building 101, South Storage Room	66
8.	Building 101, West End	71
9.	Building 1426	76

TABLE OF CONTENTS

SECTION TITLE

E. Portable Facilities
1. Group 3 Areas
   1.1 Controlled Storage Enclosure #1
   1.2 Controlled Storage Enclosure #2
   1.3 Internal Monitoring Trailers
   1.4 Change House/Frisk Enclosures
   1.5 Dry Dock Platforms

2. Group 5 Areas
   2.1 New Fuel Enclosure/Inspection and Assembly Fixture Enclosure (NFE/IAF) and Associated Ventilation Skid

F. Dry Docks
1. Dry Dock 1
2. Dry Dock 2
3. Dry Dock 3
4. Dry Dock 4
5. Dry Dock 5
6. ARDM-3
7. ARDM-3, Interior Spaces
8. Dry Dock Keel Blocks

G. Pier and Berths
1. Pier A
2. Pier C
3. Pier D
4. Pier F
5. Pier G
6. Pier H
7. Pier J
8. Wharf F

H. Radiological Transfer Routes

I. Environmental Report

TABLE OF CONTENTS

SECTION TITLE

J. **Buildings with Known Radiological History**
1. Group 2 Areas
   - 2.1 Building 11, Southwest End
   - 2.2 Building 80, Southeast End
   - 2.3 Building 1024, Southeast Corner
   - 2.4 Building 1171, East End
   - 2.5 Building 1173, Southeast End
   - 2.6 Building 1174, Storage Area
3. Group 3 Areas
   - 3.1 Building 3, Gage Calibration
   - 3.2 Building 3, Lathe Area
   - 3.3 Building 3, Supermill Area
   - 3.4 Building 9, Foundry
   - 3.5 Building 35
   - 3.6 Building 44, Plating Facility
   - 3.7 Building 58
   - 3.8 Building 59/59A, Shield Block Storage Area
   - 3.9 Building 59, Fenced Area and Connex Boxes
   - 3.10 Building 62
   - 3.11 Building 69
   - 3.12 Building 95
   - 3.13 Building 96
   - 3.14 Building 177, Contaminated Work Room
   - 3.15 Building 177, Electronics Shop and Cage
   - 3.16 Building 177, Vent Fan Work Area
   - 3.17 Building 190
   - 3.18 Building 217
   - 3.19 Building 218
   - 3.20 Building 239
   - 3.21 Building 241
   - 3.22 Building 246, Mixed Waste Storage bay
   - 3.23 Building 590A, Instrument Storage Room
   - 3.24 Building 1267
   - 3.25 Building 1317
   - 3.26 Building 1746
   - 3.27 Building 380-207
   - 3.28 Cofferdam Laydown Area
   - 3.29 Dry Dock 4 Spent Fuel Storage Area
   - 3.30 Dry Dock 5 S5G Refueling Foundations
   - 3.31 Dry Dock 5 Miscellaneous Ram Storage Areas
   - 3.32 S6G Refueling Facility Foundations
   - 3.33 Parking Lot E-5
   - 3.34 Pier F-G RAM Storage Area
   - 3.35 Pier G-H RAM Storage Area

TABLE OF CONTENTS

SECTION TITLE

J. **Buildings with Known Radiological History (cont'd)**
3. Group 3 Areas Cont'd
3.36 Pier J-K RAm Storage Area
3.37 Rail Line RAM Storage Areas
3.38 YFN-1205 Barge
3.39 Dry Dock 5 Quay Wall RAM Storage Area
4. Group 4 Areas
4.1 Building 3, Radiological Work Area
4.2 Building 1760
4.3 Dry Dock 5 S5W Refueling Foundations
4.4 Dockside Training Support Enclosure (DSTE)

1. Building 222

a. Introduction:

Building 222 was a Radiological Refueling and Repair Facility located in grid C-6 on the Charleston Naval Shipyard map. Building 222 was divided into five individual areas. These areas are Third Floor, Second Floor, First Floor, Basement, and Miscellaneous Fenced Areas.

b. Use:

Building 222 Radiological Refueling and Repair Facility began initial operations in 1972 to support overhaul and refueling of nuclear powered ships. Work in this facility included refueling, refueling training, radioactive liquid processing, reactor plant equipment refurbishing, refueling equipment repair, waste packing, portable radioactive liquid waste (RLW) tank maintenance and decontamination, and decontamination of reactor plant components. From 1972 to 1983, the basement, first floor, and portions of the second floor were controlled as Controlled Surface Contamination Areas (CSCAs). Since 1983 the general areas were controlled as radiologically controlled areas (RCAs).

c. Radiological History:

Room 218, Mens Restroom - Contamination levels were maintained less than 450 $\mu\mu Ci/100cm^2$. This area was the closest restroom for personnel exiting the Building 222, second floor, control point area. No history of spills or spread of contamination was recorded.

Third Floor Offices - Although never established as a radioactive material storage area or radiological work area, a bag with fixed radioactivity of 7500 $\mu\mu Ci$/frisk was inadvertently stored in one of the office spaces for a short time in 1978. Contamination levels were always maintained less than 450 $\mu\mu Ci/100cm^2$.

Room 203 and 204, Tool Room - Although never established as a radioactive material storage area or radiological work area, on several occasions tools with fixed radioactivity were found in this room. Contamination levels were always maintained less than 450 $\mu\mu Ci/100cm^2$.

Room 205 - Although never established as a radioactive material storage area or radiological work area, a drape with fixed radioactivity of 2000 $\mu\mu Ci$/frisk was found in this room. Loose surface contamination levels were always maintained less than 450 $\mu\mu Ci/100cm^2$.

Room 206, Radiological Control Refueling Office - No radioactive material was ever found and no radiological work was performed here. Contamination levels were always less than 450 $\mu\mu Ci/100cm^2$.

Room 207 - No radioactive material was ever found and no radiological work was performed here. Contamination levels were always less than 450

1. **Building 222**

μμCi/100cm^2.

Corridor 212 - Occasionally, packaged radioactive material was transferred through this area to the control point. Contamination levels were always less than 450 μμCi/100cm^2. No history of spills or spread of contamination was recorded.

Room 217 - Although this area was never controlled as a radioactive material storage area or a radiological work area, on at least one occasion a plug with loose surface contamination levels of several thousand μμCi/100cm^2 was found here. There was no spread of contamination to the surfaces of this room from this occurrence. Contamination levels were maintained less than 450 μμCi/100cm^2.

Tank House Fenced Area - The tank house fenced area has been established as a radiation area. Localized CSCAs have been established to perform work involving contamination levels of several thousand μμCi/100cm^2. No history of spills or spread of radioactivity to the surfaces of this area is recorded. Contamination levels in the area were always maintained less than 450 μμCi/100cm^2.

Refueling Fenced Area - The refueling fenced area has been established as a radiation area and radioactive material storage area. Localized CSCAs have been established to perform work involving contamination levels of several thousand μμCi/100cm^2. No history of spills or spread of radioactivity to the surfaces of this area is recorded. Contamination levels in the area were always maintained less than 450 μμCi/100cm^2.

Room 201, Control Point - This was the uncontrolled side of the boundary between the controlled and the uncontrolled areas of the building. Although the uncontrolled side of this area has never been used for radioactive work or radioactive material storage, radioactive material has been transferred through this area. Radiac instruments containing Th-232 and Tc-99 sources were stored and source checked in this area. Contamination levels were maintained less than 450 μμCi/100cm^2.

Room 202, Locker Room - Anticontamination clothing with contamination levels in the tens of thousands μμCi/frisk fixed and several thousand μμCi/100cm^2 loose has been found in the anticontamination clothing storage bins. No spread of radioactivity in this area was caused by this occurrence. No other spills or spread of contamination was recorded. Contamination levels subsequently were maintained less than 450 μμCi/100cm^2.

Room 211, Radiological Control Office - The area was controlled as a CSCA until it was converted into office space in 1973. Radioactive samples were counted in this area. At least one spill occurred in this area causing a spread of loose surface contamination of several thousand μμCi/100 cm^2. All areas of this room were decontaminated and surveyed prior to its conversion into office

1. Building 222

space. Contamination levels were maintained less than 450 μμCi/100cm^2.

Room 213, Mechanical Room - Localized CSCAs have been established in this area to perform maintenance on the building's controlled ventilation systems. Although high airborne areas were established for this work, no airborne radioactivity has ever been detected here. No history of spills or spread of contamination in this area has been recorded. Contamination levels were maintained less than 450 μμCi/100cm^2.

Dry Docks #1 and #2 Access Tunnels - The tunnels were controlled as CSCAs until 1983 and as RCAs thereafter. No radioactive work was performed in this area, however, packaged items with levels greater than 1 x 10^6 μμCi/100cm^2 were carried through the tunnels. On several occasions material with loose surface contamination of several thousand μμCi/100cm^2 has been inadvertently transported through the access tunnels. No contamination was spread to the surfaces of the tunnels from these occurrences. Contamination levels were maintained less than 450 μμCi/100cm^2.

Room 201, Frisk Area and Approach - This area is the controlled side of the boundary between the controlled and the uncontrolled areas of the building. The controlled side of this area was established as a CSCA until 1983 and as an RCA thereafter. On several occasions material with loose surface contamination levels in the tens of thousands of μμCi/100cm^2 has been identified here prior to exit. Loose surface contamination of several thousand μμCi/100cm^2 has been found on the surfaces of this area. All areas were decontaminated to less than 450 μμCi/100cm^2.

Room 215 - This area was established as a CSCA until 1983 and as an RCA thereafter. This area was used for counting radioactive liquid and solid samples. It was also used as a storage location for sealed radioactive sources and a source check area for radiac instruments. The sources stored here contained the isotopes Tc-99, Co-60, Cs-137, and Cd-109. Contamination levels were always maintained less than 450 μμCi/100cm^2.

Rooms 219 and 220, Decontamination Shower - The area was controlled as a CSCA until 1983 and as an RCA thereafter. Personnel with contamination levels of several thousand μμCi/frisk have been decontaminated in this area. Decontamination of personnel was restricted to specific areas of the body, the shower was never used. Contamination levels were maintained less than 450 μμCi/100cm^2.

Room 101 - This room was controlled as a CSCA until 1983 and from 1990 to base closure. From 1983 to 1990 it was controlled as an RCA. Work involving contamination levels of tens of thousands of μμCi/100cm^2 was performed in this area. Occasionally loose surface contamination levels of several thousand μμCi/100cm^2 have been found on the surfaces of this room. All areas were decontaminated to less than 450 μμCi/100cm^2.

1. Building 222

Room 102 - This room was controlled as a CSCA until 1983 and as an RCA thereafter. Work involving contamination levels of tens of thousands of $\mu\mu Ci/100cm^2$ was performed in this area. Occasionally loose surface contamination levels of several thousand $\mu\mu Ci/100cm^2$ have been found on the surfaces of this room. All areas were decontaminated to less than 450 $\mu\mu Ci/100cm^2$. Contamination levels were maintained less than 450 $\mu\mu Ci/100cm^2$.

Room 103 - This room was controlled as a CSCA until 1991 and as an RCA thereafter. Work involving contamination levels in the tens of thousands of $\mu\mu Ci/100cm^2$ was regularly performed in this area until 1991. Occasionally loose surface contamination levels of several thousand $\mu\mu Ci/100cm^2$ have been found on the surfaces of this room. All areas were decontaminated to less than $\mu\mu Ci/100cm^2$.

Room 104 - This room was controlled as a CSCA until 1991 and as an RCA thereafter. Work involving contamination levels of up to ten thousand $\mu\mu Ci/100cm^2$ was regularly performed in this area until 1991. Occasionally loose surface contamination levels of several thousand $\mu\mu Ci/100cm^2$ have been found on the surfaces of this room. All areas were decontaminated to less than 450 $\mu\mu Ci/100cm^2$.

Room 106 - This room was controlled as a CSCA until the early 1980s and as an RCA thereafter. Work involving contamination levels of up to ten thousand $\mu\mu Ci/100cm^2$ was performed in this area. Occasionally loose surface contamination levels of several thousand $\mu\mu Ci/100cm^2$ have been found on the surfaces of this room. All areas were decontaminated to less than 450 $\mu\mu Ci/100cm^2$.

Room 111, Corridors and Storage Areas - This room was controlled as a CSCA until 1983 and as an RCA thereafter. Spills of radioactive liquid have occurred from stored material spreading contamination levels of tens of thousands of $\mu\mu Ci/100cm^2$ to the floor. All areas were decontaminated to less than 450 $\mu\mu Ci/100cm^2$.

Room 112, North End - This room was controlled as a CSCA until 1983, after which it was an RCA. On several occasions material with loose surface contamination levels of several thousand $\mu\mu Ci/100cm^2$ was found in this area. Occasionally loose surface contamination was found on the surfaces of this area. All areas were decontaminated to less than 450 $\mu\mu Ci/100cm^2$.

Room 115 - This room was controlled as a CSCA until 1983 and as an RCA thereafter. Portions of the radioactive liquid waste system ran through this room. On several occasions material with loose surface contamination of several thousand $\mu\mu Ci/100cm^2$ was found in this area. Loose surface contamination of several thousand $\mu\mu Ci/100cm^2$ has been found on the surfaces of this room. All areas were decontaminated to less than 450 $\mu\mu Ci/100cm^2$.

1. Building 222

Room 116 - This room was controlled as a CSCA until 1983 and as an RCA thereafter. When this room was used for contaminated tool issue, loose surface contamination levels in the tens of thousands of $\mu\mu Ci/100cm^2$ were occasionally found in this area. On several occasions since that time, material with loose surface contamination levels of several thousand $\mu\mu Ci/100cm^2$ has been found. All areas were decontaminated to less than 450 $\mu\mu Ci/100cm^2$.

Room 118, Staging and Storage - This room was controlled continuously as a CSCA until 1983 and occasionally during refueling operations thereafter. Occasionally radiological work was performed in a glovebox in this area. On several occasions material with loose surface contamination of several thousand $\mu\mu Ci/100cm^2$ caused a spread of contamination to the floor of this room. All areas were decontaminated to less than 450 $\mu\mu Ci/100cm^2$. Contamination levels were maintained less than 450 $\mu\mu Ci/100cm^2$.

Room 001, Basement General Area - This room was controlled as a CSCA until 1983 and as an RCA thereafter. Localized CSCAs were established for maintenance on the radioactive liquid waste processing system involving loose surface contamination levels in the millions of $\mu\mu Ci/100cm^2$. Spills of radioactive liquid involving loose surface contamination of tens of thousands $\mu\mu Ci/100cm^2$ have occurred in this room. All areas were decontaminated to less than 450 $\mu\mu Ci/100cm^2$. Contamination levels were maintained less than 450 $\mu\mu Ci/100cm^2$.

Room 002, Effluent Tank Area - This room was controlled as a CSCA until 1983 and as an RCA thereafter. Maintenance involving loose surface contamination levels in the hundreds of thousands of $\mu\mu Ci/100cm^2$ was performed on the radioactive liquid waste processing system. Spills of liquid involving loose surface contamination of several thousand $\mu\mu Ci/100cm^2$ were found in this area. All areas were decontaminated to less than 450 $\mu\mu Ci/100cm^2$.

Room 006, Waste Packer Annex - This room was controlled as a CSCA until 1983 and as an RCA thereafter. Occasionally loose surface contamination of several thousand $\mu\mu Ci/100cm^2$ was found on floor of this room. All areas were decontaminated to less than $\mu\mu Ci/100cm^2$.

Room 011 - This room was controlled as a CSCA until 1983 and as an RCA thereafter. There is no history of loose surface contamination in this area. Contamination levels were maintained less than 450 $\mu\mu Ci/100cm^2$.

Room 012, Decontamination Room Vestibule - This room was always controlled as a CSCA. Occasionally material with loose surface contamination of tens of thousands of $\mu\mu Ci/100cm^2$ was placed in this area. All areas were decontaminated to less than 450 $\mu\mu Ci/100cm^2$.

High Rad Fort - This room was controlled as a CSCA until 1983 and as an RCA thereafter. Occasionally loose surface contamination of several thousand

1. Building 222

μμCi/100cm^2 was found in this area. On one occasion personnel opened drums and handled material with contamination levels of hundreds of thousands of μμCi/100cm^2. Fluid from the spill did not contact the surfaces of the High Rad Fort. All areas were decontaminated to less than 450 μμCi/100cm^2.

Refueling Slab - This area was controlled as a radiation area and radioactive material storage area. Localized CSCAs were established to perform work on the liquid processing system. Spills of radioactive liquid have occurred from the liquid processing system causing loose surface contamination of up to ten thousand μμCi/100cm^2 in this area. All areas were decontaminated to less than 450 μμCi/100cm^2.

Room 105 - This area has always been controlled as a CSCA. The area has routinely been controlled as a high airborne area. Items worked on in this area had levels greater than ten thousand μμCi/100cm^2. The spread of contamination to levels of tens of thousands of μμCi/100cm^2 on the floor and high airborne radioactivity above the allowable limits have occurred in this area. All contaminated areas found were decontaminated to less than 450 μμCi/100cm^2.

Room 112, South End - This room was controlled as a CSCA until 1983, after which it was an RCA. A spill of 20 gallons of radioactive liquid occurred due to a ruptured hose in the radioactive liquid processing system. The spill caused a spread of contamination involving levels of tens of thousands of μμCi/100cm^2 to the floor and walls of the south end of this room. The liquid seeped through small cracks and service penetrations to the decontamination room below.

Room 004, Decontamination Room - This area has always been controlled as a CSCA. The area has been regularly controlled as a high airborne area. Spills of radioactive liquid and spread of contamination to levels of tens of thousands of μμCi/100cm^2 have occurred in this room. All areas found contaminated were decontaminated to less than 450 μμCi/100cm^2.

Room 005, Waste Packer - The waste packing room has always been controlled as a CSCA. The room was used to perform work involving high levels of contamination. The area has routinely been controlled as a high airborne area. Spills of radioactive liquid and high airborne radioactivity have spread contamination levels of several hundred thousand μμCi/100cm^2 to all surfaces of this room. The surfaces of the room were decontaminated to less than 450 μμCi/100cm^2 in the general area after these occurrences.

Elevator and Elevator Shaft - The elevator and elevator shaft was controlled in the same manner as the building general areas, a CSCA until 1983, and an RCA thereafter. In 1990 a spill of radioactive liquid was discovered in the elevator that had spread contamination on the elevator, down the wall of the shaft, and into the bottom of the elevator shaft. This spill involved contamination levels of several thousand μμCi/100cm^2. The accessible portions of this spill area were decontaminated to levels less than 450 μμCi/100cm^2.

1. Building 222

Refueling Area RLW Trench - There is no history of contamination found in the trough or failure of the piping. Contamination levels were always less than 450 $\mu\mu Ci/100cm^2$.

d. Items Removed:

Room doors, elevator, walls, concrete floor, electrical systems, floor covering, metal partitions, ventilation systems, radioactive liquid piping systems, and expanded metal fencing.

e. Survey Requirements:

1. Third Floor - Groups 1 & 2
2. Second Floor - Groups 1 & 2
3. Second Floor - Groups 3 & 6
4. Second Floor - Group 4
5. First Floor - Group 3
6. First Floor - Groups 4 & 6
7. First Floor - Group 5
8. Basement - Group 4
9. Basement - Group 5
10. Miscellaneous Fenced Areas - Group 2
11. Miscellaneous Fenced Areas - Groups 3 & 6
12. Miscellaneous Areas - Group 4

2. Bldg. 222, Third Floor

a. Introduction:

Building 222 is located in grid C-6 of the Charleston Naval Shipyard map (Figure 10). This facility began initial operation in 1972 and was used as a permanent nuclear repair and refueling facility. The third floor of this facility primary was used as office areas and conference rooms.

(1) **Description:**

The spaces surveyed in accordance with the Group 2 requirements consist of a 40' by 30' floor area in the northwest corner of the third floor. This area was previously one office space. However it was later subdivided into multiple office spaces. The floor is made of a concrete slab covered by tiling.

(2) **Brief History:**

(a) **Use:** Office spaces.

(b) **Radiological History:** Once in 1978, an empty polyvinyl chloride (PVC) bag with fixed radioactivity of 7500 μμCi/probe was inadvertently stored in one of the northwest office spaces for a short time. Loose surface contamination was not detected.

(3) **Survey Requirements:**

Group 2 surveys were performed in third floor office spaces Area 1, Area 2 and Area 3. Group 1 surveys were performed in all remaining areas of this floor as discussed in the CNSY Final Release Survey Plan.

b. Discussion:

Group 2 survey areas were divided into approximately 10' by 10' grids. Where physically possible, each grid was subdivided into two 3' by 3' subsections which were located in areas of highest potential for contamination. One of these subsections was surveyed using the IM-247/PD and the other using the IM-253/PD (HV-1 PHA). Solid material samples were not required.

The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the floors were 40, 200 and 6000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 1720.

c. Group 1 Summary:

Surveys and investigations performed in accordance with the Group 1 survey requirements did not detect any radionuclides other than those occurring due to natural radioactivity.

2. Bldg. 222, Third Floor

d. Group 2 Summary:

Surveys performed with the IM-247/PD did not detect areas greater than 450 $\mu\mu Ci/20cm^2$.

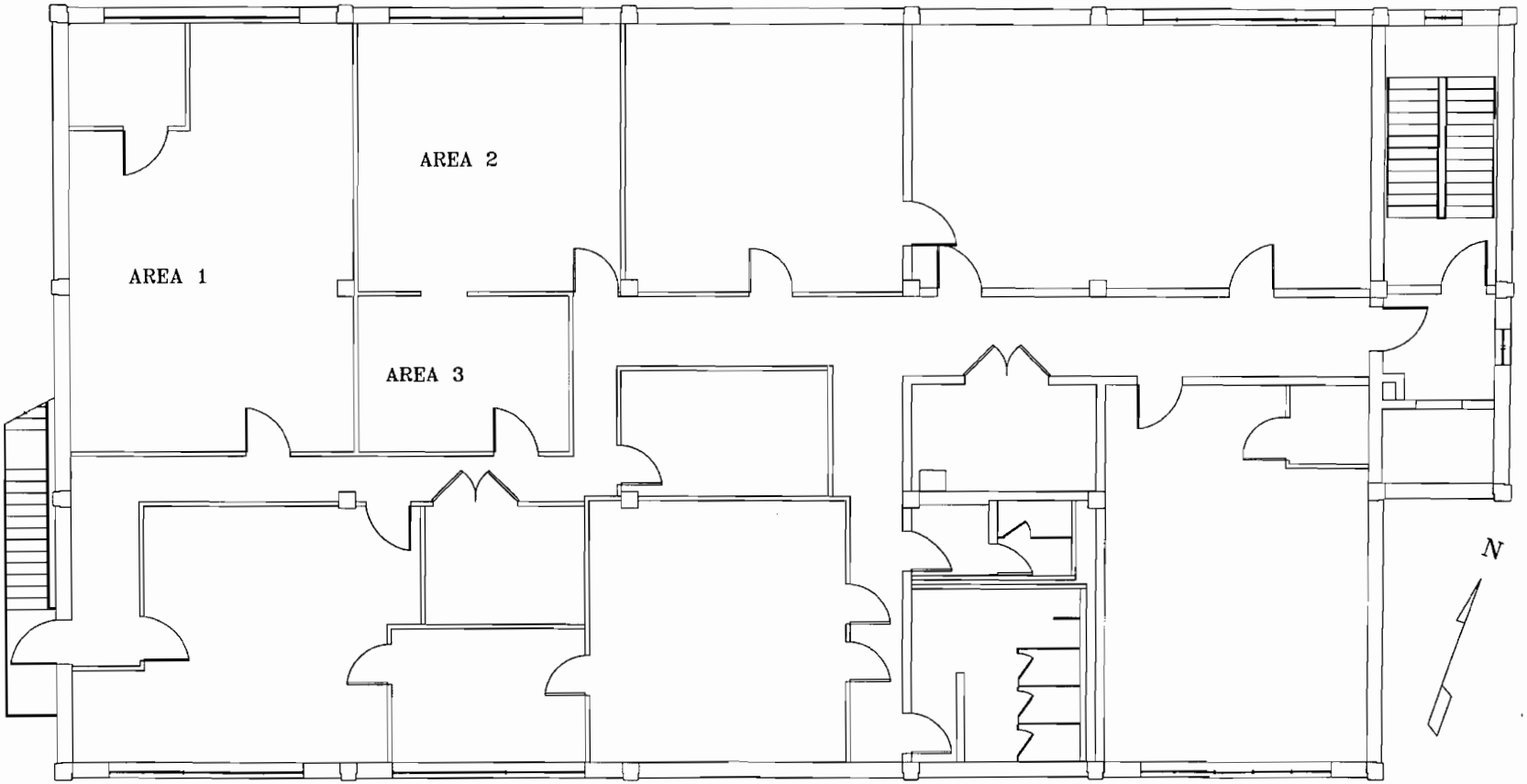
Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) were not required.

Solid material samples were not required.

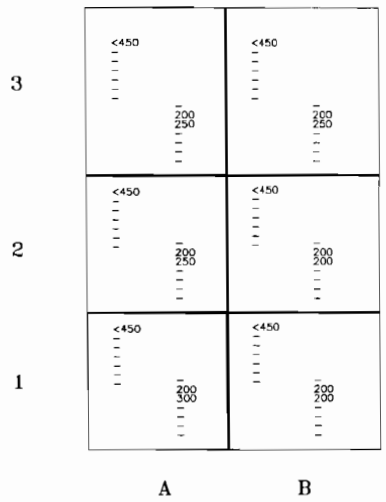
2. Bldg. 222, Third Floor

e. Site Map

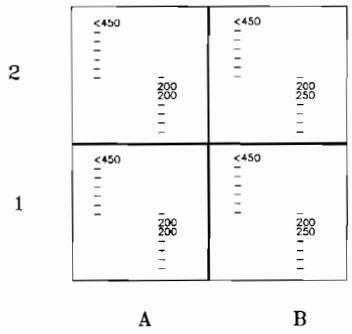


2. Bldg. 222, Third Floor

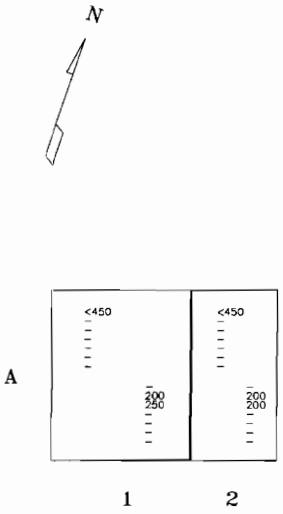
f. Localized Grid Maps



AREA 1



AREA 2



AREA 3

Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

2. Bldg. 222, Third Floor

g. Prior to Photographs

Viewing entrance of Area 1.

2. Bldg. 222, Third Floor

g. Prior to Photographs

Area 1 supervisor room.

2. Bldg. 222, Third Floor

g. Prior to Photographs

Inside Area 2.

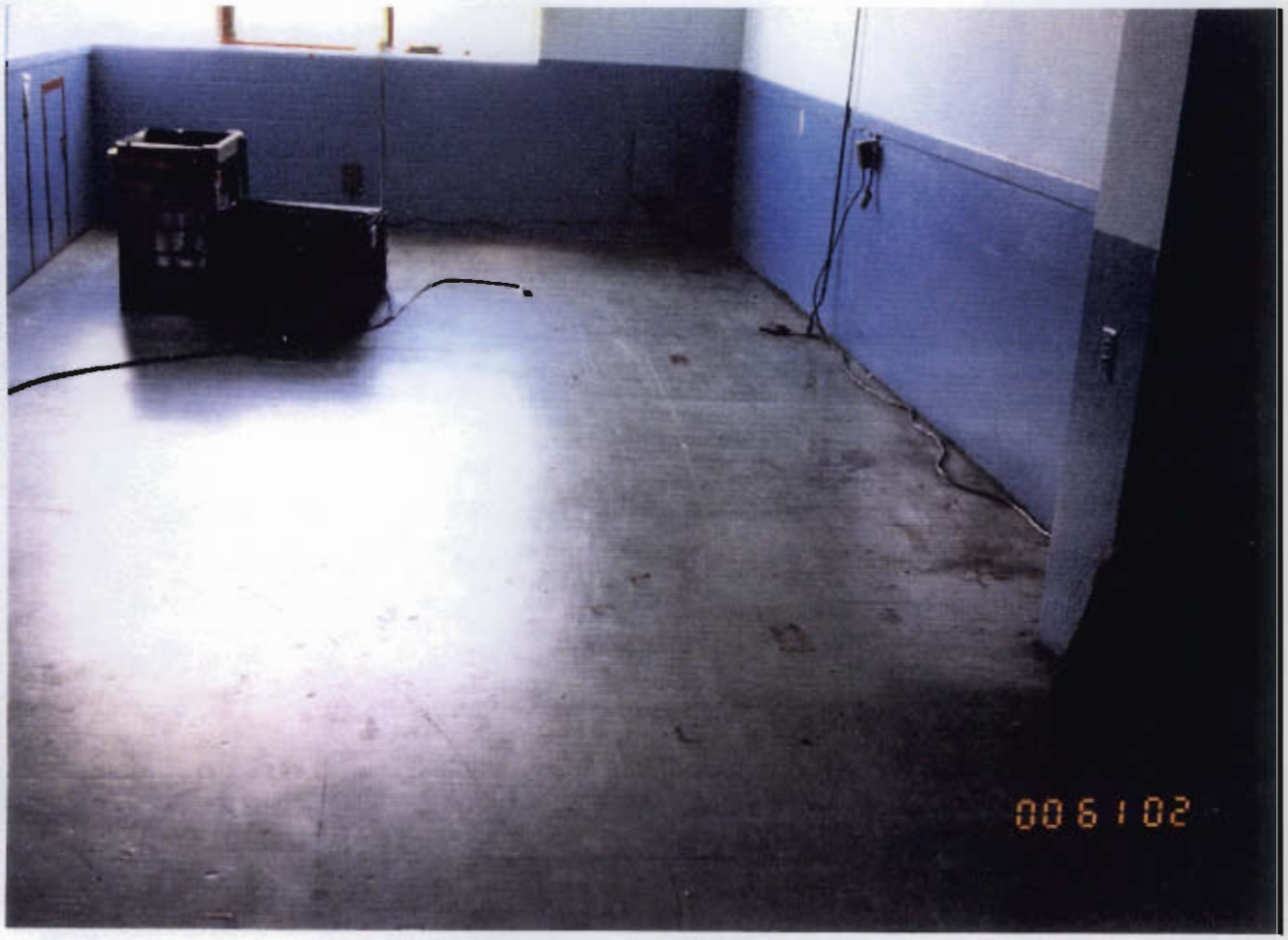
2. Bldg. 222, Third Floor

g. Prior to Photographs

Viewing into Area 3, behind fan.

2. Bldg. 222, Third Floor

h. After Photographs



Area 1.

2. Bldg. 222, Third Floor

h. After Photographs

Viewing into supervisor room.

2. Bldg. 222, Third Floor

h. After Photographs

Area 2.

2. Bldg. 222, Third Floor

h. After Photographs

Area 3.

3. Bldg. 222, Second Floor Groups 1 & 2

a. Report

(1) Description:

The second floor Group 1 areas consisted of the service elevator, room 218, east basement stairwell and service room (not shown), and electrical station. The second floor Group 2 areas consisted of rooms 203, 204, 205, 206, 207, 210 (First/Second floor east stairs and landing), 212 and corridor, 217, and the west stairs.The walls are painted cinder block construction, the floor is tile over concrete, and the ceiling is concrete.

(2) Discussion:

Group 1 surveys were performed in these areas in accordance with localized survey instructions. Surveys using the IM-253/PD (HV-1 PHA and HV-2 GROSS) were performed in selected locations within these areas. Any significant indications above background were thoroughly investigated by performing additional surveys with the IM-247/PD and in some cases removing solid samples from the suspect area.

Group 2 survey areas were divided into 10' by 10' grids. Where physically possible, each grid was subdivided into two 3' by 3' subsections which were located in areas of highest potential for contamination. One of these subsections was surveyed using the IM-247/PD and the other using the IM-253/PD (HV-1 PHA). Solid material samples were not required.

The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the Group 2 floors were 40, 200, and 6000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 1720.

(3) Group 1 Summary:

Surveys and investigations performed in accordance with the Group 1 survey requirements did not detect any radionuclides other than those occurring due to natural radioactivity.

(4) Group 2 Summary:

Surveys performed with the IM-247/PD did not detect areas greater than 450 $\mu\mu Ci/20cm^2$.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

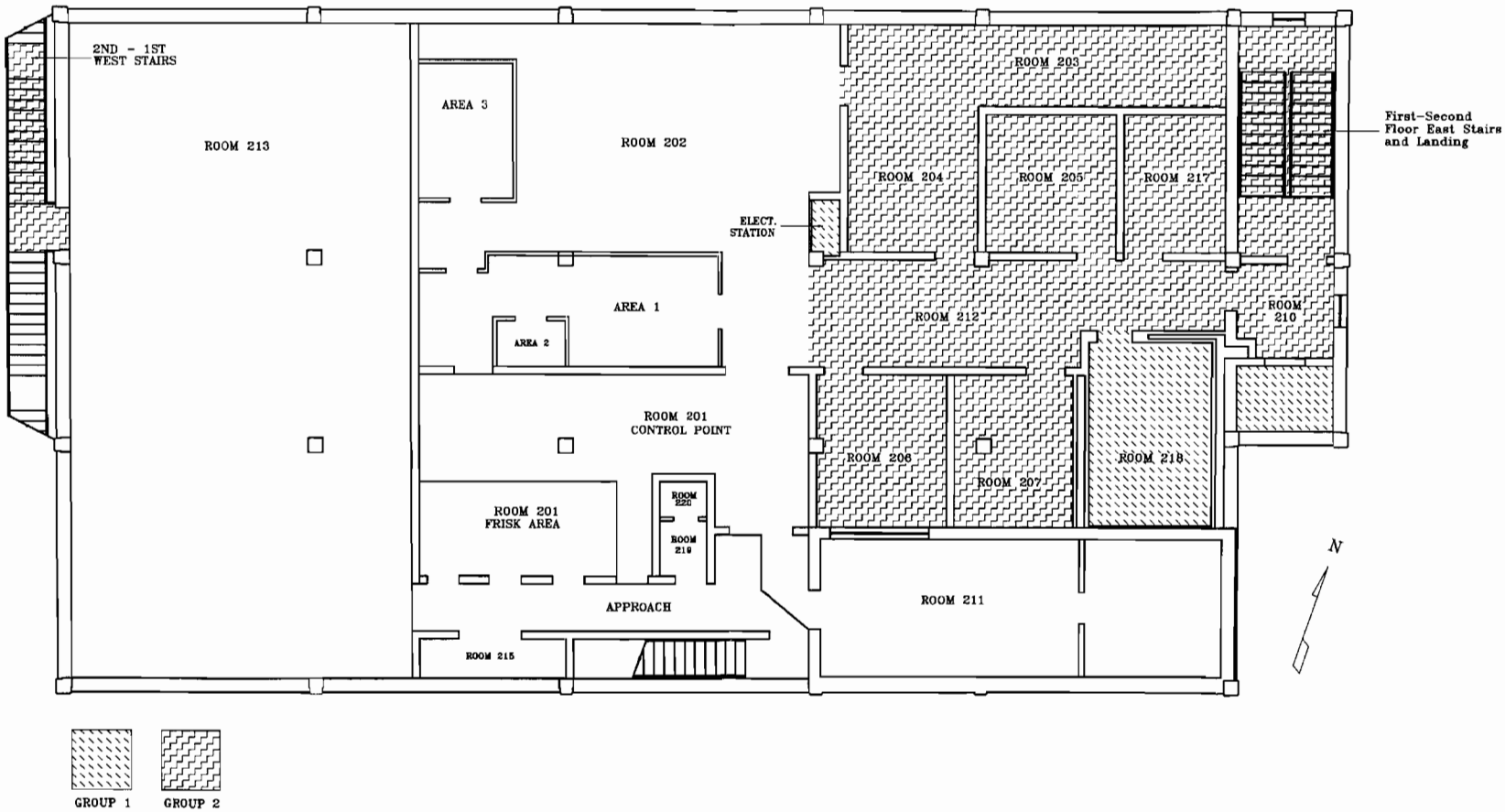
Surveys performed with the IM-253/PD (HV-2 GROSS) were not required.

3. Bldg. 222, Second Floor Groups 1 & 2

Solid material samples were not required.

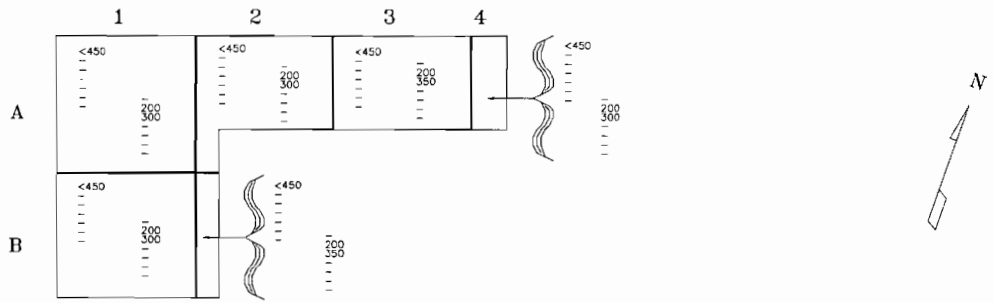
3. Bldg. 222, Second Floor Groups 1 & 2

b. Site Map



3. Bldg. 222, Second Floor Groups 1 & 2

c. Grid Map Rooms 203/204



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

3. Bldg. 222, Second Floor Groups 1 & 2

c. Prior to Photographs Rooms 203/204

Standing in entrance, viewing into Room 204.

3. Bldg. 222, Second Floor Groups 1 & 2

c. After Photographs Rooms 203/204

Viewing into Room 203.

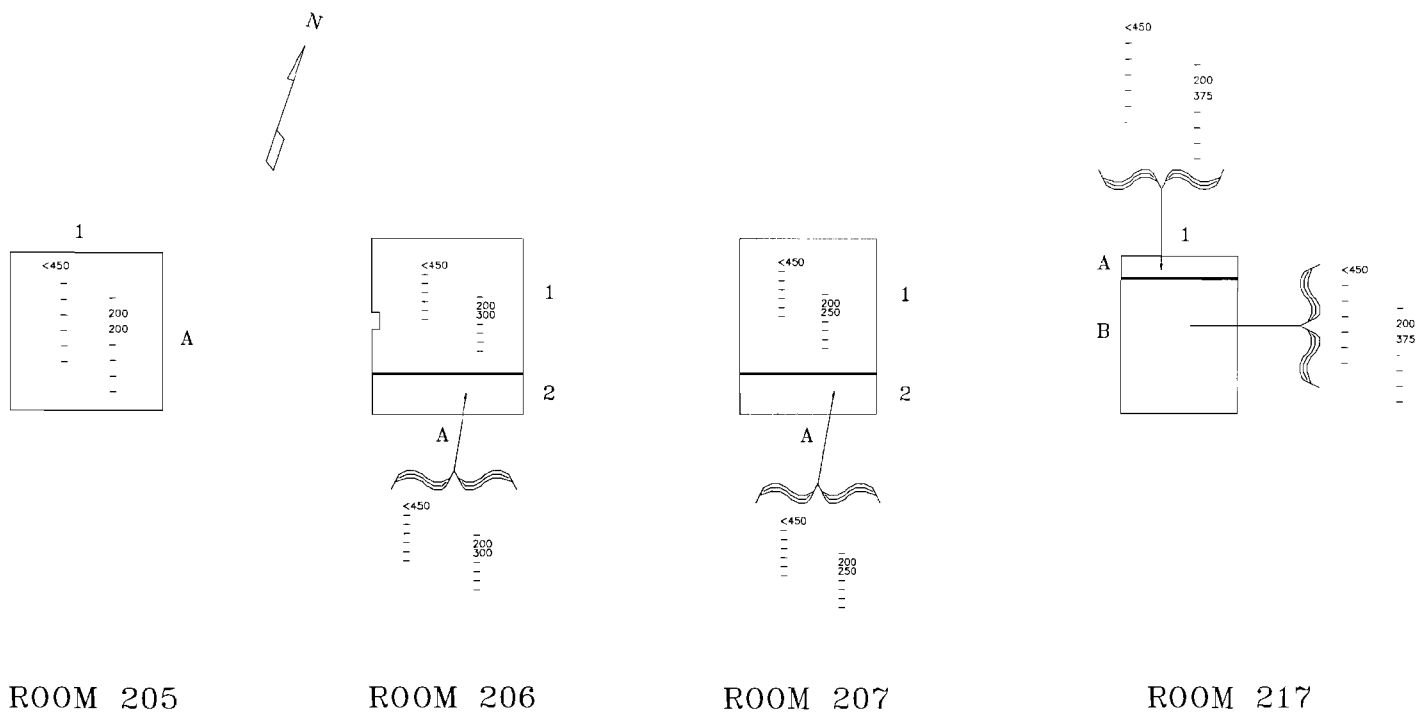
3. Bldg. 222, Second Floor Groups 1 & 2

c. After Photographs Rooms 203/204

Standing in Room 203, viewing into Room 204.

3. Bldg. 222, Second Floor Groups 1 & 2

c. Grid Map Rooms 205, 206, 207, 217



ROOM 205 ROOM 206 ROOM 207 ROOM 217

Sample Data

<450 – IM-247/PD Results [μμC/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

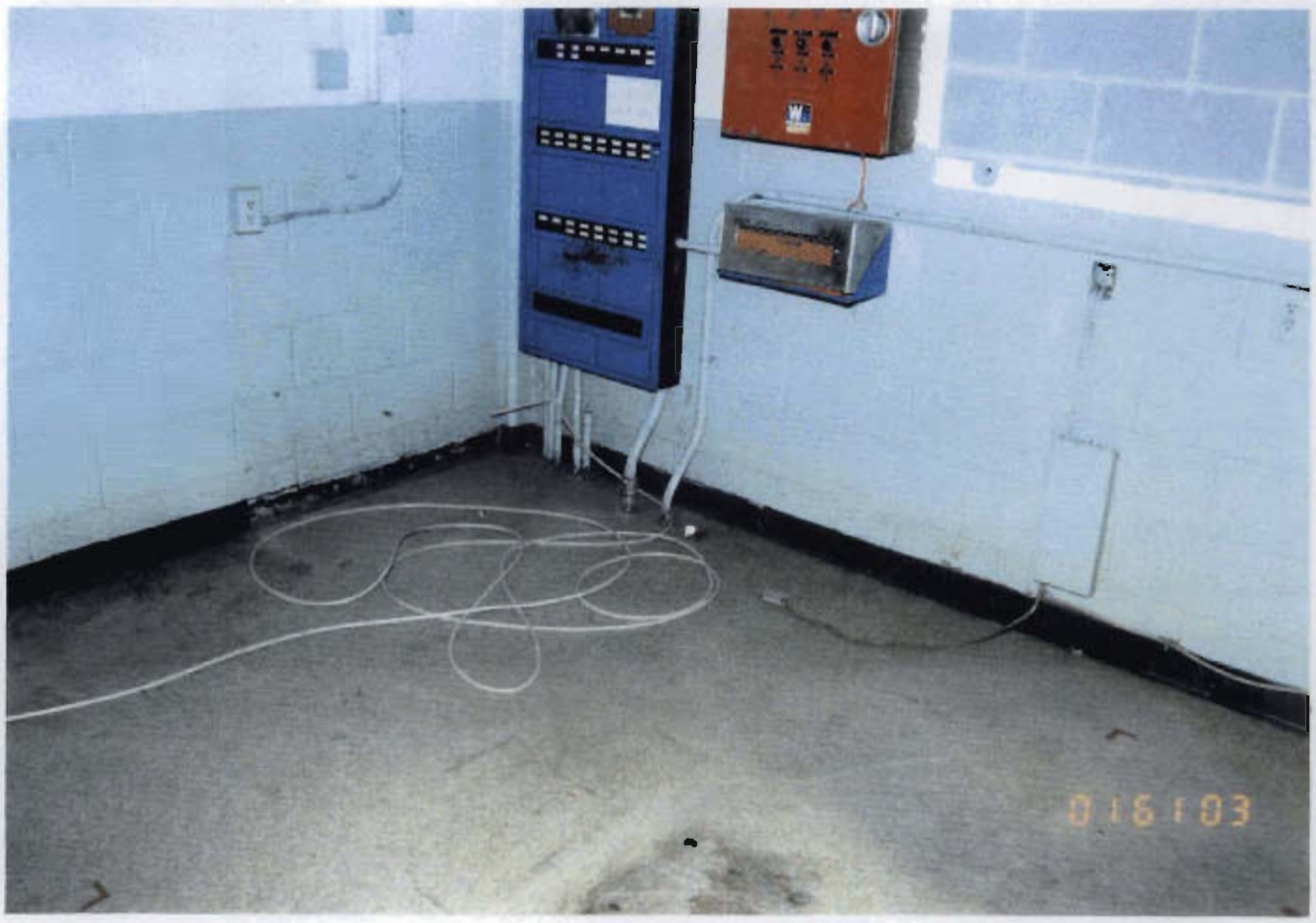
3. Bldg. 222, Second Floor Groups 1 & 2

c. Prior to Photographs Room 205

Standing in entrance, viewing into Room 205.

3. Bldg. 222, Second Floor Groups 1 & 2

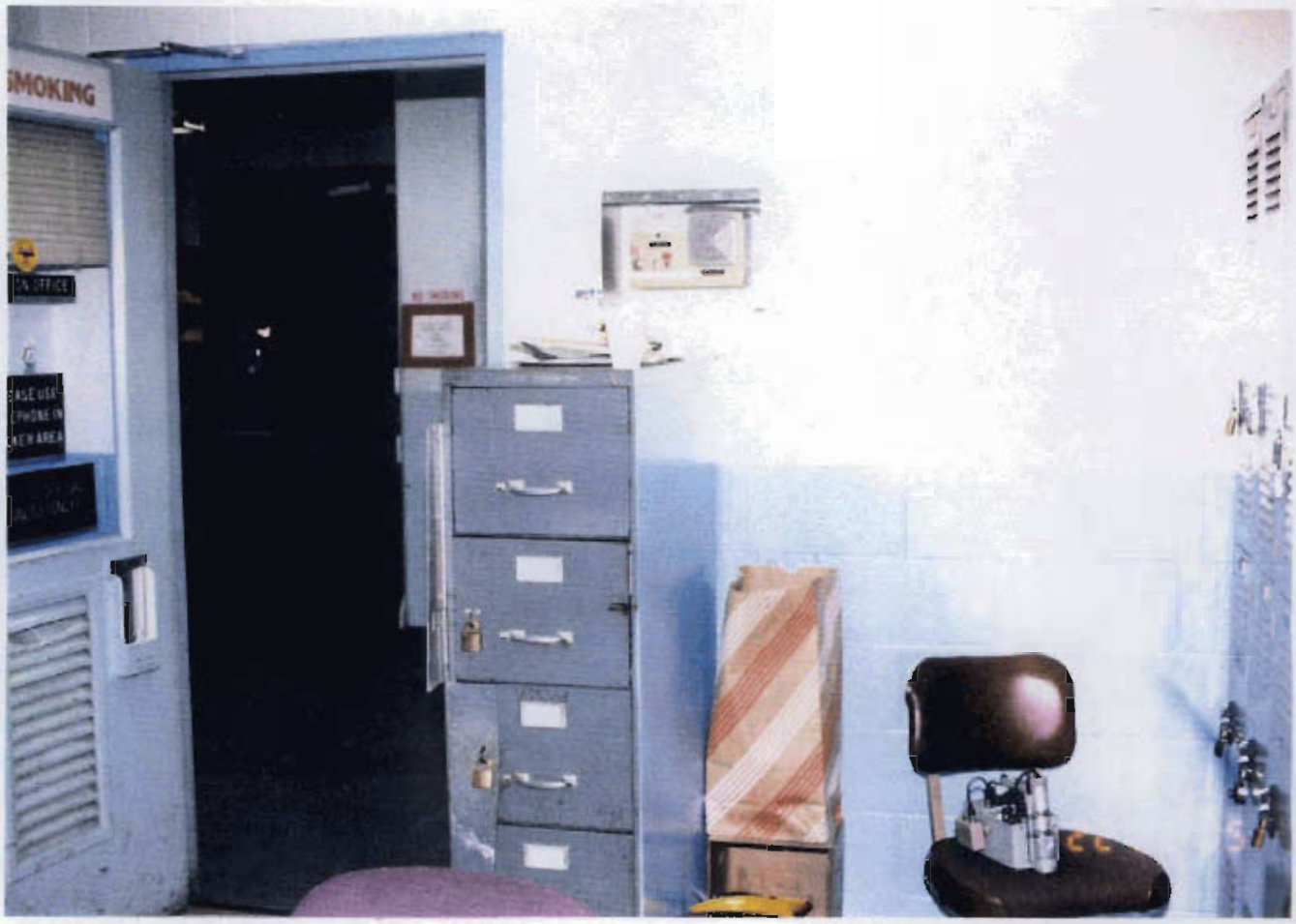
c. After Photographs Room 205



Standing in entrance, viewing into Room 205.

3. Bldg. 222, Second Floor Groups 1 & 2

c. Prior to Photographs Room 206



Room 206, viewing toward entrance.

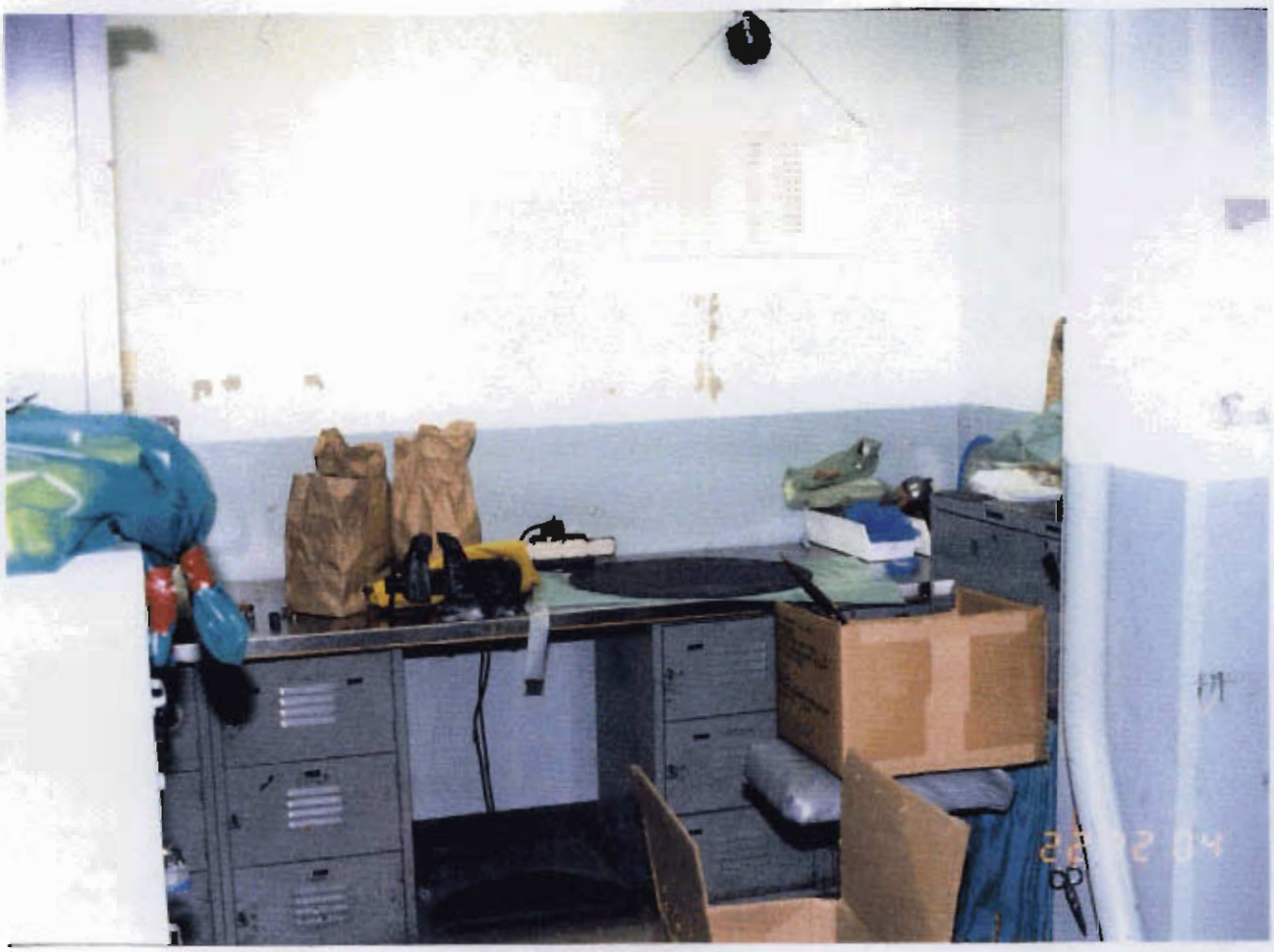
3. Bldg. 222, Second Floor Groups 1 & 2

c. After Photographs Room 206

Standing in entrance, viewing into Room 206.

3. Bldg. 222, Second Floor Groups 1 & 2

c. Prior to Photographs Room 207



Viewing into Room 207.

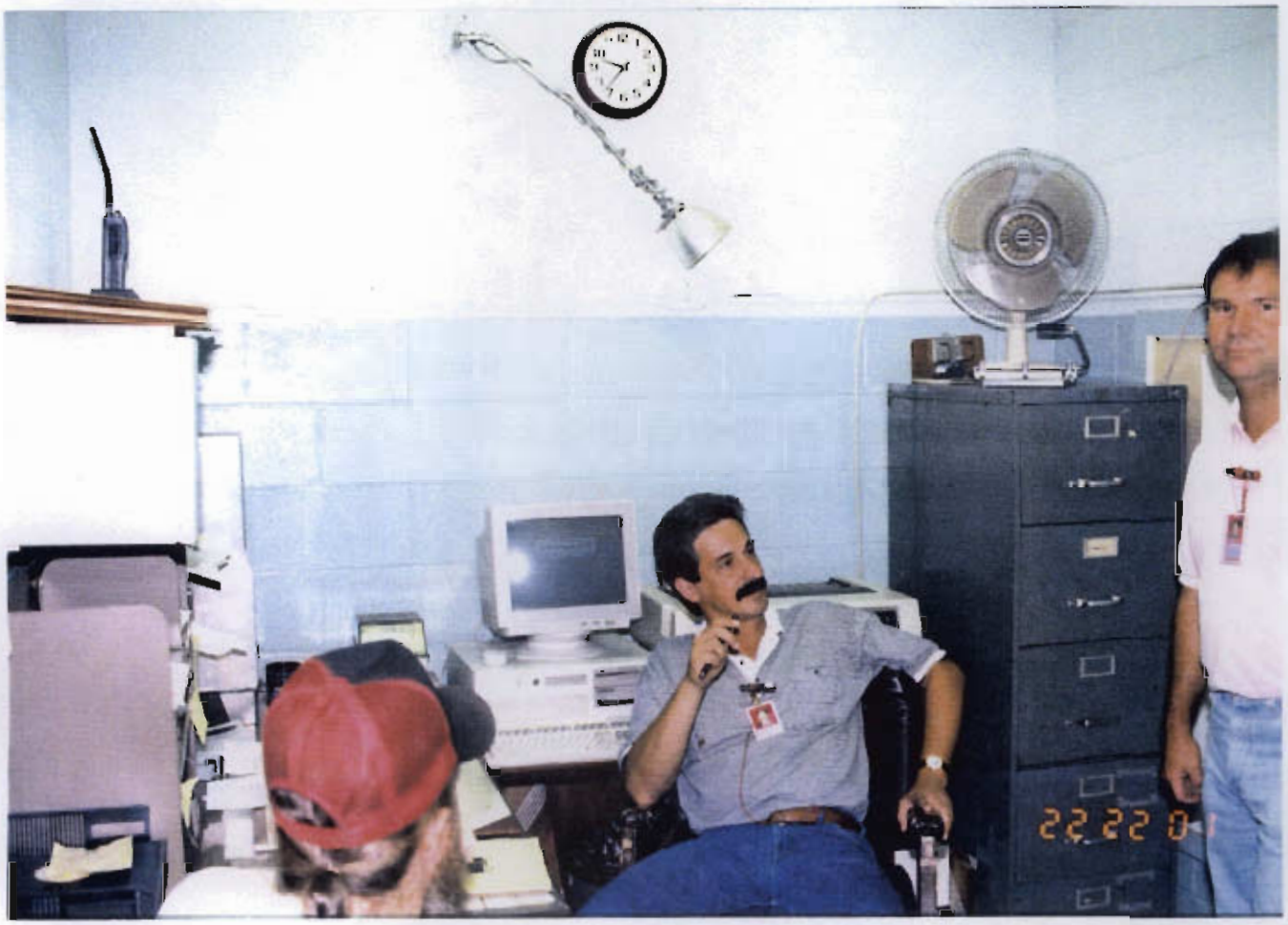
3. Bldg. 222, Second Floor Groups 1 & 2

c. After Photographs Room 207

Viewing into Room 207.

3. Bldg. 222, Second Floor Groups 1 & 2

c. Prior to Photographs Room 217



Viewing into Room 217.

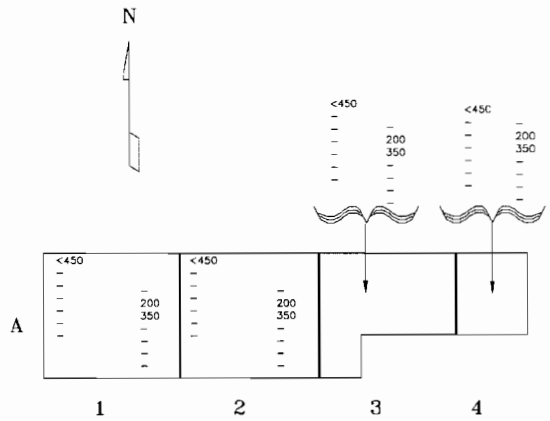
3. Bldg. 222, Second Floor Groups 1 & 2

c. After Photographs Room 217

Viewing inside Room 217.

3. Bldg. 222, Second Floor Groups 1 & 2

c. Grid Map Room 212

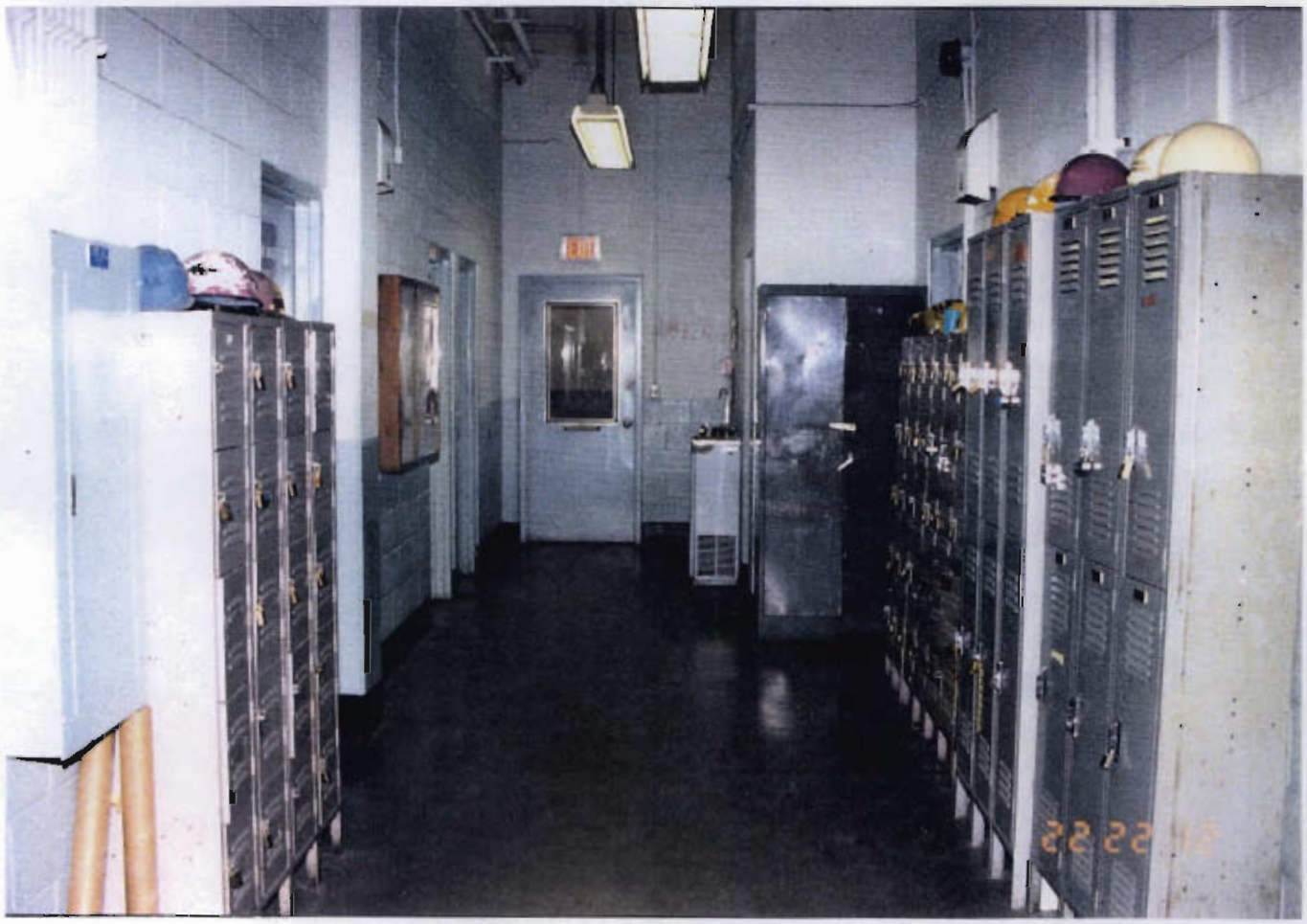


Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

3. Bldg. 222, Second Floor Groups 1 & 2

c. Prior to Photographs Room 212



Viewing toward east stairs.

3. Bldg. 222, Second Floor Groups 1 & 2

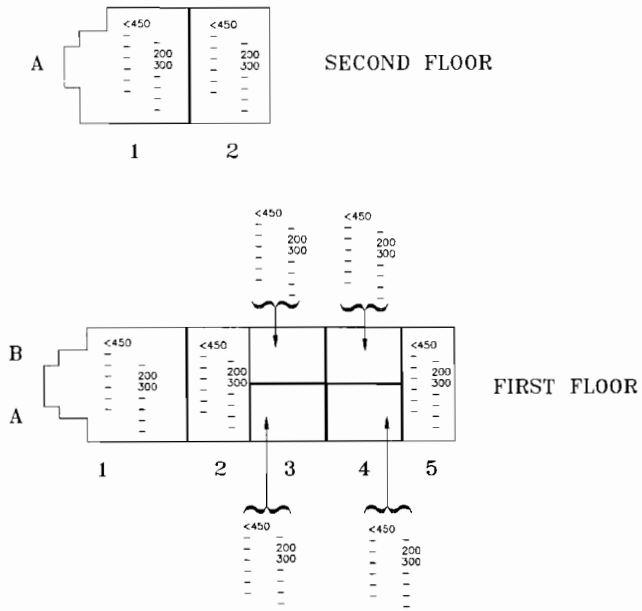
c. After Photographs Room 212

Viewing toward east stairs.

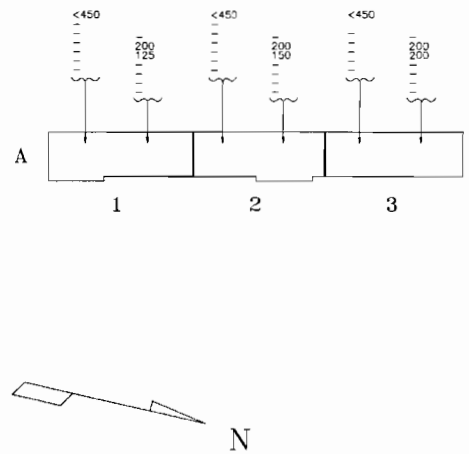
3. Bldg. 222, Second Floor Groups 1 & 2

c. Grid Map Stairs

1ST/2ND FLOOR EAST STAIRS AND LANDINGS



SECOND FLOOR WEST STAIRS



Sample Data

<450 – IM-247/PD Results [μμC/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7500 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

3. Bldg. 222, Second Floor Groups 1 & 2

c. Prior to Photographs Stairs

1st floor to stairwell landing.

3. Bldg. 222, Second Floor Groups 1 & 2

c. Prior to Photographs Stairs

Viewing from stairwell landing to 2nd floor.

3. Bldg. 222, Second Floor Groups 1 & 2

c. After Photographs Stairs

1st floor east entrance.

3. Bldg. 222, Second Floor Groups 1 & 2

c. After Photographs Stairs

Viewing stairwell landing from 2nd floor.

3. Bldg. 222, Second Floor Groups 1 & 2

c. After Photographs Stairs

2nd floor landing.

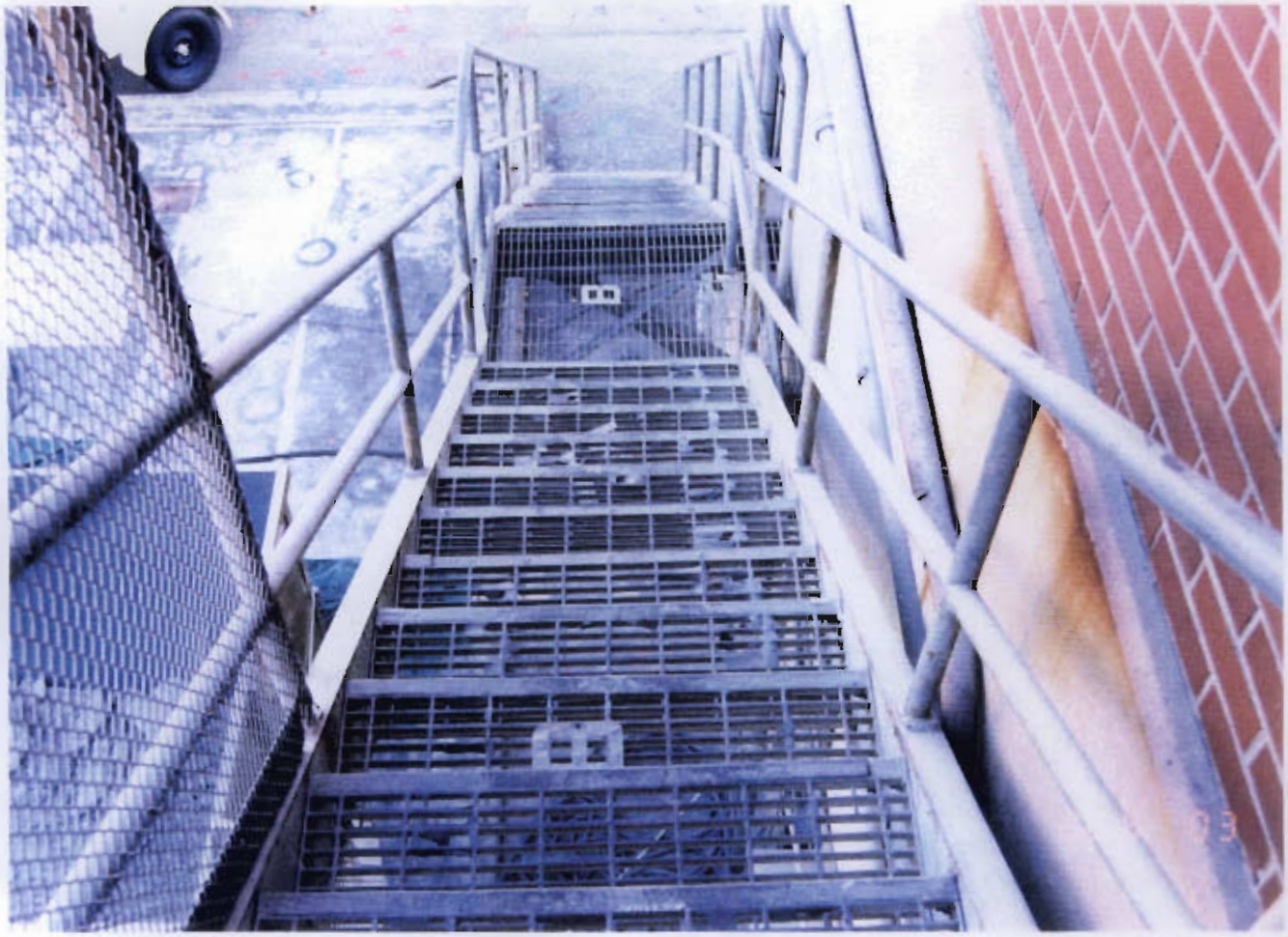
3. Bldg. 222, Second Floor Groups 1 & 2

c. Prior to Photographs Stairs

West end stairs.

3. Bldg. 222, Second Floor Groups 1 & 2

c. After Photographs Stairs



West end stairs, viewing down from 2nd floor.

4. Bldg. 222, Second Floor Groups 3 & 6

a. Report

(1) Description:

The second floor Group 3 areas consisted of rooms 201, 202, 211, and 213. The second floor Group 6 area consisted of the 201 Control Point area. The floors are painted concrete. The walls are painted cinder block and metal/plexiglass. The ceilings are concrete, drywall, and expanded metal.

(2) Discussion:

The Group 3 areas were divided into 5' by 5' floor grids and 5' by 6' wall grids up to 6' in height where physically possible. One hundred percent of all grids were surveyed using the IM-247/PD and the IM-253/PD (HV-1 PHA). A minimum of 25% of all grids were surveyed using the IM-253/PD (HV-2 GROSS). Additionally, solid material samples were taken from each wall and floor grid. These samples were removed from the area indicating the highest potential within each grid. In addition, a minimum of 25% of the Group 6 area floor grids were surveyed using the AN/PDR-56.

The four sides of the concrete columns in rooms 201 and 213 were gridded and surveyed as walls.

Surveys of Room 213 floor grids A-10, A-11, E-5, and F-5 were not required. These areas are presently occupied by a make-up air handling unit (grids A-10 and A-11) and a HVAC duct space (grids E-5 and F-5).

The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the Group 3 floors were 40, 200, and 6000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 1720. The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the Group 3 walls were also 40, 200, and 6000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 1635.

A total of 305 solid material samples were taken. Room 210 Wall 10 grids A1 and A2 were not sampled due to being unpainted metal. The following naturally occurring radionuclides were typical isotopes identified during analysis of solid material samples: lead 212, lead 214, bismuth 214, and potassium 40.

(3) Summary:

Surveys performed with the IM-247/PD did not detect areas greater than 450 $\mu\mu Ci/20cm^2$.

Surveys performed with the AN/PDR-56 found no detectable alpha radioactivity.

4. Bldg. 222, Second Floor Groups 3 & 6

Surveys performed with the IM-253/PD (HV-1 PHA) detected 40 areas greater than or equal to twice background.

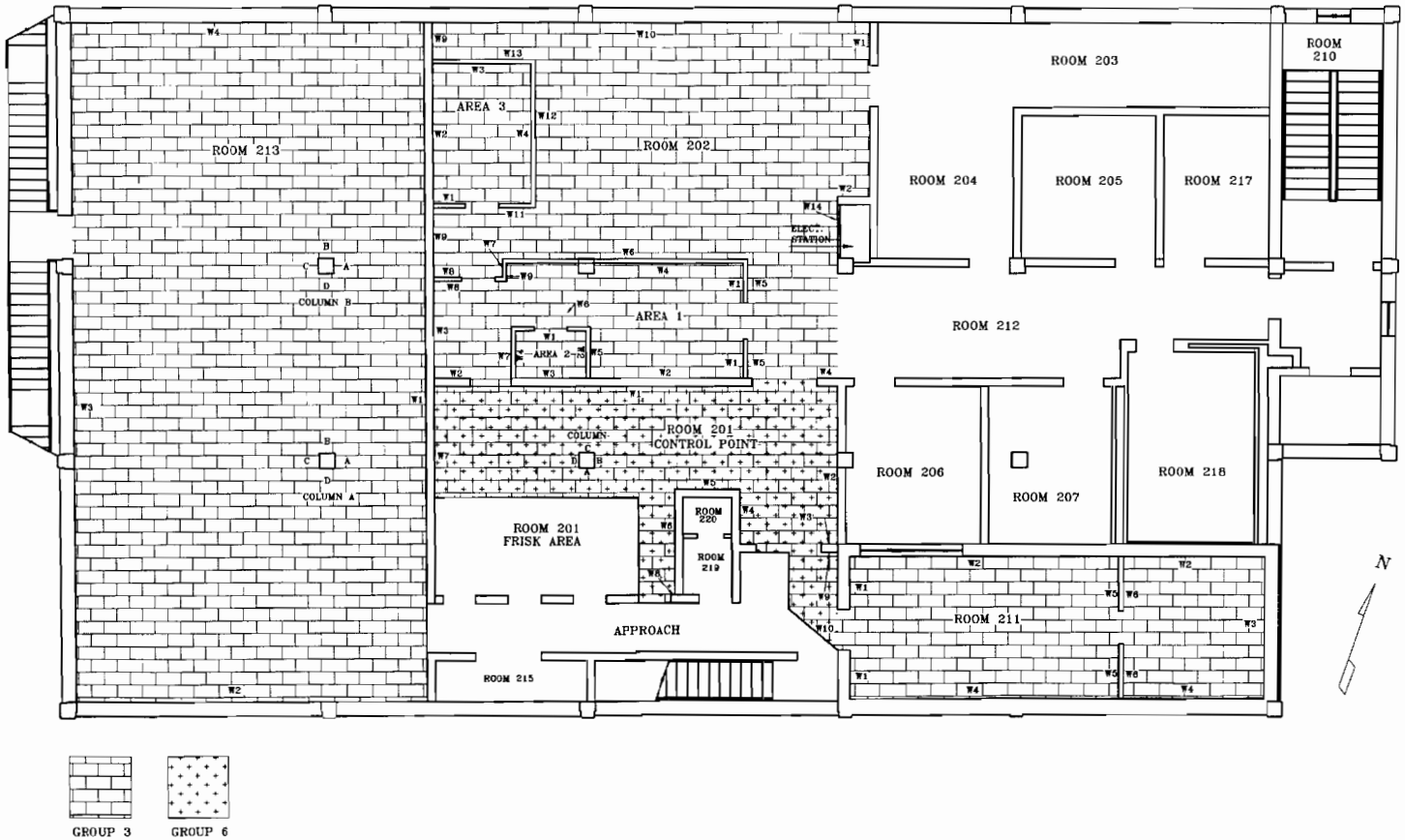
Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) detected gross gamma equivalent cobalt 60 levels ranging from a low of less than 0.17 pCi/g to a high of 4.06 pCi/g.

Analysis performed on solid material samples with the MCA for specific cobalt 60 indicated that all solid material samples were less than 1 pCi/g.

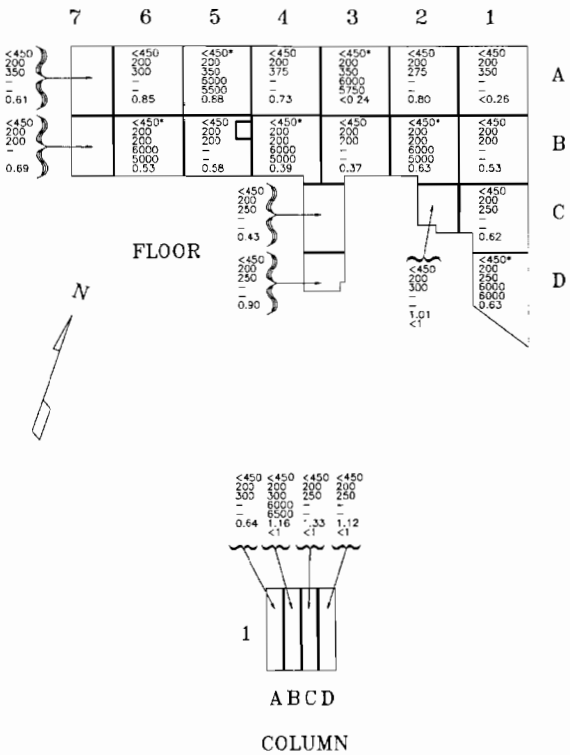
4. Bldg. 222, Second Floor Groups 3 & 6

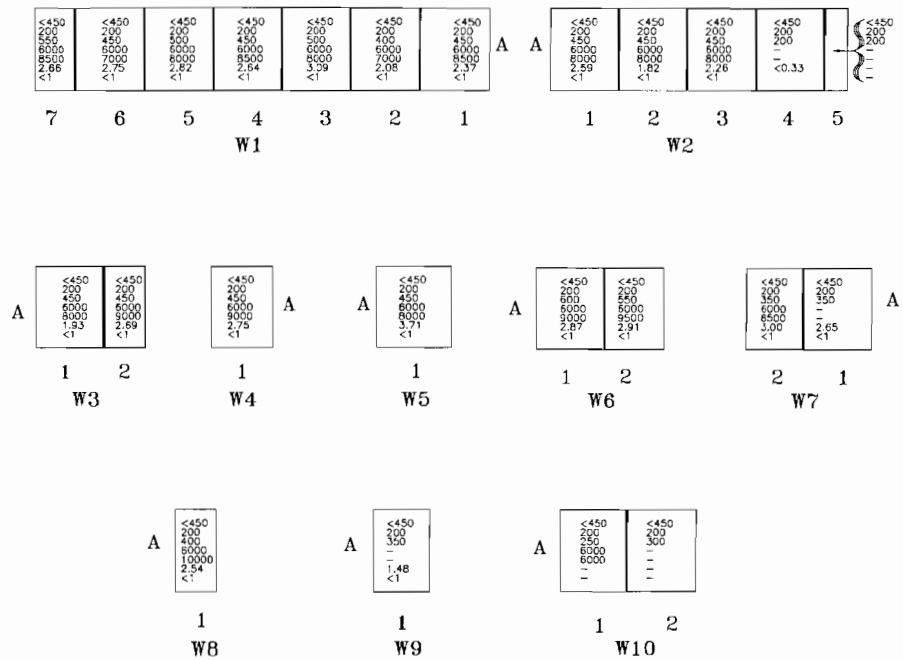
b. Site Map



4. Bldg. 222, Second Floor Groups 3 & 6

c. Grid Map Room 201 Control Point





Note:
*Denotes grids which were surveyed with an AN/PDR-56 for Alpha radioactivity and no detectable activity was found.

Sample Data
<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

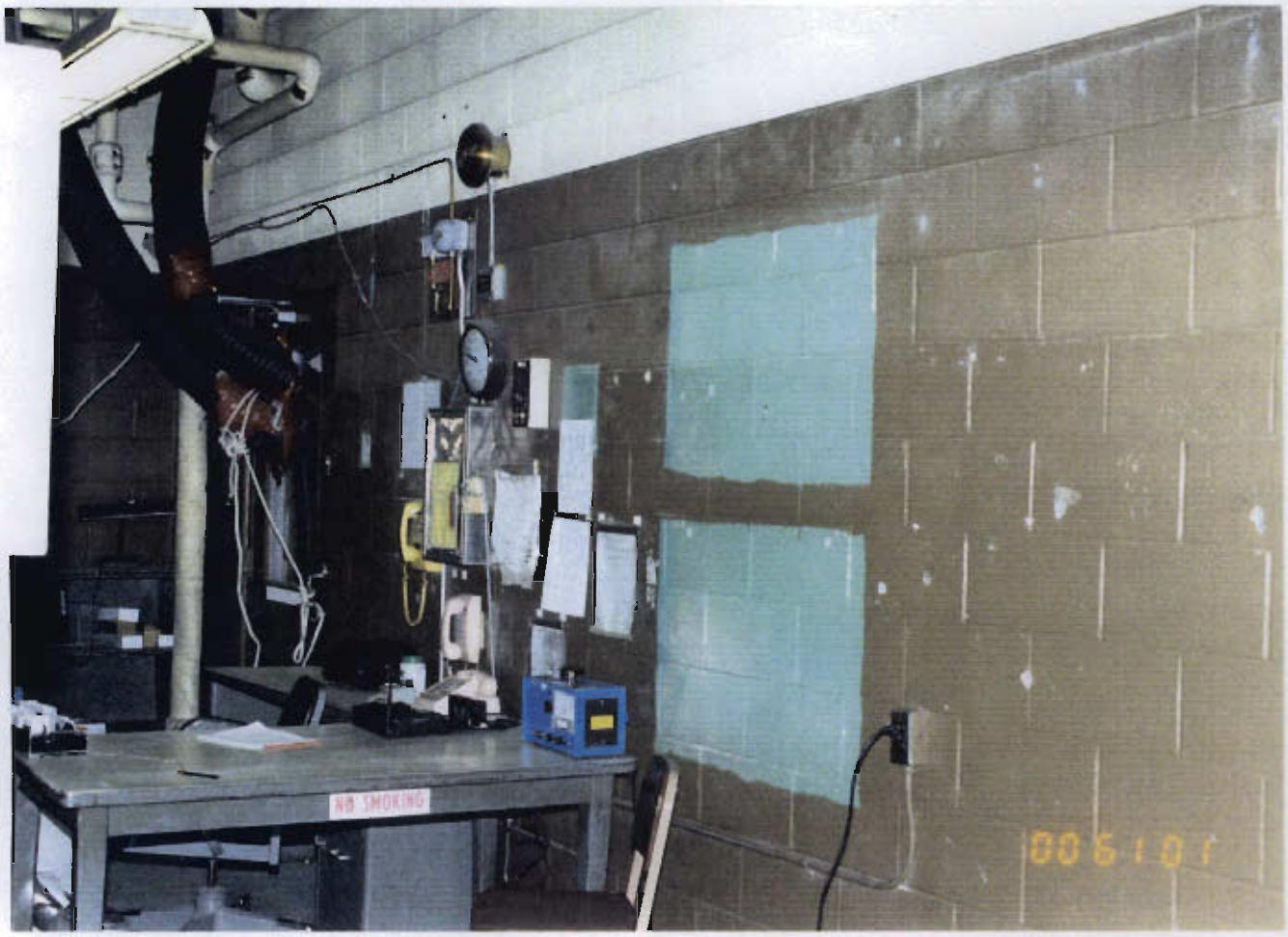
4. Bldg. 222, Second Floor Groups 3 & 6

c. Prior to Photographs Room 201 Control Point

Viewing toward entrance.

4. Bldg. 222, Second Floor Groups 3 & 6

c. Prior to Photographs Room 201 Control Point



Viewing toward Wall-1.

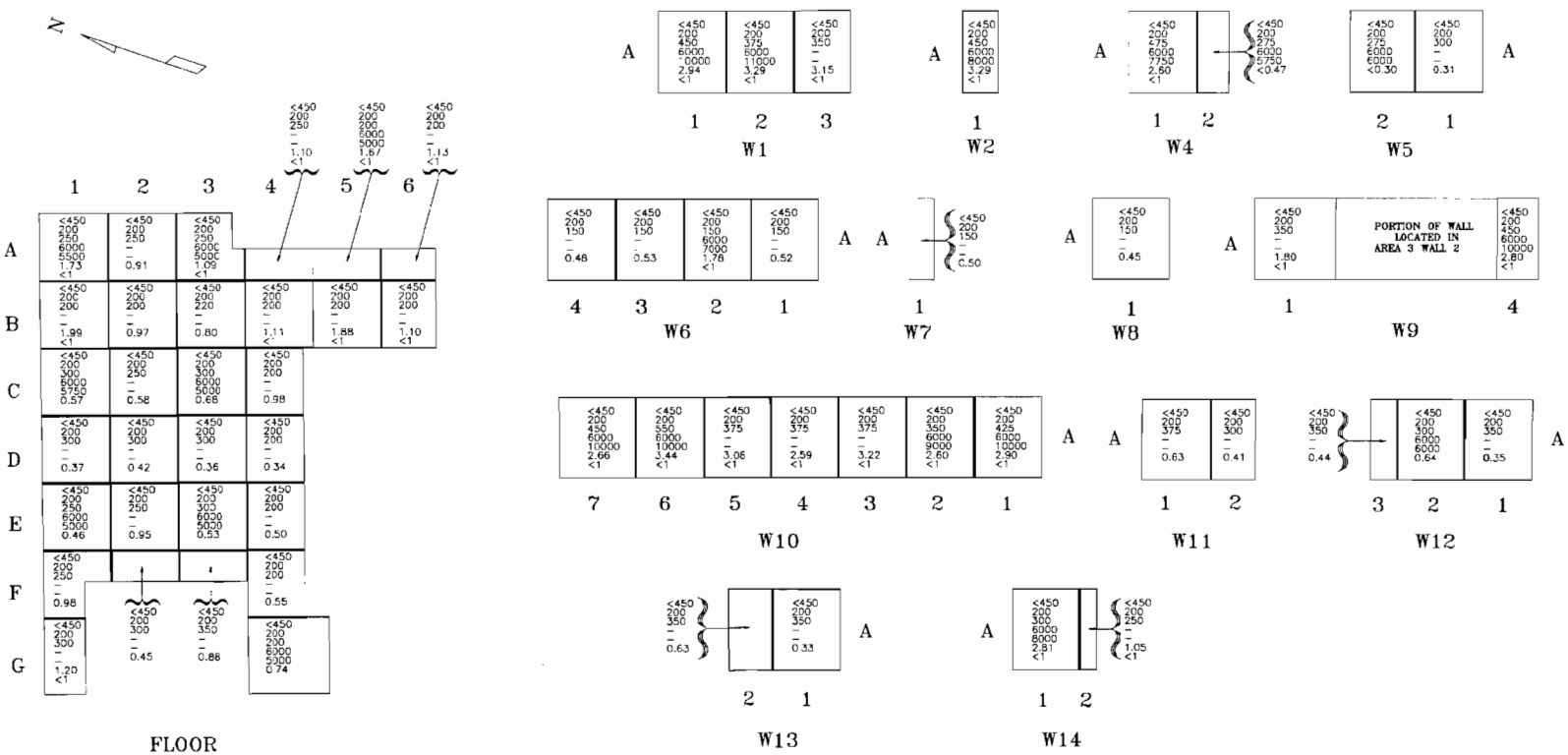
4. Bldg. 222, Second Floor Groups 3 & 6

c. After Photographs Room 201 Control Point

Viewing control point and frisking area.

4. Bldg. 222, Second Floor Groups 3 & 6

c. Grid Map Room 202



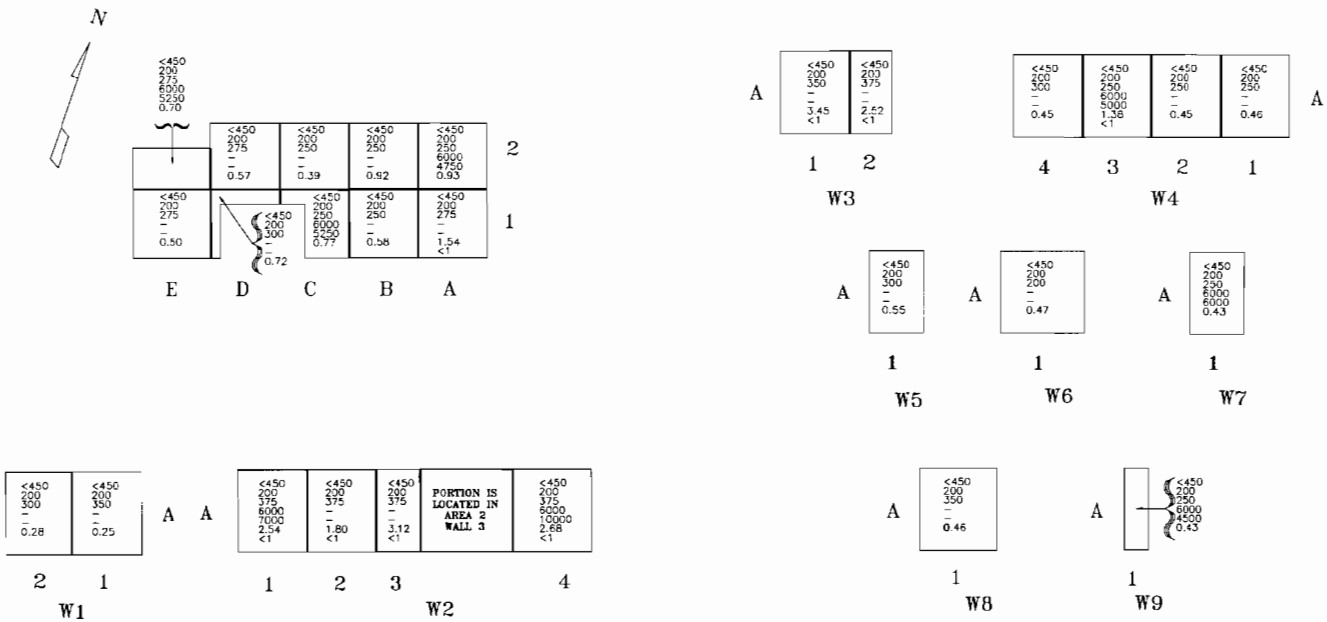
Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

4. Bldg. 222, Second Floor Groups 3 & 6

c. Grid Map Room 202

AREA 1

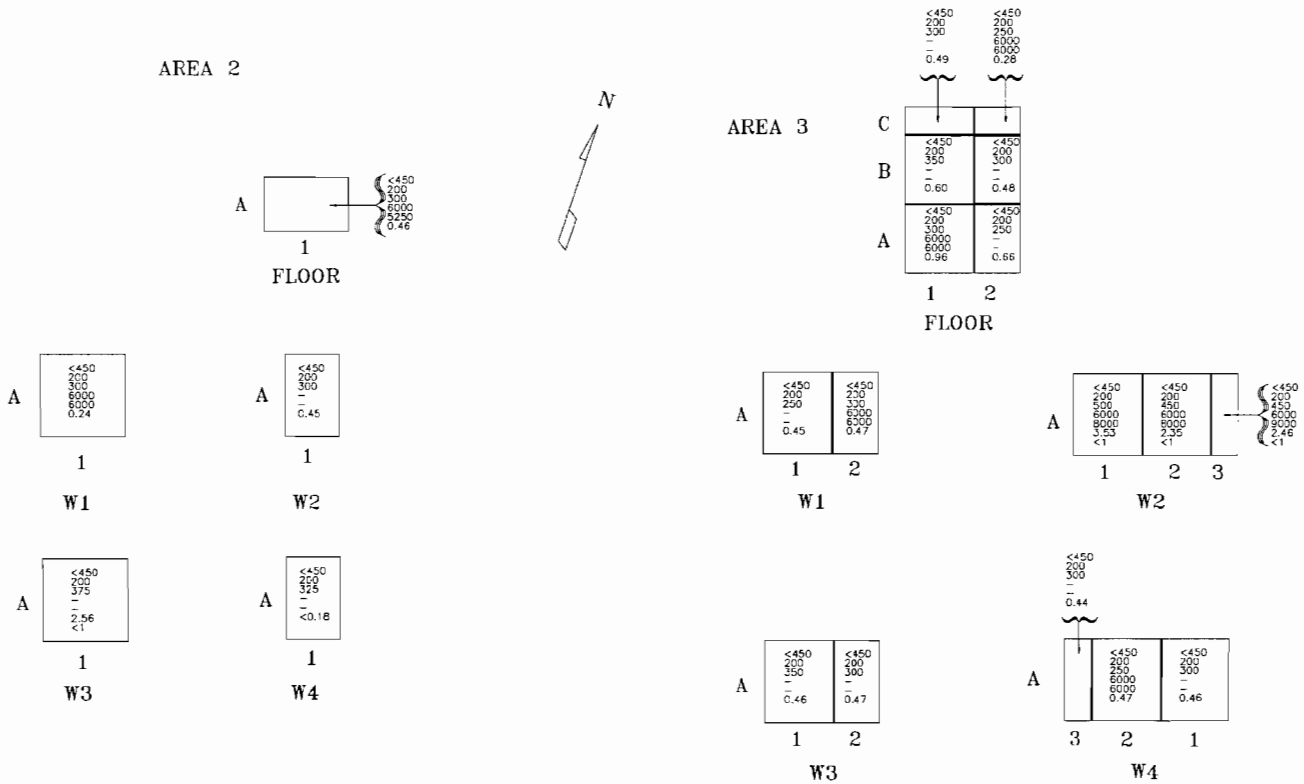


Sample Data

<450 – IM-247/PD Results [μμC/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pC/g]
<1 – MCA Specific Co-60 Results [pC/g]

4. Bldg. 222, Second Floor Groups 3 & 6

c. Grid Map Room 202



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

4. Bldg. 222, Second Floor Groups 3 & 6

c. Prior to Photographs Room 202

Viewing Wall-1.

4. Bldg. 222, Second Floor Groups 3 & 6

c. Prior to Photographs Room 202

Viewing Wall-12.

4. Bldg. 222, Second Floor Groups 3 & 6

c. Prior to Photographs Room 202

Viewing into Area 1.

4. Bldg. 222, Second Floor Groups 3 & 6

c. Prior to Photographs Room 202

Viewing into Area 3.

4. Bldg. 222, Second Floor Groups 3 & 6

c. After Photographs Room 202

Viewing Wall-1.

4. Bldg. 222, Second Floor Groups 3 & 6

c. After Photographs Room 202

Viewing Wall-12.

4. Bldg. 222, Second Floor Groups 3 & 6

c. After Photographs Room 202

Viewing into Area 1.

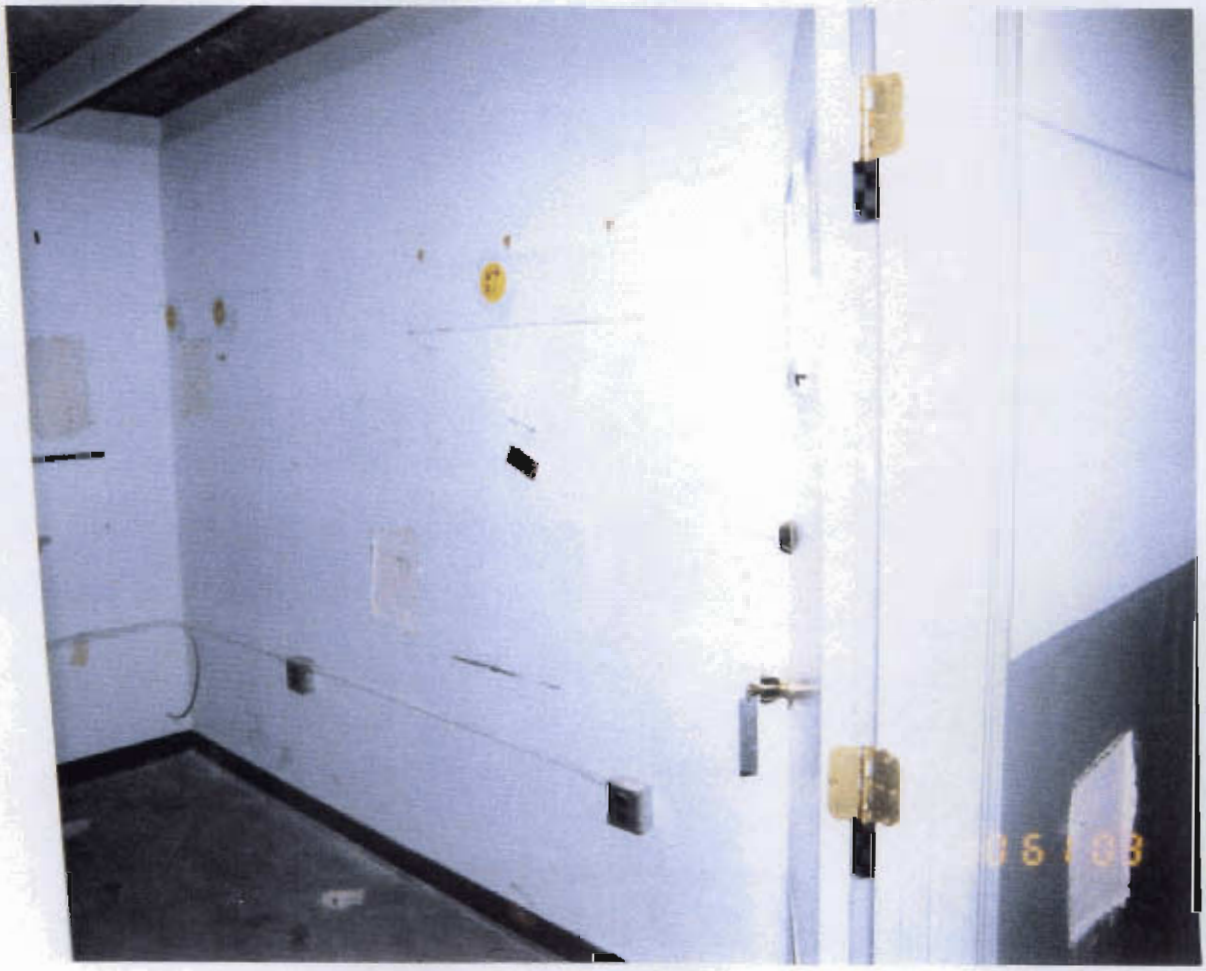
4. Bldg. 222, Second Floor Groups 3 & 6

c. After Photographs Room 202

Veiwing into Area 2

4. Bldg. 222, Second Floor Groups 3 & 6

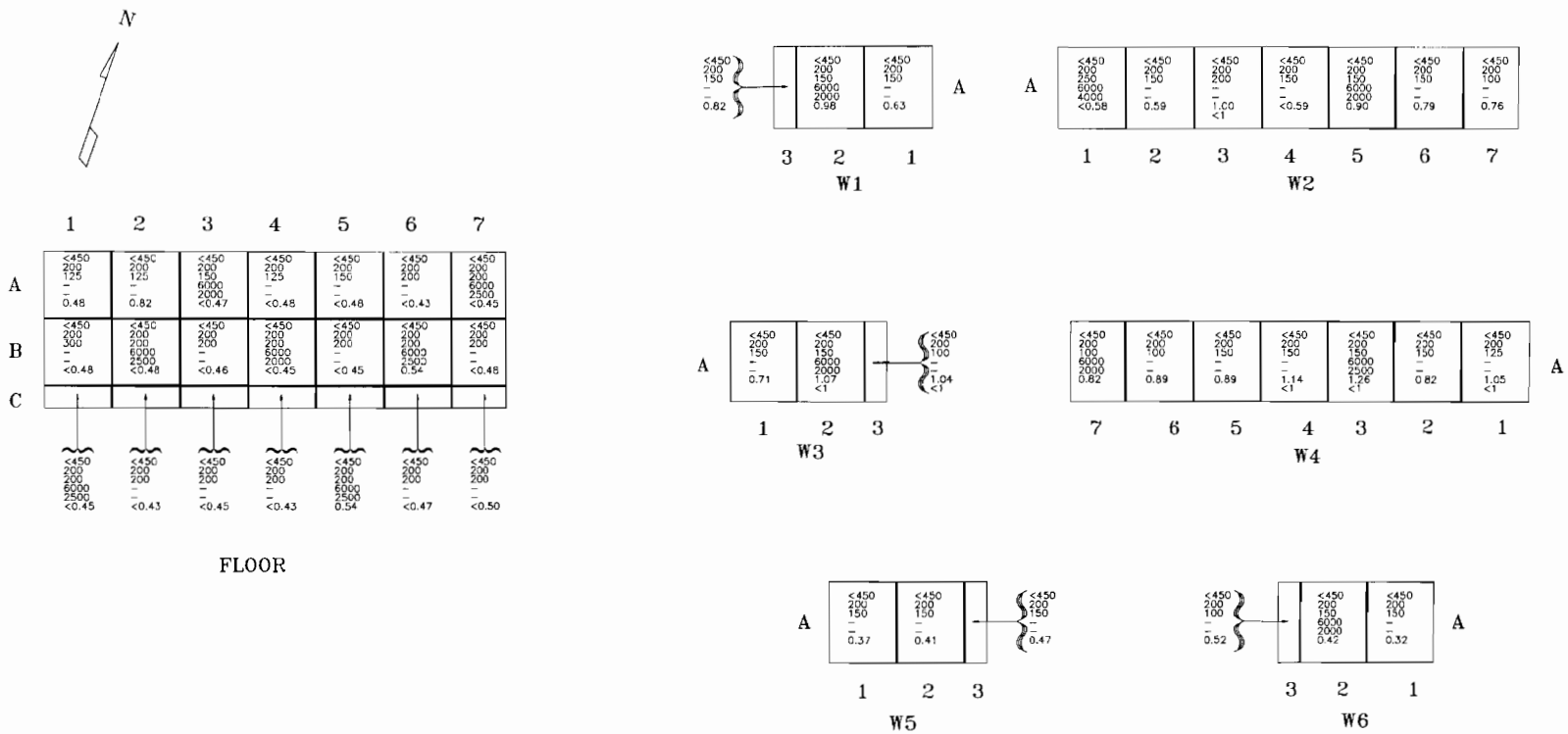
g. After Photograph



Veiwing into Area 3.

4. Bldg. 222, Second Floor Groups 3 & 6

c. Grid Map Room 211



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

4. Bldg. 222, Second Floor Groups 3 & 6

c. Prior to Photographs Room 211

Viewing toward Wall-5

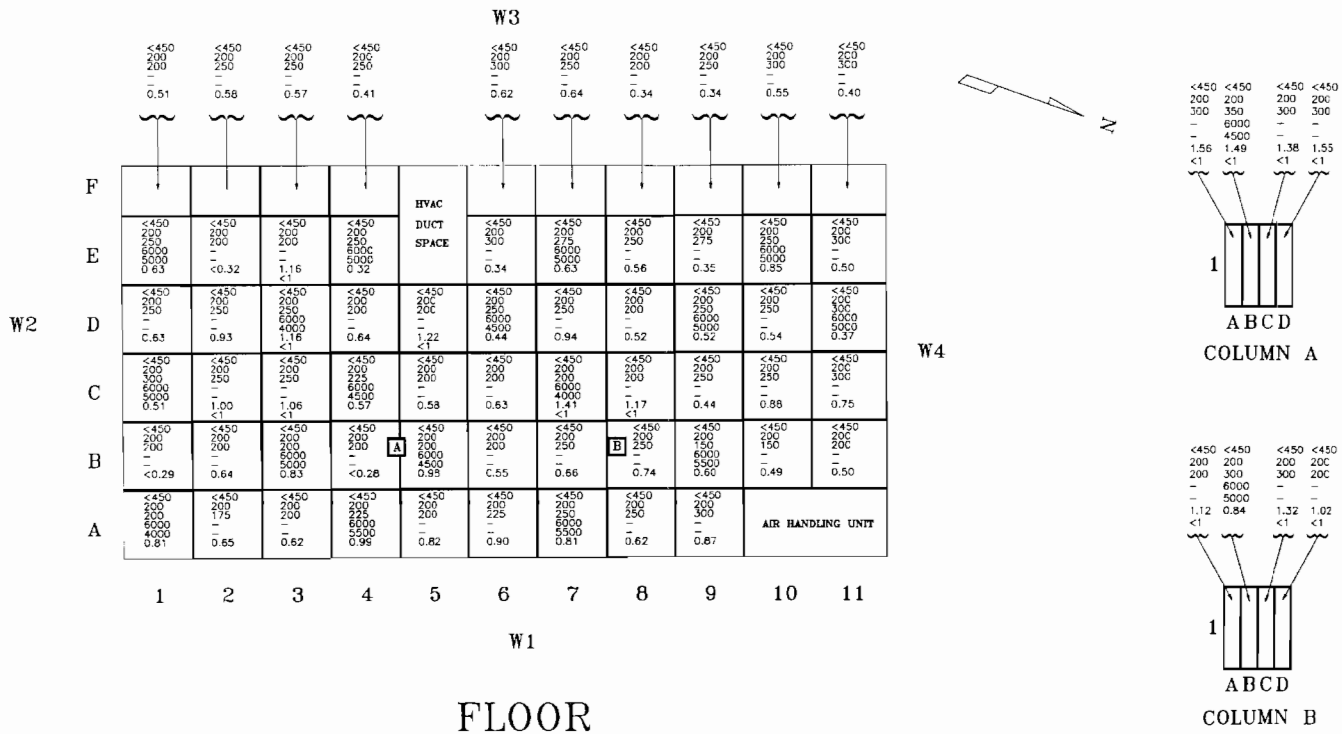
4. Bldg. 222, Second Floor Groups 3 & 6

c. After Photographs Room 211

Viewing toward Wall-5.

4. Bldg. 222, Second Floor Groups 3 & 6

c. Grid Map Room 213



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

4. Bldg. 222, Second Floor Groups 3 & 6

c. Grid Map Room 213

WALL 1

<450 200 375 – – 4.06 <1	<450 200 350 – – 3.11 <1	<450 200 375 6000 7500 3.20 <1	<450 200 375 – – 2.37 <1	<450 200 375 – – 3.36 <1	<450 200 375 6000 7500 3.23 <1	<450 200 375 – – 3.17 <1	<450 200 350 – – 3.27 <1	<450 200 350 6000 8000 0.41	<450 200 350 – – <0.17	<450 200 350 – – 3.52 <1
11	10	9	8	7	6	5	4	3	2	1

A

WALL 2

A	<450 200 350 – – 2.33 <1	<450 200 500 6000 8500 3.12 <1	<450 200 500 6000 9000 3.76 <1	<450 200 600 6000 8000 3.65 <1	<450 200 450 6000 8000 3.67 <1	<450 200 500 6000 8500 3.52 <1
	1	2	3	4	5	6

WALL 3

A	<450 200 350 – – 2.75 <1	<450 200 350 – – 3.13 <1	<450 200 350 6000 8000 3.40 <1	<450 200 350 – – 2.99 <1	<450 200 375 – – 3.03 <1	<450 200 475 6000 8500 3.01 <1	<450 200 450 6000 8000 3.06 <1	<450 200 250 – – 2.93 <1	<450 200 500 6000 8250 3.51 <1	<450 200 450 6000 9000 3.66 <1	<450 200 450 6000 8000 3.42 <1
	1	2	3	4	5	6	7	8	9	10	11

WALL 4

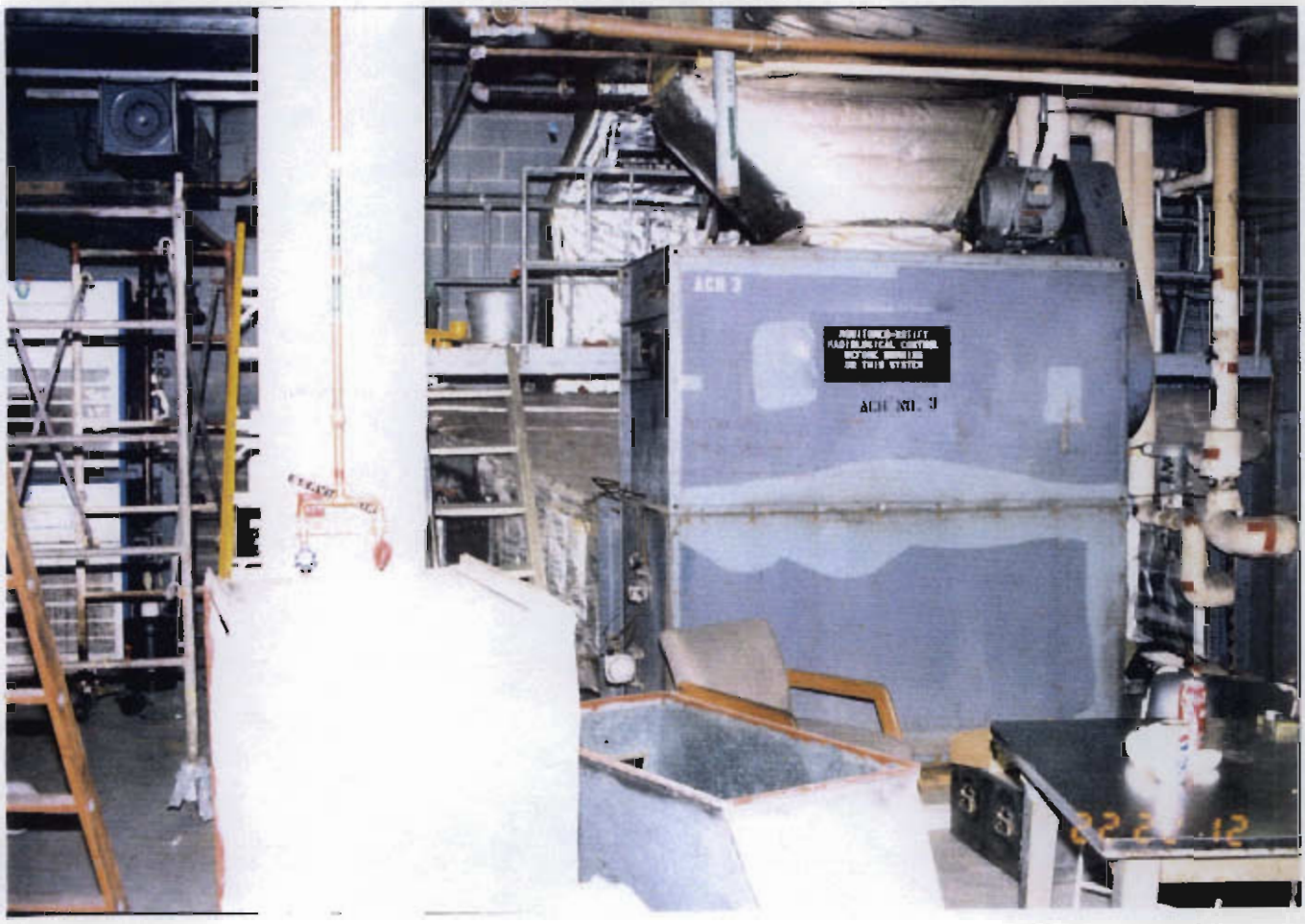
<450 200 450 6000 8500 3.66 <1	<450 200 200 6000 8500 3.04 <1	<450 200 200 – – 0.82	<450 200 450 6000 8500 3.52 <1	<450 200 450 6000 8000 3.90 <1	<450 200 375 6000 8500 3.36 <1	A
1	2	3	4	5	6	

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

4. Bldg. 222, Second Floor Groups 3 & 6

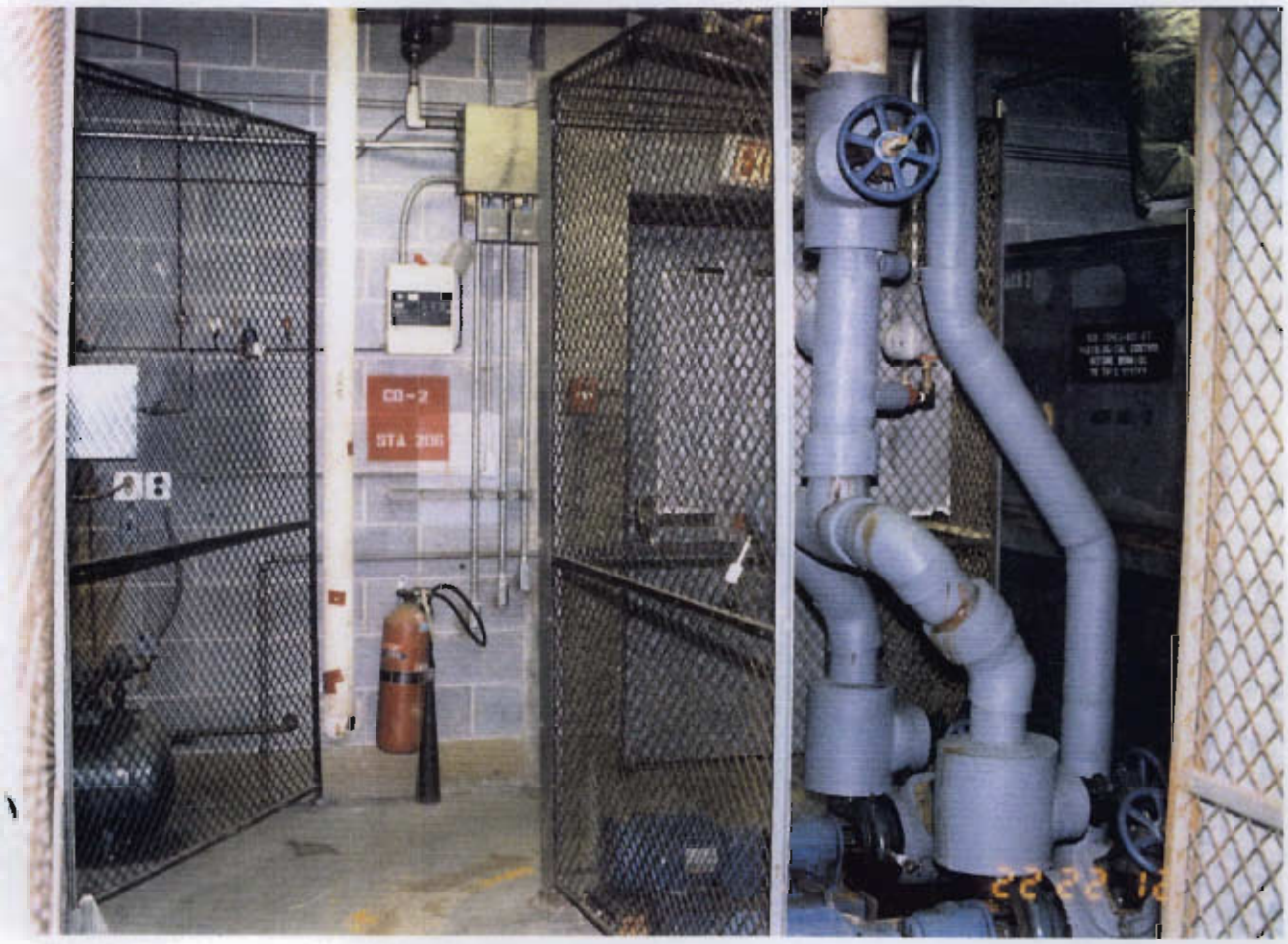
c. Prior to Photographs Room 213



Viewing toward Wall-4.

4. Bldg. 222, Second Floor Groups 3 & 6

c. Prior to Photographs Room 213



Viewing toward Wall-3.

4. Bldg. 222, Second Floor Groups 3 & 6

c. After Photographs Room 213

Viewing toward Wall-1.

4. Bldg. 222, Second Floor Groups 3 & 6

c. After Photographs Room 213

Viewing toward Wall-2.

5. Bldg. 222, Second Floor Group 4

a. Report

(1) Description:

The second floor Group 4 areas consisted of the rooms 220, 219, 215, and 201 Frisk Area and Frisk Area Approach. The walls are cinder block, the floor is concrete, and the ceiling is concrete.

(2) Discussion:

The second floor Group 4 areas consisted of rooms 220, 219, 215, and 201 Frisk Area and Frisk Area Approach. These areas were divided into 3' by 3' floor grids and 9' by 9' ceiling grids. The walls were divided into grids 3' by 3', up to 12' high, then 9' by 9' grids beyond 12'. Each grid was identified with its unique designation.

One hundred percent of all 3' by 3' grids were surveyed using the IM-247/PD and the IM-253/PD (HV-1 PHA). A minimum of 25% of all 3' by 3' grids were surveyed using the IM-253/PD (HV-2 GROSS). A minimum of 25% of all 9' by 9' grids were surveyed using the IM-247/PD, IM-253/PD (HV-1 PHA and HV-2 GROSS). A minimum of one solid material sample was taken from each 3' by 3' grid and from a minimum of 25% of all 9' by 9' grids. At least one solid material sample was taken from each wall and ceiling grid. Additionally, solid material samples were taken from selected structural joints and crevices. Results from these samples were incorporated into the report by utilizing the higher of the normal grid sample or the joint/crevice sample result.

The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the Group 4 floors and ceiling were 40, 200 and 6000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 1720. The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the Group 4 walls were also 40, 200 and 6000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 1635.

A total of 330 solid material samples were taken. Each solid sample was removed from the grid location indicating the area of highest potential. Samples taken from Walls 2 and 3 of room 201 Frisk Area and Frisk Area Approach (W2-K1, W2-K2 and W3-B1) consisted of paint and had a limit of 3 pCi/g. The following naturally occurring radionuclides were typical isotopes identified during analysis of solid material samples: lead 212, lead 214, bismuth 214, and potassium 40.

(3) Summary:

Surveys performed with the IM-247/PD did not detect areas greater than 450 $\mu\mu Ci/20cm^2$.

5. Bldg. 222, Second Floor Group 4

Surveys performed with the IM-253/PD (HV-1 PHA) detected 228 areas greater than or equal to twice background.

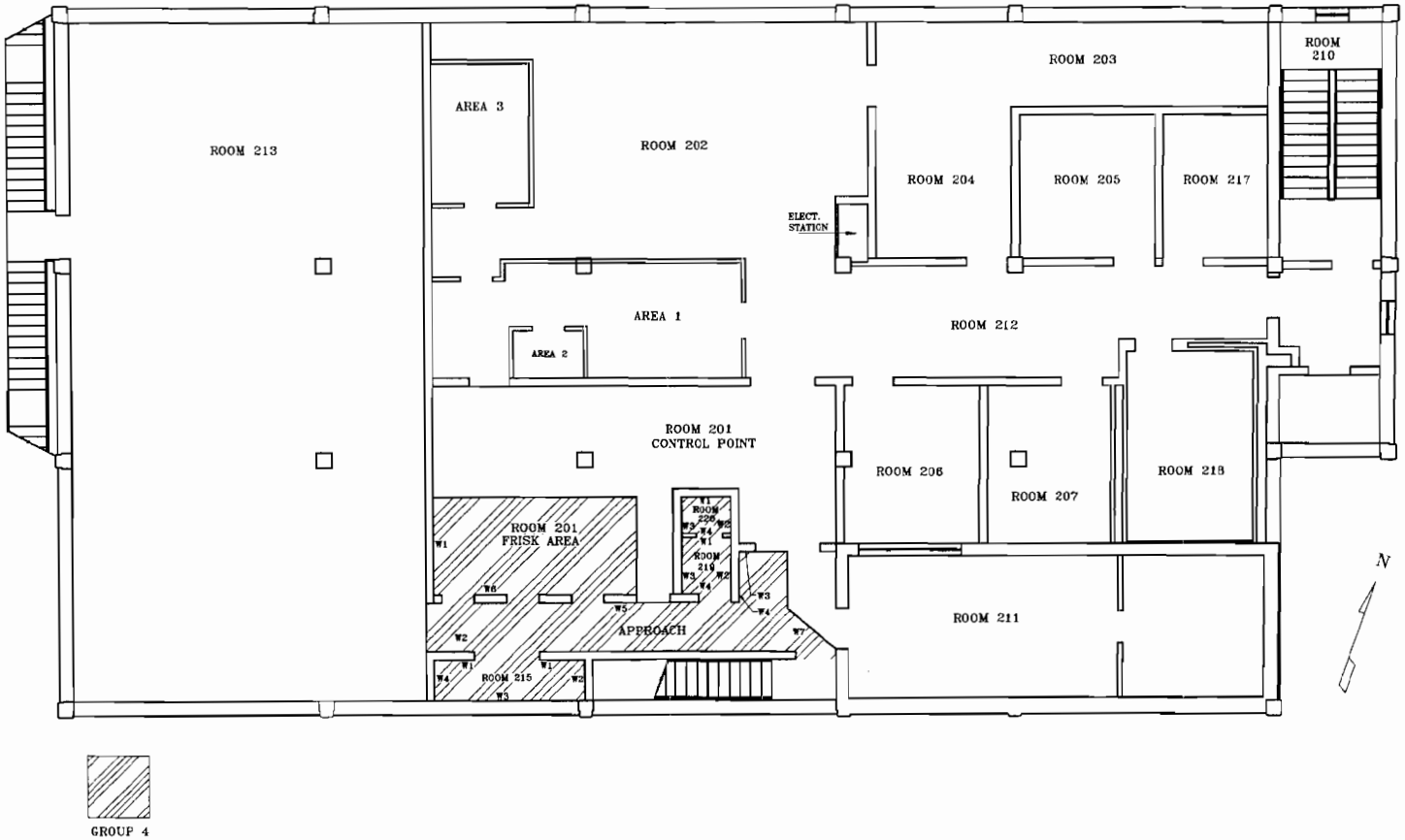
Surveys performed with the IM-253/PD (HV-2 GROSS) detected 81 areas greater than or equal to twice background.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) detected gross gamma equivalent cobalt 60 levels ranging from a low of less than 0.31 pCi/g to a high of 5.42 pCi/g.

Analysis performed on solid material samples with the MCA for specific cobalt 60 indicated that all solid material samples were less than 1 pCi/g for non-paint samples and less than 3 pCi/g for paint samples.

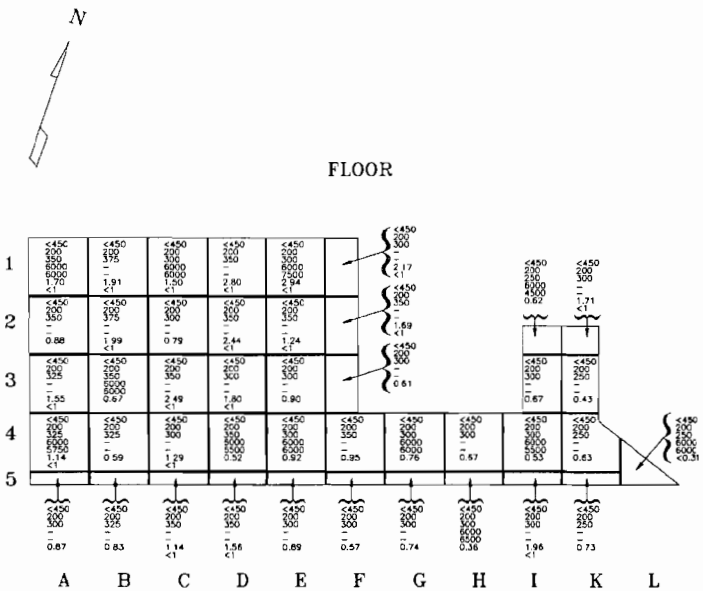
5. Bldg. 222, Second Floor Group 4

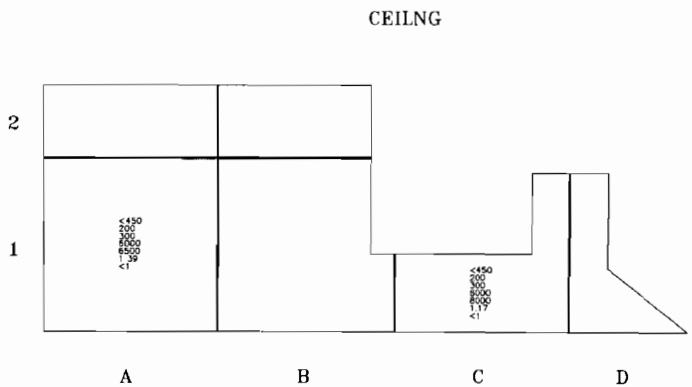
b. Site Map



5. Bldg. 222, Second Floor Group 4

c. Grid Map Room 201 Frisk Area & Approach





Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

5. Bldg. 222, Second Floor Group 4

c. Grid Map Room 201 Frisk Area & Approach

WALL 1

	A	B	C	D	E
5			<450 200 500 6000 10000 2.81 <1		
4	<450 200 500 6000 10000 1.72 <1	<450 200 500 6000 10000 3.20 <1	<450 200 500 6000 9500 3.35 <1	<450 200 450 6000 9000 3.64 <1	<450 200 450 6000 8500 2.85 <1
3	<450 200 500 6000 10000 2.79 <1	<450 200 500 6000 10000 3.41 <1	<450 200 500 6000 9500 2.88 <1	<450 200 375 – – 3.44 <1	<450 200 450 6000 9500 2.99 <1
2	<450 200 300 – – 1.00 <1	<450 200 200 6000 4000 <0.43	<450 200 450 6000 9000 2.59 <1	<450 200 375 – – 1.86 <1	<450 200 375 – – 2.40 <1
1	<450 200 300 – – <0.51	<450 200 200 6000 4000 0.55	<450 200 375 6000 8500 2.50 <1	<450 200 375 – – 2.28 <1	<450 200 350 6000 7500 3.76 <1

WALL 2

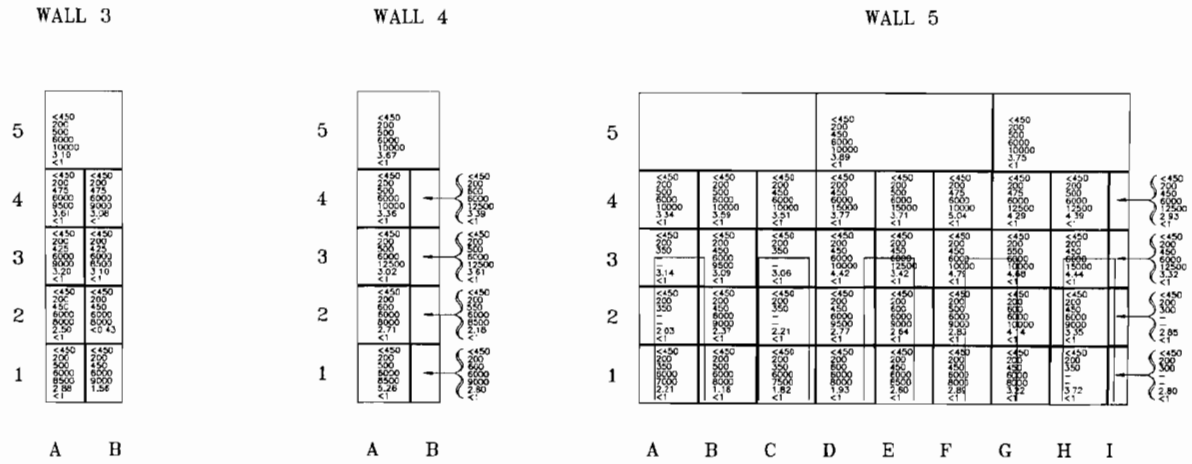
	K	J	I	H	G	F	E	D	C	B	A
5					<450 200 450 6000 8500 <1				<450 200 450 6000 9000 3.30 <1		
4	<450 200 450 6000 9500 2.95 <1	<450 200 450 6000 9500 3.38 <1	<450 200 500 6000 9500 3.85 <1	<450 200 500 6000 10000 3.85 <1	<450 200 500 6000 10000 4.01 <1	<450 200 500 6000 10000 3.91 <1	<450 200 500 6000 10000 3.54 <1	<450 200 500 6000 9500 4.19 <1	<450 200 500 6000 10000 3.77 <1	<450 200 500 6000 10000 3.09 <1	<450 200 500 6000 10000 2.53 <1
3	<450 200 450 6000 8000 <0.53	<450 200 450 6000 9000 3.33 <1	<450 200 500 6000 9500 3.01 <1	<450 200 500 6000 9750 3.18 <1	<450 200 450 6000 9500 3.42 <1	<450 200 500 6000 9500 4.12 <1	<450 200 500 6000 12500 4.97 <1	<450 200 450 6000 9000 4.05 <1	<450 200 450 6000 9000 3.45 <1	<450 200 450 6000 9000 4.35 <1	<450 200 500 6000 9750 2.55 <1
2	<450 200 250 – – <2.44	<450 200 450 6000 8500 2.23 <1	<450 200 500 6000 8500 3.12 <1	<450 200 450 6000 9000 2.95 <1	<450 200 450 6000 9000 2.89 <1	<450 200 500 6000 8500 3.21 <1	<450 200 500 6000 8000 3.04 <1	<450 200 600 6000 8000 3.00 <1	<450 200 450 6000 8000 2.36 <1	<450 200 450 6000 8000 4.19 <1	<450 200 450 6300 8000 2.13 <1
1	<450 200 250 – – <2.28	<450 200 450 6000 8000 2.41 <1	<450 200 400 6000 7000 2.71 <1	<450 200 400 6000 8500 2.89 <1	<450 200 400 6000 8500 2.58 <1	<450 200 450 6000 8000 3.57 <1	<450 200 450 6000 8000 2.75 <1	<450 200 450 6000 8000 1.83 <1	<450 200 450 6000 8000 2.72 <1	<450 200 550 6000 8000 3.79 <1	<450 200 450 6000 8000 1.94 <1

Note
Samples taken from grids W2-K1, W2-K2, and W3-B1 consist of paint and have a limit of 3 pCi/g.

Sample Data
<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

5. Bldg. 222, Second Floor Group 4

c. Grid Map Room 201 Frisk Area & Approach



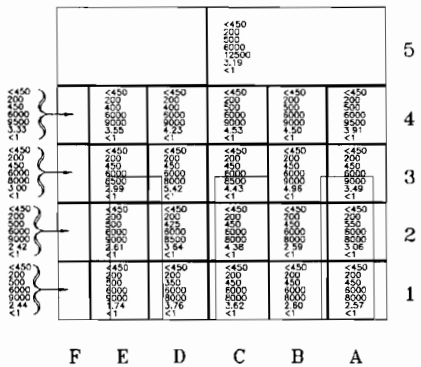
Note
Samples taken from grids W2-K1, W2-K2, and W3-B1 consist of paint and have a limit of 3 pCi/g.

Sample Data
< 450 – IM-247/PD Results [μCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

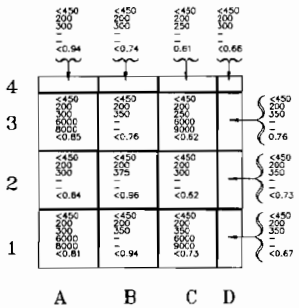
5. Bldg. 222, Second Floor Group 4

c. Grid Map Room 201 Frisk Area & Approach

WALL 6



WALL 7



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

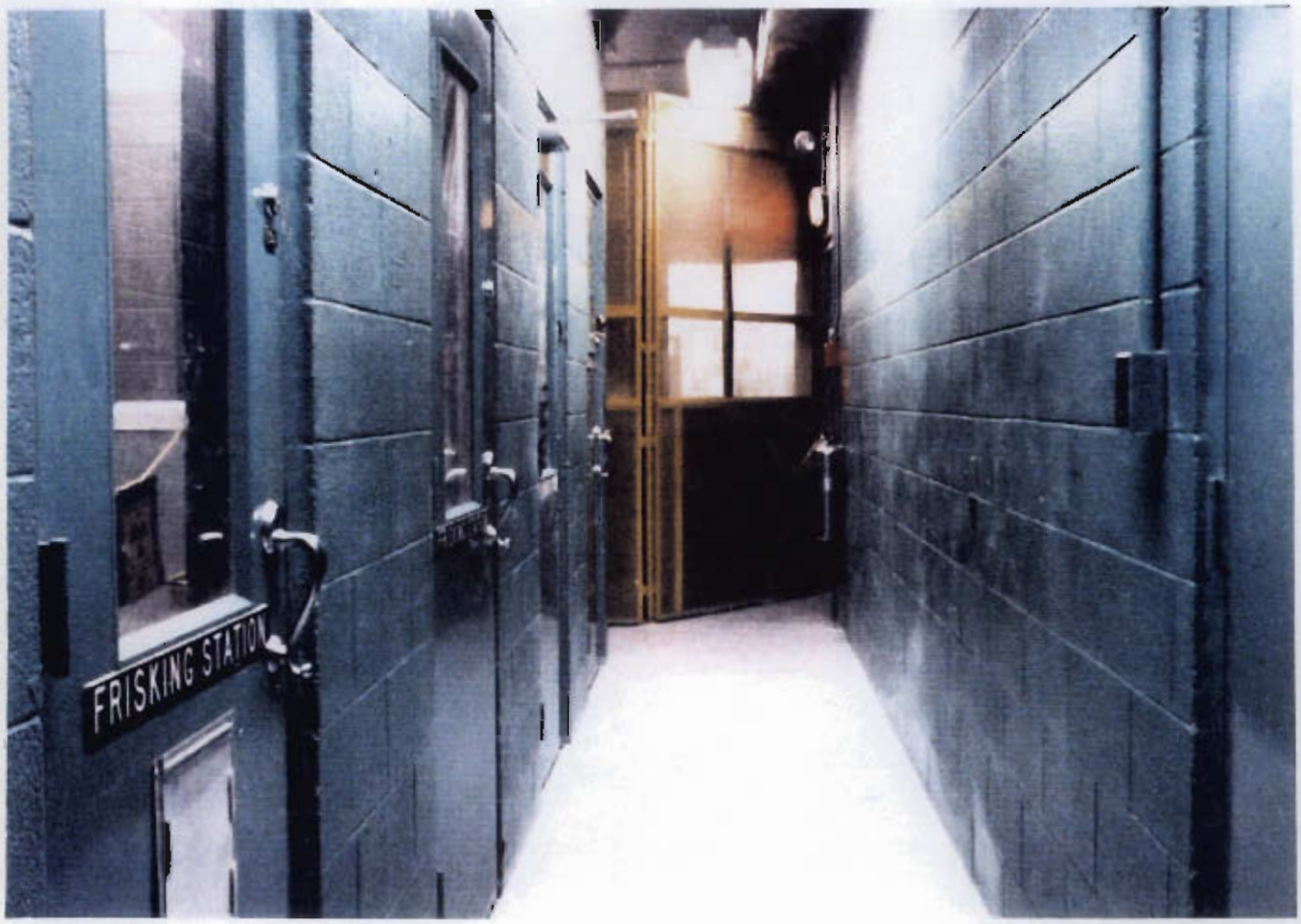
5. Bldg. 222, Second Floor Group 4

c. Prior to Photographs Room 201 Frisk Area & Approach

Frisking area and controlled area entrance.

5. Bldg. 222, Second Floor Group 4

c. Prior to Photographs Room 201 Frisk Area & Approach



Approach area viewing Wall-7.

5. Bldg. 222, Second Floor Group 4

c. After Photographs Room 201 Frisk Area & Approach

Viewing Wall-6.

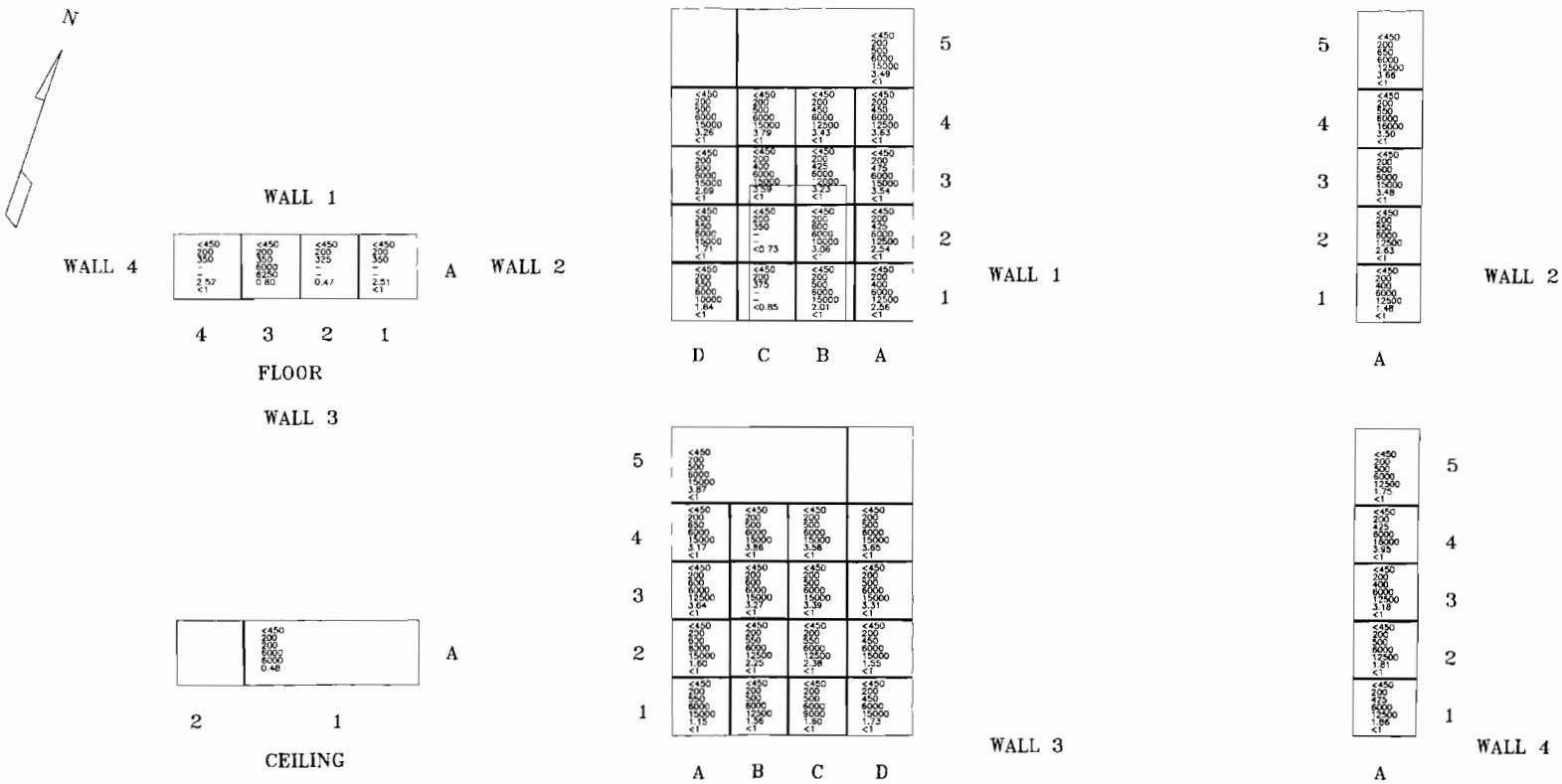
5. Bldg. 222, Second Floor Group 4

c. After Photographs Room 201 Frisk Area & Approach

Facing toward entrance of Room 201.

5. Bldg. 222, Second Floor Group 4

c. Grid Map Room 215

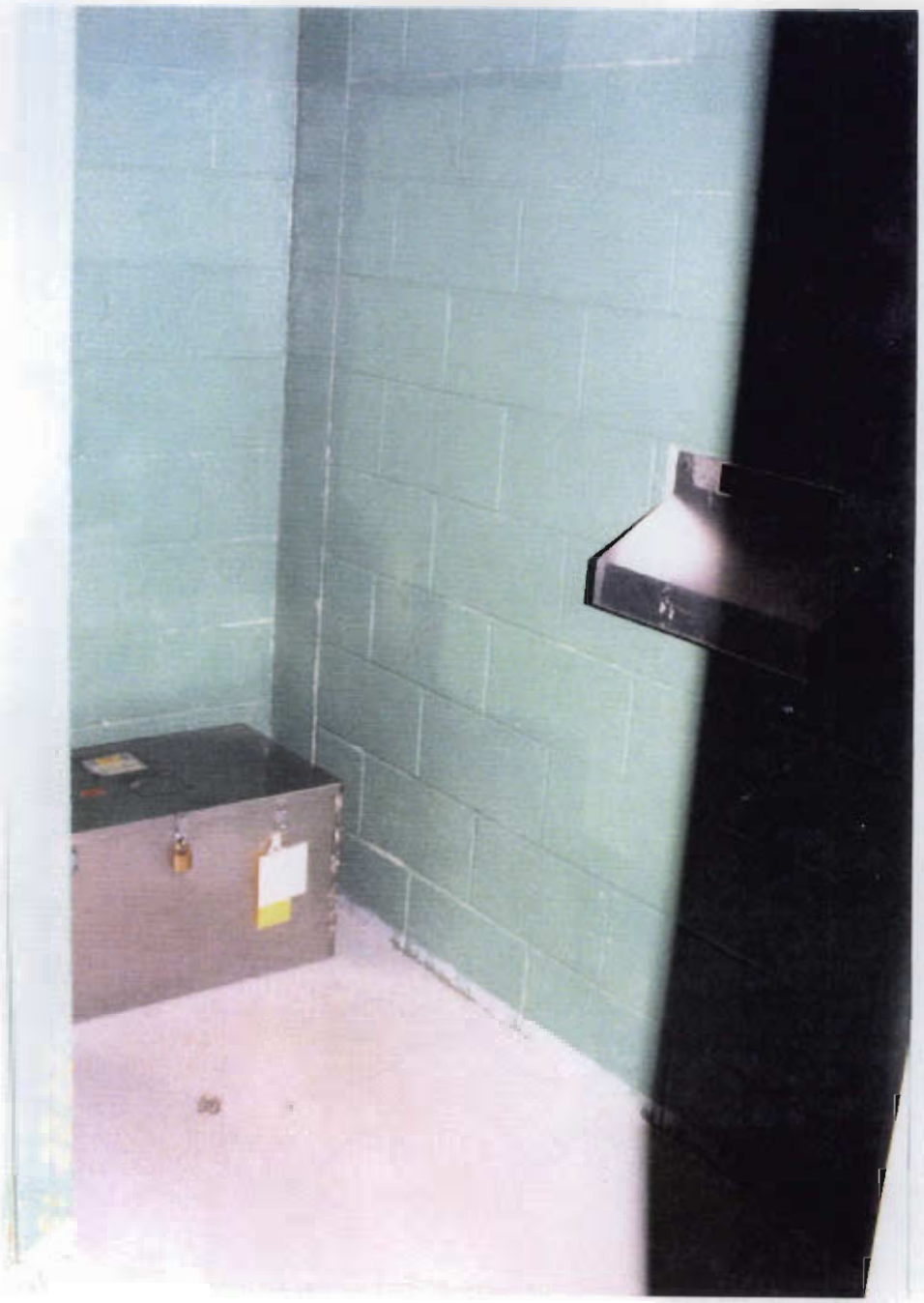


Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

5. Bldg. 222, Second Floor Group 4

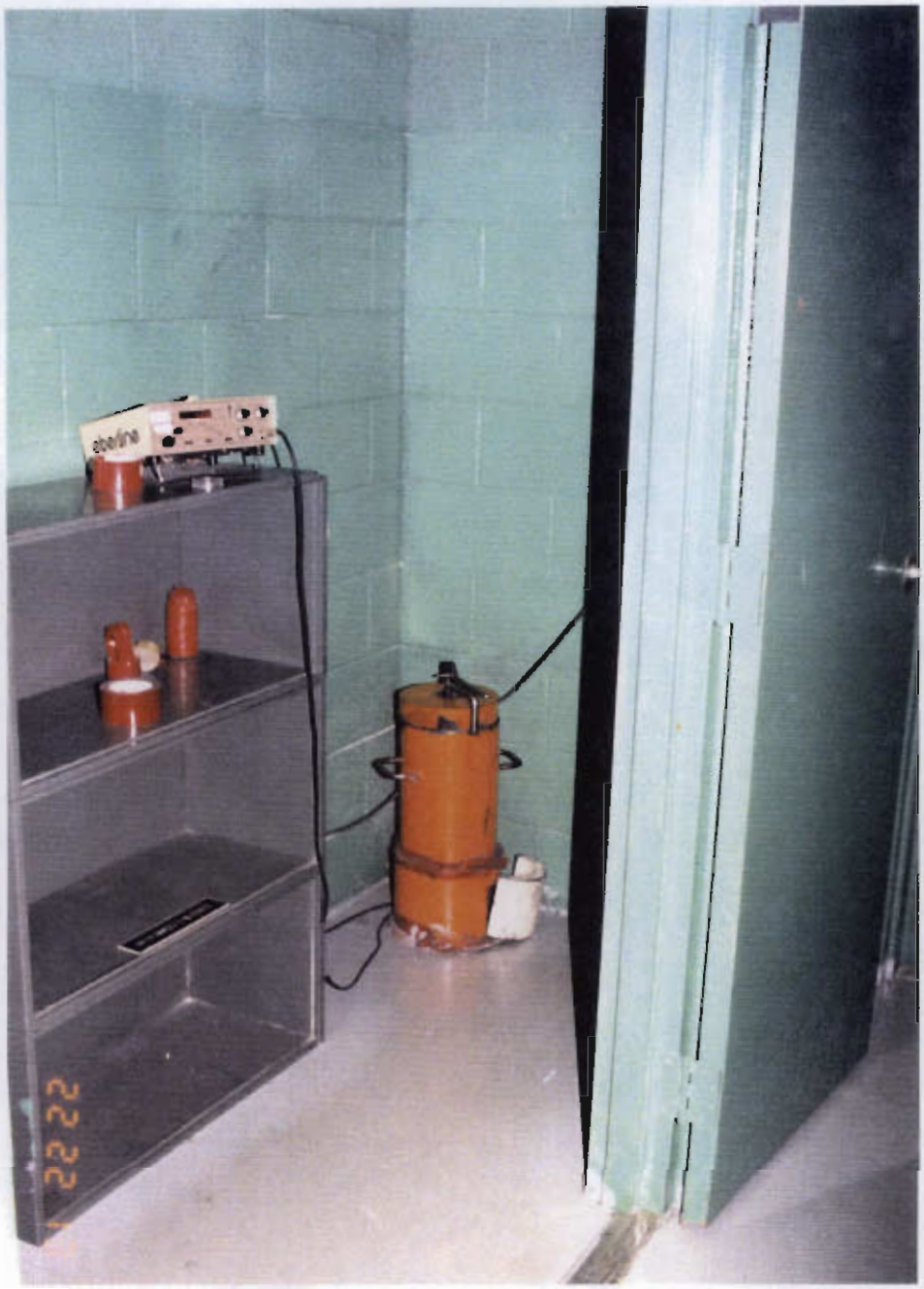
c. Prior to Photographs Room 215



Viewing Wall-2.

5. Bldg. 222, Second Floor Group 4

c. Prior to Photographs Room 215



Viewing Wall-4.

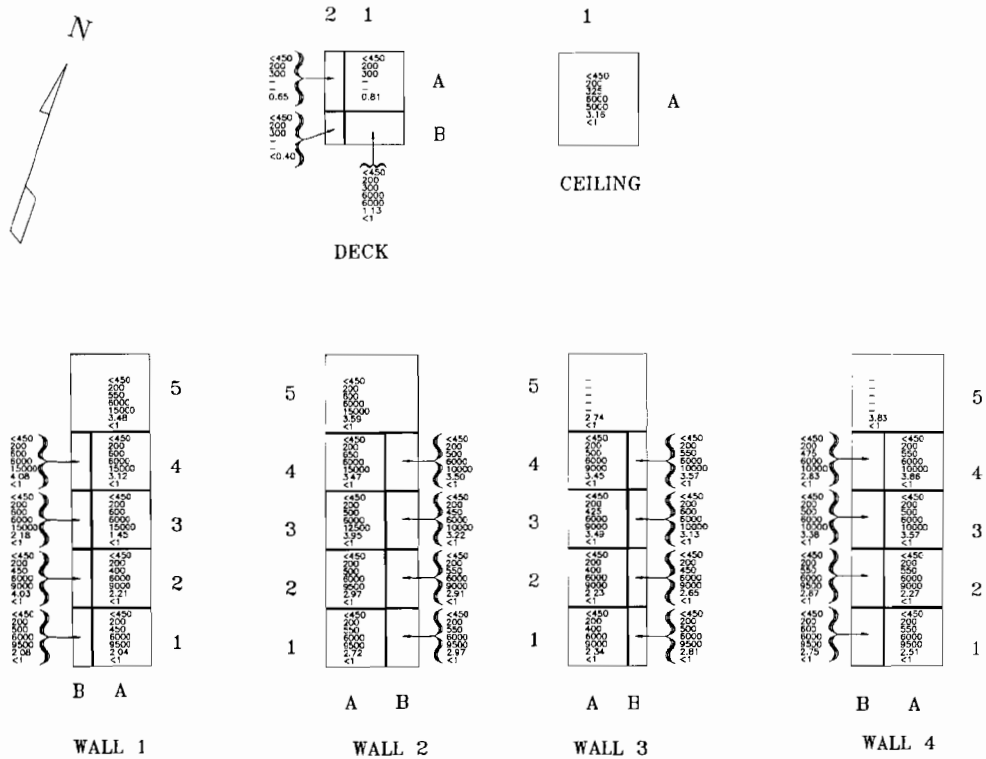
5. Bldg. 222, Second Floor Group 4

c. After Photographs Room 215

Viewing Wall-3.

5. Bldg. 222, Second Floor Group 4

c. Grid Map Room 219

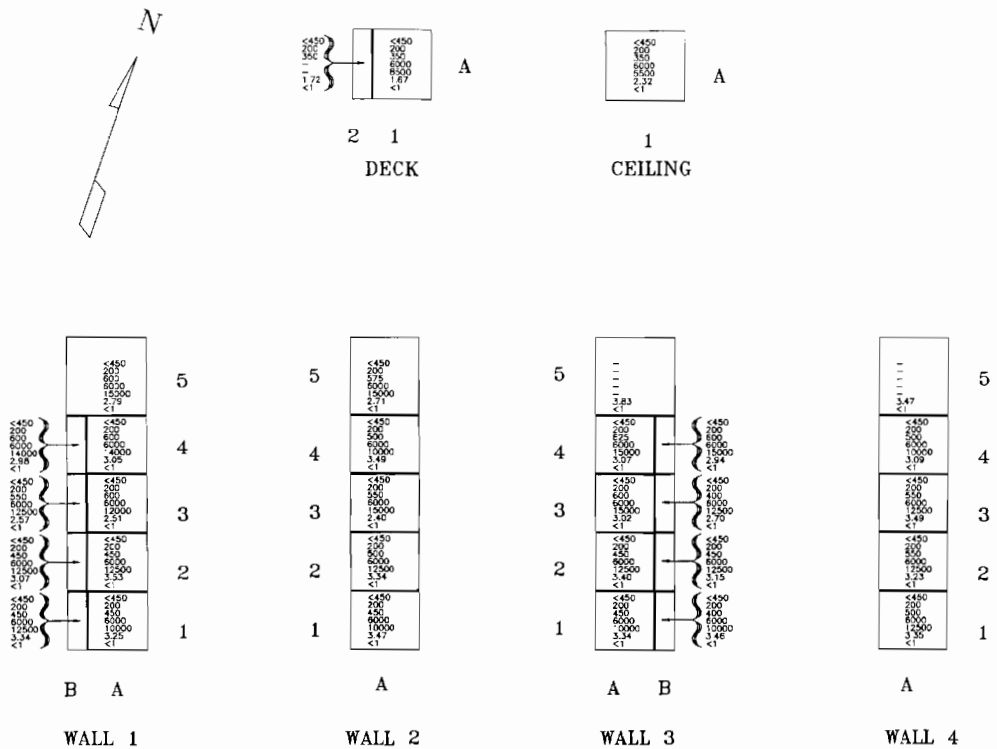


Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.,
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

5. Bldg. 222, Second Floor Group 4

c. Grid Map Room 220



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

5. Bldg. 222, Second Floor Group 4

c. Prior to Photographs Room 219/220

Viewing into Room 219/220.

5. Bldg. 222, Second Floor Group 4

c. After Photographs Room 219/220

Viewing into Room 219/220.

6. Bldg. 222, First Floor Group 3

a. Report

(1) Description:

The first floor Group 3 areas consisted of Dry Dock #1 and #2 Tunnels. The floors, walls, and ceiling are concrete construction.

(2) Discussion:

The Group 3 areas were divided into 5' by 5' floor grids and 5' by 6' wall grids up to 6' in height where physically possible. One hundred percent of all grids were surveyed using the IM-247/PD and the IM-253/PD (HV-1 PHA). A minimum of 25 percent of all grids were surveyed using the IM-253/PD (HV-2 GROSS). Additionally, solid material samples were taken from each wall and floor grid. These samples were removed from the area indicating the highest potential within each grid.

The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the Group 3 floors and walls were 40, 125, and 3000 counts per minute respectively. These radiation levels were based upon background levels obtained from Pier T.

A total of 268 solid material samples were taken. Paint samples were taken from Dry Dock #1 Tunnel grids W9-A1, W15-A1, W15-A2, and Dry Dock #2 Tunnel grids W1-A1, W9-A1, W9-A1, W15-A1, and W15-A2. The following naturally occurring radionuclides were typical isotopes identified during analysis of solid material samples: lead 212, lead 214, bismuth 214 and potassium 40.

(3) Summary:

Surveys performed with the IM-247/PD did not detect areas greater than 450 $\mu\mu Ci/20cm^2$.

Surveys performed with the IM-253/PD (HV-1 PHA) detected 24 areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) detected eight areas greater than or equal to twice background.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) detected gross gamma equivalent cobalt 60 levels ranging from a minimum detectable activity of less than 0.29 pCi/g to a high of 4.44 pCi/g.

Analysis performed on solid material paint samples with the MCA for specific cobalt 60 indicated that all paint samples were less than 3 pCi/g. Analysis performed on remaining samples with the MCA for specific cobalt 60 indicated all solid material samples were less than 1 pCi/g and showed no traces of

6. Bldg. 222, First Floor Group 3

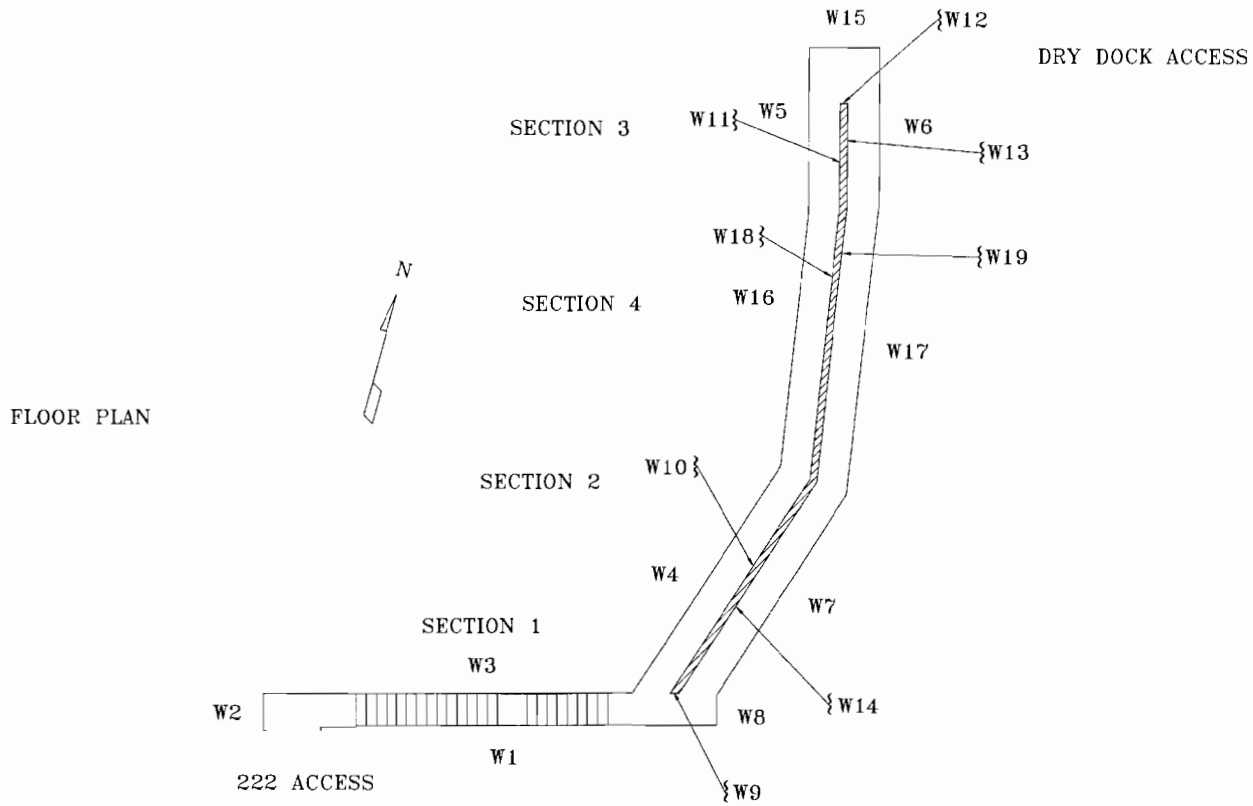
cobalt 60, with the exception of 5 samples taken from Dry Dock #2 Tunnel. The extent of the contamination was identified by taking additional solid material samples from the surrounding vicinity. Remediation consisted of the excavation of concrete to a minimum depth of ½" from the identified areas. Following remediation, additional solid material samples were taken from the affected areas and all were less than 1 pCi/g specific cobalt 60. No traces of cobalt 60 were identified.

6. Bldg. 222, First Floor Group 3

b. Site Map

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #1 Tunnel



6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #1 Tunnel

	1	2	3	4	5	6	7	8	9	10	11	12
A	<450 125 375 3000 8000 0.83	<450 125 225 – – 0.62	<450 125 200 – – 0.54	<450 125 150 – – 1.08 <1	<450 125 125 – – 1.27 <1	<450 125 125 – – 0.79	<450 125 125 3000 4000 0.46	<450 125 125 – – 0.57	<450 125 125 – – 0.74	<450 125 150 – – 0.62	<450 125 150 3000 4000 1.12 <1	<450 125 150 – – 0.71

FLOOR PLAN – SECTION 1

	1	2	3	4	5	6
B	<450 125 150 – – 1.35 <1	<450 125 150 – – 1.35 <1	<450 125 125 – – 0.74	<450 125 125 3000 3000 0.98	<450 125 125 – – 0.94	<450 125 125 – – 0.76
A	<450 125 150 – – 1.18 <1	<450 125 125 3000 3500 1.4: <1	<450 125 150 – – 0.75	<450 125 125 – – 1.00 <1	<450 125 175 3000 3500 0.66	<450 125 125 – – 0.61

FLOOR PLAN – SECTION 2

Sample Data

<450 – IM-247/PD Results [$\mu\mu$Ci/20cm^2]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7500 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #1 Tunnel

	1	2	3
B	<450 125 125 – – 0.66	<450 125 125 – – 0.96	<450 125 125 3000 3000 0.81
A	<450 125 150 3000 3500 1.00 <1	<450 125 150 – – <0.42	<450 125 105 – – 0.72

FLOOR PLAN – SECTION 3

	1	2	3	4	5	6
B	<450 125 150 – – 0.83	<450 125 150 – – 0.76	<450 125 150 – – 1.06 <1	<450 125 150 3000 3500 1.41 <1	<450 125 150 – – 1.01 <1	<450 125 150 – – 0.77
A	<450 125 125 – – 0.50	<450 125 150 3000 3500 0.61	<450 125 150 – – 0.56	<450 125 125 – – <0.40	<450 125 150 – – <0.35	<450 125 150 3000 3500 <0.39

FLOOR PLAN – SECTION 4

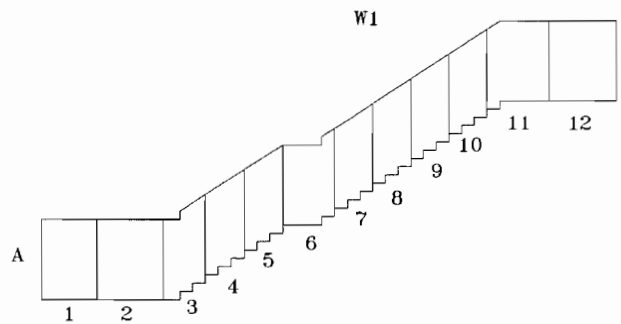
Sample Data

<450 – IM-247/PD Results [$\mu\mu$C/20cm^2]
230 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #1 Tunnel

	1	2	3	4	5	6	7	8	9	10	11	12
A	<450 125 150 – – 0.97	<450 125 100 3000< 3500 0.51	<450 125 150 – – 1.73 <1	<450 125 200 – – 1.37 <1	<450 125 100 – – 1.51 <1	<450 125 150 3000 4000 1.28 <1	<450 125 100 – – 2.11 <1	<450 125 450 – – 0.97	<450 125 450 – – 2.70 <1	<450 125 450 – – 2.98 <1	<450 125 500 – – 3.01 <1	<450 125 450 3000 10000 3.03 <1

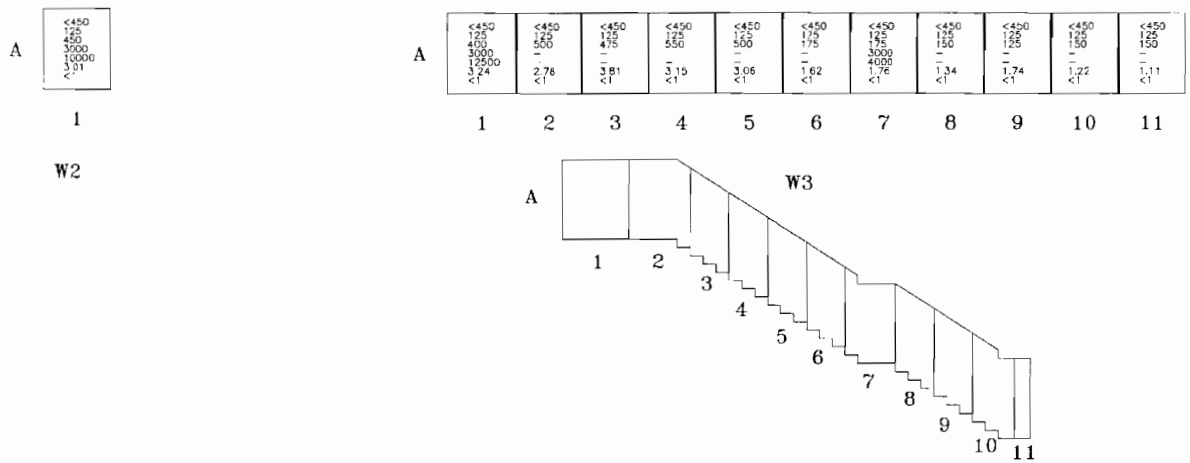


Sample Data

<450 – IM-247/PD Results [μμC/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #1 Tunnel



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #1 Tunnel

W4

	1	2	3	4	5	6
A	<450 125 150 – – 0.81	<450 175 – – 0.91	<450 125 175 3000 3250 0.56	<450 125 150 – – 1.80 <1	<450 125 150 – – 2.80 <1	<450 125 125 – – 1.02 <1

W5

	1	2	3
A	<450 125 125 – – 2.44 <1	<450 125 150 3000 3500 1.27 <1	<450 125 150 – – 1.36 <1

W6

	1	2	3
A	<450 125 175 – – 0.95	<450 125 175 3000 4000 0.81	<450 125 200 – – 1.28 <1

W7

	1	2	3	4	5
A	<450 125 175 – – 1.26 <1	<450 125 200 – – 0.80	<450 125 175 3000 3000 1.41 <1	<450 125 150 – – 0.50	<450 125 150 – – 1.35 <1

W8

	1
A	<450 125 175 3000 3500 1.19 <1

Sample Data

<450 – IM-247/PD Results [μpCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #1 Tunnel

W9

	1
A	<450 125 175 – – 0.95

W10

	1	2	3	4	5	6
A	<450 125 150 – – 1.52 <1	<450 125 175 – – 1.06 <1	<450 125 175 – – 0.95	<450 125 125 3000 3500 0.90	<450 125 125 – – 1.37 <1	<450 125 175 – – 0.74

W11

	1	2
A	<450 125 150 – – 0.89	<450 125 150 3000 3500 1.27 <1

W12

	1
A	<450 125 125 – – 0.50

W13

	1	2
A	<450 125 100 – – 0.90	<450 125 100 3000 3500 0.72

W14

	1	2	3	4	5	6
A	<450 125 100 – – 1.00 <1	<450 125 100 – – 0.78	<450 125 100 – – 0.95	<450 125 100 3000 3000 0.94	<450 125 100 – – 0.81	<450 125 100 – – <0.49

Note:
Solid sample taken from grid W9-A1 consist of paint and have a limit of 3 pCi/g.

Sample Data

<450 – IM-247/PD Results ($\mu\mu$Ci/20cm^2)
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #1 Tunnel

	1	2
A	<450 125 200 3000 5000 0.74	<450 125 200 – – 0.73

W15

	1	2	3	4	5
A	<450 125 155 3000 3500 0.54	<450 125 150 – – <0.42	<450 125 150 – – 0.76	<450 125 175 – – 0.81	<450 125 150 3000 3000 0.83

W16

	1	2	3	4	5	6
A	<450 125 150 – – 1.33 <1	<450 125 150 3000 3000 0.67	<450 125 150 – – 0.69	<450 125 175 – – 0.80	<450 125 150 3000 3000 0.77	<450 125 150 – – 1.04 <1

W17

	1	2	3	4	5	6
A	<450 125 150 – – 0.69	<450 125 200 3000 3500 0.73	<450 125 200 – – 0.93	<450 125 150 – – 0.64	<450 125 150 – – 2.59 <1	<450 125 200 3000 3500 1.10 <1

W18

	1	2	3	4	5	6
A	<450 125 150 – – 1.00 <1	<450 125 175 3000 3500 0.79	<450 125 150 – – 0.63	<450 125 125 – – 0.82	<450 125 150 3000 3500 1.24 <1	<450 125 125 – – 0.89

W19

Note:
Solid samples taken from grids W15-A1 and W15-A2 consist of paint and have a limit of 3 pCi/g.

Sample Data
< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

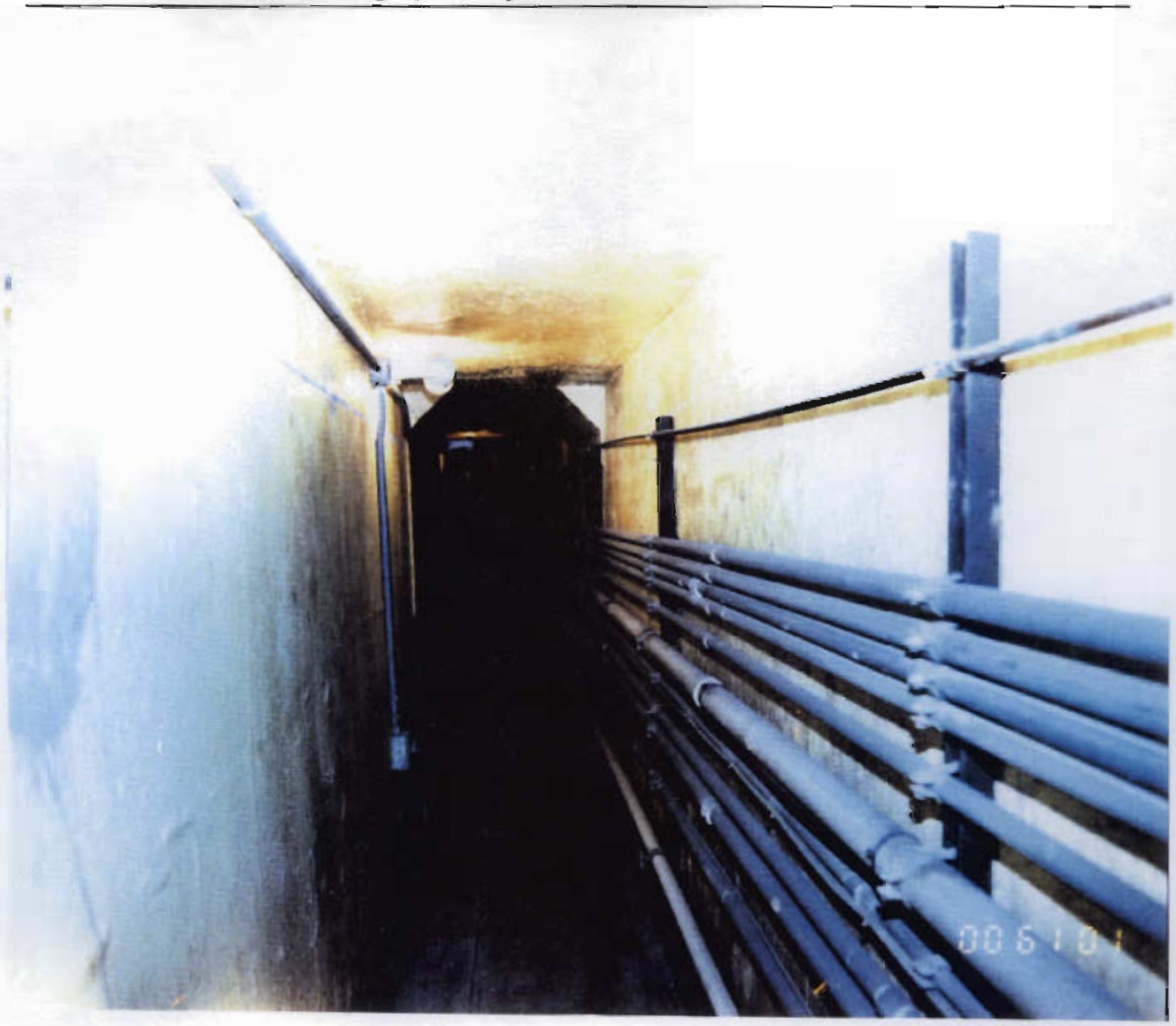
6. Bldg. 222, First Floor Group 3

c. Prior to Photographs, Drydock #1 Tunnel

Viewing section 1, personnel passageway

6. Bldg. 222, First Floor Group 3

c. Prior to Photographs, Drydock #1 Tunnel



Viewing section 2, service passageway

6. Bldg. 222, First Floor Group 3

c. Prior to Photographs, Drydock #1 Tunnel

Viewing section 3, service passageway

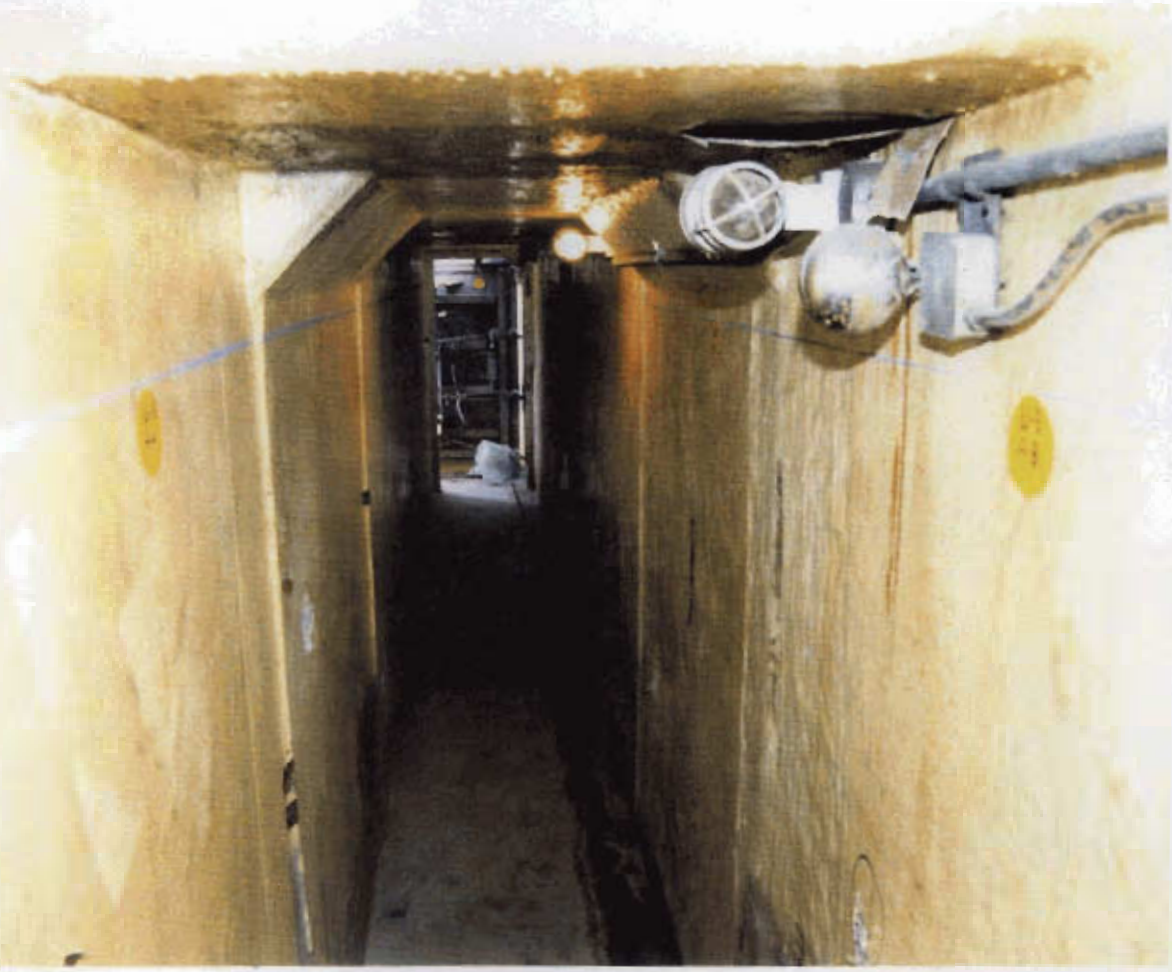
6. Bldg. 222, First Floor Group 3

c. After Photographs, Drydock #1 Tunnel

Viewing section 3, service passageway

6. Bldg. 222, First Floor Group 3

c. After Photographs, Drydock #1 Tunnel



Viewing section 3, personnel passageway

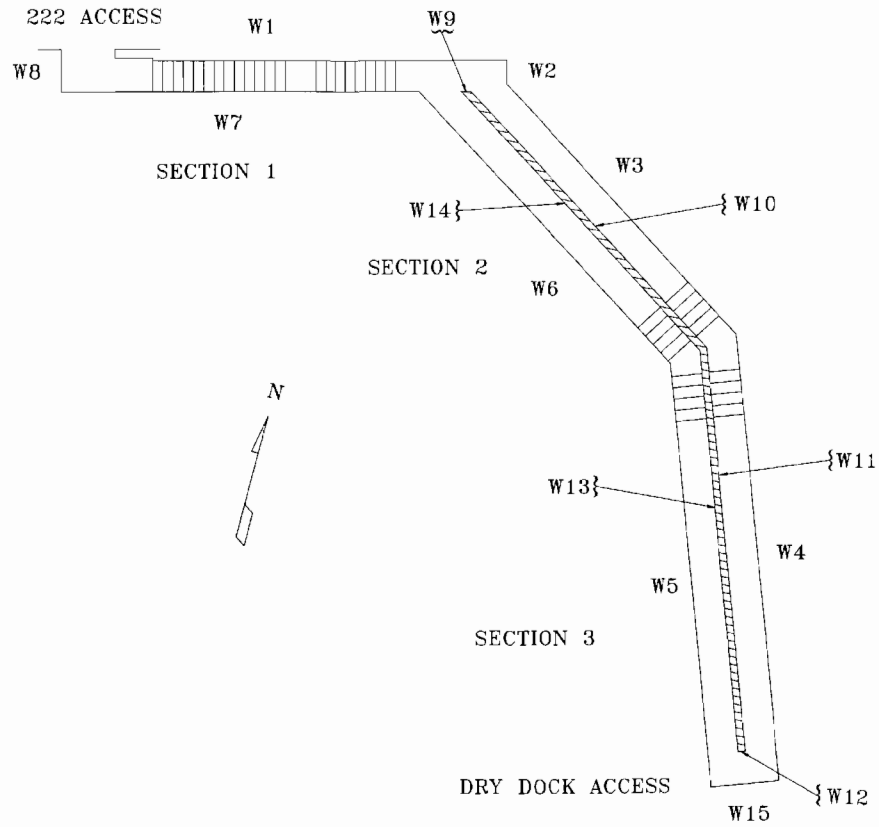
6. Bldg. 222, First Floor Group 3

c. After Photographs, Drydock #1 Tunnel

Viewing section 2, personnel passageway

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #2 Tunnel



FLOOR PLAN

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #2 Tunnel

	1	2	3	4	5	6	7	8	9	10	11
A	<450 125 350 3000< 8000 1.65 <1	<450 125 350 – – 1.17 <1	<450 125 150 – – 1.06 <1	<450 125 150 – – 1.40 <1	<450 125 150 3000< 4000 0.70	<450 125 150 – – 0.85	<450 125 150 – – 0.58	<450 125 200 – – 0.95	<450 125 125 3000 3500 0.51	<450 125 150 – – 0.40	<450 125 125 – – 4.20 <1

FLOOR PLAN – SECTION 1

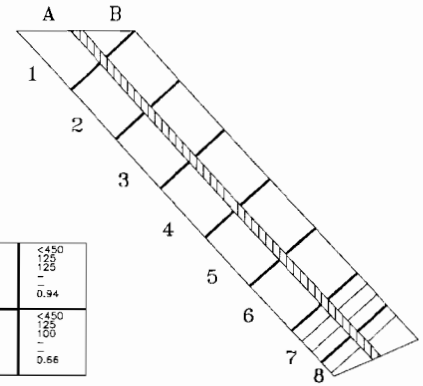
Sample Data

<450 – IM-247/PD Results [$\mu\mu$Ci/20cm^2]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #2 Tunnel

	1	2	3	4	5	6	7	8
B	<450 125 125 – – 1.51 <1	<450 125 200 – – 0.59	<450 125 150 – – 1.90 <1	<450 125 125 3000 3500 <0.40	<450 125 125 – – <0.47	<450 125 150 3000 3000 0.98	<450 125 150 – – 0.97	<450 125 125 – – 0.94
A	<450 125 125 – – 0.96	<450 125 125 3000 3500 0.75	<450 125 150 – – 0.54	<450 125 200 – – 0.53	<450 125 200 3000 3500 0.42	<450 125 200 – – <0.33	<450 125 150 – – 0.87	<450 125 100 – – 0.66



FLOOR PLAN

SECTION 2

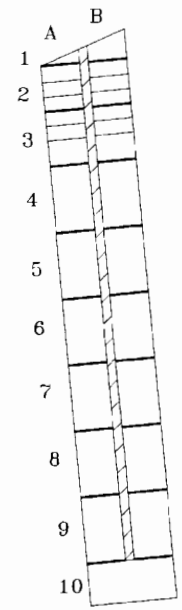
Sample Data

<450 – IM-247/PD Results [μμC/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #2 Tunnel

	1	2	3	4	5	6	7	8	9	10
B	<450 125 150 – – 0.54	<450 125 175 – – 0.74	<450 125 150 – – 0.51	<450 125 150 – – 2.19 <1	<450 125 150 3000 4000 0.52	<450 125 175 – – 0.56	<450 125 175 – – 0.40	<450 125 150 3000 4000 0.75	<450 125 150 – – 0.83	<450 125 175 – – 0.78
A	<450 125 150 – – <0.47	<450 125 125 – – 1.04 <1	<450 125 125 3000 3000 <0.45	<450 125 150 – – 0.38	<450 125 100 – – <0.43	<450 125 125 – – <0.40	<450 125 150 3000 3500 0.57	<450 125 150 – – 0.69	<450 125 150 3000 3000 0.53	<450 125 150 – – 0.63



FLOOR PLAN

SECTION 3

Sample Data

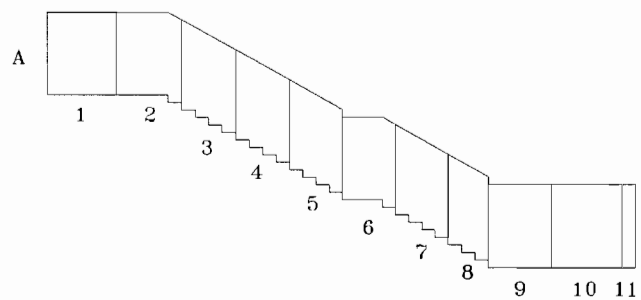
< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #2 Tunnel

	1	2	3	4	5	6	7	8	9	10	11
A	<450 125 200 – – 0.67	<450 125 500 3000 10000 3.25 <1	<450 125 500 – – 3.19 <1	<450 125 500 – – 3.22 <1	<450 125 400 – – 2.32 <1	<450 125 175 – – 1.56 <1	<450 125 175 – – 1.84 <1	<450 125 175 – – 1.84 <1	<450 125 175 3000 4000 3.16 <1	<450 125 175 – – 1.46 <1	<450 125 175 – – 0.71

W1



Note:
Solid sample taken from grid W1-A1 consist of paint and have a limit of 3 pCi/g.

Sample Data
<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7200 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #2 Tunnel

W2

	1
A	<450 125 125 3000 3500 <0.37

W3

	1	2	3	4	5	6	7
A	<450 125 125 – – 0.71	<450 125 100 3000 3500 0.96	<450 125 125 – – 1.00 <1	<450 125 150 3000 3500 1.03 <1	<450 125 100 – – 0.78	<450 125 150 – – 1.30 <1	<450 125 100 – – 0.73

W4

	1	2	3	4	5	6	7	8	9	10
A	<450 125 150 – – 0.71	<450 125 100 – – 0.74	<450 125 150 – – 0.69	<450 125 150 3000 3500 0.75	<450 125 150 – – 0.77	<450 125 150 – – 0.96	<450 125 150 3000 3500 0.61	<450 125 125 – – 1.01 <1	<450 125 125 – – 1.55 <1	<450 125 125 – – 0.59

W5

	1	2	3	4	5	6	7	8	9
A	<450 125 150 – – 0.69	<450 125 150 3000 2500 <0.37	<450 125 125 – – 1.05 <1	<450 125 150 – – 0.79	<450 125 150 3000 3500 1.13 <1	<450 125 175 – – 0.77	<450 125 150 – – 0.43	<450 125 125 3000 3500 0.53	<450 125 125 – – 1.13 <1

W6

	1	2	3	4	5	6	7	8
A	<450 125 125 – – 0.50	<450 125 150 – – 0.96	<450 125 150 – – 1.10 <1	<450 125 150 3000 3500 0.98	<450 125 175 – – 0.90	<450 125 150 – – 0.79	<450 125 150 – – 0.96	<450 125 150 3000 3500 0.84

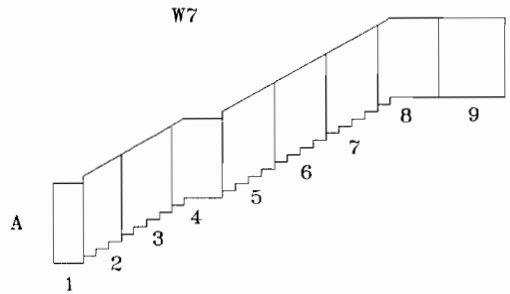
Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #2 Tunnel

	1	2	3	4	5	6	7	8	9
A	<450 125 150 – – 1.16 <1	<450 125 150 – – 1.45 <1	<450 125 200 – – 1.88 <1	<450 125 150 3000 3000 2.28 <1	<450 125 300 – – 1.71 <1	<450 125 350 – – 4.44 <1	<450 125 400 – – 3.49 <1	<450 125 400 3000 10000 2.81 <1	<450 125 400 – – 3.03 <1



Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

6. Bldg. 222, First Floor Group 3

c. Grid Map, Drydock #2 Tunnel

W8

	1
A	<450 125 400 3000 10000 3.40 <1

W9

	1
A	<450 125 125 – – 3.21 <3

W10

	1	2	3	4	5	6	7	8
A	<450 125 125 – – 0.91	<450 125 100 – – 0.77	<450 125 150 3000 3500 0.49	<450 125 100 – – 0.69	<450 125 150 – – 0.85	<450 125 150 3000 3500 0.51	<450 125 150 – – 0.77	<450 125 150 – – 1.05 <1

W11

	1	2	3	4	5	6	7	8	9
A	<450 125 125 – – <0.29	<450 125 125 3000 3000 0.50	<450 125 125 – – 1.08 <1	<450 125 150 – – 0.33	<450 125 125 3000 3500 0.70	<450 125 125 – – 0.55	<450 125 125 3000 3500 0.85	<450 125 100 – – 0.59	<450 125 125 – – 0.60

W12

	1
A	<450 125 100 – – 0.76

W13

	1	2	3	4	5	6	7	8	9
A	<450 125 150 – – 1.14 <1	<450 125 150 – – 0.85	<450 125 150 – – <0.39	<450 125 150 3000 3500 0.43	<450 125 150 – – 0.81	<450 125 150 – – 0.47	<450 125 150 – – 1.05 <1	<450 125 150 3000 4000 0.70	<450 125 150 – – 1.23 <1

W15

	1	2
A	<450 125 150 – – <0.60	<450 125 150 – – <0.77

W14

	1	2	3	4	5	6	7	8
A	<450 125 150 – – 1.17 <1	<450 125 150 3000 3500 1.05 <1	<450 125 150 – – 1.01 <1	<450 125 150 3000 4000 1.10 <1	<450 125 150 – – 1.16 <1	<450 125 150 3000 4000 1.26 <1	<450 125 150 – – 0.83	<450 125 150 – – 1.18 <1

Note:
Solid samples taken from grids W9-A1, W15-A1, and W15-A2 consist of paint and have a limit of 3 pCi/g.

Sample Data
<450 – IM-247/PD Results [$\mu\mu C/20cm^2$]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

6. Bldg. 222, First Floor Group 3

c. Prior to Photographs, Drydock #2 Tunnel

Viewing section 2, personnel passageway

6. Bldg. 222, First Floor Group 3

c. Prior to Photographs, Drydock #2 Tunnel

Viewing section 3, service passageway

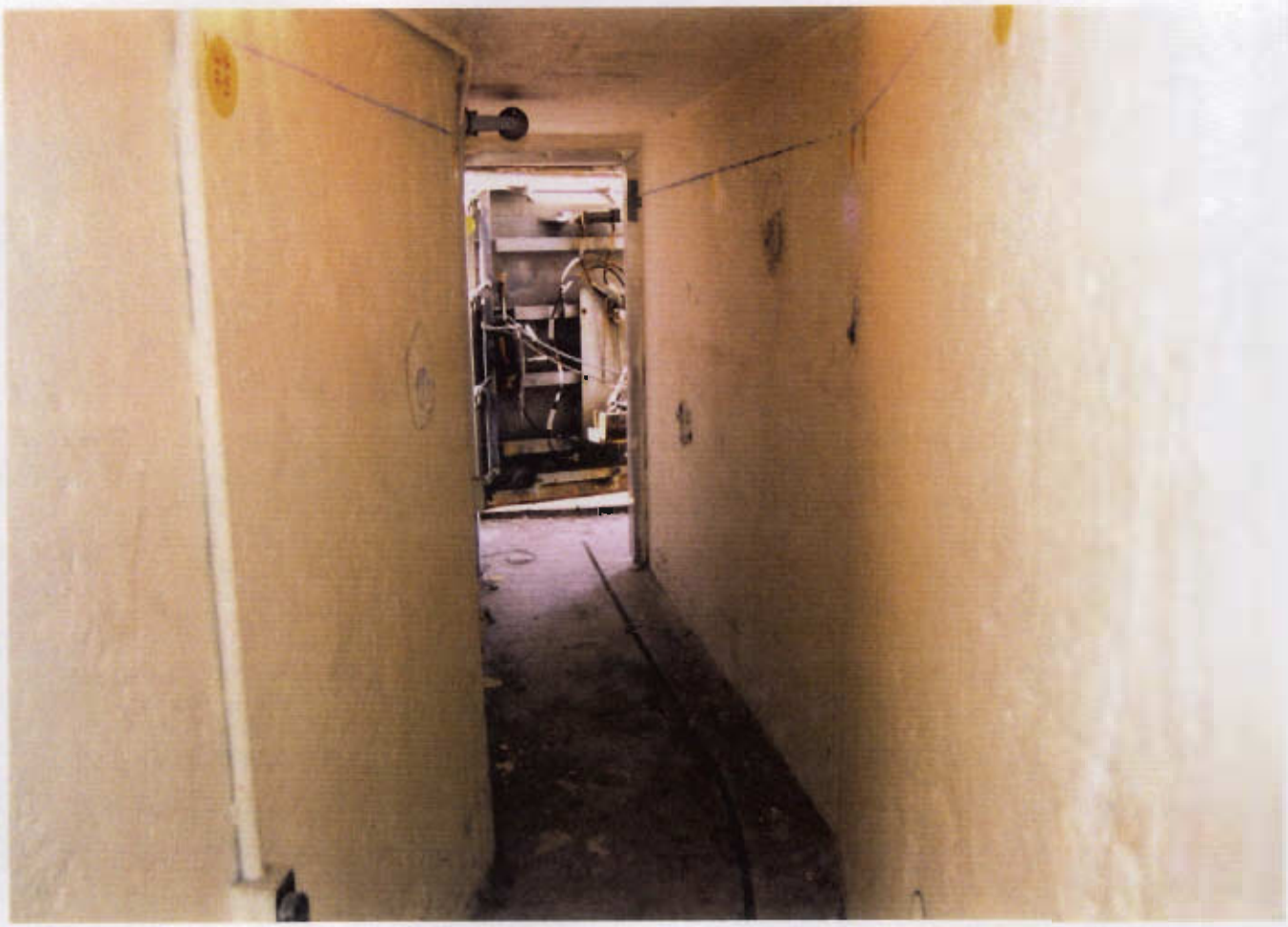
6. Bldg. 222, First Floor Group 3

c. After Photographs, Drydock #2 Tunnel

Viewing section 1, personnel passageway

6. Bldg. 222, First Floor Group 3

c. After Photographs, Drydock #2 Tunnel



Viewing section 3, personnel passageway

6. Bldg. 222, First Floor Group 3

c. After Photographs, Drydock #2 Tunnel

Viewing section 2, service passageway

7. Bldg. 222, First Floor Groups 4 & 6

a. Report

(1) Description:

The first floor Group 4 areas consisted of rooms 101, 102, 103, 104, 106, 111, 112 North End, 115, 116, 118, 1st to 2nd Floor stairwell, and the Heating Ventilation Air Conditioning (HVAC) Duct Space. The Group 6 area was located in room 118. These areas are primarily of concrete construction with the majority of the walls, floors, and ceilings painted.

(2) Discussion:

The Group 4 areas were divided into 2558 3' by 3' floor and wall grids and 9' by 9' wall and ceiling grids. The walls were divided into grids 3' by 3', up to 12' high, then 9' by 9' grids above 12'. In room 111 all the wall areas and ceiling areas were divided into 3' by 3' grids. Each grid was identified with its own unique designator.

One hundred percent of all 3' by 3' grids were surveyed using the IM-247/PD and the IM-253/PD (HV-1 PHA). A minimum of 25 percent of all 3' by 3' grids were surveyed using the IM-253/PD (HV-2 GROSS). A minimum of 25 percent of all 9' by 9' grids were surveyed using the IM-247/PD and IM-253/PD (HV-1 PHA and HV-2 GROSS). A minimum of one solid material sample was taken from each 3' by 3' grid and from a minimum of 25 percent of all 9' by 9' grids. At least one solid material sample was taken from each wall and ceiling grid with the exception of the ceiling and a portion of wall 4 in room 118 which were constructed of unpainted galvanized metal with an unpainted metal sliding roof hatch; and in room 112 north, wall 2, which has an unpainted metal door. Additionally, solid material samples were taken from selected structural joints and crevices. Results from these samples were incorporated into the report by utilizing the higher of the normal grid sample or the joint/crevice sample result. In addition, a minimum of 25 percent of the Group 6 area floor grids in room 118 were surveyed using the AN/PDR-56.

The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the Group 4 floors, walls, and ceiling were 40, 200, and 6000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 1720 and Building 1635.

A total of 2537 solid material samples were taken. Each solid sample was removed from the grid location indicating the area of highest potential. Additionally, solid material samples were taken from selected structural joints and crevices. Results from these samples were incorporated into the report by utilizing the higher of the normal grid sample or the joint/crevice sample result. Paint samples were taken from Wall 1 in Room 101 (W1-C1 and W1-C2), from Wall 1 in Room 104 (W1-A1 and W1-B1), from Wall 10 in Room 111 (W10-A1, W10-A2, and W10-A3), from Wall 1 in Room 115 (W1-A1 and W1-B1), and

7. Bldg. 222, First Floor Groups 4 & 6

from Wall 4 in Room 118 (W4-A13 and W4-B13). The following naturally occurring radionuclides were typical isotopes identified during analysis of solid material samples: lead 212, lead 214, thallium 208, potassium 40, and bismuth 214.

(3) Summary:

Surveys performed with the IM-247/PD did not detect areas greater than 450 $\mu\mu Ci/20cm^2$.

Surveys performed with the AN/PDR-56 found no detectable alpha radioactivity.

Surveys performed with the IM-253/PD (HV-1 PHA) detected 874 areas greater than or equal to twice background.

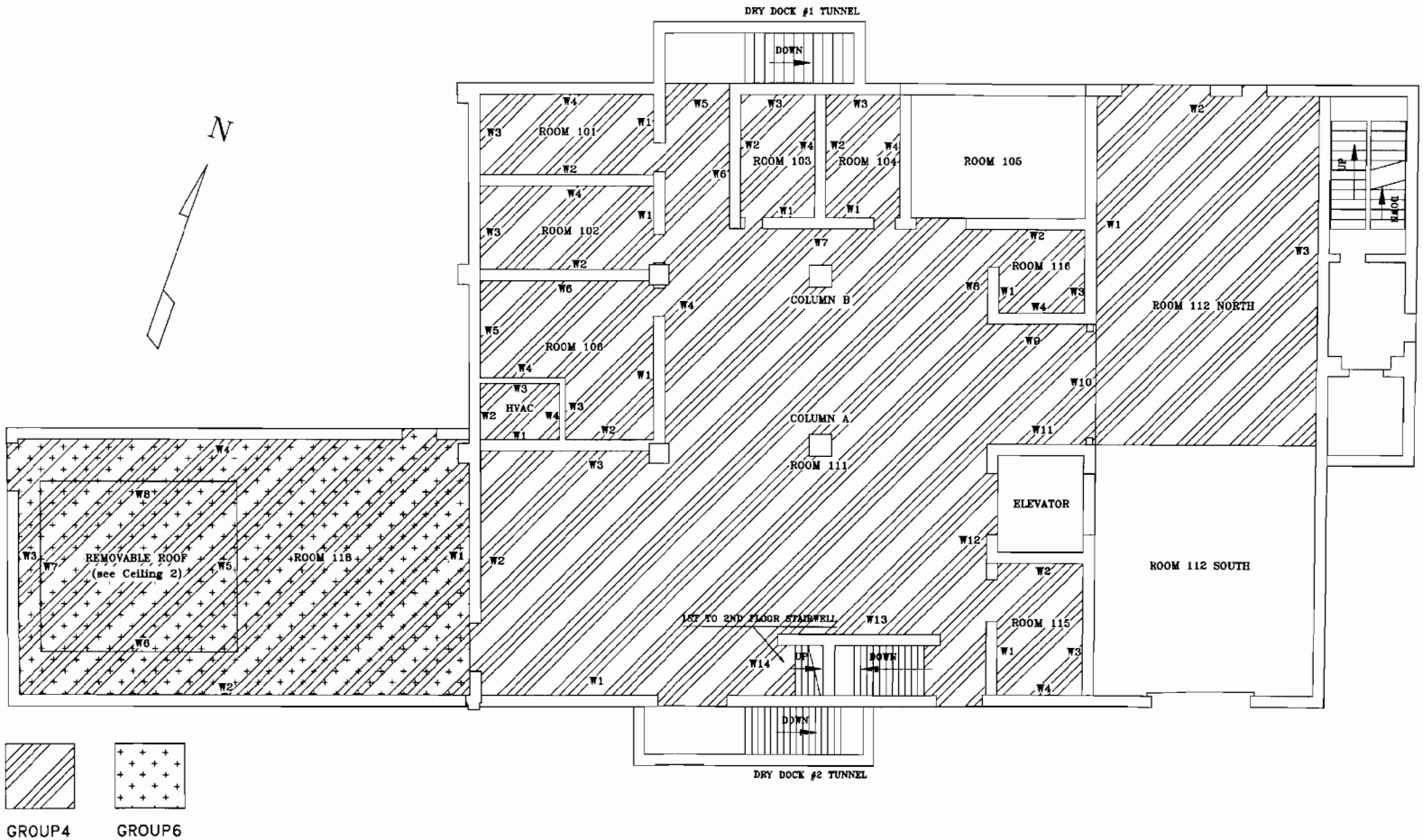
Surveys performed with the IM-253/PD (HV-2 GROSS) detected 29 areas greater than or equal to twice background.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) detected gross gamma equivalent cobalt 60 levels ranging from less than minimum detectable activity of 0.21 pCi/g to a high of 9.40 pCi/g.

Analysis performed on solid material paint samples with the MCA for specific cobalt 60 indicated that all paint samples were less than 3 pCi/g. Analysis performed on initial solid material samples with the MCA for specific cobalt 60 identified five solid material samples containing specific cobalt 60 greater than minimum detectable activity. These were taken from room 103, room 111, room 104, and room 116. The extent of the contamination was identified by taking additional solid material samples from the surrounding vicinity in each room. Room 103 and room 116 floor/wall joints were remediated by removal of concrete. Additionally, room 111 door frame (portion of W12) was removed and disposed of as radioactive material. Following remediation, additional solid material samples were taken from the affected areas and all were less than 1 pCi/g specific cobalt 60. No traces of cobalt 60 were identified.

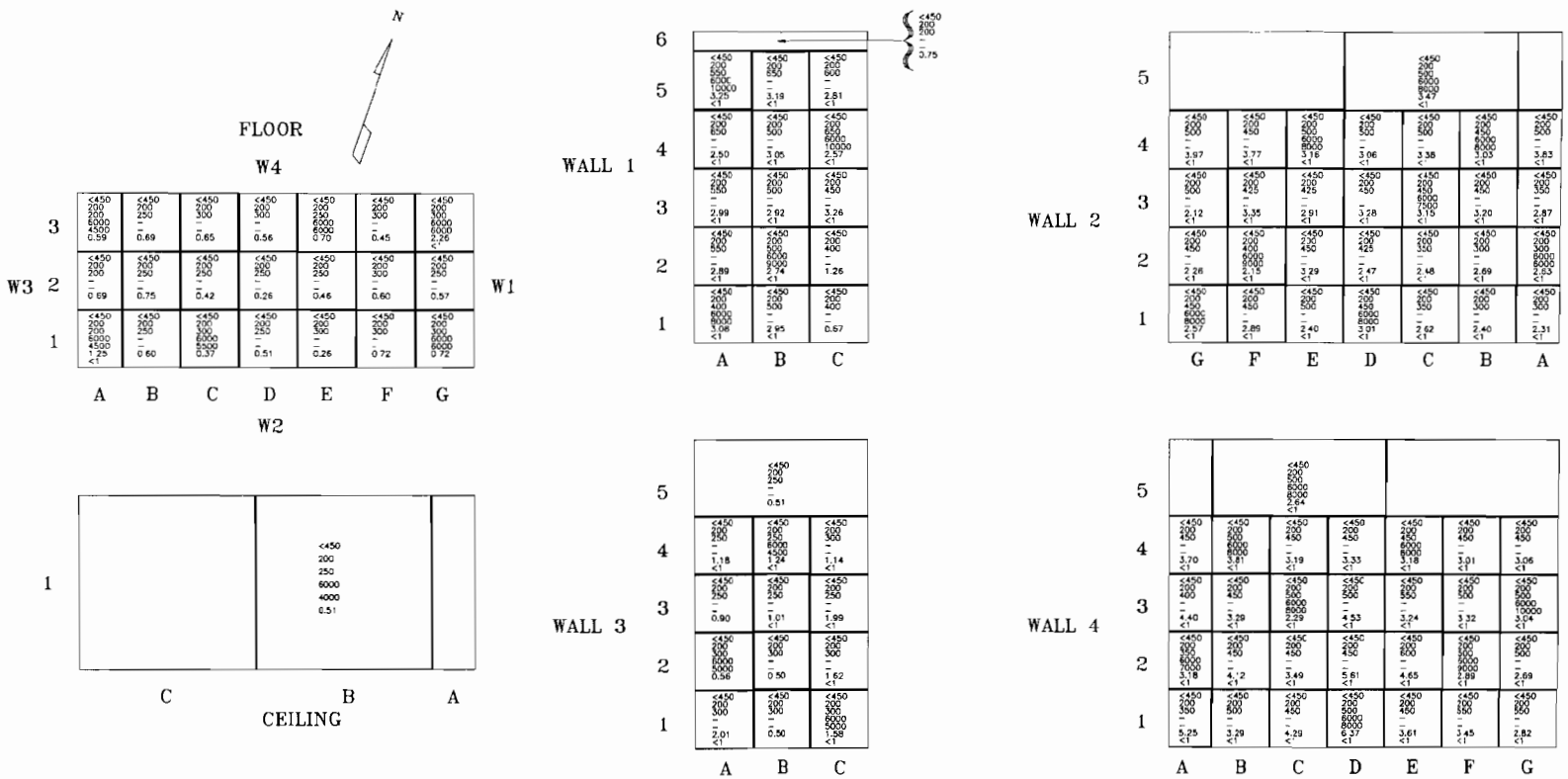
7. Bldg. 222, First Floor Groups 4 & 6

b. Group 4 & 6 Site Map



7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 101

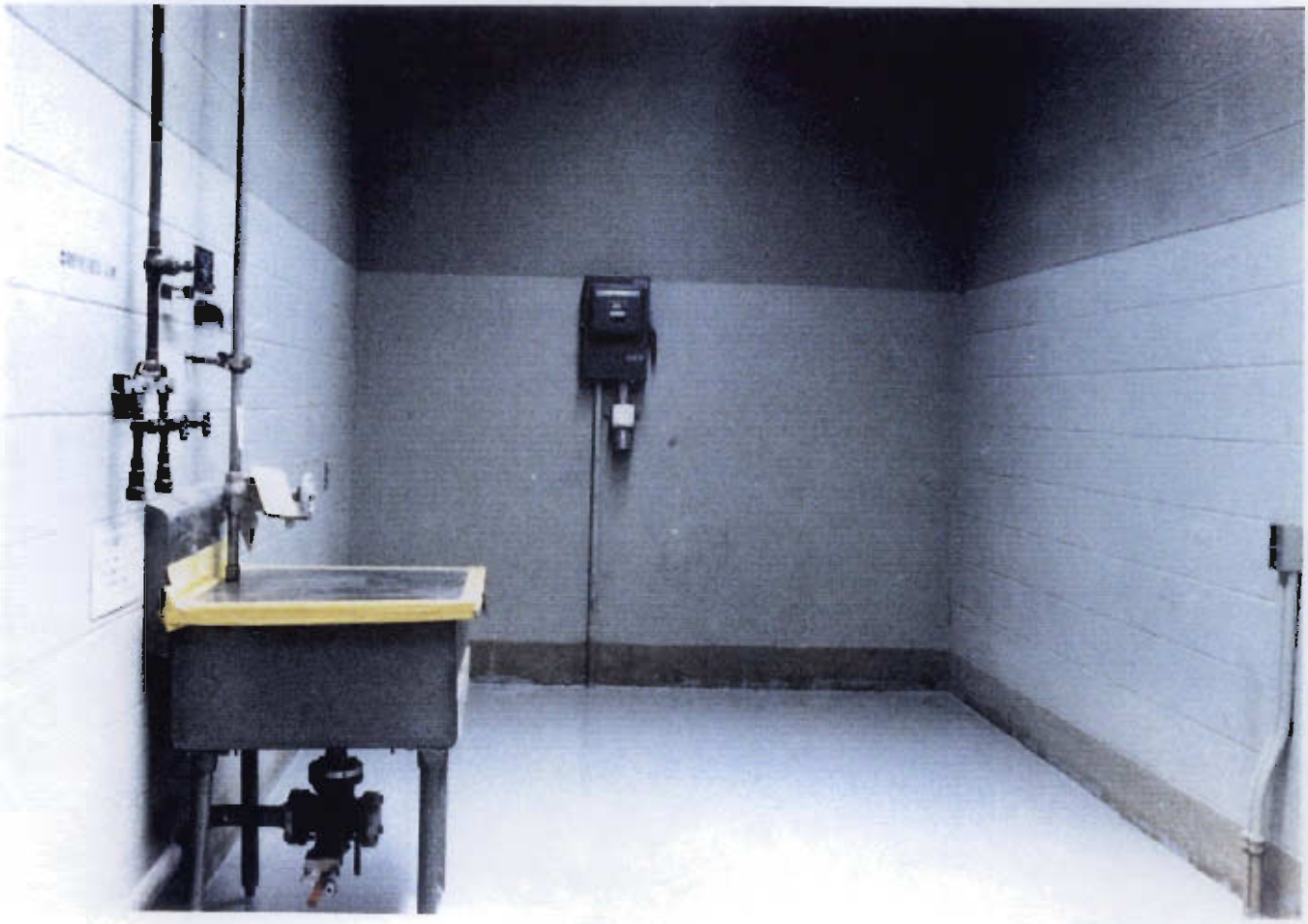


Note:
Solid samples taken from grids W1-C1 and W1-C2 consist of paint and have a limit of 3 pCi/g.

Sample Data
<450 – IM-247/PD Results [µµCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Prior to Photographs, Room 101



Viewing into room.

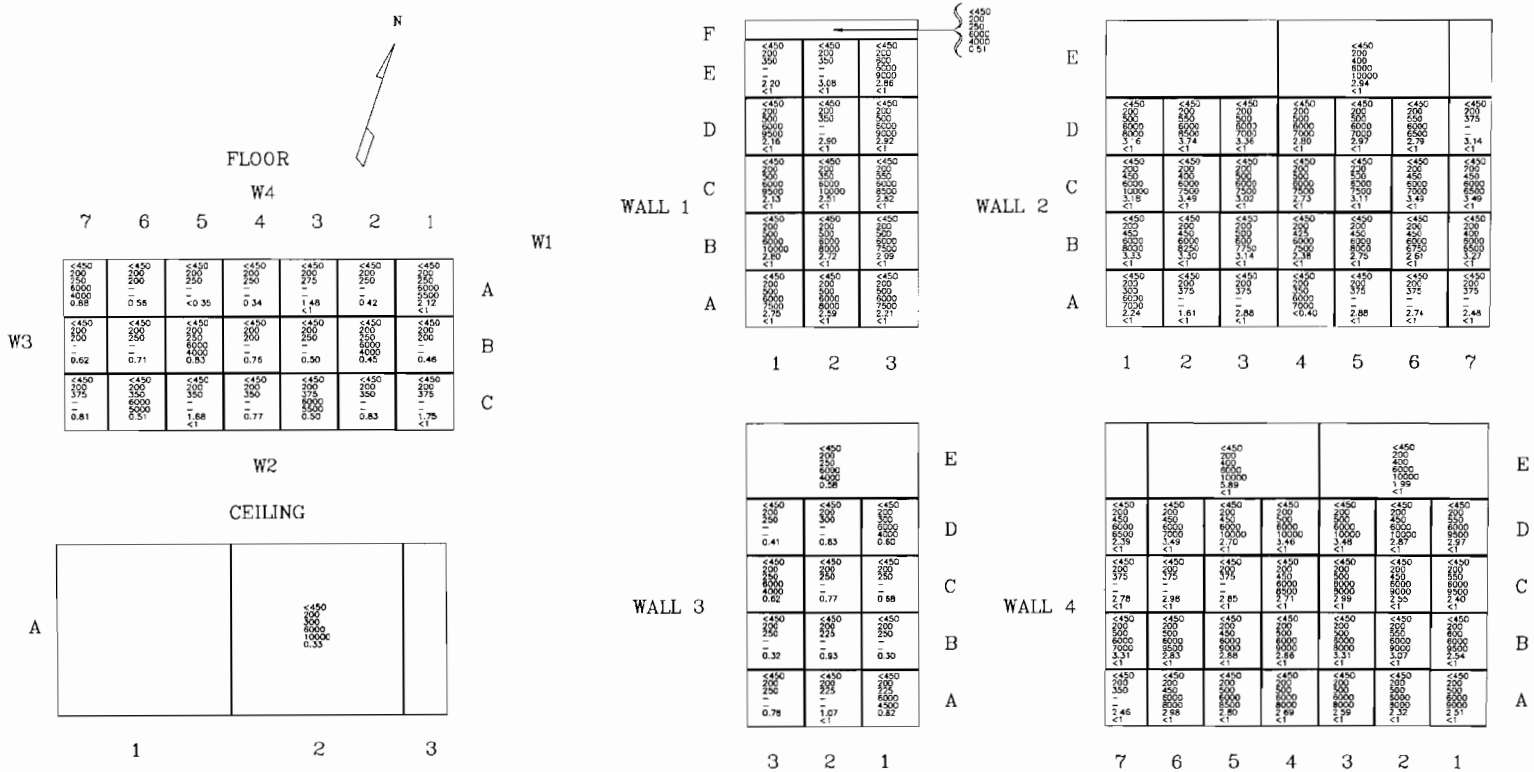
7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 101

Viewing Wall-3.

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 102



Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

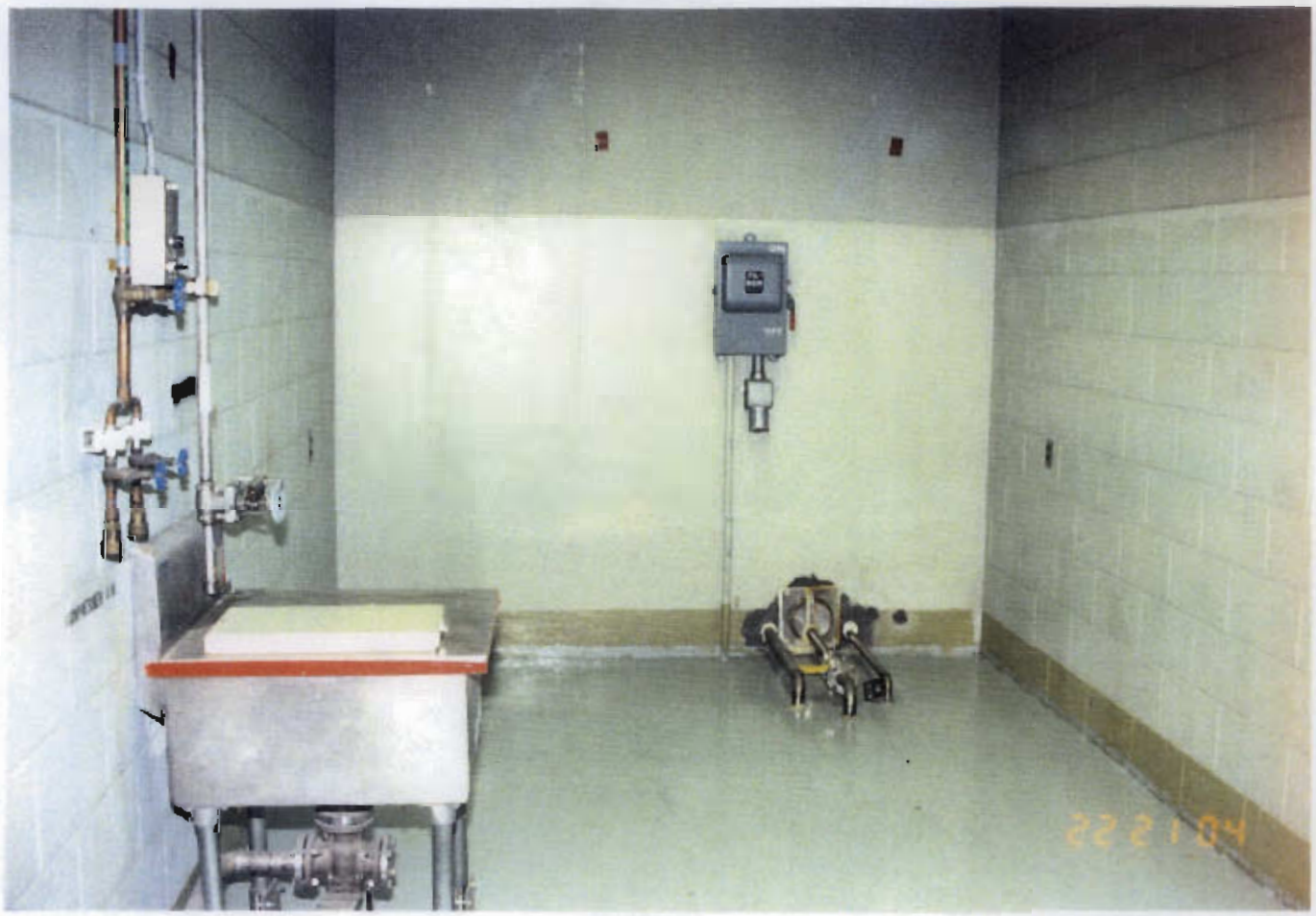
7. Bldg. 222, First Floor Groups 4 & 6

c. Prior to Photographs, Room 102

Viewing Wall-1.

7. Bldg. 222, First Floor Groups 4 & 6

c. Prior to Photographs, Room 102



Viewing Wall-3.

7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 102

Viewing Wall-3.

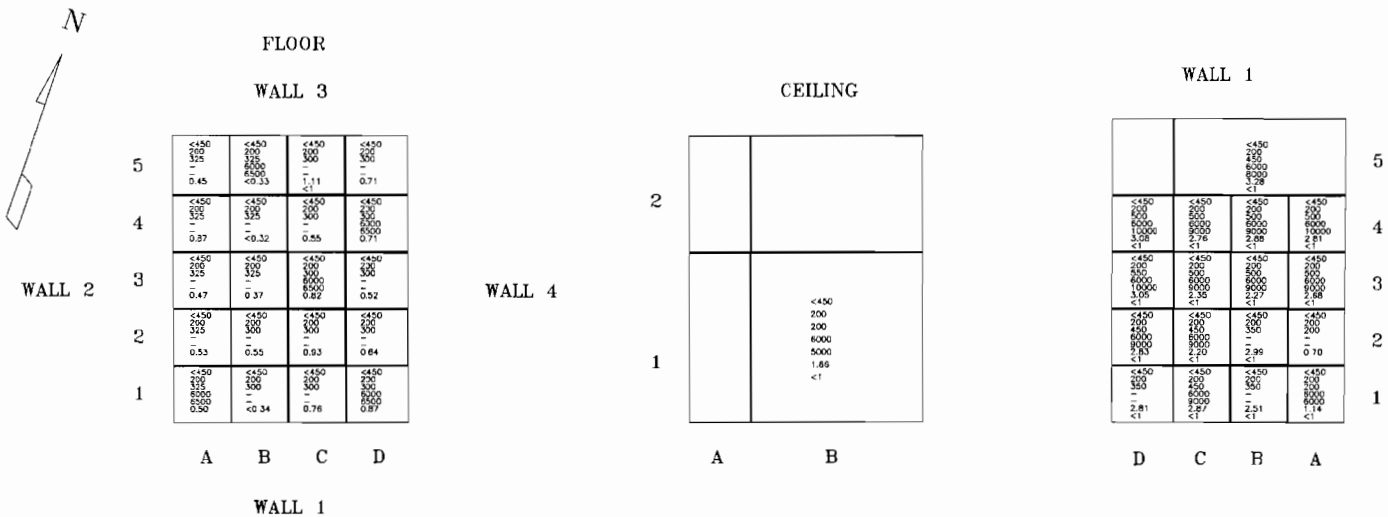
7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 102

Viewing Wall-1.

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 103



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 103

WALL 2

	A	B	C	D	E
5		<450 200 500 6000 9000 3.19 <1			
4	<450 200 450 6000 10000 2.58 <1	<450 200 450 6000 10000 3.15 <1	<450 200 500 6000 10000 2.93 <1	<450 200 450 6000 9000 3.04 <1	<450 200 500 6000 10000 3.80 <1
3	<450 200 450 6000 9000 2.78 <1	<450 200 450 6000 9000 2.72 <1	<450 200 450 6000 9500 2.42 <1	<450 200 500 6000 8750 3.23 <1	<450 200 500 6000 9000 3.49 <1
2	<450 200 450 6000 9000 2.42 <1	<450 200 500 6000 9000 2.30 <1	<450 200 500 6000 9000 2.15 <1	<450 200 500 6000 9000 3.13 <1	<450 200 450 6000 9000 2.81 <1
1	<450 200 350 — — 2.29 <1	<450 200 450 6000 8000 2.23 <1	<450 200 500 6000 7300 2.33 <1	<450 200 500 6000 9000 2.74 <1	<450 200 500 6000 9000 2.53 <1

WALL 3

	A	B	C	D
5		<450 200 500 6000 9000 2.46 <1		
4	<450 200 500 6000 10000 2.89 <1	<450 200 500 6000 12000 2.30 <1	<450 200 450 6000 11000 2.65 <1	<450 200 500 6000 10000 3.14 <1
3	<450 200 575 6000 12500 3.15 <1	<450 200 450 6000 13000 2.95 <1	<450 200 450 6000 11000 2.96 <1	<450 200 500 6000 12000 2.78 <1
2	<450 200 950 — — 3.90 <1	<450 200 450 6000 9500 2.52 <1	<450 200 500 6000 8000 2.13 <1	<450 200 450 6000 9500 3.28 <1
1	<450 200 450 6000 9500 2.76 <1	<450 200 350 — — 2.25 <1	<450 200 450 6000 9500 2.76 <1	<450 200 450 6000 9500 2.78 <1

WALL 4

	E	D	C	B	A
5			<450 200 500 6000 8000 2.84 <1		
4	<450 200 450 6000 10000 3.31 <1	<450 200 450 6000 10000 3.03 <1	<450 200 500 6000 9000 3.45 <1	<450 200 500 6000 9000 3.08 <1	<450 200 500 6000 10000 3.33 <1
3	<450 200 450 6000 11000 2.82 <1	<450 200 450 6000 12000 2.11 <1	<450 200 400 6000 9500 2.90 <1	<450 200 500 6000 9500 3.20 <1	<450 200 450 6000 10000 3.21 <1
2	<450 200 500 6000 9000 2.45 <1	<450 200 450 6000 9000 2.94 <1	<450 200 450 6000 9000 2.15 <1	<450 200 450 6000 9000 2.98 <1	<450 200 400 — — 2.24 <1
1	<450 200 500 6000 9500 2.40 <1	<450 200 350 — — 2.72 <1	<450 200 300 — — 2.83 <1	<450 200 300 — — 1.85 <1	<450 200 500 6000 9500 2.46 <1

Sample Data

<450 – IM-247/PD Results [µrC/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Prior to Photographs, Room 103

Viewing entrance

7. Bldg. 222, First Floor Groups 4 & 6

c. Prior to Photographs, Room 103

Viewing toward Wall-3

7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 103

Viewing toward Wall-3

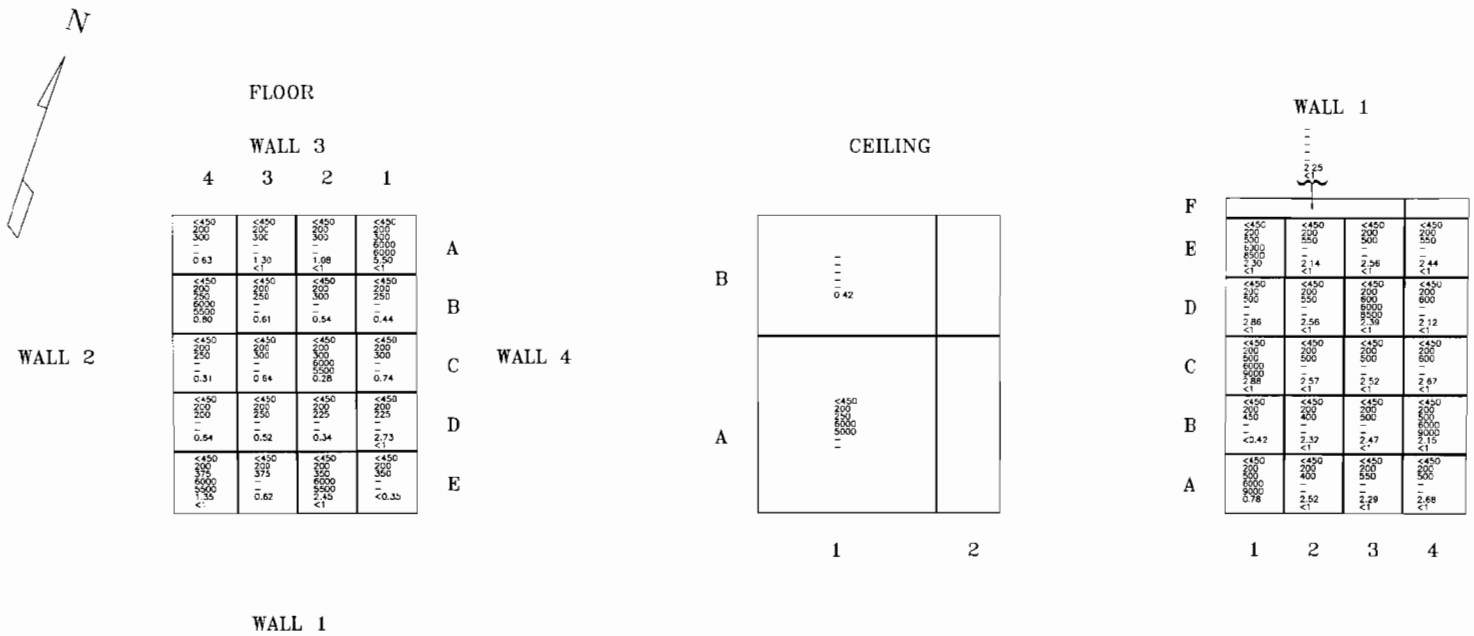
7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 103

Viewing toward Wall-1

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 104



Note:
Solid samples taken from grids W1-A1 and W1-B1 consist of paint and have a limit of 3 pCi/g.

Sample Data
<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 104

WALL 2

		<450 200 400 6000 7500 3.33 <1			E
<450 200 600 -- -- 2.32 <1	<450 200 600 6000 9000 2.50 <1	<450 200 550 -- -- 2.66 <1	<450 200 550 6000 8500 2.58 <1	<450 200 500 -- -- 2.75 <1	D
<450 200 250 -- -- 3.11 <1	<450 200 550 -- -- 2.70 <1	<450 200 600 -- -- 2.15 <1	<450 200 500 -- -- 3.35 <1	<450 200 600 -- -- 2.84 <1	C
<450 200 400 -- -- 2.62 <1	<450 200 425 -- -- 1.77 <1	<450 200 400 6000 9000 2.68 <1	<450 200 400 -- -- 2.20 <1	<450 200 350 -- -- 2.51 <1	B
<450 200 450 6000 6000 2.87 <1	<450 200 450 -- -- 2.06 <1	<450 200 400 -- -- 2.87 <1	<450 200 400 -- -- 2.67 <1	<450 200 400 6000 9000 2.82 <1	A
5	4	3	2	1	

WALL 3

-- -- -- -- -- 0.75					E
<450 200 500 -- 6000 8000 2.55 <1	<450 200 450 -- -- 2.76 <1	<450 200 500 -- -- 2.89 <1	<450 200 500 -- -- 2.77 <1		D
<450 200 450 -- -- 2.87 <1	<450 200 500 -- -- 3.23 <1	<450 200 450 6000 10000 2.75 <1	<450 200 600 -- -- 2.92 <1		C
<450 200 500 -- 6000 8000 1.92 <1	<450 200 550 -- -- 2.86 <1	<450 200 550 -- -- 2.87 <1	<450 200 500 -- -- 2.80 <1		B
<450 200 400 -- -- 2.77 <1	<450 200 500 -- -- 2.76 <1	<450 200 600 -- -- 2.31 <1	<450 200 450 6000 8500 3.60 <1		A
4	3	2	1		

WALL 4

	<450 200 425 6000 8000 2.79 <1				E
<450 200 425 -- -- 3.19 <1	<450 200 425 -- -- 2.52 <1	<450 200 450 -- -- 2.58 <1	<450 200 400 6000 8500 3.14 <1	<450 200 450 -- -- 2.59 <1	D
<450 200 450 -- 6000 8000 2.75 <1	<450 200 550 -- -- 2.88 <1	<450 200 500 -- -- 2.93 <1	<450 200 400 -- -- 3.39 <1	<450 200 450 -- -- 3.06 <1	C
<450 200 350 -- -- 2.98 <1	<450 200 350 -- -- 2.46 <1	<450 200 400 6000 8500 2.93 <1	<450 200 350 -- -- 2.55 <1	<450 200 350 -- -- 2.06 <1	B
<450 200 400 -- 6000 4000 3.35 <1	<450 200 400 -- -- 2.56 <1	<450 200 350 -- -- 2.85 <1	<450 200 400 -- -- 3.40 <1	<450 200 400 -- 6000 6000 3.22 <1	A
1	2	3	4	5	

Sample Data

<450 -- IM-247/PD Results [μμCi/20cm²]
200 -- IM-253/PD (HV-1 PHA) [bkg.]
300 -- IM-253/PD (HV-1 PHA) [cpm]
7000 -- IM-253/PD (HV-2 GROSS) [bkg.]
7300 -- IM-253/PD (HV-2 GROSS) [cpm]
1.82 -- MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 -- MCA Specific Co-60 Results [pCi/g]

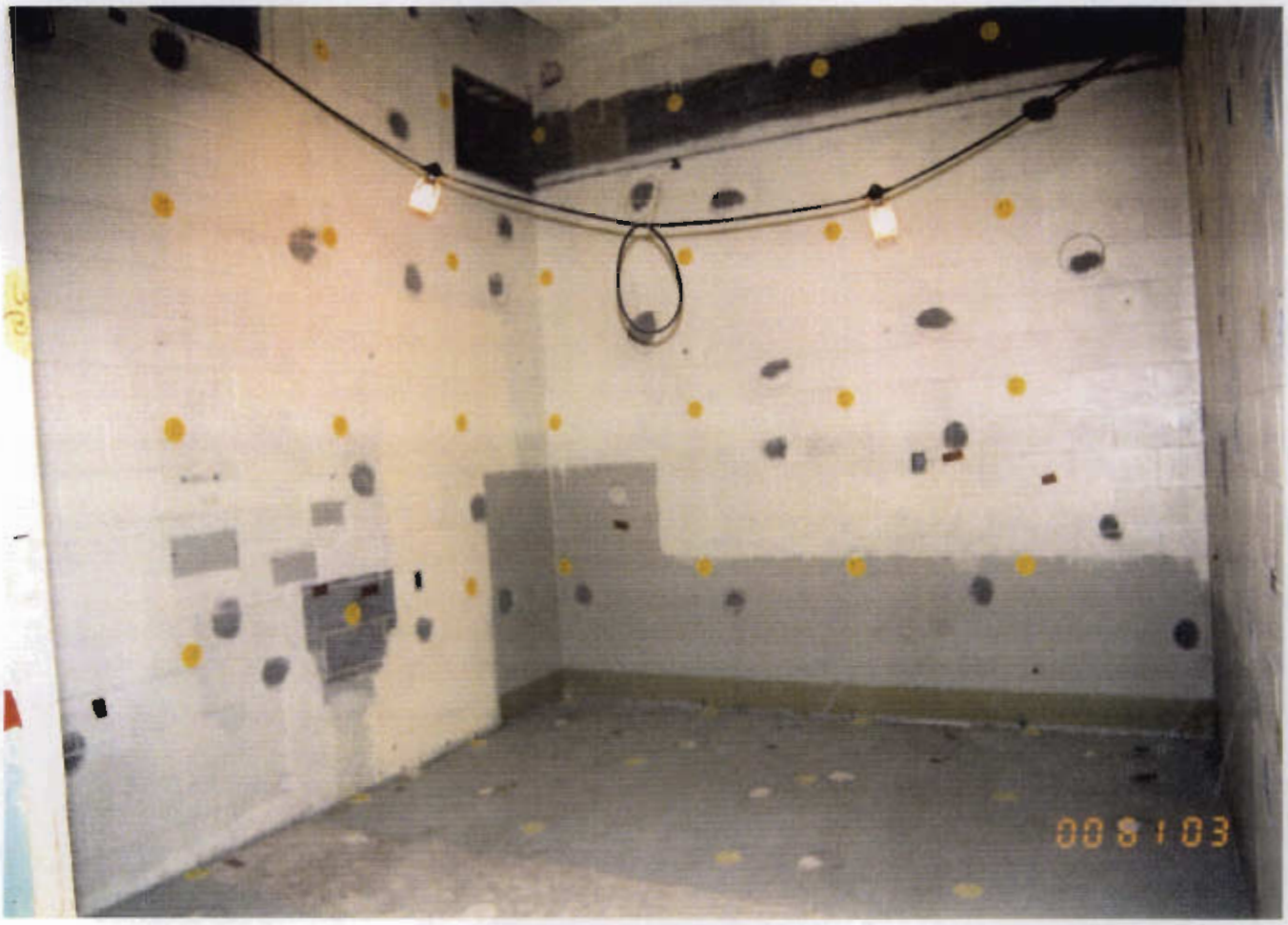
7. Bldg. 222, First Floor Groups 4 & 6

c. Prior to Photographs, Room 104

Viewing corner of Wall-2 and Wall-3

7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 104



Viewing corner of Wall-2 and Wall-3

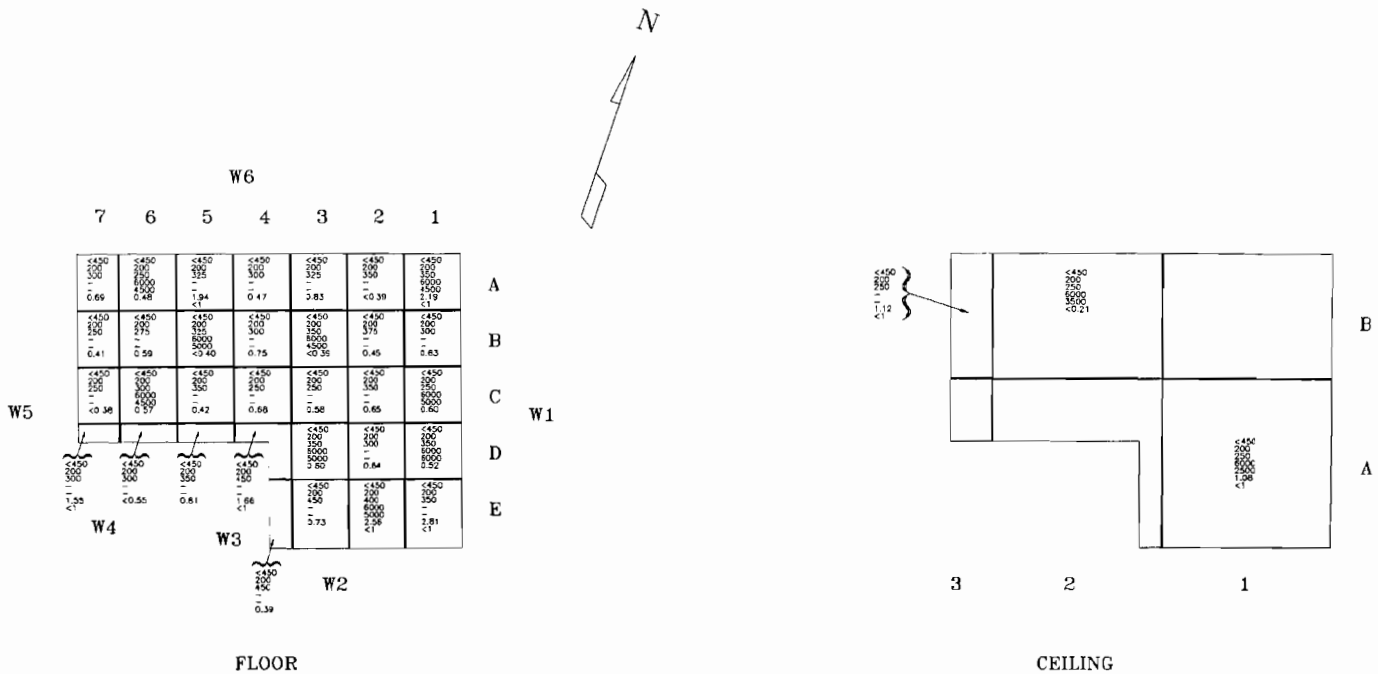
7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 104

Viewing toward Wall-1.

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 106

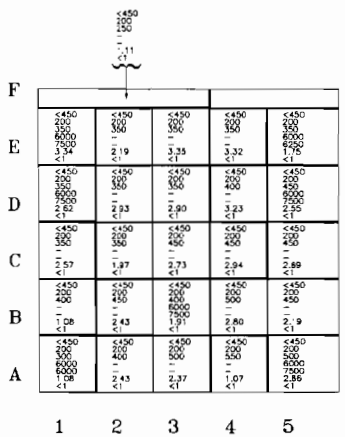


Sample Data

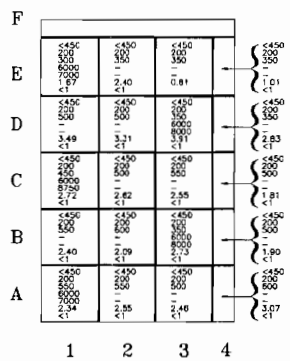
< 450 – IM-247/PD Results [μCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

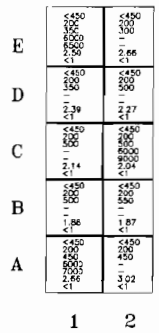
c. Grid Map, Room 106



W1



W2



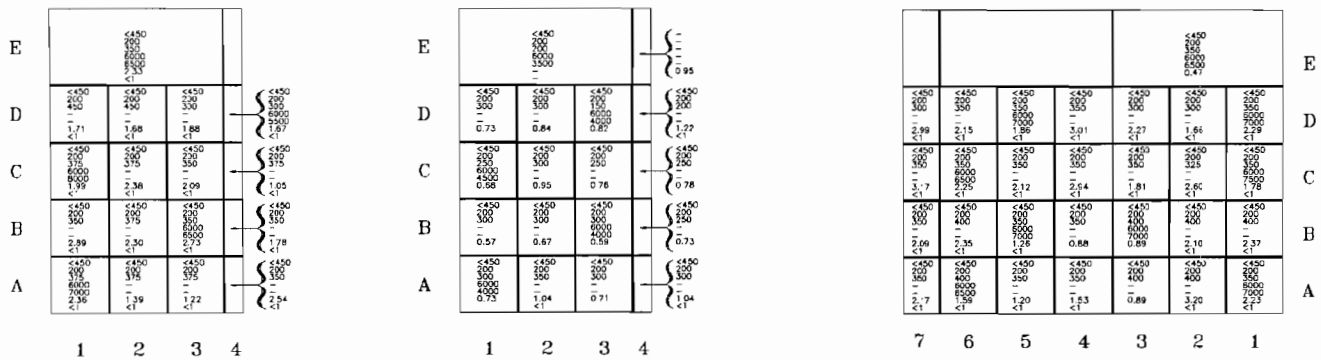
W3

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 106



Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Prior to Photographs, Room 106

Viewing toward Wall-1

7. Bldg. 222, First Floor Groups 4 & 6

c. Prior to Photographs, Room 106

Viewing toward Wall-2

7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 106

Viewing entrance

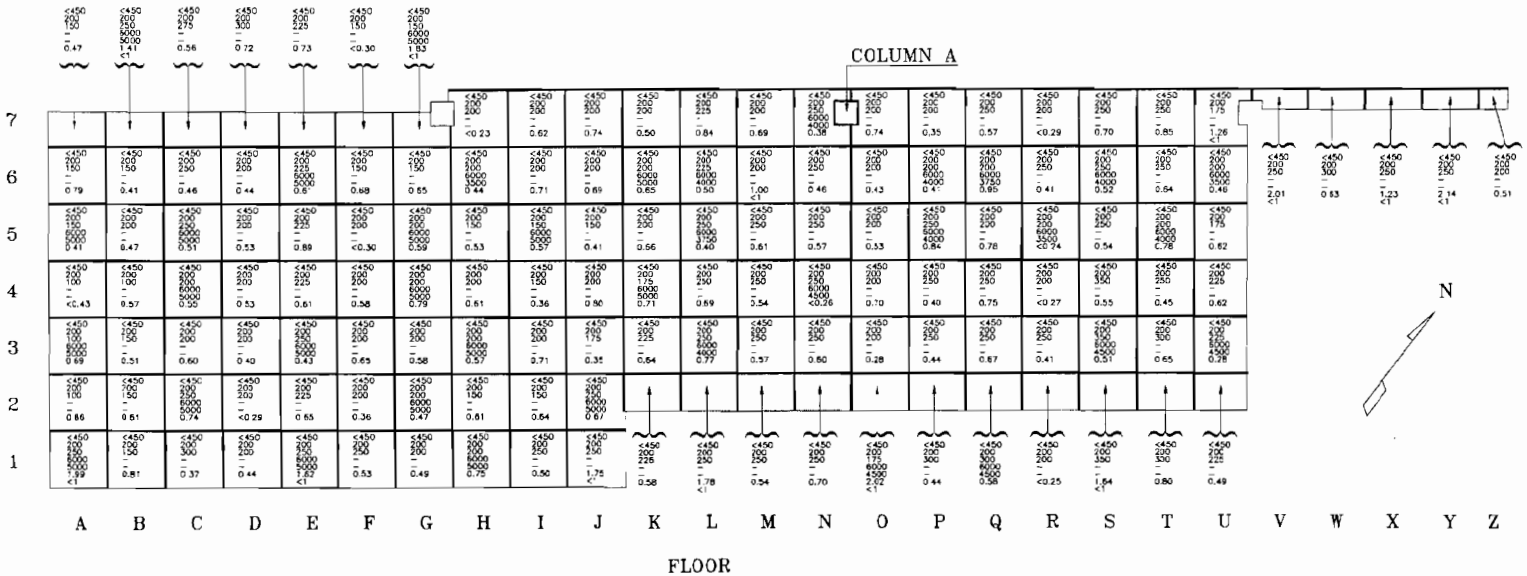
7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 106

Viewing into room

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 111

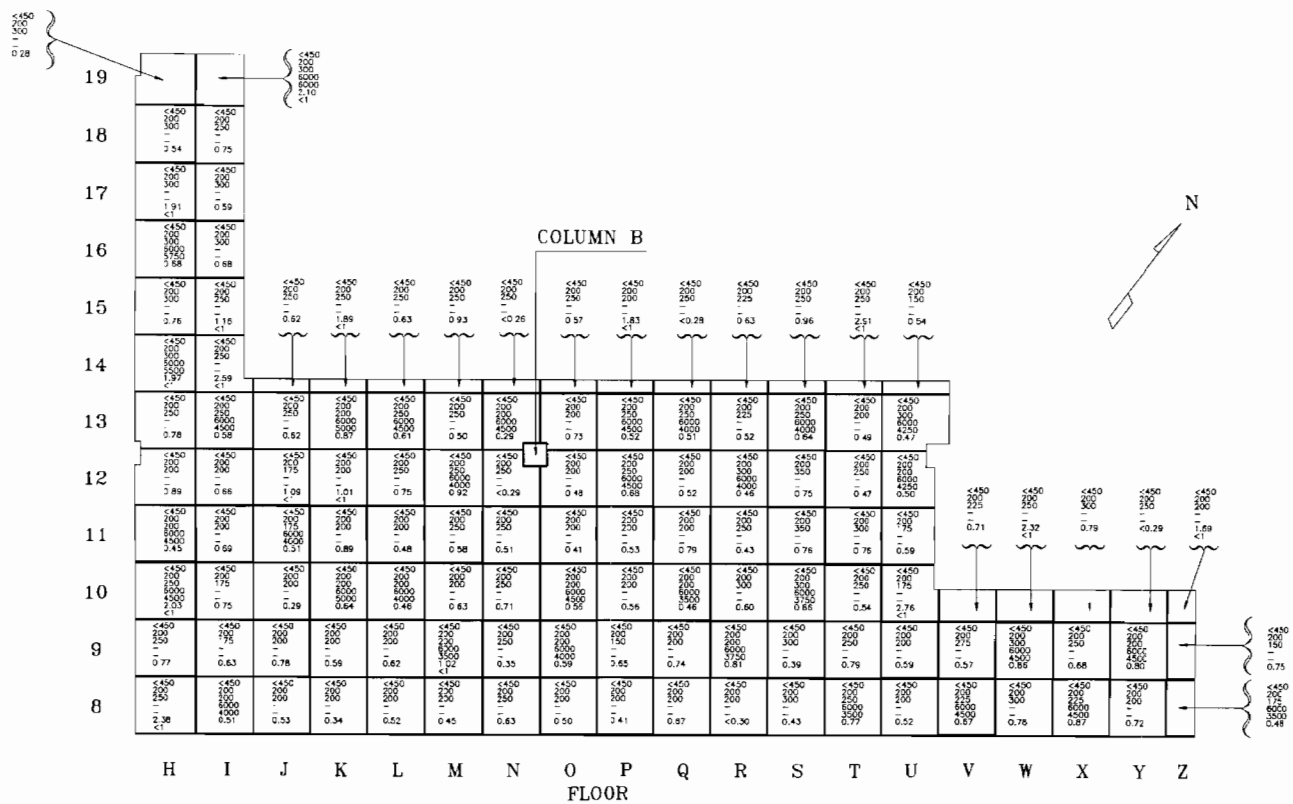


Sample Data

- <450 – IM-247/PD Results [μμCi/20cm²]
- 200 – IM-253/PD (HV-1 PHA) [bkg.]
- 300 – IM-253/PD (HV-1 PHA) [cpm]
- 7000 – IM-253/PD (HV-2 GROSS) [bkg.]
- 7300 – IM-253/PD (HV-2 GROSS) [cpm]
- 1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
- <1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 111

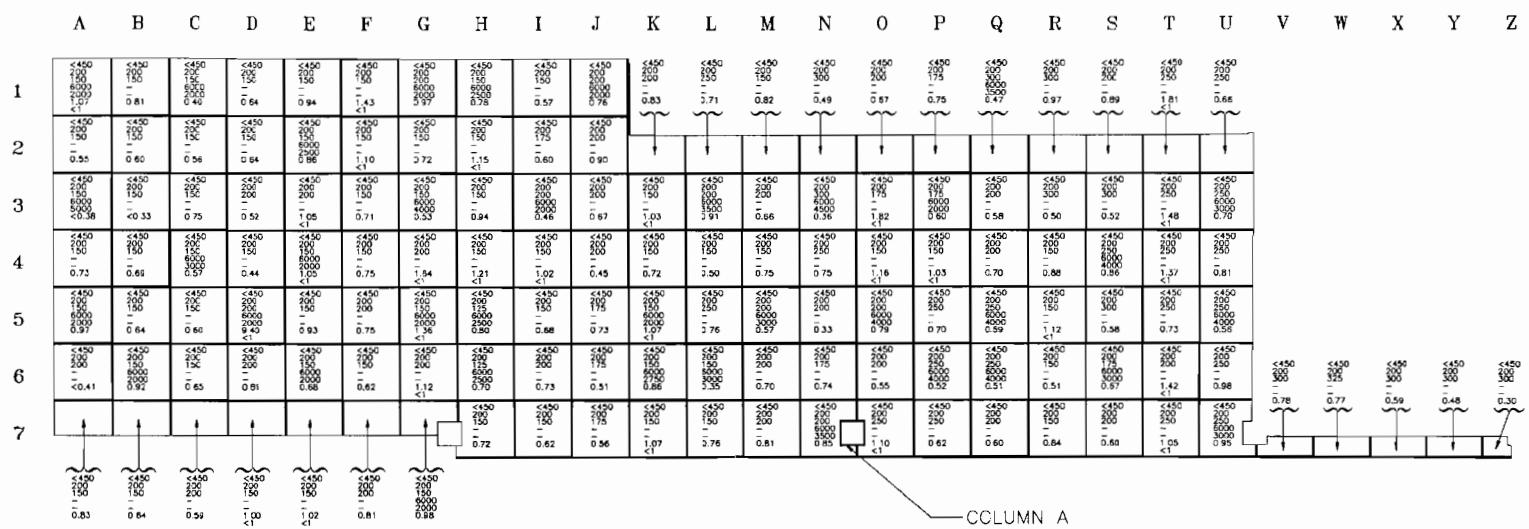


Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.62 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 111



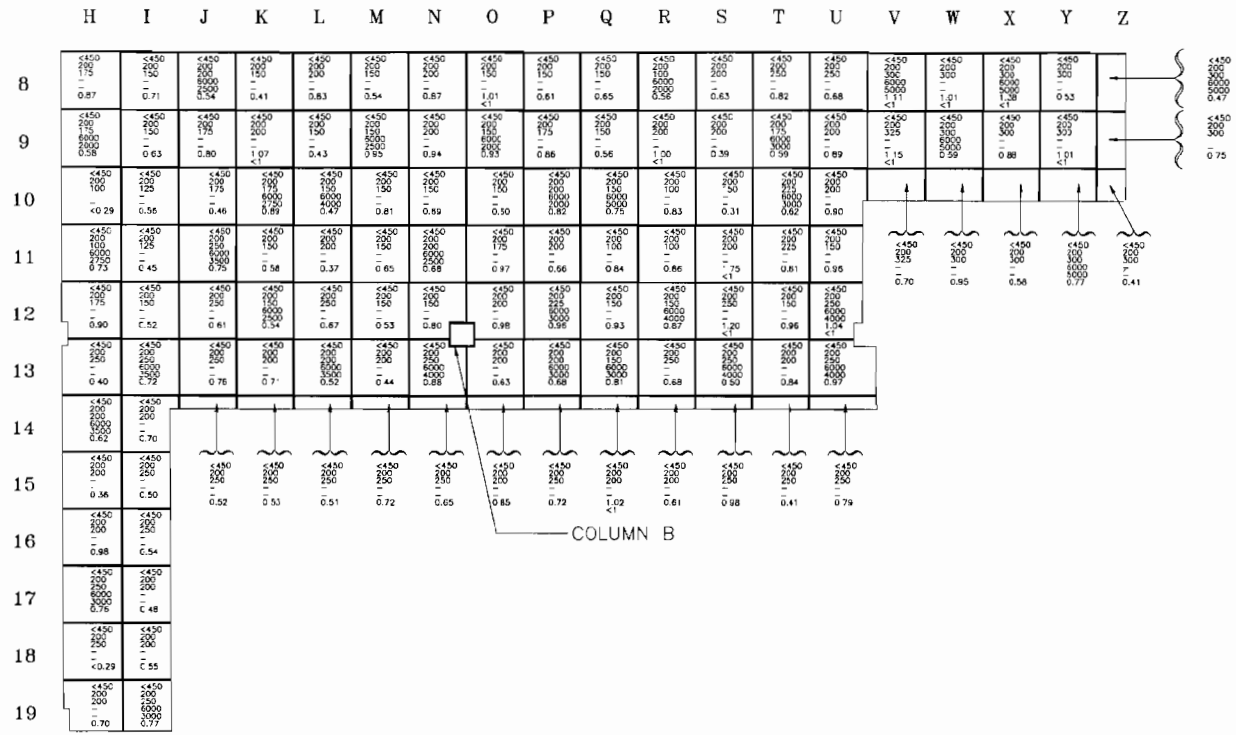
CEILING

Sample Data

< 450 – IM-247/PD Results [μCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 111



CEILING

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. **Bldg. 222, First Floor Groups 4 & 6**

c. **Grid Map, Room 111**

	A	B	C	D	E	F	G	H	I	J
5	<450 200 350 – – 1.22 <1	<450 200 350 – – 2.77 <1	<450 200 300 6000 6500 3.32 <1	<450 200 300 6000 8000 0.77	<450 200 350 – – 2.62 <1	<450 200 300 6000 8000 0.90	<450 200 300 – – 1.40 <1	<450 200 300 6000 6000 2.04 <1	<450 200 350 – – 2.82 <1	<450 200 300 6000 6000 1.31 <1
4	<450 200 350 – – 2.87 <1	<450 200 350 – – 3.26 <1	<450 200 350 – – 2.49 <1	<450 200 350 – – 1.20 <1	<450 200 300 – – 2.91 <1	<450 200 350 – – 3.51 <1	<450 200 300 – – 3.86 <1	<450 200 350 – – 3.57 <1	<450 200 350 – – 3.23 <1	<450 200 350 – – 3.54 <1
3	<450 200 350 6000 6500 3.08 <1	<450 200 350 – – 2.46 <1	<450 200 350 – – 3.84 <1	<450 200 350 – – 2.95 <1	<450 200 350 – – 3.29 <1	<450 200 350 – – 2.81 <1	<450 200 375 – – 2.16 <1	<450 200 350 – – 4.86 <1	<450 200 300 6000 6000 2.98 <1	<450 200 350 – – 2.91 <1
2	<450 200 450 6000 10000 2.49 <1	<450 200 350 – – 2.66 <1	<450 200 250 6000 4500 1.54 <1	<450 200 350 – – 2.95 <1	<450 200 450 6000 8000 3.32 <1	<450 200 400 6000 8000 3.14 <1	<450 200 450 6000 8000 2.94 <1	<450 200 375 – – 3.04 <1	<450 200 375 – – 2.24 <1	<450 200 375 – – 1.99 <1
1	<450 200 450 6000 10000 2.32 <1	<450 200 350 – – 2.36 <1	<450 200 250 – – 1.30 <1	<450 200 450 6000 8000 1.43 <1	<450 200 450 6000 6000 1.36 <1	<450 200 350 6000 8000 2.46 <1	<450 200 350 6000 6000 2.18 <1	<450 200 375 – – 2.64 <1	<450 200 375 – – 2.61 <1	<450 200 375 6000 6000 1.94 <1

W1

	A	B	C	D	E	F	G
5	<450 200 200 4000 4000 -.24 <1	<450 200 200 – – 0.65	<450 200 200 6000 3000 0.95	<450 200 200 6000 3000 0.67	<450 200 200 – – 0.71	<450 200 300 6000 3000 0.87	<450 200 300 – – 0.43
4	<450 200 200 – – 0.90	<450 200 200 – – 0.71	<450 200 200 – – 0.69	<450 200 200 – – 0.53	<450 200 200 – – 1.23 <1	<450 200 300 – – 0.87	<450 200 200 – – 0.69
3	<450 200 175 – – 0.70	<450 200 125 6000 3000 0.81	<450 200 125 – – 0.59	<450 200 175 – – <0.32	<450 200 150 6000 3000 0.70	<450 200 200 – – 0.78	<450 200 325 – – 0.61
2	<450 200 175 – – 0.64	<450 200 150 – – 0.58	<450 200 150 – – 0.84	<450 200 125 – – 0.64	<450 200 150 – – 1.15 <1	<450 200 175 – – 0.89	<450 200 325 – – 0.31
1	<450 200 175 6000 4500 0.72	<450 200 125 – – 0.59	<450 200 125 – – 0.59	<450 200 125 6000 3000 <0.30	<450 200 175 – – 0.91	<450 200 150 6000 1500 1.00 <1	<450 200 325 – – 1.48 <1

W2

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 111

	A	B	C	D	E	F	G
5	<450 200 350 6000 6000 2.04 <1	<450 200 350 – – 0.55	<450 200 350 6000 6000 3.69 <1	<450 200 350 6000 6000 3.66 <1	<450 200 350 – – 3.30 <1	<450 200 350 6000 7000 2.95 <1	<450 200 350 – – 3.57 <1
4	<450 200 350 – – 3.07 <1	<450 200 350 – – 3.60 <1	<450 200 350 – – 2.91 <1	<450 200 350 – – 3.26 <1	<450 200 350 – – 2.94 <1	<450 200 350 – – 2.64 <1	<450 200 350 – – 3.04 <1
3	<450 200 450 6000 6000 3.09 <1	<450 200 450 6000 6000 3.27 <1	<450 200 400 6000 6750 3.11 <1	<450 200 375 – – 3.15 <1	<450 200 375 6000 7000 2.93 <1	<450 200 375 – – 2.59 <1	<450 200 350 – – 3.08 <1
2	<450 200 450 6000 6500 2.58 <1	<450 200 450 – – 2.47 <1	<450 200 350 – – 2.36 <1	<450 200 350 – – 2.41 <1	<450 200 350 – – 2.47 <1	<450 200 350 – – 2.29 <1	<450 200 350 6000 6000 2.46 <1
1	<450 200 375 6000 6000 2.21 <1	<450 200 400 6000 6250 2.51 <1	<450 200 350 6000 6000 1.77 <1	<450 200 350 6000 6000 1.94 <1	<450 200 350 – – 2.49 <1	<450 200 350 – – 2.37 <1	<450 200 350 – – 2.57 <1

W3

	A	B	C	D	E	F	G	H	I	J	K	L	M
5	<450 200 200 – – 2.91 <1	<450 200 375 6000 7000 2.75 <1	<450 200 375 – – 3.12 <1	<450 200 350 6000 6000 2.78 <1	<450 200 350 – – 3.41 <1	<450 200 350 6000 6000 3.27 <1	<450 200 350 – – 3.12 <1	<450 200 350 6500 6500 2.81 <1	<450 200 400 6000 6000 3.28 <1	<450 200 400 6000 6000 2.35 <1	<450 200 400 6000 7000 2.97 <1	<450 200 350 – – 2.70 <1	<450 200 300 6000 6000 2.94 <1
4	<450 200 275 – – 2.97 <1	<450 200 375 – – 2.90 <1	<450 200 350 6000 7000 3.23 <1	<450 200 375 – – 3.00 <1	<450 200 375 – – 3.13 <1	<450 200 350 – – 3.70 <1	<450 200 350 – – 3.49 <1	<450 200 350 – – 3.07 <1	<450 200 400 6000 6000 3.44 <1	<450 200 400 6000 6000 2.53 <1	<450 200 450 6000 6000 2.81 <1	<450 200 450 6000 7500 3.48 <1	<450 200 350 – – 2.57 <1
3	<450 200 300 – – 3.62 <1	<450 200 375 – – 3.30 <1	<450 200 500 6000 6750 3.28 <1	<450 200 450 6000 6500 3.65 <1	<450 200 450 6000 6500 3.21 <1	<450 200 375 – – 3.00 <1	<450 200 375 – – 3.27 <1	<450 200 500 6000 7500 2.85 <1	<450 200 550 6000 8000 3.59 <1	<450 200 475 6000 8200 2.93 <1	<450 200 500 6000 8500 2.75 <1	<450 200 550 6000 9000 3.23 <1	<450 200 450 6000 9000 3.36 <1
2	<450 200 375 – – 1.50 <1	<450 200 350 – – 2.58 <1	<450 200 500 6000 6500 2.46 <1	<450 200 350 – – 2.39 <1	<450 200 500 – – 2.11 <1	<450 200 200 – – 1.25 <1	<450 200 200 – – 1.57 <1	<450 200 350 – – 2.93 <1	<450 200 350 – – 2.70 <1	<450 200 350 – – 2.21 <1	<450 200 350 – – 2.13 <1	<450 200 350 – – 1.96 <1	<450 200 350 – – 2.30 <1
1	<450 200 275 6000 6000 1.94 <1	<450 200 300 – – 2.04 <1	<450 200 400 – – 2.69 <1	<450 200 375 6000 6000 2.16 <1	<450 200 250 – – 2.01 <1	<450 200 200 6000 4000 1.24 <1	<450 200 200 6000 5000 1.93 <1	<450 200 350 – – 2.74 <1	<450 200 350 6000 6000 2.33 <1	<450 200 350 6000 6500 1.76 <1	<450 200 350 – – 2.01 <1	<450 200 350 6000 6500 2.65 <1	<450 200 350 – – 2.57 <1

W4

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 111

	A	B
5	<450 200 450 6000 7500 1.77 <1	<450 200 450 6000 7000 2.68 <1
4	<450 200 450 6000 7000 3.09 <1	<450 200 450 6000 9000 3.06 <1
3	<450 200 550 6000 9500 3.45 <1	<450 200 550 6000 10000 2.81 <1
2	<450 200 350 – – 1.55 <1	<450 200 350 – – 2.08 <1
1	<450 200 350 6000 7000 1.56 <1	<450 200 350 – – 2.41 <1

W5

	A	B	C	D	E	F
5	<450 200 450 6000 8000 2.77 <1	<450 200 500 6000 8000 3.12 <1	<450 200 350 6000 7500 3.04 <1	<450 200 350 6000 8000 3.22 <1	<450 200 350 – – 3.53 <1	<450 200 300 – – 3.26 <1
4	<450 200 550 6000 8000 2.95 <1	<450 200 500 6000 9000 2.52 <1	<450 200 575 – – 3.77 <1	<450 200 500 6000 7000 3.25 <1	<450 200 500 6000 8000 3.16 <1	<450 200 350 – – 3.20 <1
3	<450 200 575 6000 10000 2.79 <1	<450 200 500 6000 9500 2.51 <1	<450 200 500 6000 9000 3.72 <1	<450 200 500 6000 9000 2.55 <1	<450 200 500 6000 8000 3.04 <1	<450 200 450 6000 8000 3.35 <1
2	<450 200 350 – – 1.61 <1	<450 200 350 – – 2.28 <1	<450 200 350 – – 2.95 <1	<450 200 350 – – 1.81 <1	<450 200 350 6000 7000 2.41 <1	<450 200 350 – – 1.54 <1
1	<450 200 350 6000 7000 1.83 <1	<450 200 350 – – 1.45 <1	<450 200 350 – – 3.04 <1	<450 200 350 6000 7000 2.13 <1	<450 200 350 – – 2.01 <1	<450 200 350 – – 2.18 <1

W6

	A	B	C	D	E	F	G	H	I	J	K	L
5	<450 200 500 6000 8000 3.54 <1	<450 200 500 6000 8000 3.18 <1	<450 200 500 6000 7000 2.77 <1	<450 200 500 6000 7000 3.27 <1	<450 200 350 – – 2.97 <1	<450 200 425 6000 7000 3.54 <1	<450 200 375 6000 8750 2.85 <1	<450 200 375 – – 3.52 <1	<450 200 375 6000 7000 3.14 <1	<450 200 350 – – 3.43 <1	<450 200 350 6000 7000 3.65 <1	<450 200 350 – – 3.68 <1
4	<450 200 550 6000 8000 3.81 <1	<450 200 500 6000 7000 3.23 <1	<450 200 450 6000 7000 2.78 <1	<450 200 500 – – 3.68 <1	<450 200 500 6000 8500 3.43 <1	<450 200 425 6000 7000 3.20 <1	<450 200 425 6000 7000 3.40 <1	<450 200 450 6000 7000 3.34 <1	<450 200 350 – – 3.28 <1	<450 200 350 6000 8500 3.29 <1	<450 200 500 6000 8000 3.13 <1	<450 200 450 6000 10000 3.23 <1
3	<450 200 459 6000 7750 3.88 <1	<450 200 375 – – 3.66 <1	<450 200 450 6000 7500 2.56 <1	<450 200 450 6000 7000 3.19 <1	<450 200 450 6000 7000 3.63 <1	<450 200 450 6000 7000 3.75 <1	<450 200 375 – – 3.15 <1	<450 200 350 – – 3.51 <1	<450 200 500 – – 3.49 <1	<450 200 350 6000 8750 2.90 <1	<450 200 375 – – 3.10 <1	<450 200 375 6000 8000 2.98 <1
2	<450 200 400 6000 7000 2.79 <1	<450 200 400 6000 7000 2.32 <1	<450 200 400 6000 7000 1.93 <1	<450 200 450 6000 7000 1.75 <1	<450 200 350 – – 2.82 <1	<450 200 400 6000 7000 2.78 <1	<450 200 350 – – 2.50 <1	<450 200 300 – – 2.13 <1	<450 200 300 – – 2.79 <1		<450 200 350 – – 3.15 <1	<450 200 400 6000 7000 2.47 <1
1	<450 200 350 6000 5000 2.34 <1	<450 200 400 6000 7000 2.32 <1	<450 200 400 6000 7000 2.29 <1	<450 200 300 – – 1.85 <1	<450 200 350 – – 1.84 <1	<450 200 400 6000 7000 2.44 <1	<450 200 350 6000 6000 2.33 <1	<450 200 300 – – 2.55 <1	<450 200 350 6000 5500 2.58 <1		<450 200 350 6000 7000 2.86 <1	<450 200 350 – – 3.51 <1

W7

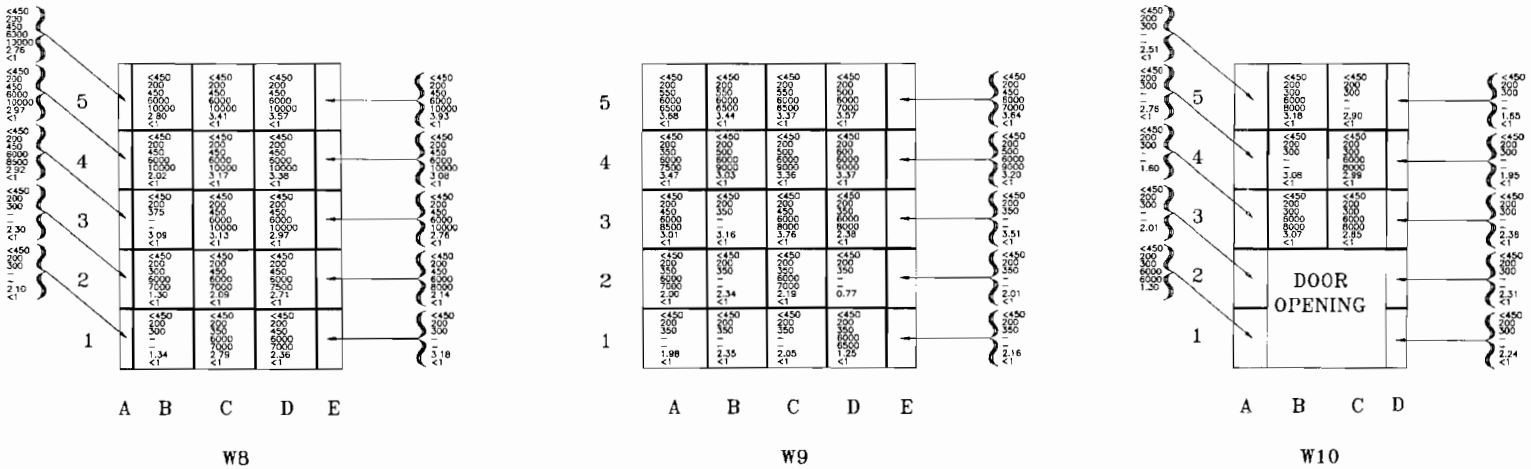
DOOR OPENING

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 111

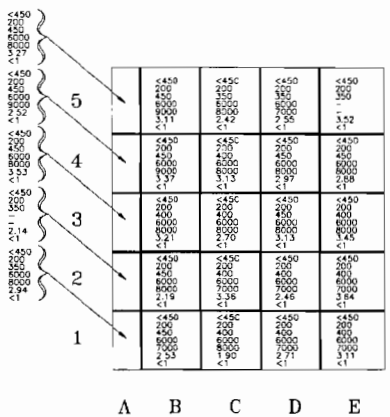


Sample Data

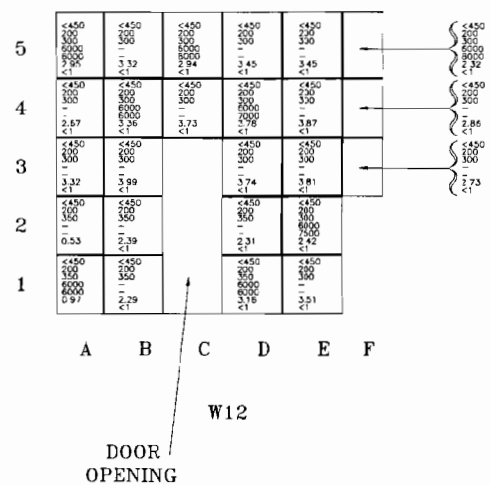
<450 – IM-247/PD Results [μCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 111



W11



W12

Sample Data

<450 – IM-247/PD Results (μμCi/20cm²)
200 – IM-253/PD (HV-1 PHA) (bkg.)
300 – IM-253/PD (HV-1 PHA) (cpm)
7000 – IM-253/PD (HV-2 GROSS) (bkg.)
7300 – IM-253/PD (HV-2 GROSS) (cpm)
1.82 – MCA Gross Gamma Eq. Co-60 (pCi/g)
<1 – MCA Specific Co-60 Results (pCi/g)

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 111

	A	B	C	D	E	F	G	H	I	J	K
5	<450 200 300 350 - - 2.91 <1	<450 200 300 6000 4000 3.21 <1	<450 200 300 350 - - 3.29 <1	<450 200 300 375 - - 3.17 <1	<450 200 300 375 - - 2.87 <1	<450 200 300 350 6000 6000 3.14 <1	<450 200 300 350 6000 6000 3.00 <1	<450 200 300 350 - - 3.31 <1	<450 200 300 350 6000 7000 3.12 <1	<450 200 300 350 - - 2.91 <1	<450 200 300 350 6000 6000 2.70 <1
4	<450 200 300 350 - - 2.72 <1	<450 200 300 350 - - 3.12 <1	<450 200 300 350 - - 2.81 <1	<450 200 300 375 6000 6500 2.99 <1	<450 200 300 375 - - 2.47 <1	<450 200 300 350 - - 3.54 <1	<450 200 300 350 - - 2.68 <1	<450 200 300 350 - - 3.22 <1	<450 200 300 350 - - 2.96 <1	<450 200 300 350 - - 2.09 <1	<450 200 300 350 - - 3.36 <1
3	<450 200 300 350 6000 11000 3.82 <1	<450 200 300 350 - - 2.91 <1	<450 200 300 350 - - 3.10 <1	<450 200 300 375 - - 3.13 <1	<450 200 300 375 - - 3.41 <1	<450 200 300 350 - - 3.44 <1	<450 200 300 350 - - 2.78 <1	<450 200 300 350 - - 2.09 <1	<450 200 300 350 - - 2.74 <1	<450 200 300 350 6000 6000 2.48 <1	<450 200 300 350 - - 2.56 <1
2	<450 200 300 - - - 1.06 <1	<450 200 300 - - - 2.47 <1	<450 200 300 350 6000 7000 2.34 <1	<450 200 300 350 - - 2.26 <1	<450 200 300 350 6000 7000 2.26 <1	<450 200 300 325 - - 2.29 <1	<450 200 300 375 - - 2.26 <1	<450 200 300 375 - - 1.50 <1	<450 200 300 375 - - 1.76 <1	<450 200 300 375 - - 1.92 <1	<450 200 300 375 - - 2.44 <1
1	<450 200 300 6000 7000 2.07 <1	<450 200 300 - - - 2.15 <1	<450 200 300 350 - - 2.88 <1	<450 200 300 350 6000 7000 2.76 <1	<450 200 300 350 - - 2.60 <1	<450 200 300 350 - - 2.81 <1	<450 200 300 375 6000 6500 2.50 <1	<450 200 300 350 - - 2.35 <1	<450 200 300 350 6000 8500 1.78 <1	<450 200 300 350 6000 10000 1.33 <1	<450 200 300 375 - - 2.81 <1

W13

	A	B
5	<450 200 300 - - - 1.16 <1	<450 200 300 6000 6000 2.92 <1
4	<450 200 300 - - - 3.22 <1	<450 200 300 - - - 2.89 <1
3	<450 200 300 - - - 2.86 <1	<450 200 300 9000 9000 2.80 <1
2	<450 200 300 - - - 2.75 <1	<450 200 350 - - - 1.89 <1
1	<450 200 300 - - - 1.39 <1	<450 200 350 6000 7000 1.83 <1

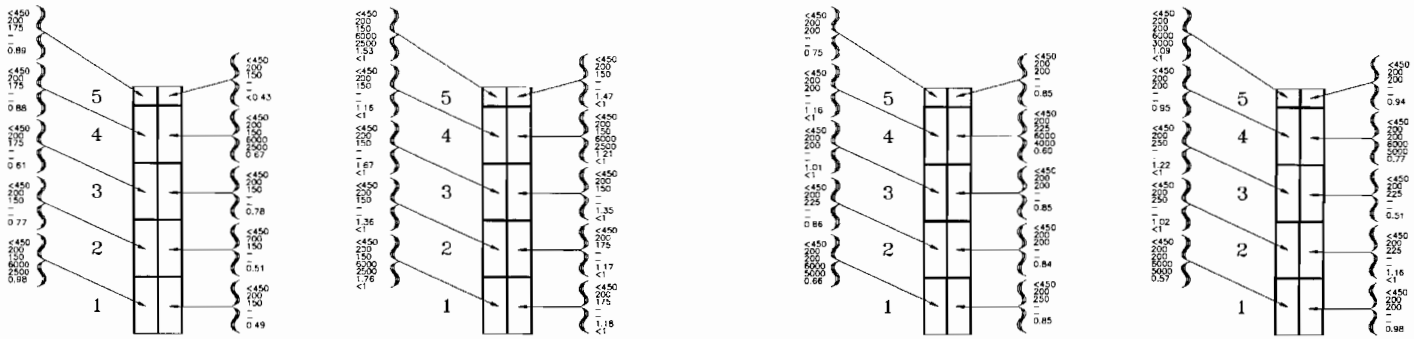
W14

Sample Data

<450 – IM-247/PD Results [$\mu\mu$Ci/20cm^2]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 111

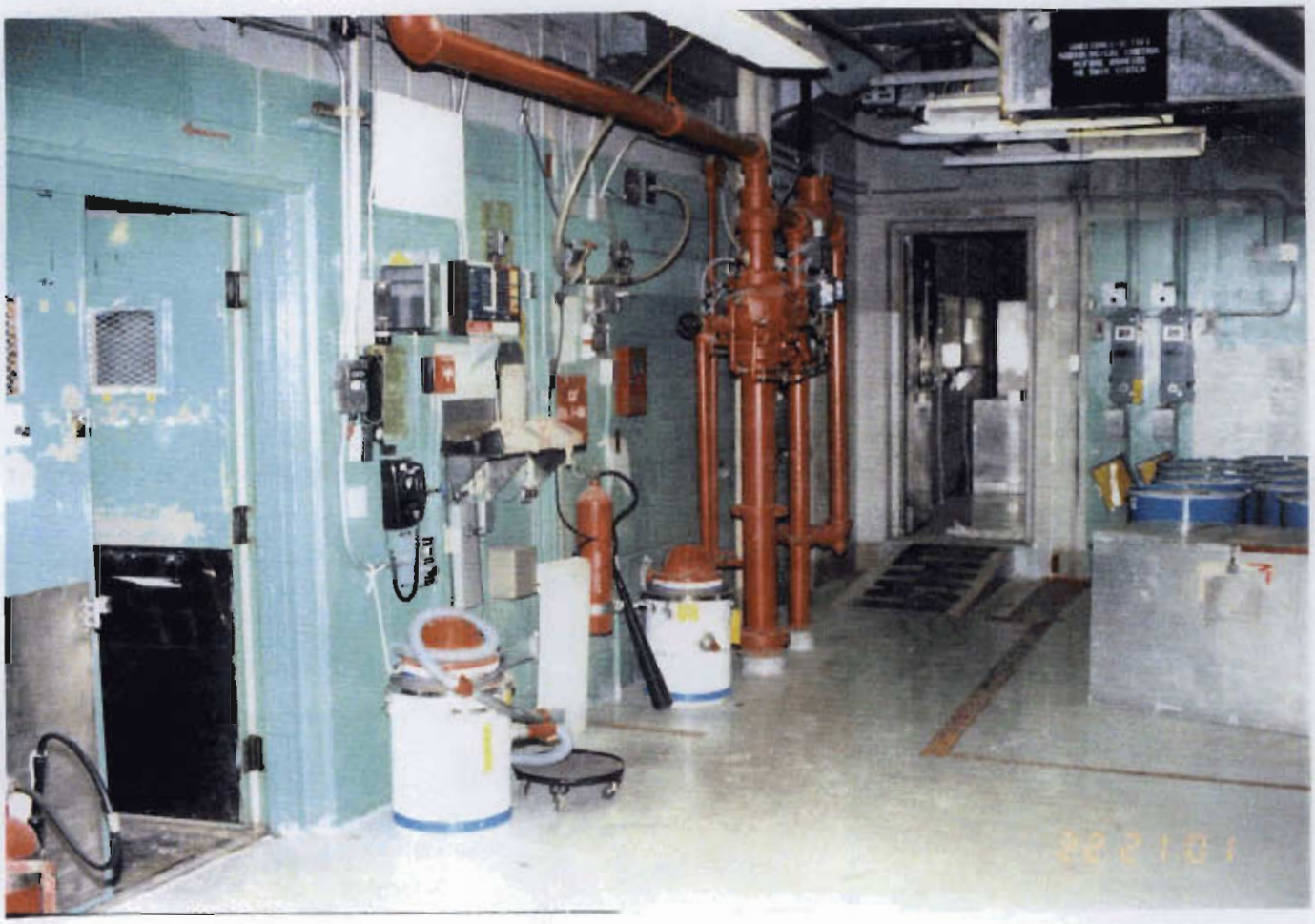


Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Prior to Photographs, Room 111



Looking toward dry dock 2 door

7. Bldg. 222, First Floor Groups 4 & 6

c. Prior to Photographs, Room 111

Viewing toward dry dock 1 door

7. Bldg. 222, First Floor Groups 4 & 6

c. Prior to Photographs, Room 111

Viewing toward Room 112

7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 111

Viewing toward Room 118 entrance

7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 111

Viewing toward dry dock 1 door

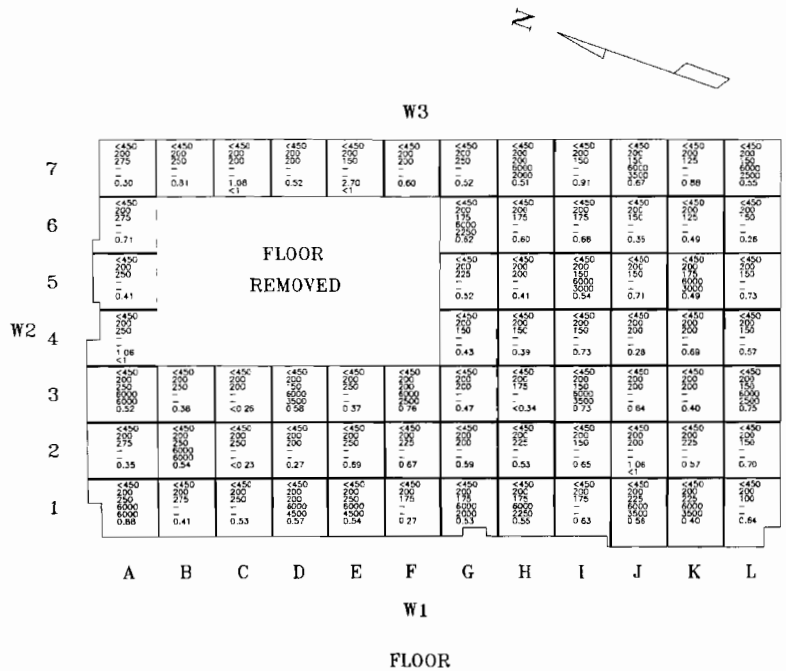
7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 111

Viewing toward elevator

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 112 North

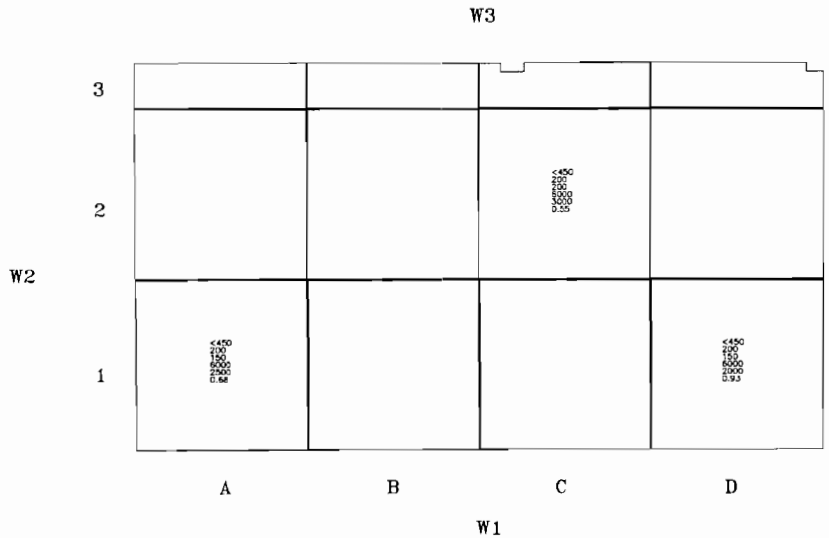


Sample Data

<450 – IM-247/PD Results [µCu/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 112 North



CEILING

Sample Data

<450 -- IM-247/PD Results [μμCi/20cm²]
200 -- IM-253/PD (HV-1 PHA) [bkg.]
300 -- IM-253/PD (HV-1 PHA) [cpm]
7000 -- IM-253/PD (HV-2 GROSS) [bkg.]
7300 -- IM-253/PD (HV-2 GROSS) [cpm]
1.82 -- MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 -- MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 112 North

						<450 200 375 6000 6000 3.25 <1						5
<450 200 350 – – 2.79 <1	<450 200 375 – – 3.38 <1	<450 200 375 6000 6000 3.15 <1	<450 200 375 6000 6500 3.19 <1	<450 200 375 – – 3.48 <1	<450 200 350 – – 2.36 <1	<450 200 350 – – 3.70 <1	<450 200 300 6000 3000 3.33 <1	<450 200 350 – – 4.72 <1	<450 200 300 6000 7000 3.42 <1	<450 200 300 – – 3.64 <1	<450 200 350 – – 3.96 <1	4
<450 200 300 6000 5500 3.20 <1	<450 200 375 – – 3.79 <1	<450 200 375 – – 3.08 <1	<450 200 350 – – 3.74 <1	<450 200 350 – – 3.33 <1	<450 200 350 6000 5750 2.83 <1	<450 200 375 – – 3.75 <1	<450 200 350 – – 4.13 <1	<450 200 350 – – 2.82 <1	<450 200 375 – – 3.75 <1	<450 200 375 6000 7000 4.22 <1	<450 200 375 – – 3.30 <1	3
<450 200 150 – – 1.17 <1	DOOR		<450 200 350 – – 2.89 <1	<450 200 350 – – 2.79 <1	<450 200 350 – – 2.85 <1	<450 200 350 6000 8000 2.80 <1	<450 200 350 – – 2.20 <1	<450 200 300 – – 2.96 <1	<450 200 200 – – 3.00 <1	<450 200 200 – – 2.53 <1	<450 200 200 – – 3.2 <1	2
<450 200 150 – – 1.06 <1	OPENING		<450 200 350 – – 2.84 <1	<450 200 350 – – 2.65 <1	<450 200 350 6000 7500 3.17 <1	<450 200 350 – – 3.24 <1	<450 200 350 – – 2.94 <1	<450 200 200 6000 7000 2.71 <1	<450 200 200 – – 3.02 <1	<450 200 200 – – 2.46 <1	<450 200 200 6000 7000 2.55 <1	1
L	K	J	I	H	G	F	E	D	C	B	A	

W1

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 112 North

	A	B	C	D	E	F	G
5			<450 200 250 6000 7000 0.63				
4	<450 200 300 – – 3.76 <1	<450 200 200 6000 4500 – –	<450 200 200 – 6000 – –	<450 200 300 – 6000 7000 3.27 <1	<450 200 200 6000 7000 3.21 <1	<450 200 200 – – 3.50 <1	<450 200 200 – 6000 8000 3.85 <1
3	<450 200 300 – – 3.06 <1	<450 200 250 – – – –	<450 200 200 – – – –	<450 200 300 – – 3.01 <1	<450 200 200 – – 3.20 <1	<450 200 200 – – 3.49 <1	<450 200 300 – – 4.05 <1
2	<450 200 300 – – 1.87 <1	<450 200 250 – – – –	<450 200 200 – – – –	<450 200 300 – – 3.47 <1	<450 200 190 – – 3.59 <1	<450 200 150 – – 3.18 <1	<450 200 150 – – 3.05 <1
1	<450 200 300 6000 6000 3.33 <1	<450 200 200 – – – –	<450 200 200 6000 6000 – –	<450 200 300 – – 2.95 <1	<450 200 150 6000 7000 3.26 <1	<450 200 150 – – 3.31 <1	<450 200 150 – 6000 6000 3.27 <1

W2

	A	B	C	D	E	F	G	H	I	J	K	L
5				<450 200 150 6000 2500 0.64								
4	<450 200 275 – – 0.63	<450 200 200 6000 5000 0.64	<450 200 225 – – 0.47	<450 200 239 – – 0.96	<450 200 150 6000 2500 0.67	<450 200 125 – – 0.50	<450 200 133 – 6000 2100 0.76	<450 200 100 – – 0.49	<450 200 100 6000 2000 0.39	<450 200 150 – – 0.80	<450 200 150 6000 6000 0.59	<450 200 150 – – 1.14 <1
3	<450 200 250 – – 0.91	<450 200 225 – – 0.86	<450 200 250 – – 0.98	<450 200 200 – – 0.64	<450 200 150 – – 0.50	<450 200 150 – – <0.26	<450 200 125 – – 0.47	<450 200 100 – – 0.57	<450 200 100 – – 0.64	<450 200 150 – – 0.83	<450 200 150 – – 0.55	<450 200 150 – – 0.70
2	<450 200 200 – – 1.02 <1	<450 200 150 – – 0.96	<450 200 100 – – 0.78	<450 200 150 6000 7000 0.72	<450 200 100 – – 0.77	<450 200 150 – – 0.59	<450 200 100 – – 0.47	<450 200 100 – – 0.85	<450 200 100 – – 0.77	<450 200 200 6000 6300 0.67	<450 200 150 – – 0.69	<450 200 100 6000 1500 1.18 <1
1	<450 200 150 6000 3000 1.27 <1	<450 200 150 – – 0.70	<450 200 150 6000 2150 0.67	<450 200 150 – – 0.58	<450 200 150 – – 0.88	<450 200 100 6000 7000 0.93	<450 200 100 – – 0.70	<450 200 100 6000 2300 0.54	<450 200 100 – – 0.51	<450 200 100 – – 0.64	<450 200 100 – – 0.62	<450 200 100 – – 1.15 <1

W3

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

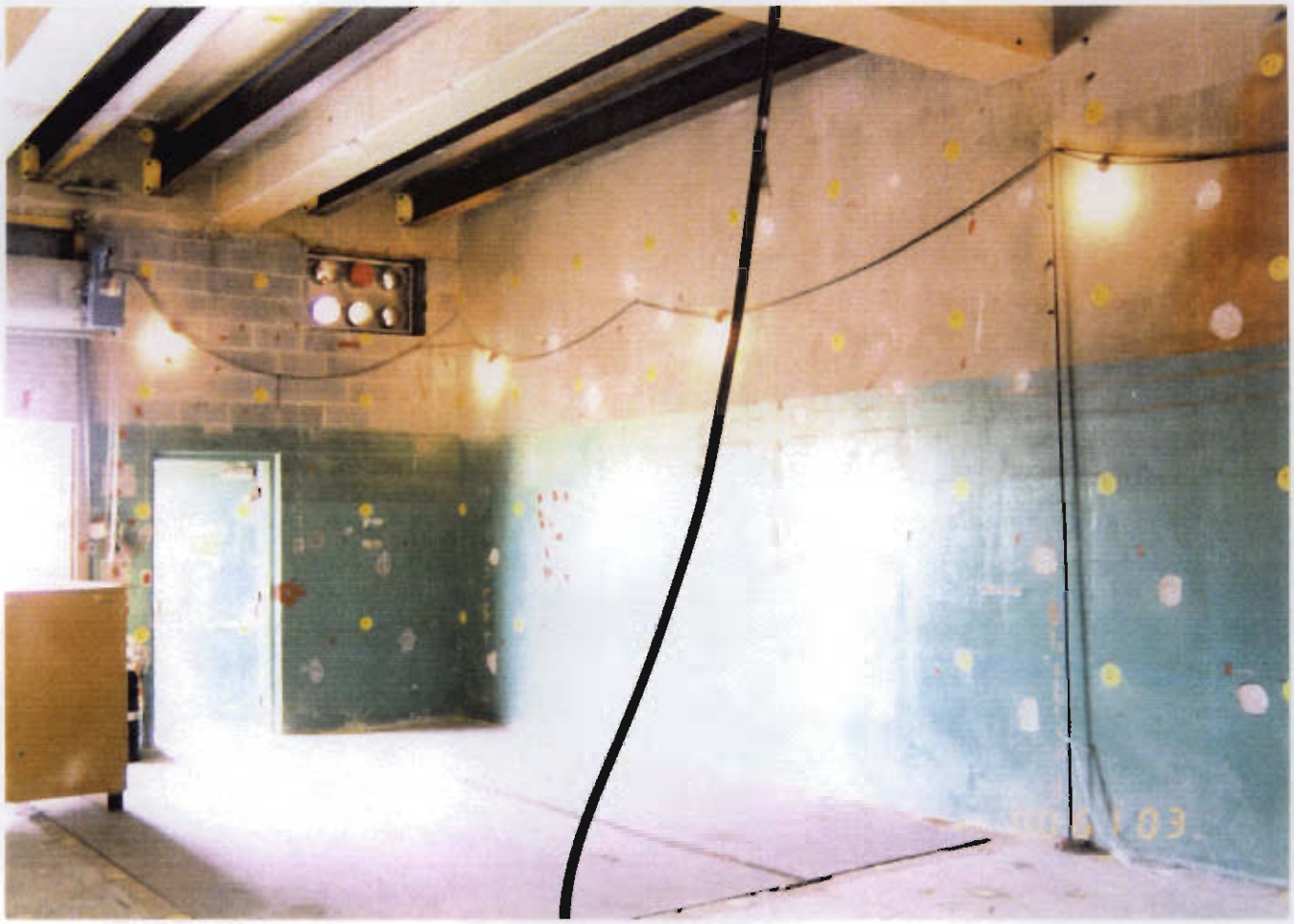
7. Bldg. 222, First Floor Groups 4 & 6

c. Prior to Photographs, Room 112 North

Viewing toward Wall-2

7. Bldg. 222, First Floor Groups 4 & 6

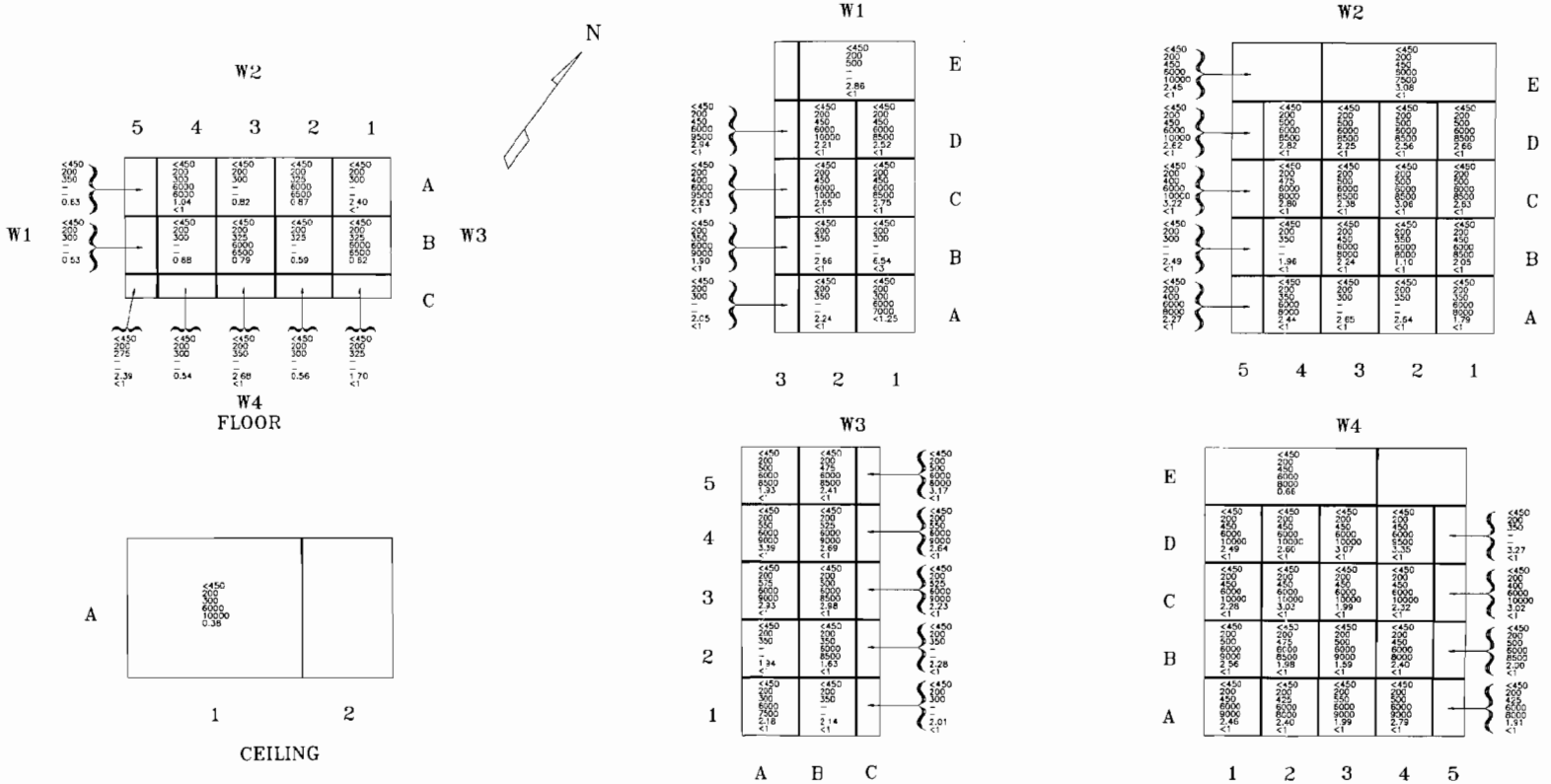
c. After Photographs, Room 112 North



Viewing toward corner of Wall-2 and Wall-3

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 115

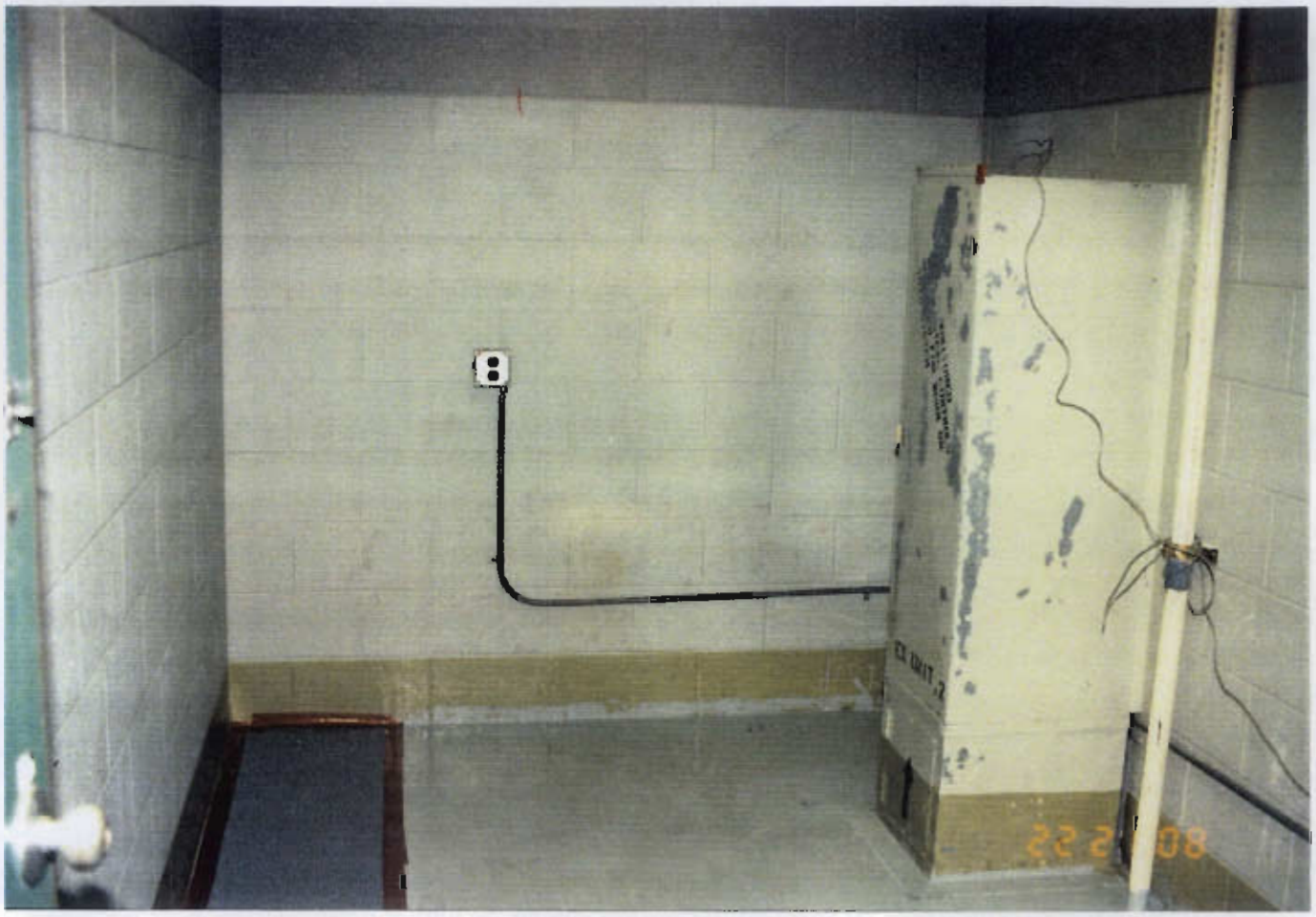


Note:
Solid samples taken from grids W1-A1 and W1-B1 consist of paint and have a limit of 3 pCi/g.

Sample Data
< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Prior to Photographs, Room 115



Looking into room

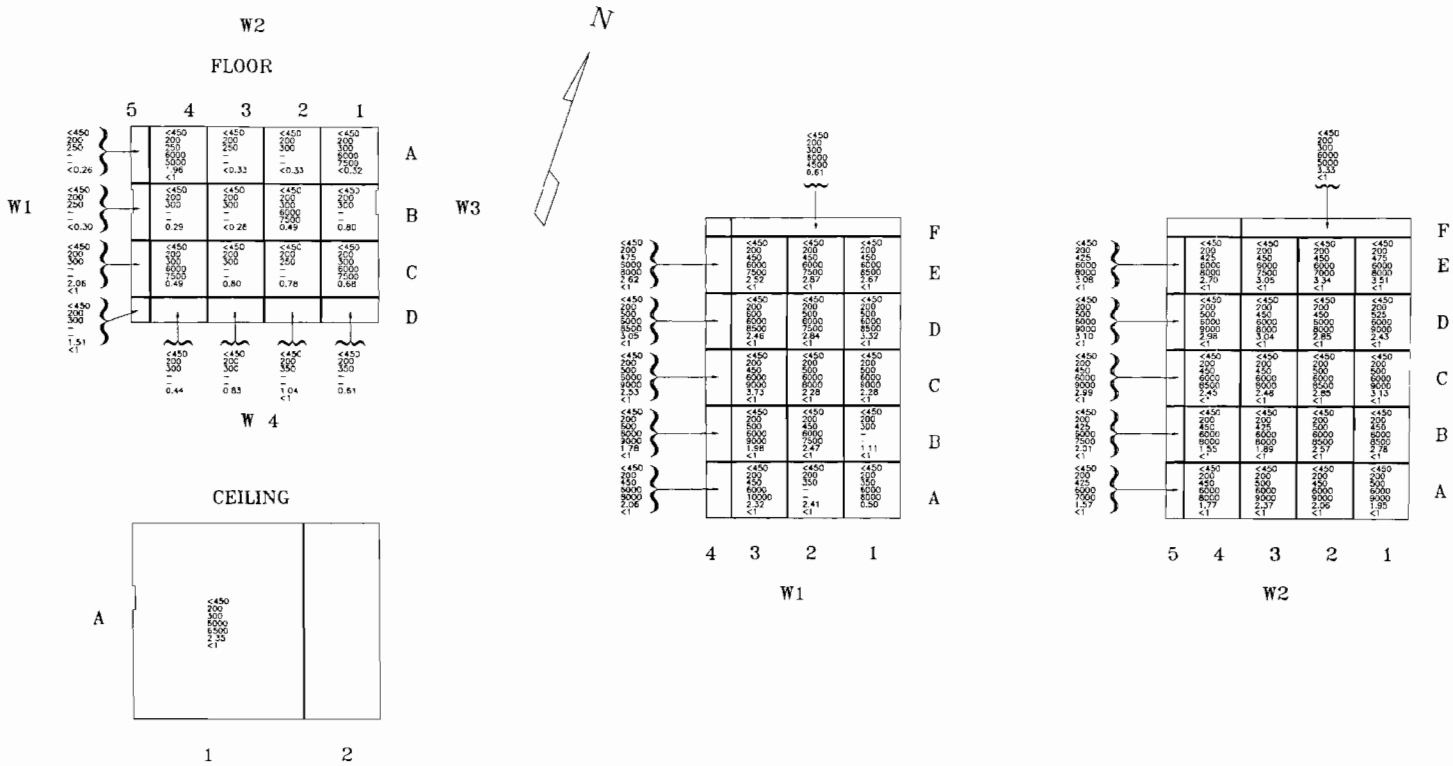
7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 115

Looking into room

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 116



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 116

W3

	1	2	3	4
E		<450 200 450 6000 8000 3.31 <1		
D	<450 200 475 6000 8500 2.81 <1	<450 200 450 6000 8000 3.09 <1	<450 200 475 6000 8500 2.97 <1	<450 200 475 6000 8000 3.06 <1
C	<450 200 500 6000 8000 2.73 <1	<450 200 450 6000 8500 3.16 <1	<450 200 450 6000 8500 2.59 <1	<450 200 450 6000 8000 2.74 <1
B	<450 200 450 5000 8000 2.12 <1	<450 200 450 6000 8000 2.35 <1	<450 200 475 6000 8500 1.89 <1	<450 200 450 6000 8000 2.30 <1
A	<450 200 450 6000 8000 1.92 <1	<450 200 450 6000 7500 2.28 <1	<450 200 450 6000 7000 2.07 <1	<450 200 450 6000 8000 2.52 <1

W4

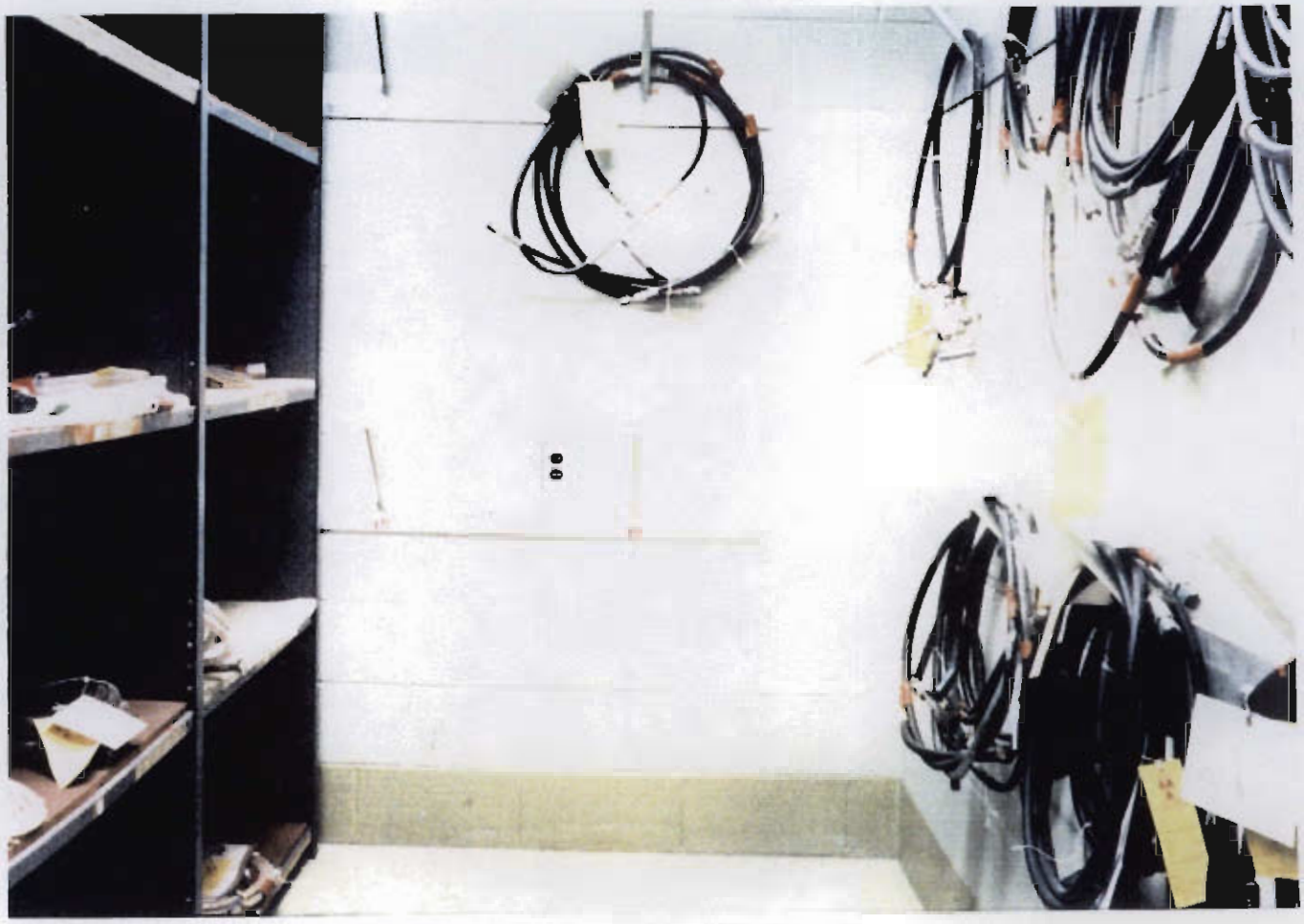
	1	2	3	4	5
E		<450 200 450 6000 8000 3.22 <1			
D	<450 200 525 6000 9000 2.90 <1	<450 200 500 6000 8500 3.31 <1	<450 200 500 6000 8500 2.71 <1	<450 200 500 6000 8500 3.28 <1	<450 200 475 6000 8000 3.17 <1
C	<450 200 450 6000 8500 3.22 <1	<450 200 450 6000 8500 2.83 <1	<450 200 500 6000 9000 2.48 <1	<450 200 500 6000 10000 3.42 <1	<450 200 500 6000 10000 3.12 <1
B	<450 200 500 6000 8500 2.91 <1	<450 200 475 6000 8000 2.58 <1	<450 200 450 6000 8500 2.48 <1	<450 200 450 6000 8000 2.56 <1	<450 200 425 6000 8000 1.98 <1
A	<450 200 450 6000 8000 1.90 <1	<450 200 450 6000 7500 1.75 <1	<450 200 350 – – 2.28 <1	<450 200 450 6000 8000 2.87 <1	<450 200 400 6000 8000 2.11 <1

Sample Data

<450 – IM-247/PD Results [$\mu\mu$Ci/20cm^2]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

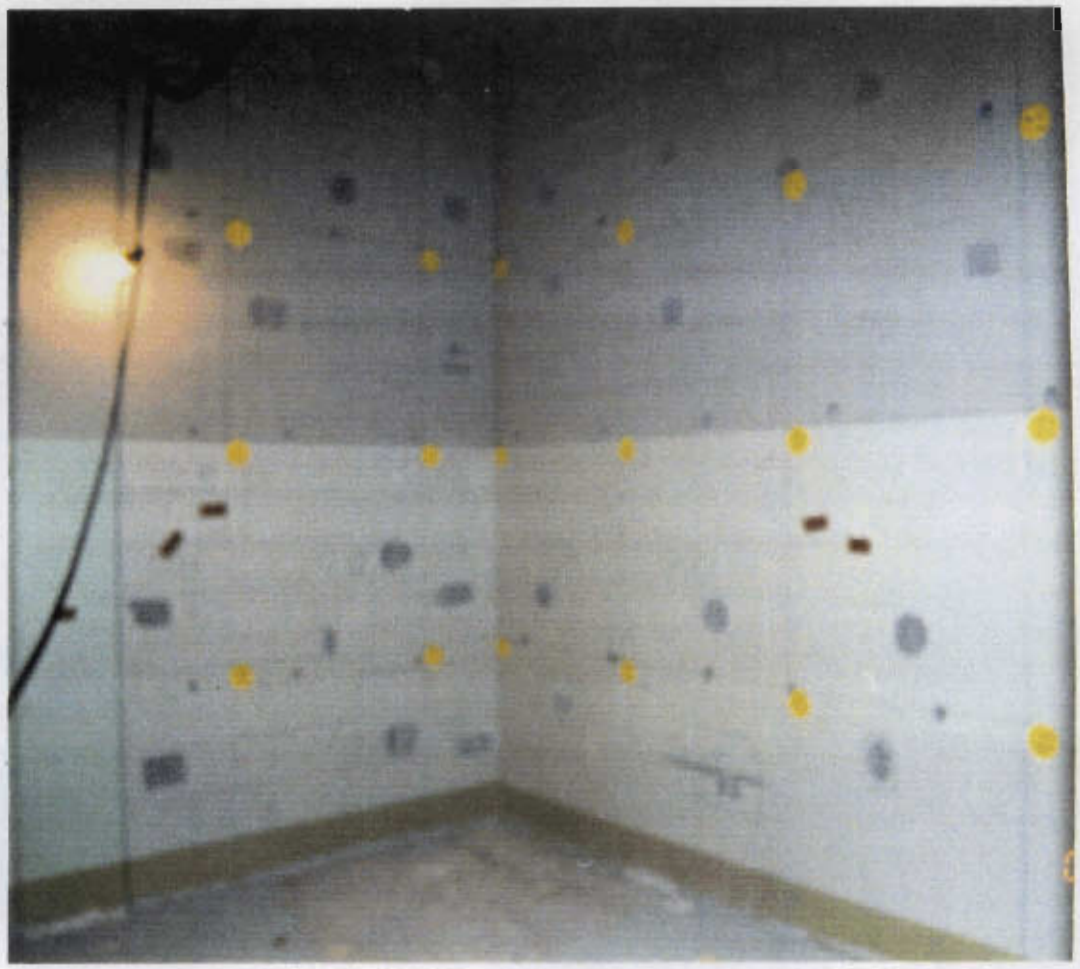
c. Prior to Photographs, Room 116



Viewing toward Wall-3

7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 116



Viewing toward corner of Wall-3 and Wall-4

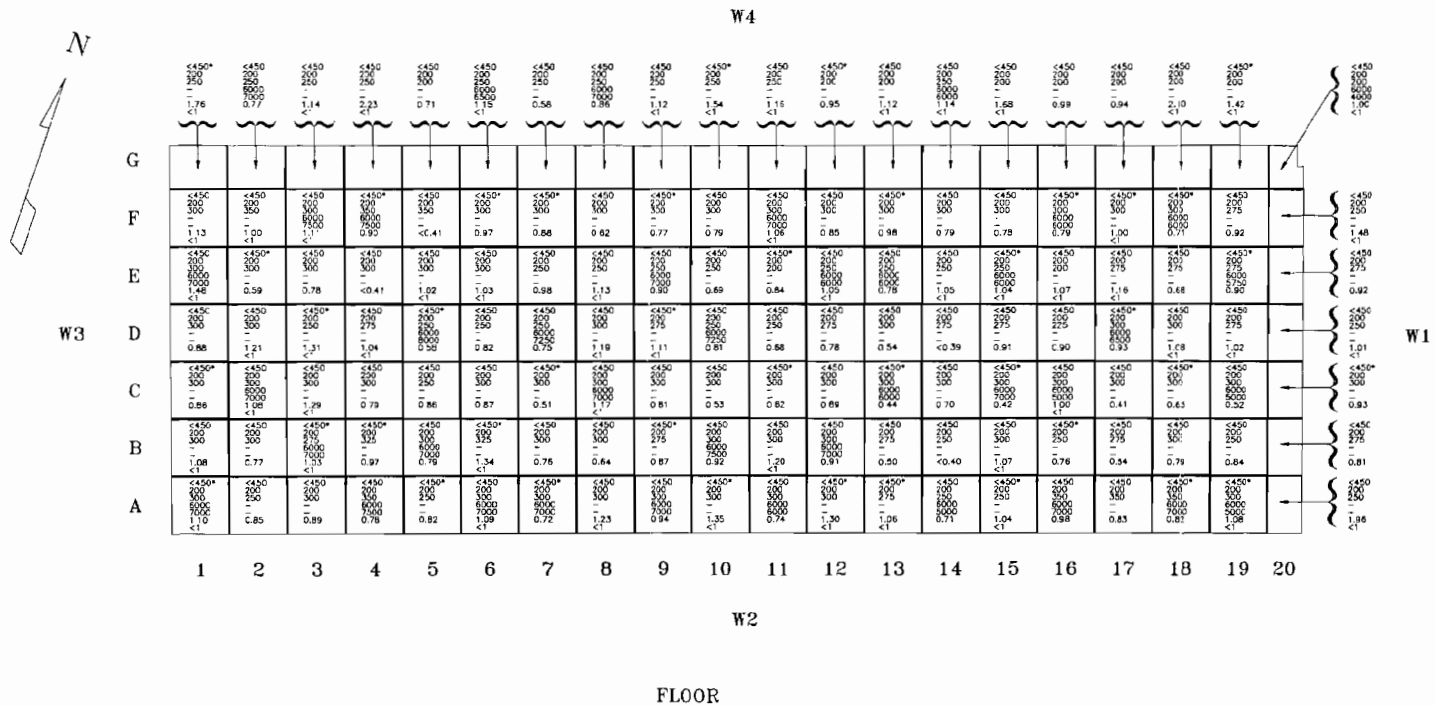
7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 116

Viewing toward entrance

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 118

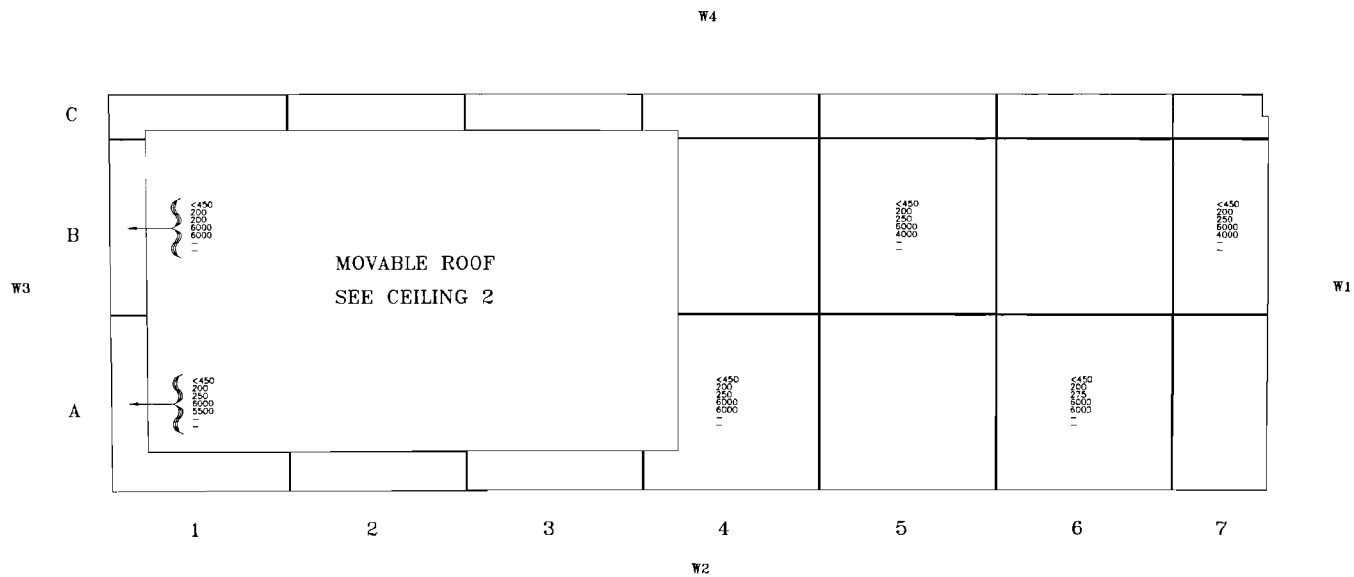


Note:
*Denotes grids which were surveyed with an AN/PDR-56 for Alpha radioactivity and no detectable activity was found.

Sample Data
<450 – IM-247/PD Results [μCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 118

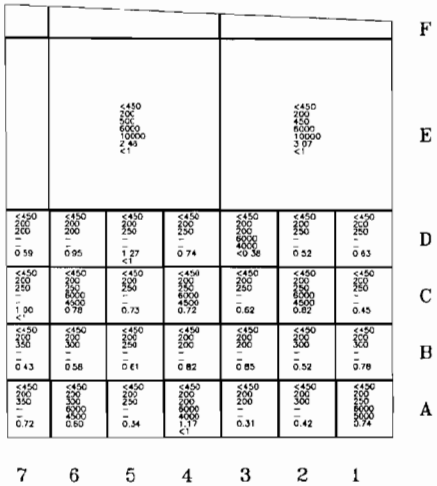


CEILING 1

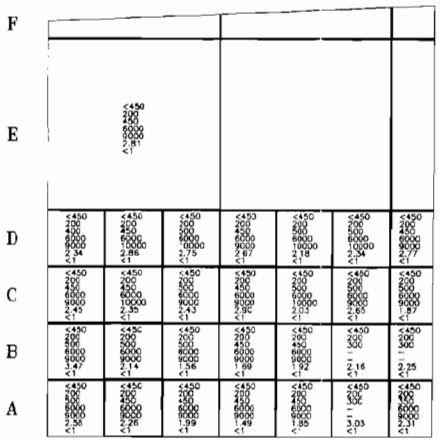
Sample Data
<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 118



W1



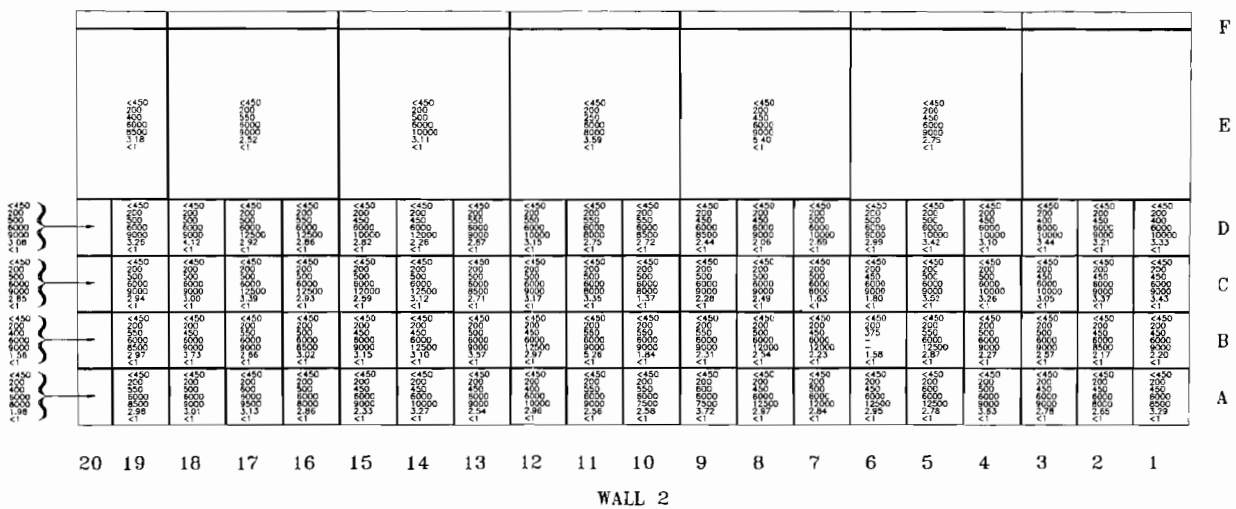
W3

Sample Data

<450 – IM-247/PD Results [μCv/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 118



Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 118

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F																				
E	<450 200 500 6000 9500 2.46 <1			<450 200 475 6000 9000 3.70 <1			<450 200 500 6000 10000 2.66 <1			<450 200 450 6000 8500 3.89 <1			<450 200 450 6000 8000 3.09 <1			<450 200 425 6000 10000 3.69 <1			<450 200 450 6000 8500 2.67 <1	
D	<450 200 500 6000 9000 2.62 <1	<450 200 500 6000 10000 2.92 <1	<450 200 500 6000 9500 3.02 <1	<450 200 500 6000 9000 2.50 <1	<450 200 500 6000 9000 2.67 <1	<450 200 500 6000 9000 2.97 <1	<450 200 500 6000 8000 3.13 <1	<450 200 500 6000 8500 3.03 <1	<450 200 500 6000 9000 2.74 <1	<450 200 450 6000 7500 2.94 <1	<450 200 500 6000 8000 4.5 <1	<450 200 500 6000 8500 3.90 <1	<450 200 450 6000 8500 2.37 <1	<450 200 450 6000 8000 2.75 <1	<450 200 450 6000 8000 2.16 <1	<450 200 450 6000 8000 2.30 <1	<450 200 500 6000 8500 2.77 <1	<450 200 500 6000 8000 2.13 <1	<450 200 450 6000 8500 3.08 <1	<450 200 450 6000 9000 2.42 <1
C	<450 200 450 6000 9000 2.87 <1	<450 200 450 6000 9000 2.74 <1	<450 200 500 6000 9000 2.97 <1	<450 200 500 6000 9500 2.16 <1	<450 200 500 6000 9000 2.96 <1	<450 200 450 6000 9500 3.59 <1	<450 200 500 6000 9500 2.38 <1	<450 200 550 6000 9500 3.73 <1	<450 200 550 6000 9500 3.50 <1	<450 200 550 6000 9500 3.41 <1	<450 200 500 6000 9500 3.22 <1	<450 200 500 6000 9500 3.18 <1	<450 200 500 6000 9000 3.20 <1	<450 200 600 6000 9500 3.06 <1	<450 200 600 6000 9000 3.32 <1	<450 200 550 6000 9000 2.96 <1	<450 200 550 6000 9000 2.93 <1	<450 200 550 6000 9000 2.94 <1	<450 200 450 6000 9000 2.69 <1	<450 200 250 - - 2.37 <1
B	<450 200 600 6000 10000 2.30 <1	<450 200 550 6000 9000 2.12 <1	<450 200 500 6000 10000 3.06 <1	<450 200 450 6000 8500 2.42 <1	<450 200 500 6000 9000 2.55 <1	<450 200 500 6000 9000 3.49 <1	<450 200 450 6000 9000 2.28 <1	<450 200 450 6000 8500 2.45 <1	<450 200 450 6000 8000 2.64 <1	<450 200 500 6000 8000 2.76 <1	<450 200 350 - - 2.56 <1	<450 200 375 - - 2.57 <1	<450 200 375 - - 2.62	<450 200 375 - - 2.36 <1	<450 200 350 - - 2.33 <1	<450 200 350 6000 8000 1.87 <1	<450 200 375 - - 2.55 <1	<450 200 375 - - 1.89 <1	<450 200 250 - - - -	
A	<450 200 500 6000 9500 2.23 <1	<450 200 500 6000 10000 2.15 <1	<450 200 550 6000 10000 1.55 <1	<450 200 500 6000 8000 1.93 <1	<450 200 450 6000 8000 2.56 <1	<450 200 450 6000 8000 1.18 <1	<450 200 450 6000 8500 2.23 <1	<450 200 450 6000 8000 1.61 <1	<450 200 450 6000 8000 2.04 <1	<450 200 450 6000 8500 1.99 <1	<450 200 375 6000 9000 1.82 <1	<450 200 375 - - 1.80 <1	<450 200 375 - - <2.20	<450 200 375 - - 1.80 <1	<450 200 375 6000 7500 2.32 <1	<450 200 375 - - 1.75 <1	<450 200 375 - - 2.73 <1	<450 200 375 - - 2.31 <1	<450 200 225 6000 4000 - -	<450 200 225 - - 2.18 <1

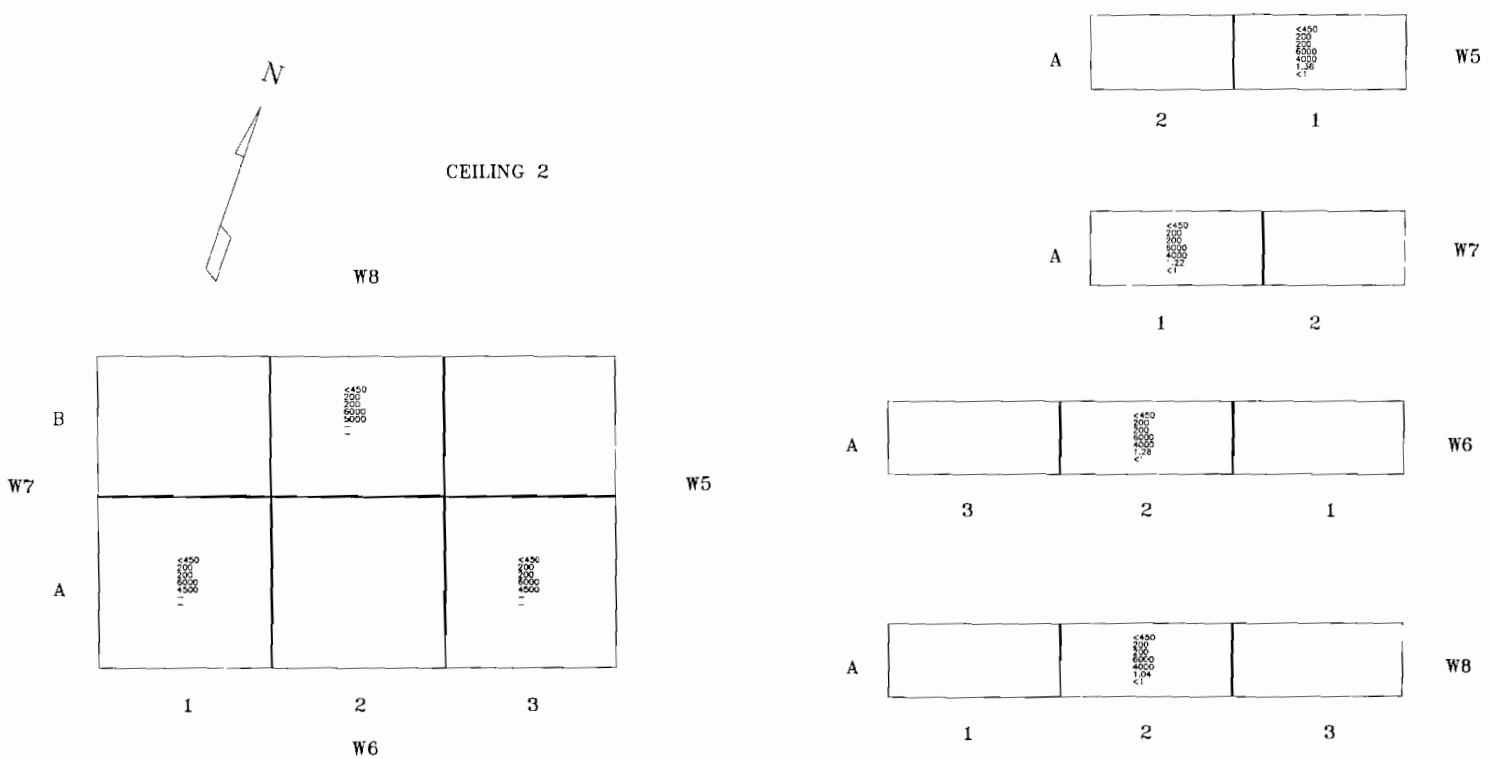
W4

Note:
Solid samples taken from grids W4-A13 and W4-B13 consist of paint and have a limit of 3 pCi/g.

Sample Data
<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, Room 118



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

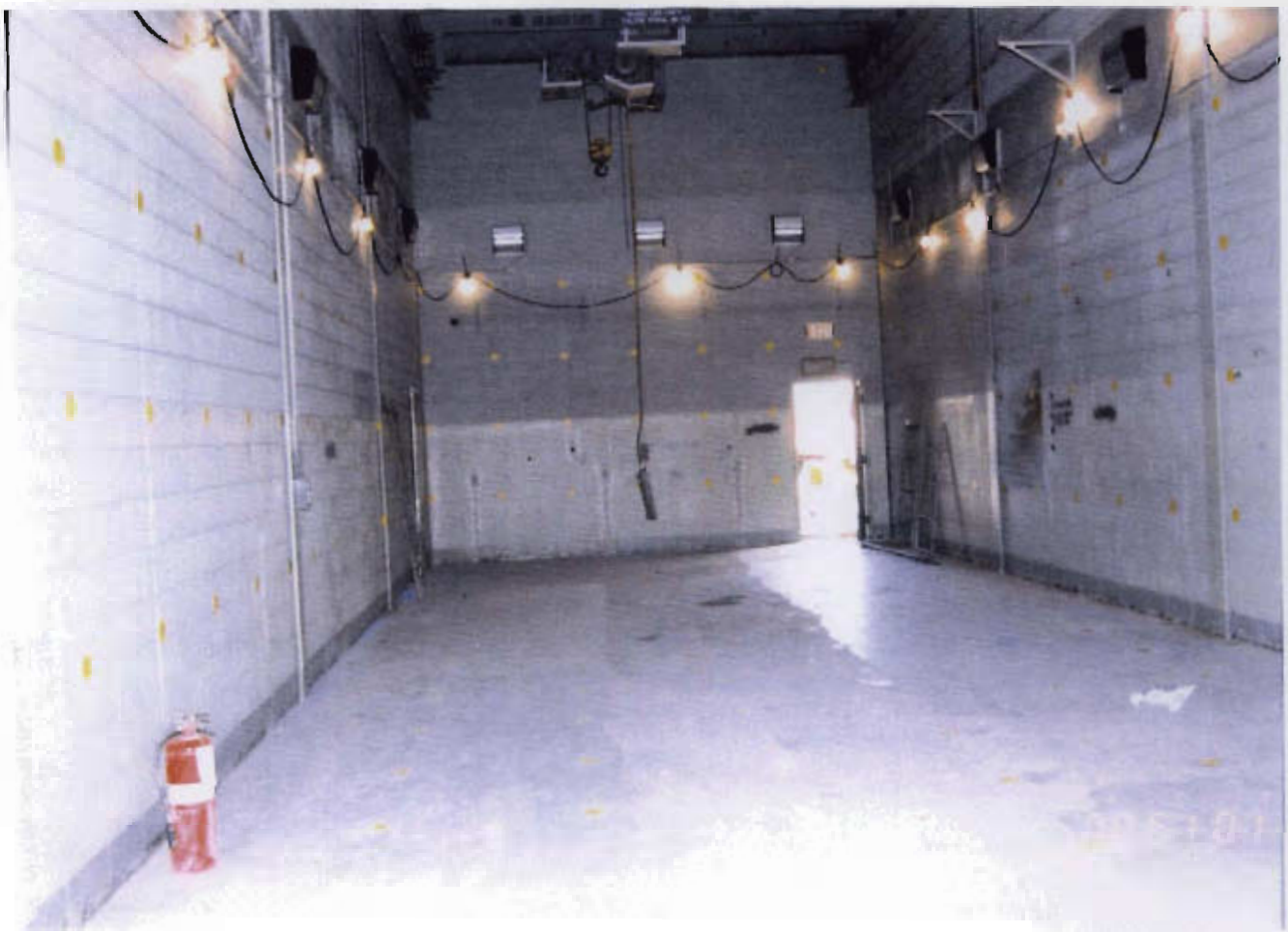
7. Bldg. 222, First Floor Groups 4 & 6

c. During Photographs, Room 118

Viewing toward Wall-1

7. Bldg. 222, First Floor Groups 4 & 6

c. During Photographs, Room 118



Viewing toward Wall-3

7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 118

Viewing toward Wall-1

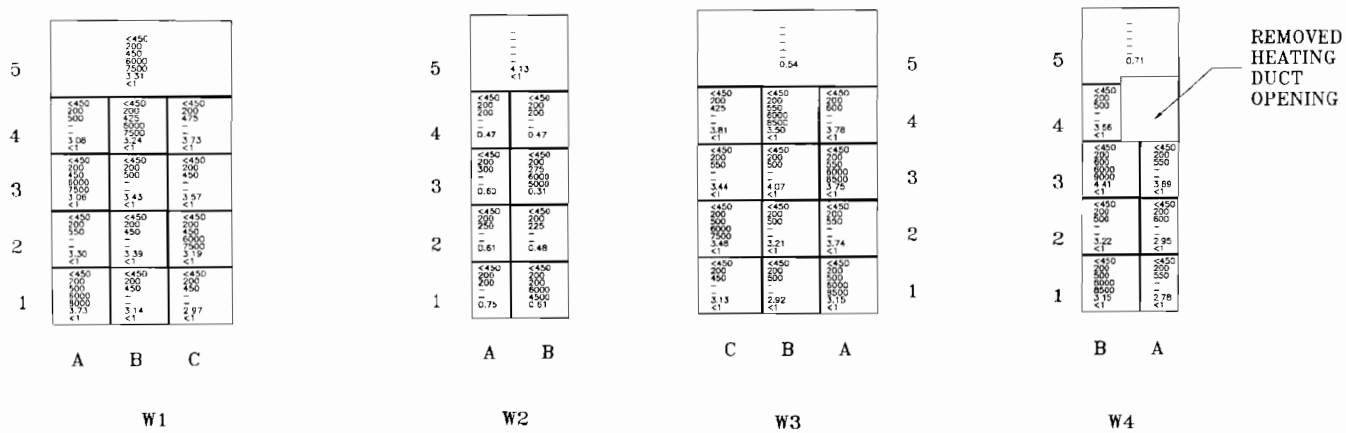
7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, Room 118

Viewing toward Wall-3

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, HVAC



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, HVAC

View southeast towards Wall 1

7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, HVAC

View southwest towards Wall 2

7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, HVAC

View northwest towards Wall 3

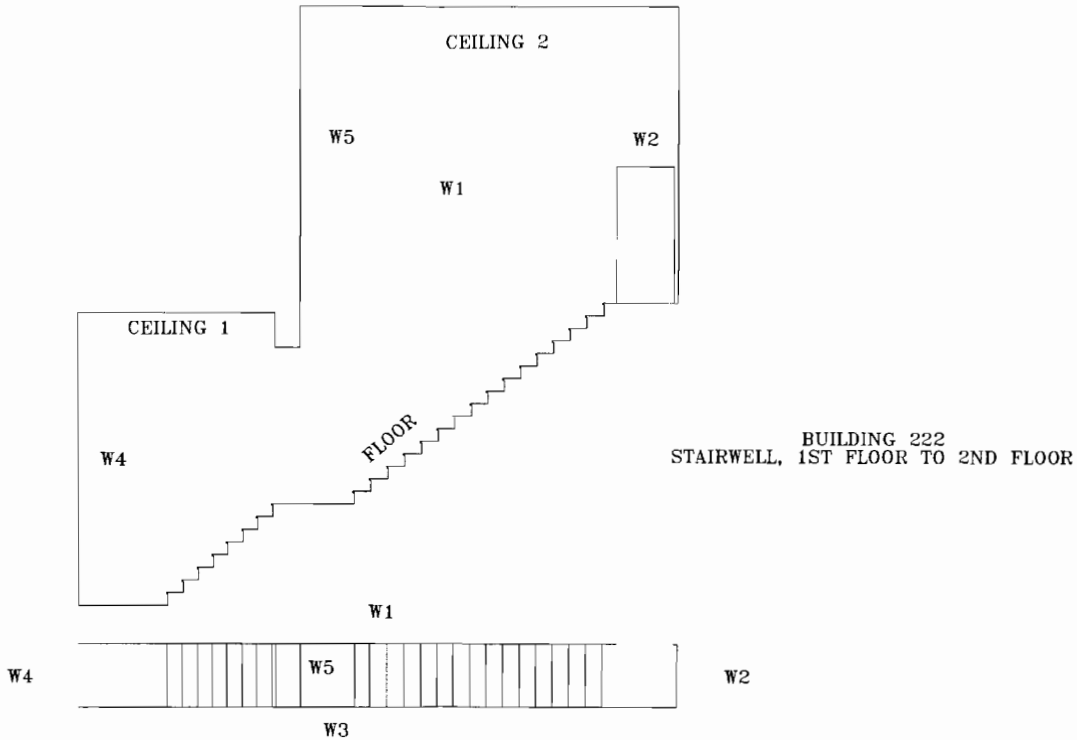
7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, HVAC

View northeast towards Wall 4

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, 1st to 2nd Floor Stairwell



Sample Data

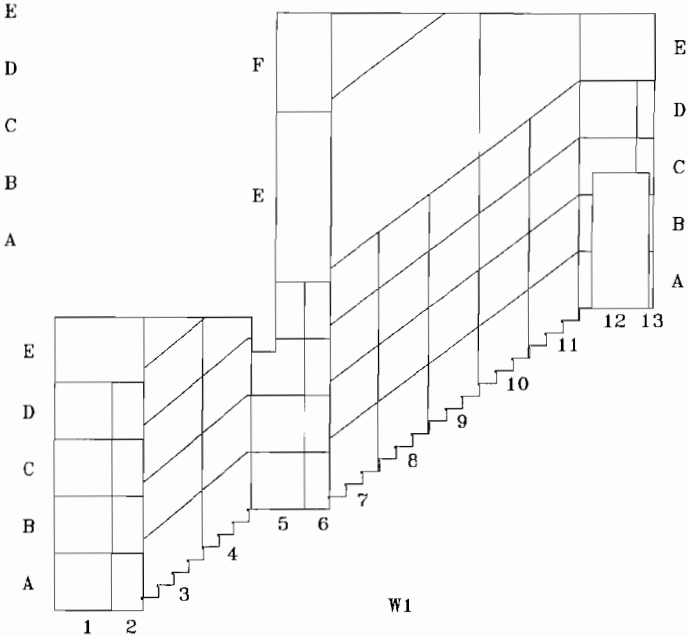
< 450 – IM-247/PD Results [μμC/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, 1st to 2nd Floor Stairwell

	1	2	3	4	5	6	7	8	9	10	11	12	13
F					<450 200 500 6000 10000 3.27 <1			<450 200 450 6000 9000 3.40 <1					
E													
D	<450 200 600 – 3.03 <1	<450 200 600 – 3.05 <1	<450 200 600 – 3.33 <1	<450 200 600 – 3.26 <1	<450 200 500 – 3.08 <1	<450 200 500 – 3.47 <1	<450 200 500 – 3.01 <1	<450 200 500 – 3.02 <1	<450 200 450 – 2.56 <1	<450 200 500 6000 10000 3.22 <1	<450 200 450 – 3.73 <1	<450 200 450 6000 11000 3.29 <1	<450 200 450 – 3.04 <1
C	<450 200 450 6000 7500 2.30 <1	<450 200 450 – 3.19 <1	<450 200 500 – 3.00 <1	<450 200 500 6000 7500 3.22 <1	<450 200 500 6000 9000 3.16 <1	<450 200 500 – 3.11 <1	<450 200 500 6000 12500 3.95 <1	<450 200 500 – 3.29 <1	<450 200 550 – 3.37 <1	<450 200 500 – 3.50 <1	<450 200 450 – 3.18 <1	<450 200 400 – 3.28 <1	<450 200 400 – 2.87 <1
B	<450 200 450 – 1.62 <1	<450 200 450 – 2.07 <1	<450 200 450 – 2.02 <1	<450 200 450 – 2.23 <1	<450 200 450 – 2.47 <1	<450 200 500 – 1.96 <1	<450 200 500 – 1.48 <1	<450 200 550 – 2.99 <1	<450 200 600 6000 12500 0.50	<450 200 500 – 2.12 <1	<450 200 500 – 1.87 <1	<450 200 300 – 2.35 <1	<450 200 300 – 1.06 <1
A	<450 200 300 6000 9000 2.47 <1	<450 200 450 – 2.31 <1	<450 200 450 – 2.13 <1	<450 200 500 6000 8500 2.67 <1	<450 200 500 6000 10000 3.01 <1	<450 200 500 – 2.30 <1	<450 200 500 6000 8500 1.86 <1	<450 200 500 – 2.24 <1	<450 200 550 – 3.12 <1	<450 200 300 – 0.84	<450 200 450 6000 12500 0.54	<450 200 300 6000 8500 2.69 <1	<450 200 300 – 0.51

W1

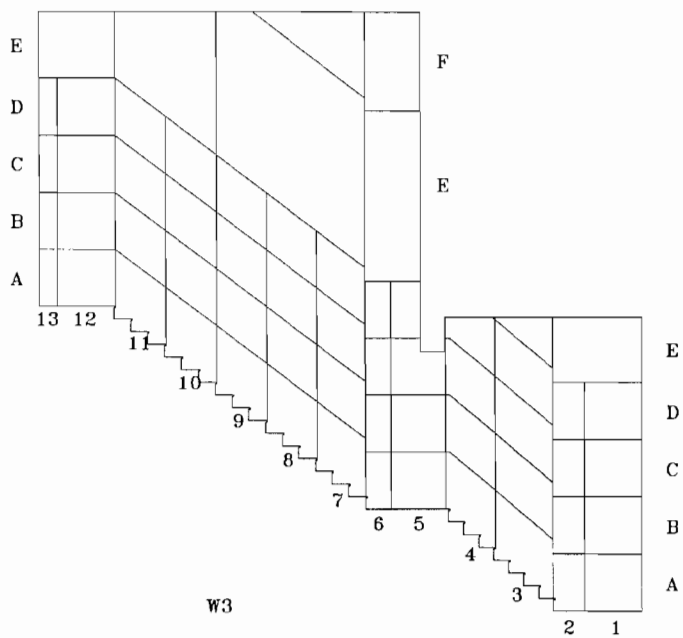


Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, 1st to 2nd Floor Stairwell



	1	2	3	4	5	6	7	8	9	10	11	12	13	
F					<450 200 400 500 6000 10000 3.02 <1			<450 200 450 6000 10000 0.92						F
E														E
D	<450 200 500 – – 3.00 <1	<450 200 500 – – 2.23 <1	<450 200 450 – – 3.19 <1	<450 200 350 – – 0.90	<450 200 425 – – 2.88 <1	<450 200 450 – – 2.88 <1	<450 200 500 – – 2.95 <1	<450 200 500 – – 3.47 <1	<450 200 450 – – 3.16 <1	<450 200 500 6000 8500 3.18 <1	<450 200 450 – – 3.19 <1	<450 200 450 – – 2.81 <1	<450 200 450 – – 2.84 <1	D
C	<450 200 500 6000 12500 3.22 <1	<450 200 450 – – 2.91 <1	<450 200 475 – – 1.99 <1	<450 200 425 6000 10000 1.36 <1	<450 200 500 6000 10000 4.52 <1	<450 200 450 – – 0.98	<450 200 500 5000 10000 1.05 <1	<450 200 500 – – 3.58 <1	<450 200 450 – – 2.96 <1	<450 200 500 – – 3.06 <1	<450 200 450 – – 3.65 <1	<450 200 425 6000 12000 3.85 <1	<450 200 450 – – 3.04 <1	C
B	<450 200 450 – – 2.76 <1	<450 200 450 – – 2.73 <1	<450 200 450 – – 2.25 <1	<450 200 450 – – 2.97 <1	<450 200 450 – – 2.31 <1	<450 200 450 – – 2.61 <1	<450 200 450 – – 2.31 <1	<450 200 450 – – 0.65	<450 200 475 6000 8000 2.85 <1	<450 200 500 – – 2.52 <1	<450 200 450 – – 3.12 <1	<450 200 450 – – 2.51 <1	<450 200 450 – – 2.80 <1	B
A	<450 200 450 6000 8000 2.80 <1	<450 200 450 – – 2.22 <1	<450 200 450 – – 2.27 <1	<450 200 450 6000 8000 2.47 <1	<450 200 500 6000 8000 2.27 <1	<450 200 450 – – 2.39 <1	<450 200 450 6000 8000 2.29 <1	<450 200 450 – – 2.48 <1	<450 200 500 – – 2.56 <1	<450 200 500 – – 1.78 <1	<450 200 500 5000 8000 2.13 <1	<450 200 450 6000 11000 2.29 <1	<450 200 425 – – 2.24 <1	A
	1	2	3	4	5	6	7	8	9	10	11	12	13	

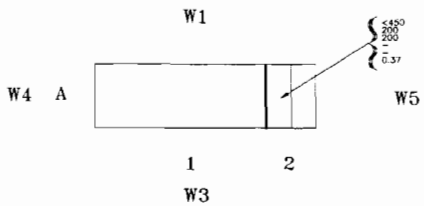
W3

Sample Data

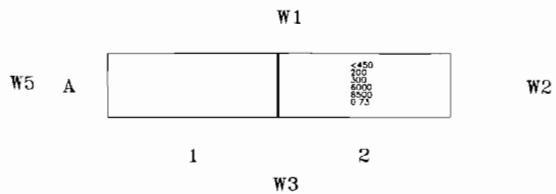
<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

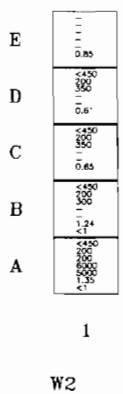
c. Grid Map, 1st to 2nd Floor Stairwell

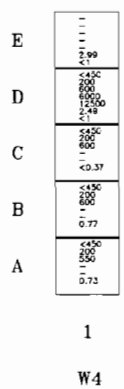


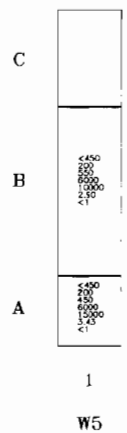
CEILING 1



CEILING 2







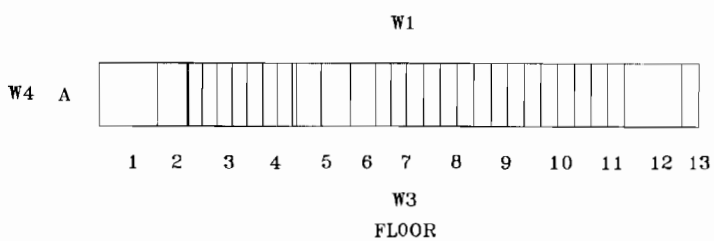
Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Grid Map, 1st to 2nd Floor Stairwell

	1	2	3	4	5	6	7	8	9	10	11	12	13
A	<450 200 300 6000 7500 1.11 <1	<450 200 300 -- 0.68	<450 200 350 -- 1.24 <1	<450 200 350 -- 1.19 <1	<450 200 350 6000 7500 1.70 <1	<450 200 300 -- 0.97	<450 200 325 -- 1.33 <1	<450 200 300 -- 1.01 <1	<450 200 350 6000 8000 1.09 <1	<450 200 300 -- 1.00 <1	<450 200 350 -- 6.44 <1	<450 200 300 6000 7500 0.94	<450 200 300 -- 1.63 <1



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

7. Bldg. 222, First Floor Groups 4 & 6

c. Prior to Photographs, 1st to 2nd Floor Stairwell

Viewing down toward floor 1

7. Bldg. 222, First Floor Groups 4 & 6

c. After Photographs, 1st to 2nd Floor Stairwell

Viewing down toward floor 1

8. Bldg. 222, First Floor Group 5

a. Report

(1) Description:

The first floor Group 5 areas consisted of room 105 and room 112 South End. These areas are primarily of concrete construction with the majority of the walls, floors, and ceilings painted.

(2) Discussion:

The Group 5 areas were divided into 244 grids. The floor grids were divided into 3' by 3' grids. The walls were divided into grids 3' by 3', up to 12' high, then 6' by 6' grids above 12'. Each grid was identified with its own unique designator.

One hundred percent of all 3' by 3' grids were surveyed using the IM-247/PD and the IM-253/PD (HV-1 PHA). A minimum of 25 percent of all 3' by 3' grids were surveyed using the IM-253/PD (HV-2 GROSS). A minimum of 25 percent of the ceiling 6' by 6' grids and 50 percent of the wall 6' by 6' grids was surveyed using the IM-247/PD and IM-253/PD (HV-1 PHA and HV-2 GROSS). One solid material sample was taken from within each 3' by 3' grid, a minimum of 50 percent of 6' by 6' wall grids, and a minimum of 25 percent of 6' by 6' ceiling grids. Additionally, solid material samples were taken from selected structural joints and crevices. Results from these samples were incorporated into the report by utilizing the higher of the normal grid sample or the joint/crevice sample result.

The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the Group 5 floors, walls, and ceiling were 40, 200, and 6000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 1720 and Building 1635.

A total of 243 solid material samples were taken. Each solid sample was removed from the grid location indicating the area of highest potential. Additionally, solid material samples were taken from selected structural joints and crevices. Results from these samples were incorporated into the report by utilizing the higher of the normal grid sample or the joint/crevice sample result. The following naturally occurring radionuclides were typical isotopes identified during analysis of solid material samples: lead 212, lead 214, thallium 208, potassium 40, and bismuth 214.

(3) Summary:

Surveys performed with the IM-247/PD did not detect areas greater than 450 $\mu\mu Ci/20cm^2$.

8. Bldg. 222, First Floor Group 5

Surveys performed with the IM-253/PD (HV-1 PHA) detected 104 areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) detected two areas greater than or equal to twice background.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) detected gross gamma equivalent cobalt 60 levels ranging from a low of 0.26 pCi/g to a high of 4.61 pCi/g.

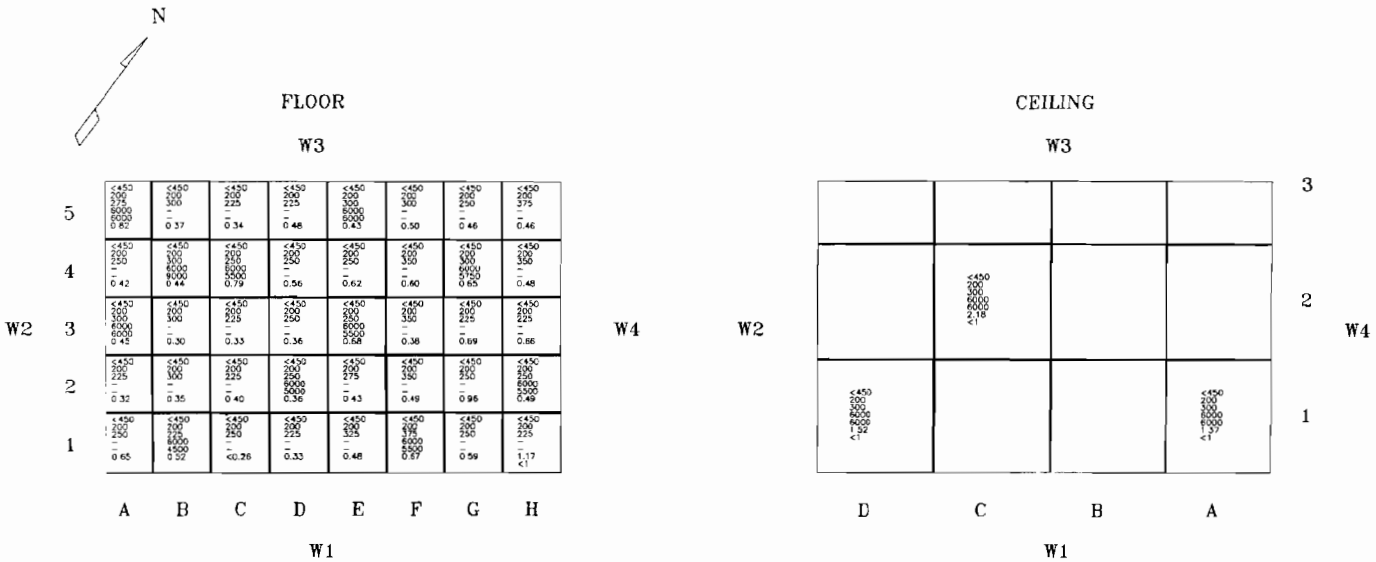
Analyses performed on initial solid material samples with the MCA for specific cobalt 60 identified seven samples containing cobalt 60 greater than the minimum detectable activity. The extent of the contamination was identified by taking additional solid material samples from the surrounding vicinity. Room 105 and room 112 south end were remediated by the concrete floor being removed. Following remediation, additional solid material samples were taken from the affected areas and all were less than 1 pCi/g specific cobalt 60. No traces of cobalt 60 were identified.

8. Bldg. 222, First Floor Group 5

b. Group 5 Site Map

8. Bldg. 222, First Floor Group 5

c. Grid Map, Room 105

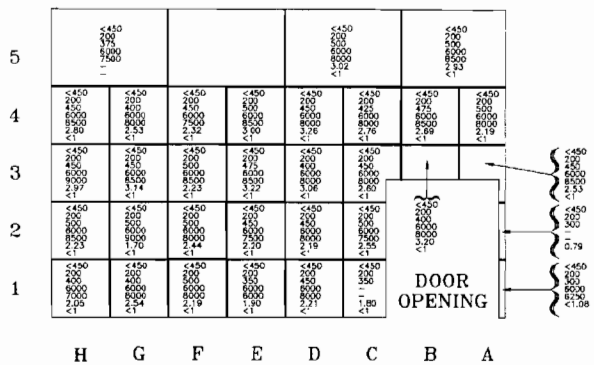


Sample Data

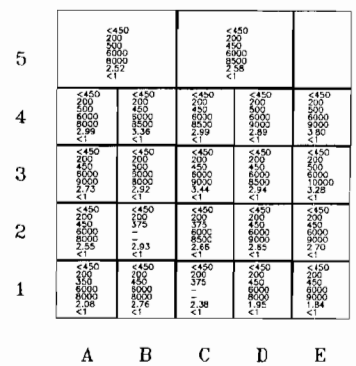
< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

8. Bldg. 222, First Floor Group 5

c. Grid Map, Room 105



W1



W2

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [μCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

8. Bldg. 222, First Floor Group 5

c. Grid Map, Room 105

	A	B	C	D	E	F	G	H
5			<450 200 500 5000 8000 0.83				<450 200 500 5000 8000 0.68	
4	<450 200 550 6000 10000 3.61 <1	<450 200 550 6000 9000 2.73 <1	<450 200 450 6000 8000 2.59 <1	<450 200 500 6000 8500 3.26 <1	<450 200 550 6000 9000 2.25 <1	<450 200 500 6000 9000 2.94 <1	<450 200 500 6000 9000 2.61 <1	<450 200 500 6000 9000 2.76 <1
3	<450 200 550 6000 8500 3.13 <1	<450 200 500 6000 9000 2.87 <1	<450 200 500 6000 8000 2.94 <1	<450 200 500 6000 8000 1.99 <1	<450 200 500 6000 8500 3.17 <1	<450 200 500 6000 9000 3.20 <1	<450 200 500 6000 8500 3.05 <1	<450 200 450 6000 8000 3.08 <1
2	<450 200 600 6000 12500 2.69 <1	<450 200 500 6000 10000 2.11 <1	<450 200 500 6000 10000 2.84 <1	<450 200 400 6000 8000 2.18 <1	<450 200 500 6000 9000 2.22 <1	<450 200 500 6000 9000 2.27 <1	<450 200 500 6000 9000 2.69 <1	<450 200 500 6000 9000 2.98 <1
1	<450 200 450 6000 9000 2.43 <1	<450 200 450 6000 10000 2.69 <1	<450 200 450 6000 8000 1.97 <1	<450 200 450 6000 8000 2.11 <1	<450 200 450 6000 10000 2.18 <1	<450 200 350 — — 2.53 <1	<450 200 450 6000 7500 2.10 <1	<450 200 500 6000 8000 1.79 <1

W3

	A	B	C	D	E
5	<450 200 450 6000 9000 2.85 <1	<450 200 450 6000 7000 0.30	<450 200 450 6000 9000 2.70 <1		
4	<450 200 350 — — 3.14 <1	<450 200 500 5000 10000 2.80 <1	<450 200 500 6000 10000 3.51 <1	<450 200 500 6000 10000 2.66 <1	<450 200 500 6000 9000 2.73 <1
3	<450 200 450 5000 8500 3.02 <1	<450 200 500 6000 8500 2.17 <1	<450 200 450 6000 11000 2.63 <1	<450 200 500 6000 11000 2.80 <1	<450 200 500 6000 12000 3.18 <1
2	<450 200 500 6000 8000 2.49 <1	<450 200 500 6000 8500 2.98 <1	<450 200 500 6000 8500 1.97 <1	<450 200 550 6000 8000 2.45 <1	<450 200 500 6000 9000 2.42 <1
1	<450 200 450 5000 7500 2.08 <1	<450 200 400 6000 7500 2.38 <1	<450 200 450 6000 7500 2.05 <1	<450 200 450 6000 7500 2.09 <1	<450 200 450 6000 7500 2.38 <1

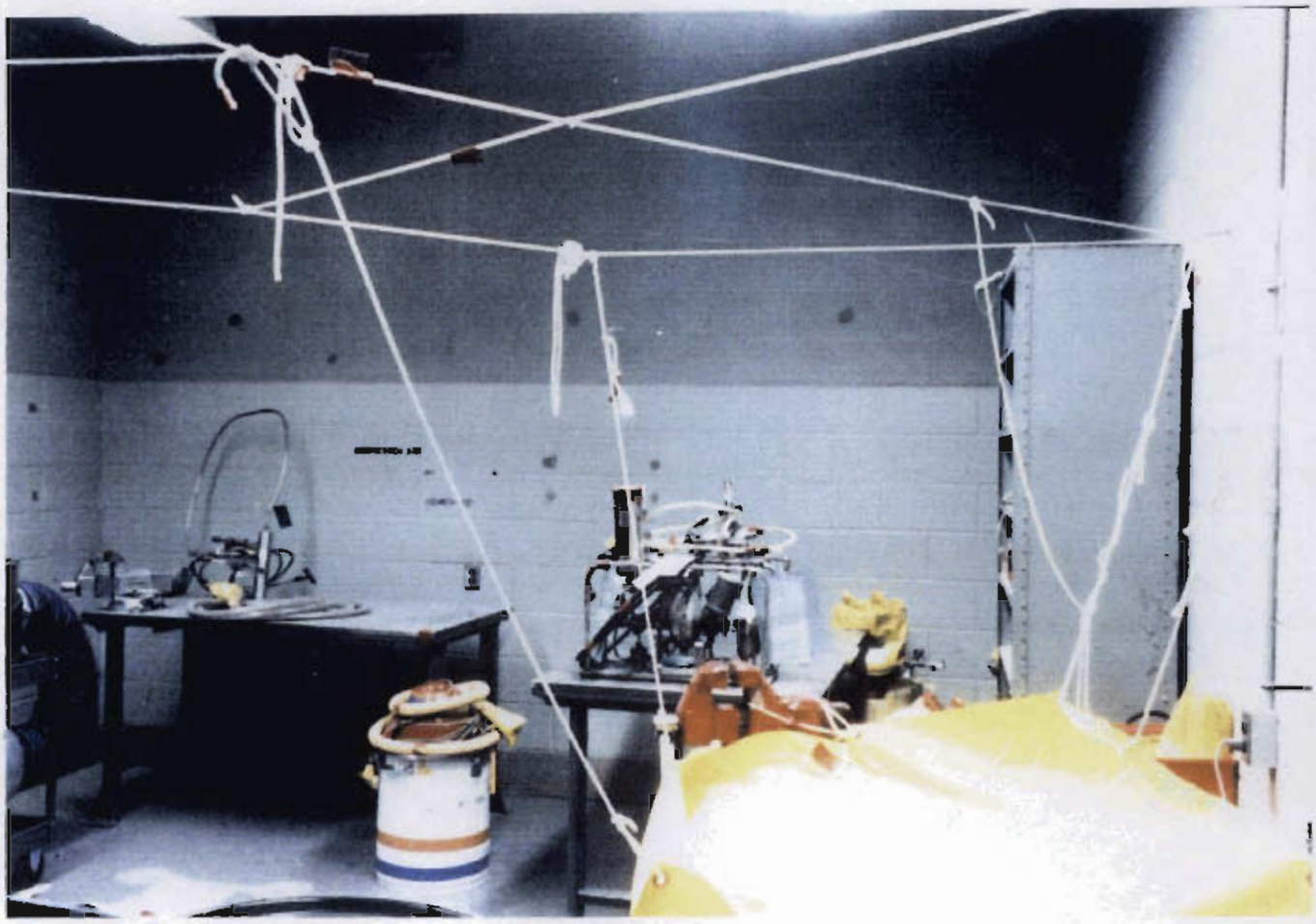
W4

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

8. Bldg. 222, First Floor Group 5

c. Prior to Photographs, Room 105



Viewing Wall-4

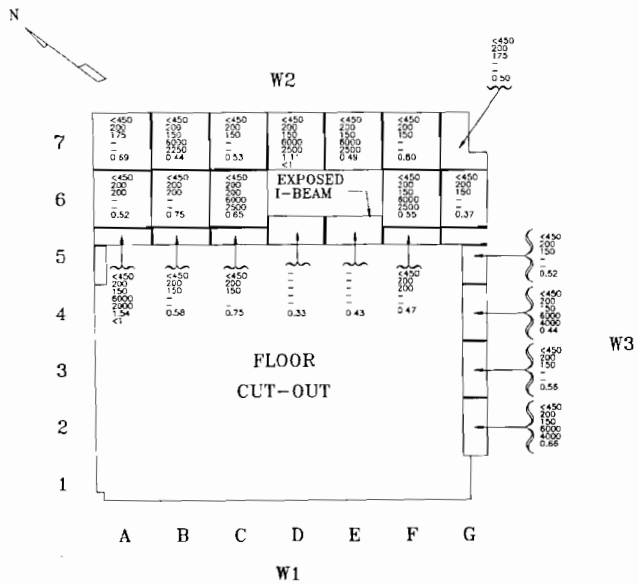
8. Bldg. 222, First Floor Group 5

c. After Photographs, Room 105

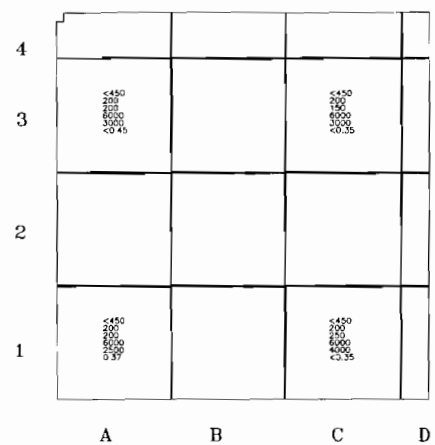
Viewing Wall-3

8. Bldg. 222, First Floor Group 5

c. Grid Map, Room 112 South



FLOOR GRID



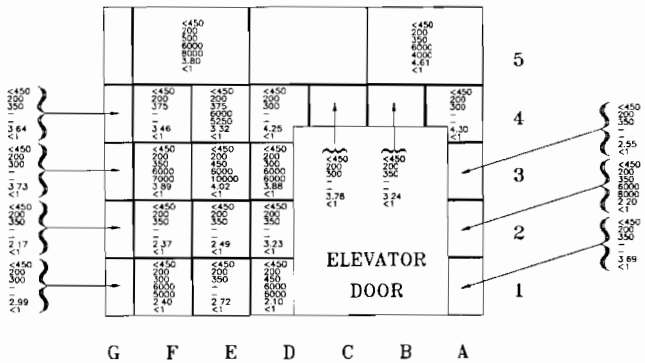
CEILING

Note:
Remediation resulted in the floor being removed in grids D-5 and E-5 exposing the support beams. Survey results not included for removed section. Sample results are for post remediation analysis.

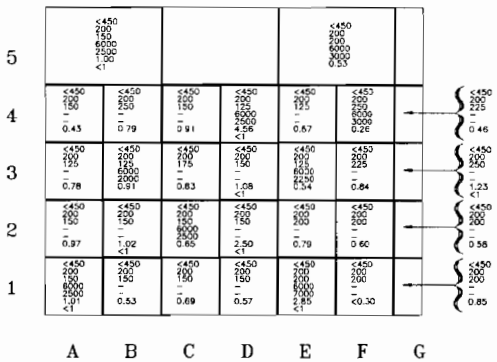
Sample Data
< 450 – IM-247/PD Results [µµCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

8. Bldg. 222, First Floor Group 5

c. Grid Map, Room 112 South



W1



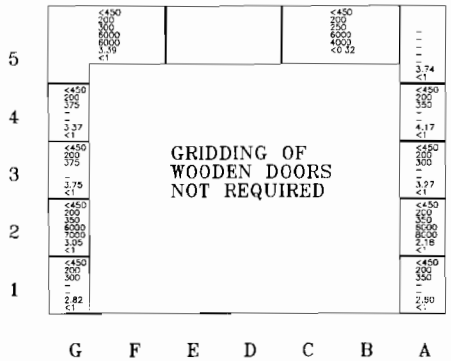
W2

Sample Data

– <450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

8. Bldg. 222, First Floor Group 5

c. Grid Map, Room 112 South



W3

Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

8. Bldg. 222, First Floor Group 5

c. Prior to Photographs, Room 112 South

Viewing Wall-3

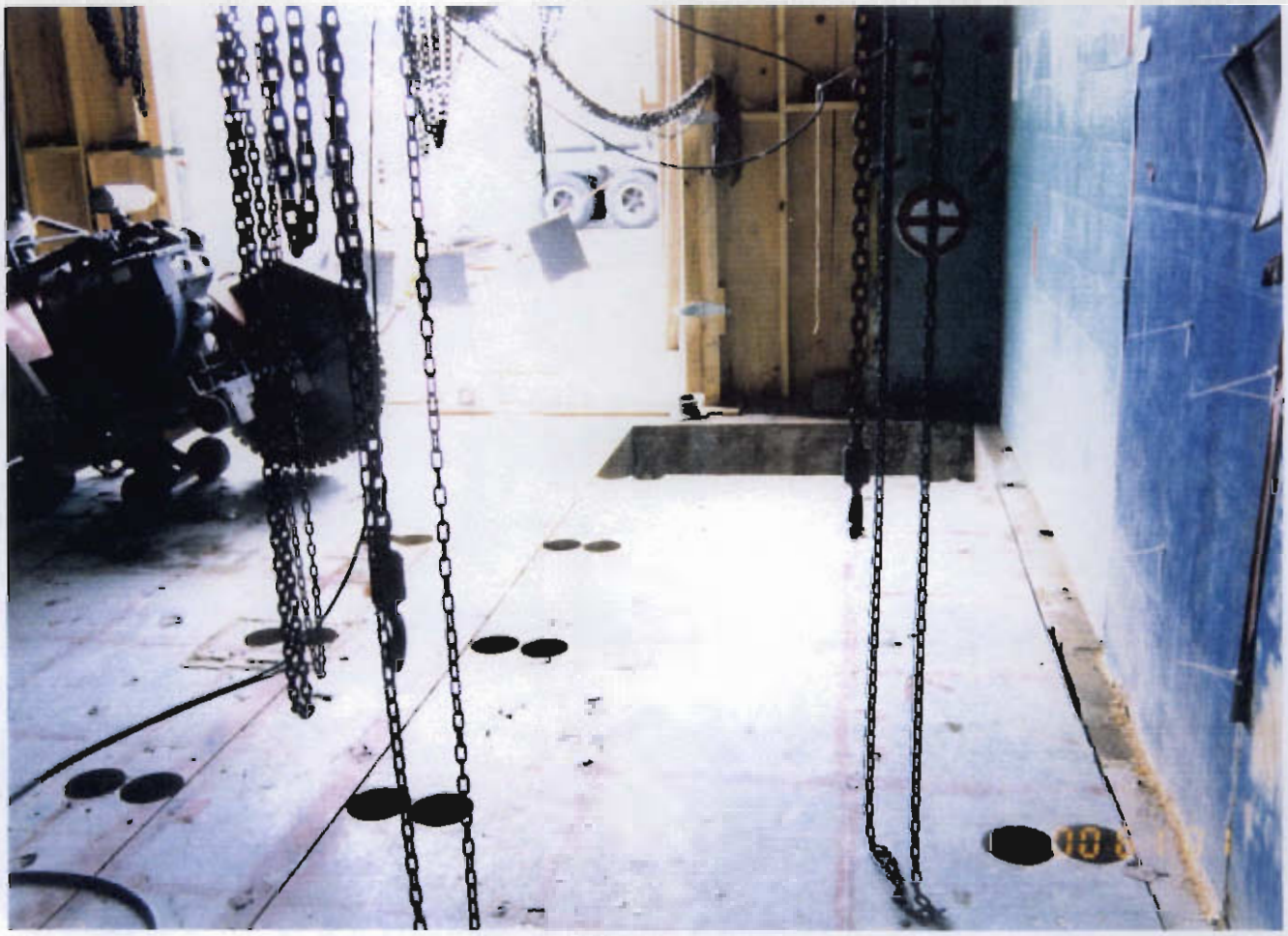
8. Bldg. 222, First Floor Group 5

c. In Process Photographs, Room 112 South

Start of remediation, viewing Wall-3

8. Bldg. 222, First Floor Group 5

c. In Process Photographs, Room 112 South



During remediation, viewing Wall-3

8. Bldg. 222, First Floor Group 5

c. In Process Photographs, Room 112 South

During remediation, viewing Wall-3

8. Bldg. 222, First Floor Group 5

c. After Photographs, Room 112 South

Viewing toward Wall-3

9. Bldg. 222, Basement Group 2

a. Report

(1) Description:

The basement Group 2 area consisted of the fire exit stairs. The fire exit stairs are constructed of concrete.

(2) Discussion:

Group 2 survey areas were divided into five 10' by 10' grids. Where physically possible, each grid was subdivided into two 3' by 3' subsections which were located in areas of highest potential for contamination. One of these subsections was surveyed using the IM-247/PD and the other using the IM-253/PD (HV-1 PHA). Solid material samples were not required.

The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the Group 2 floors were 40, 200, and 6000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 1720.

(3) Summary:

Surveys performed with the IM-247/PD did not detect areas greater than 450 $\mu\mu Ci/20cm^2$.

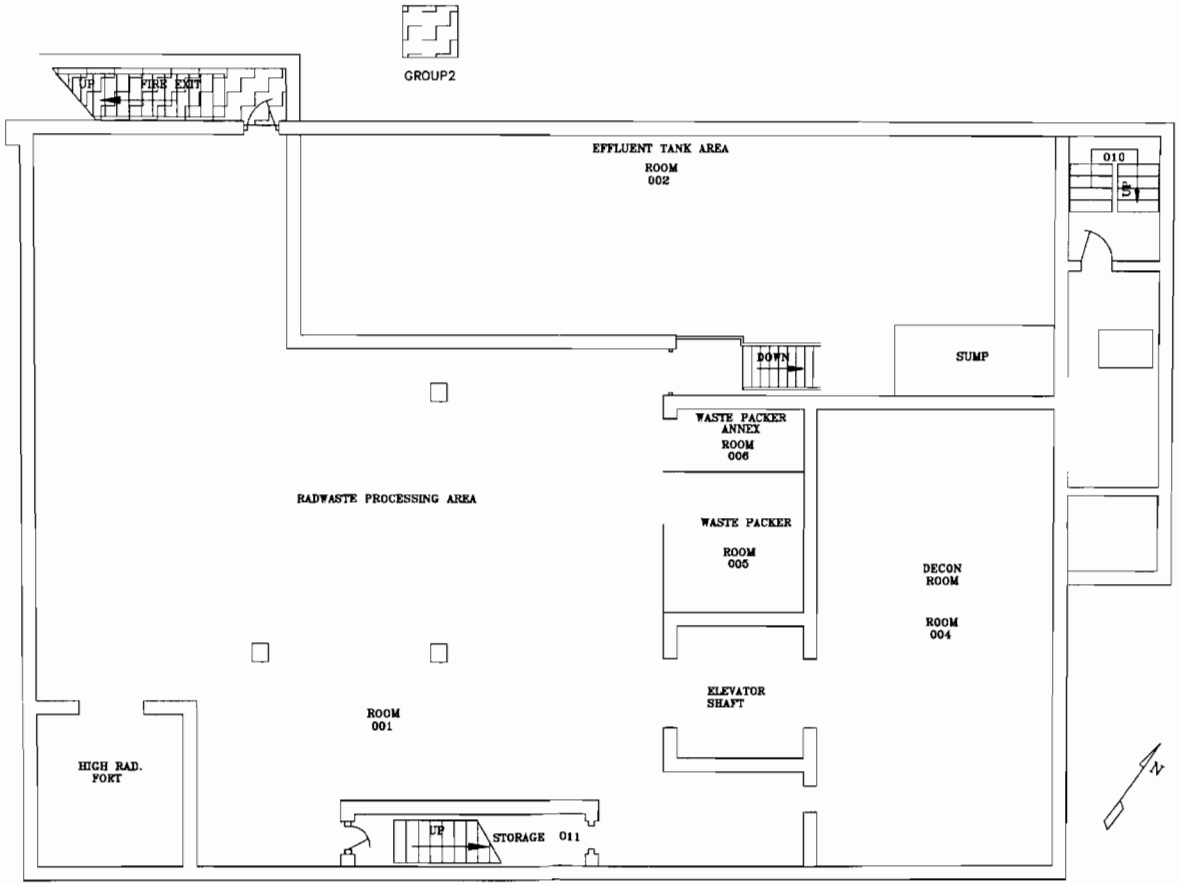
Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) were not required.

Solid material samples were not required.

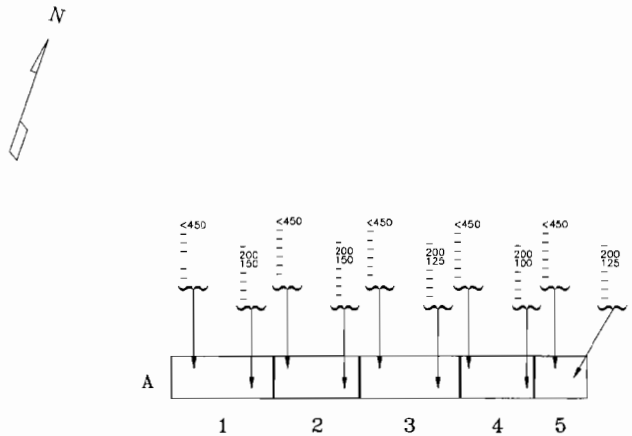
9. Bldg. 222, Basement Group 2

b. Site Map



9. Bldg. 222, Basement Group 2

c. Grid Map, Fire Exit Stairs



Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

9. Bldg. 222, Basement Group 2

c. Prior to Photographs, Fire Exit Stairs

Viewing floor from above

9. Bldg. 222, Basement Group 2

c. After Photographs, Fire Exit Stairs

Viewing floor from above

10. Bldg. 222, Basement Group 4

a. Report

(1) Description:

The basement Group 4 areas consisted of rooms 001, 002, 006, 011, basement to first floor stairwell, and the High Rad Fort. These areas are of concrete construction.

(2) Discussion:

The Group 4 areas were divided into 1748 3' by 3' floor and wall grids and 9' by 9' wall and ceiling grids. The walls and ceilings were divided into grids 3' by 3', up to 12' high, then 9' by 9' grids above 12' except for room 002 ceiling where grids in proximity to ventilation supply/returns are 3' by 3'. The tank saddles, the demineralizer foundation, and columns A-D located in room 001 were gridded and surveyed as walls. Room 002 included a sump pit area. Also portions of the ceiling were removed from room 002. Each grid was identified with a unique designation.

One hundred percent of all 3' by 3' grids were surveyed using the IM-247/PD and the IM-253/PD (HV-1 PHA). A minimum of 25 percent of all 3' by 3' grids were surveyed using the IM-253/PD (HV-2 GROSS). A minimum of 25 percent of all 9' by 9' grids were surveyed using the IM-247/PD and IM-253/PD (HV-1 PHA and HV-2 GROSS). A minimum of one solid material sample was taken from within each 3' by 3' grid and from within a minimum of 25 percent of all 9' by 9' grids. At least one solid material sample was taken from each wall and ceiling grid. Additionally, solid material samples were taken from selected structural joints and crevices. Results from these samples were incorporated into the report by utilizing the higher of the normal grid sample or the joint/crevice sample result.

The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the Group 4 floors, walls, and ceiling were 40, 200, and 6000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 1720 and Building 1635.

A total of 1740 solid material samples were taken. Each solid sample was removed from the grid location indicating the area of highest potential. Solid samples were not required from tank saddle C3 and D3 because of proximity to the wall; available survey data in the area does not require surveys in these inaccessible areas. A paint sample was taken from the basement to first floor stairwell grid W3-A13. No sample was taken from stairwell grid W3-B13 as this was lightly painted metal. The following naturally occurring radionuclides were typical isotopes identified during analysis of solid material samples: lead 212, lead 214, thallium 208, and potassium 40.

10. Bldg. 222, Basement Group 4

(3) Summary:

Surveys performed with the IM-247/PD did not detect areas greater than 450 $\mu\mu Ci/20cm^2$.

Surveys performed with the IM-253/PD (HV-1 PHA) detected 98 areas greater than or equal to twice background.

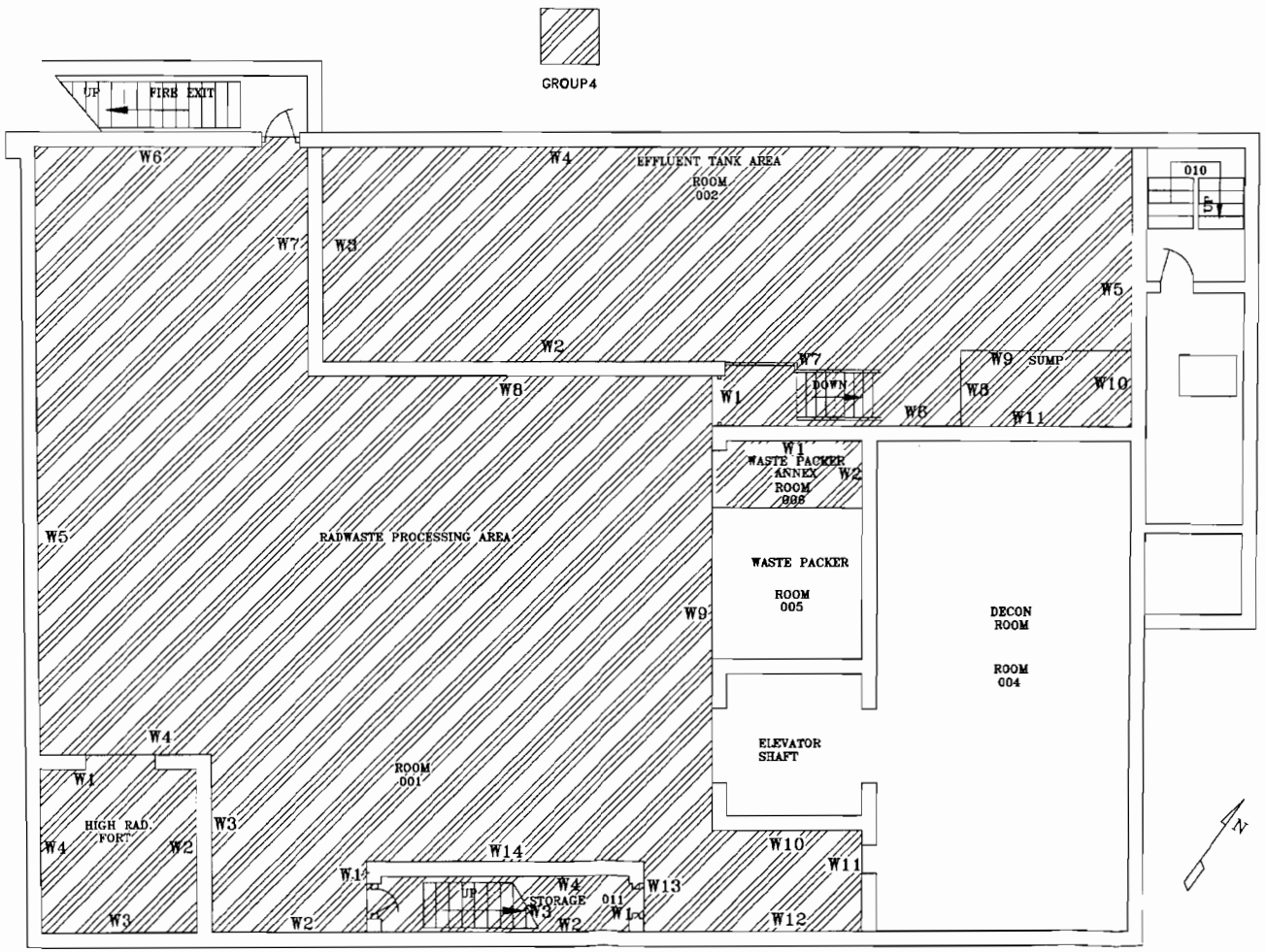
Surveys performed with the IM-253/PD (HV-2 GROSS) detected 2 areas greater than or equal to twice background.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) detected gross gamma equivalent cobalt 60 levels ranging from a minimum detectable activity of less than 0.11 pCi/g to a high of 14.38 pCi/g.

Analysis performed on solid material paint samples with the MCA for specific cobalt 60 indicated paint samples were less than 3 pCi/g. Analysis performed on solid material samples with the MCA for specific cobalt 60 indicated that all solid material samples were less than 1 pCi/g and showed no traces of cobalt 60 with the exception of samples taken from room 001, 002, 006, 011, basement to first floor stairwell, and the High Rad Fort. The extent of the areas containing cobalt 60 was identified by taking additional solid material samples from the surrounding vicinity. These areas were remediated by the excavation of concrete to a minimum depth of 1/2" using scabbling equipment and in some situations by the removal of a wall. Following remediation, additional solid material samples taken from the remediated areas were less than 1 pCi/g for specific cobalt 60. No traces of cobalt 60 were identified.

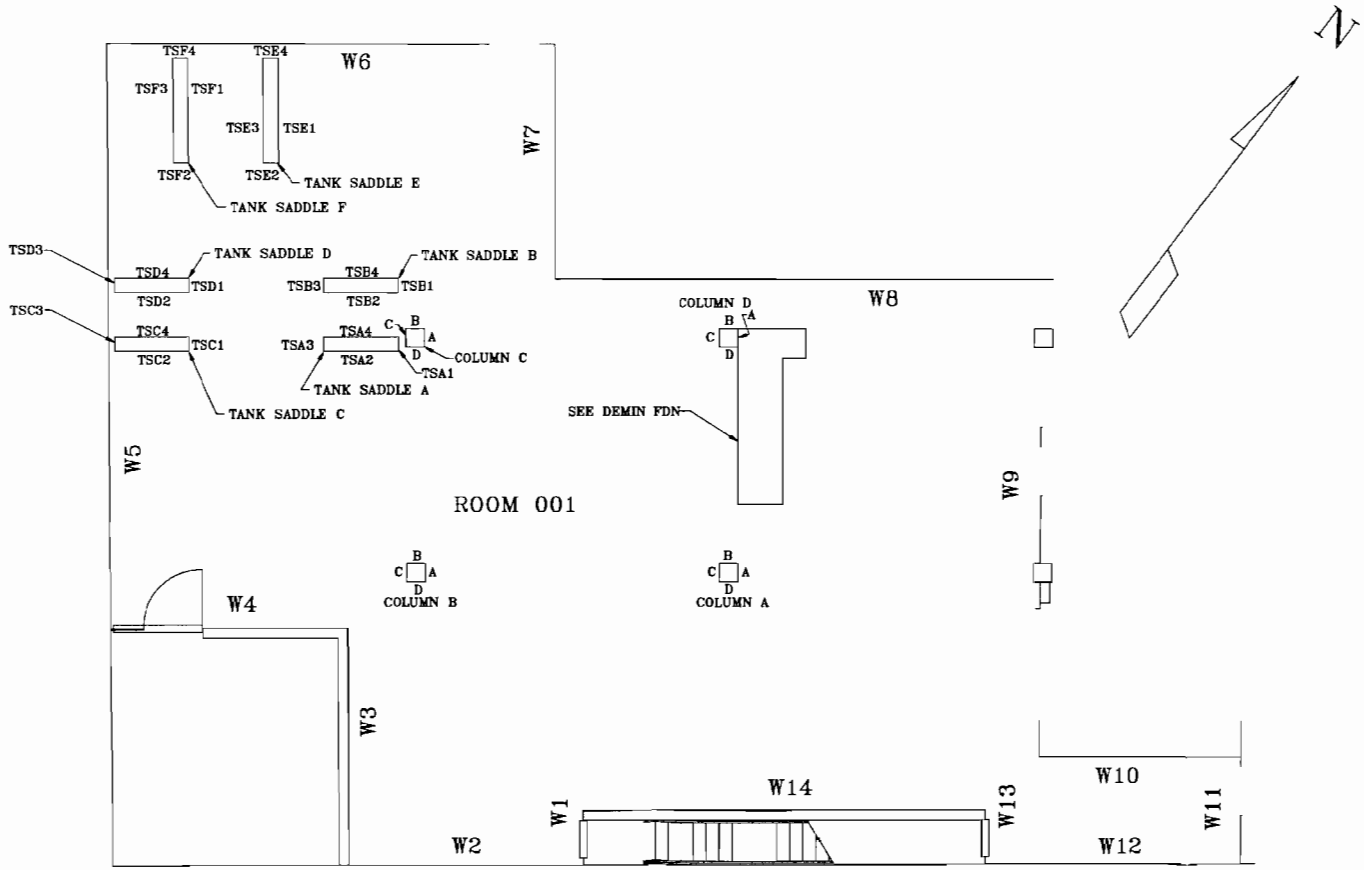
10. Bldg. 222, Basement Group 4

b. Group 4 Site Map



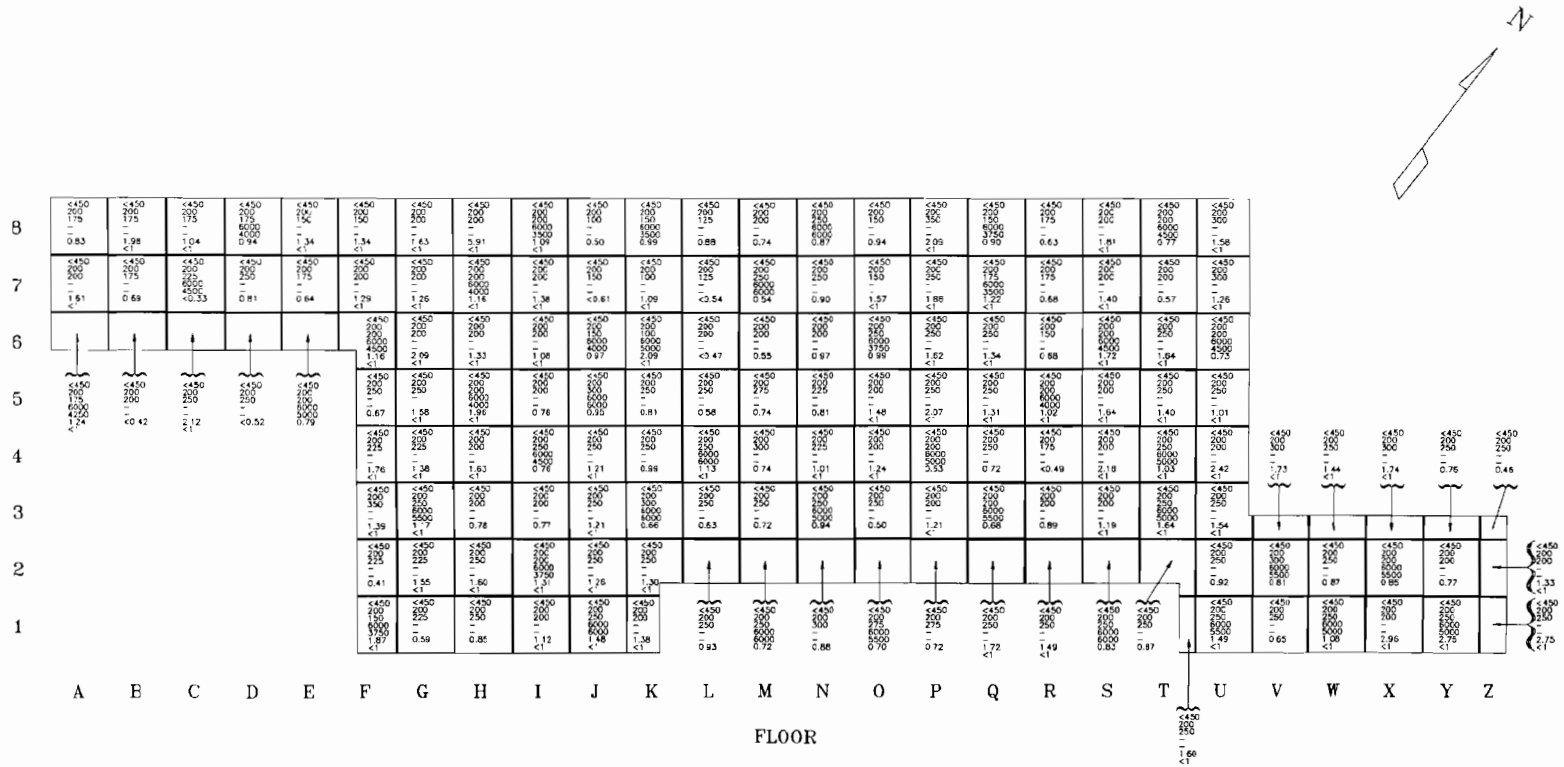
10. Bldg. 222, Basement Group 4

b. Site Map, Room 001, General Area



10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area

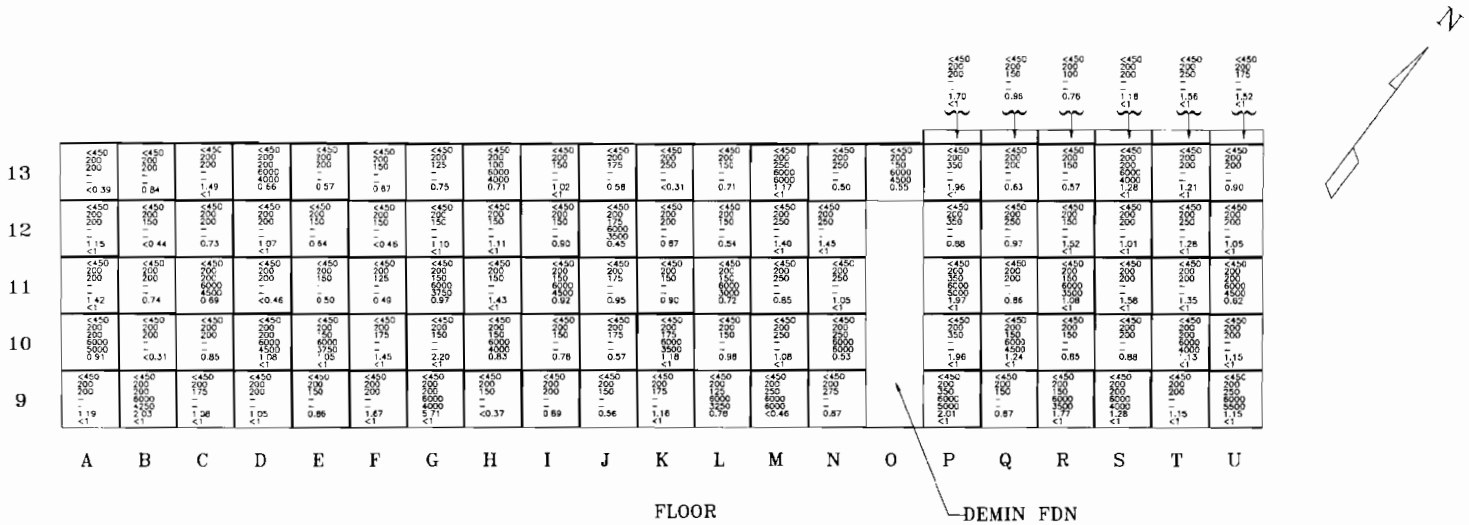


Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area

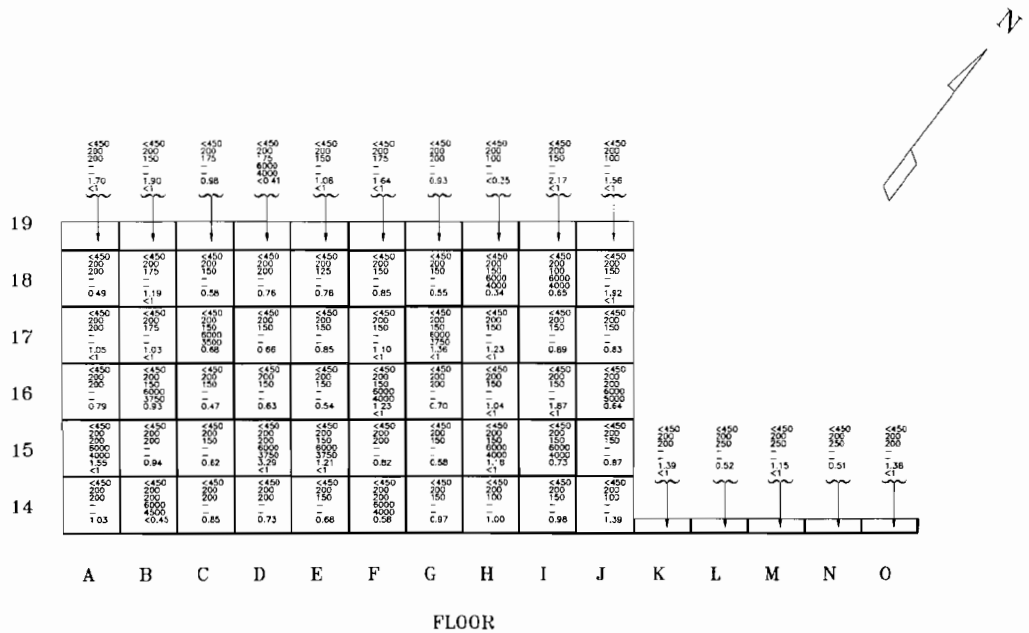


Sample Data

<450 – IM-247/PD Results [μμCv/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCv/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area

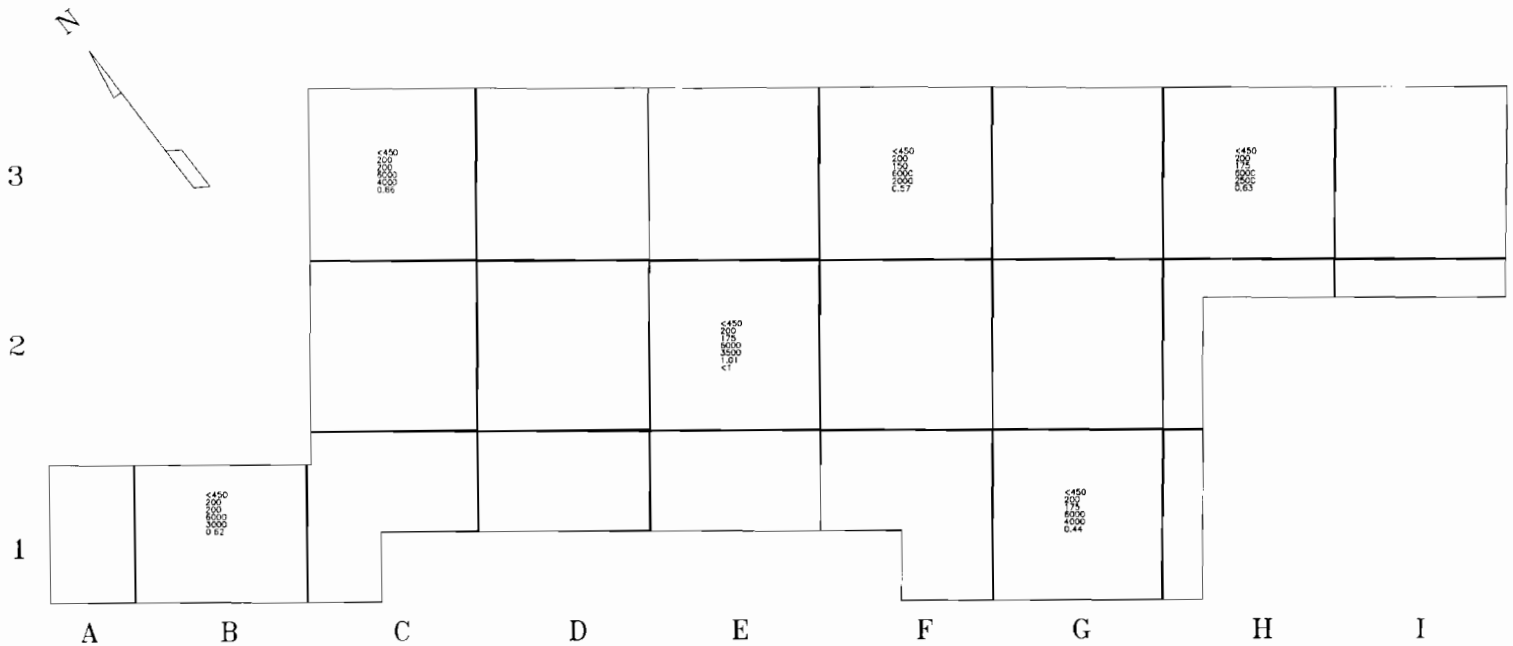


Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area

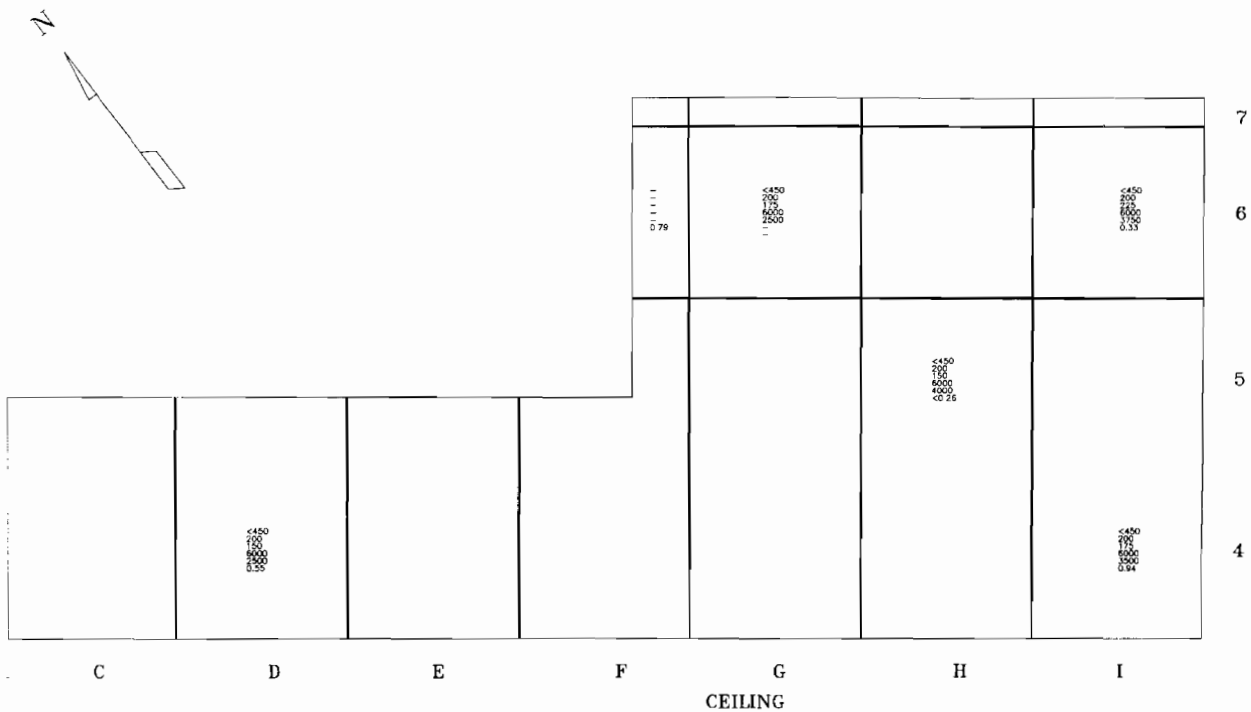


CEILING

Sample Data
<450 – IM-247/PD Results [μμCv/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCv/g]
<1 – MCA Specific Co-60 Results [pCv/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area

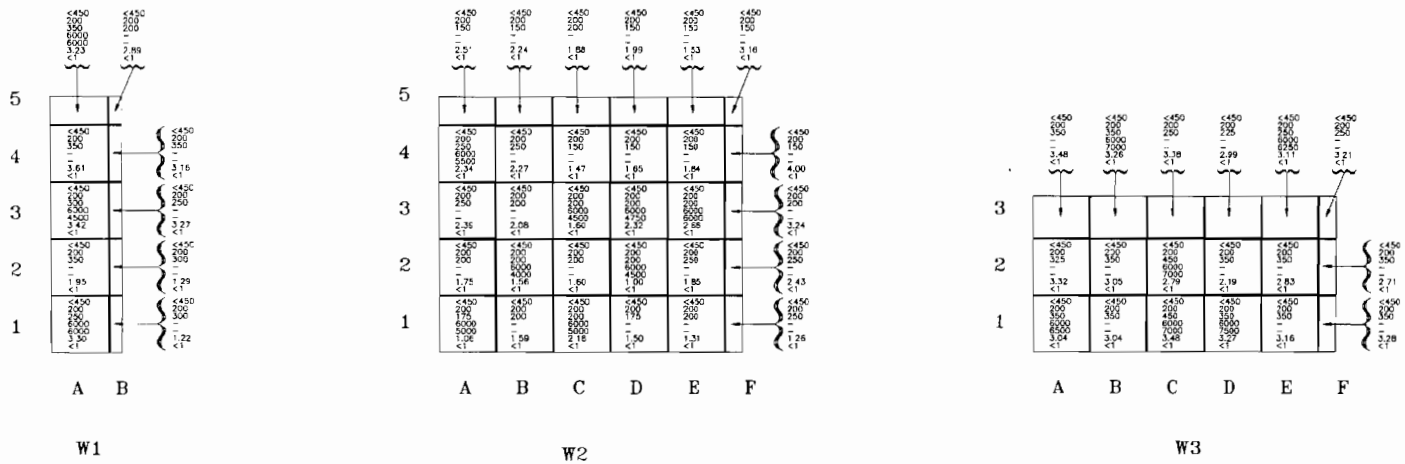


Sample Data

<450 – IM-247/PD Results [μμCv/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area

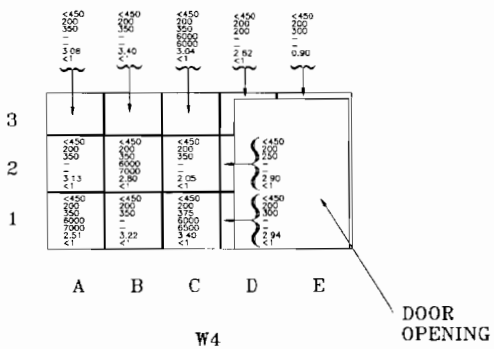


Sample Data

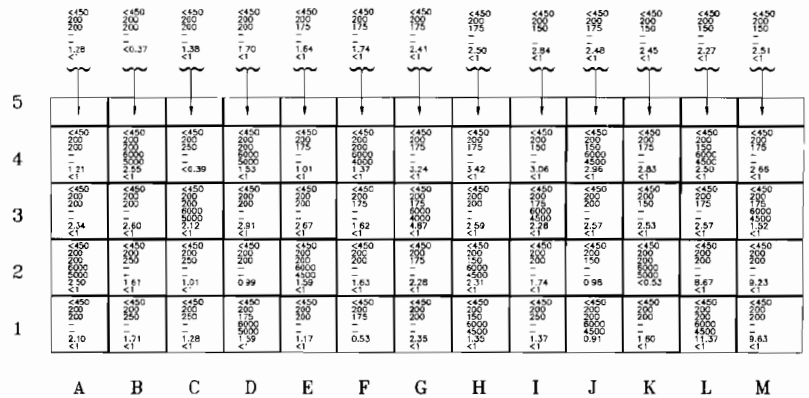
<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area



W4



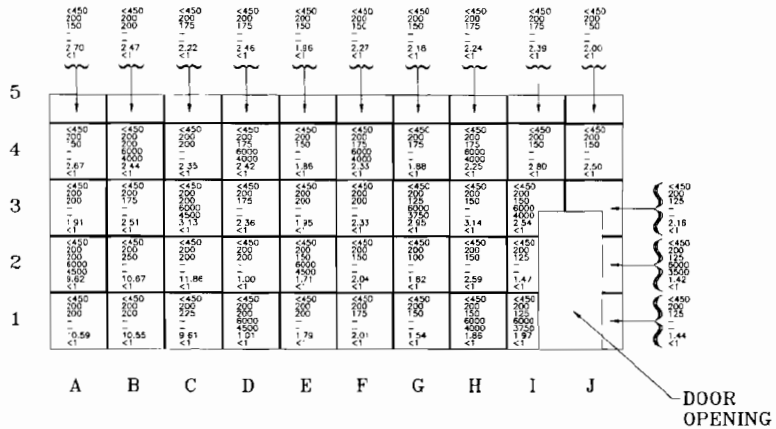
W5

Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area



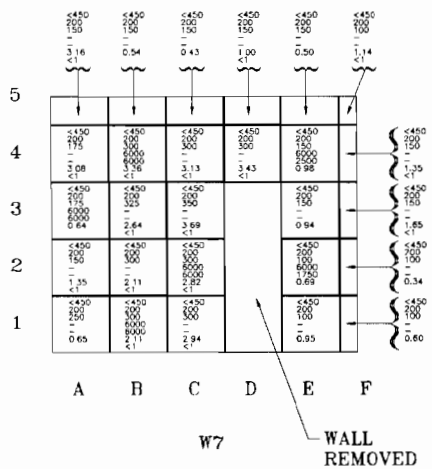
W6

Sample Data

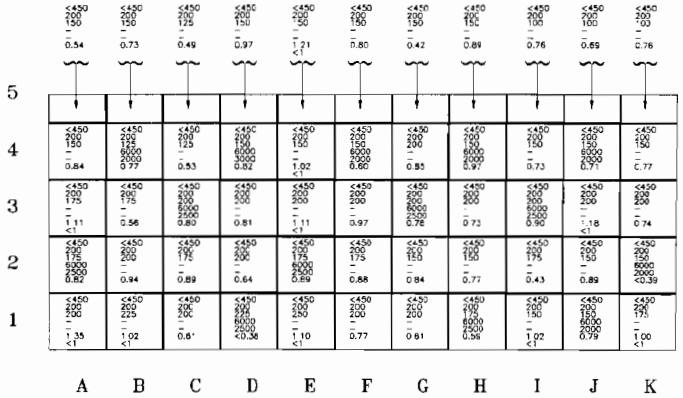
< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area



W7



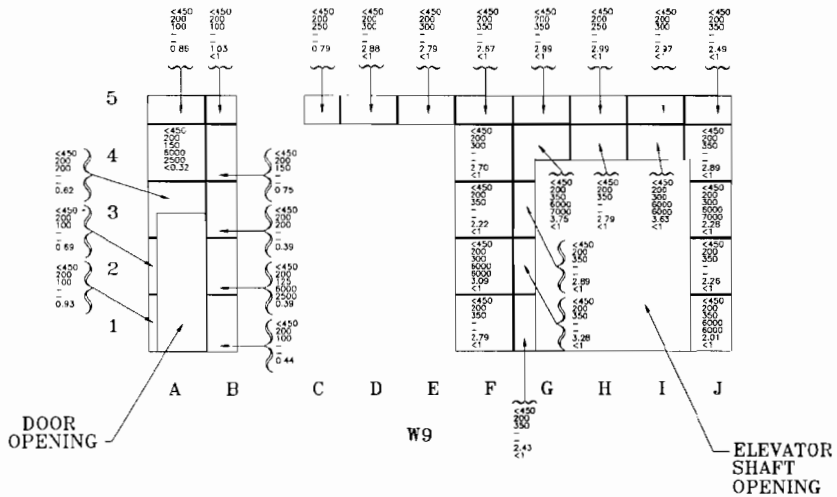
W8

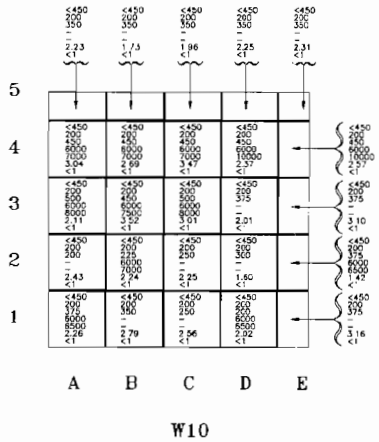
Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area



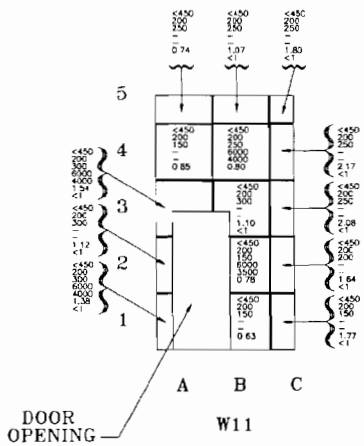


Note:
Data for Wall 9 grids C-5, D-5, and E-5 was from block below existing beam. Block was removed after sampling for safety concerns.

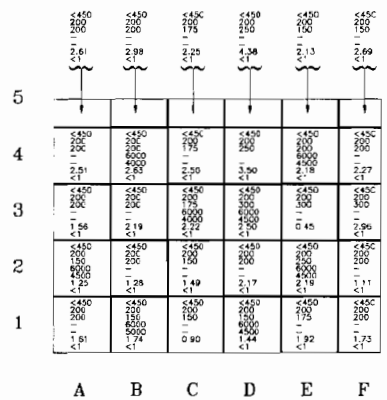
Sample Data
< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area



W11



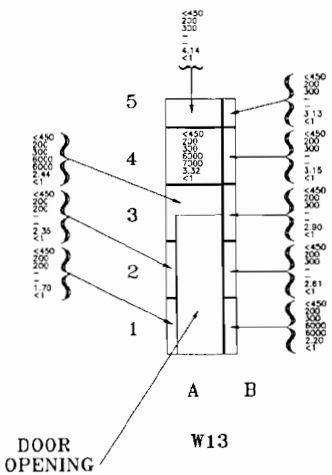
W12

Sample Data

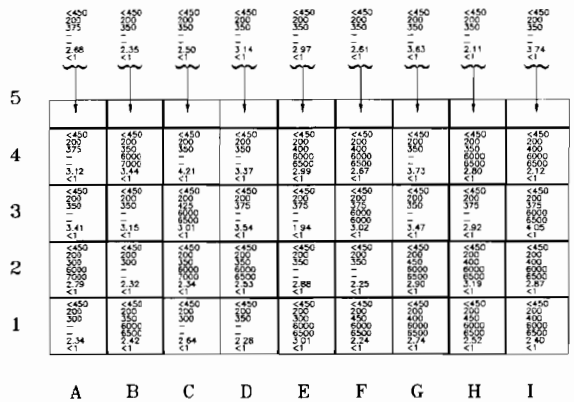
< 450 – IM-247/PD Results [μμCi/200cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area



W13



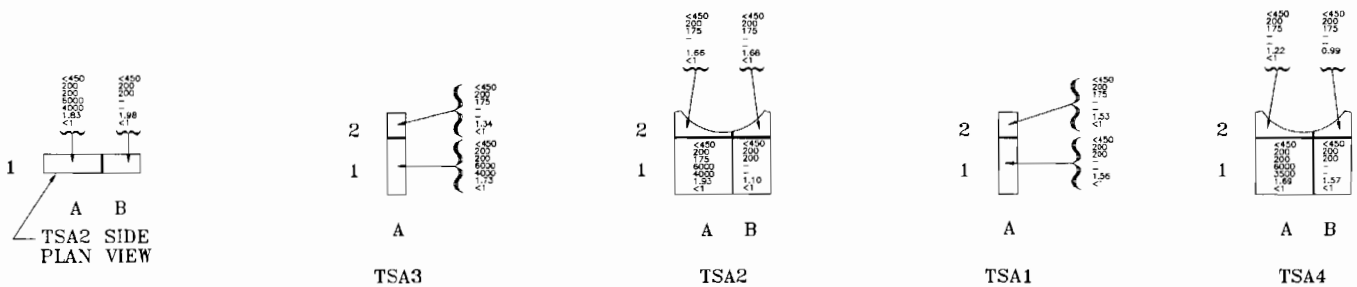
W14

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area

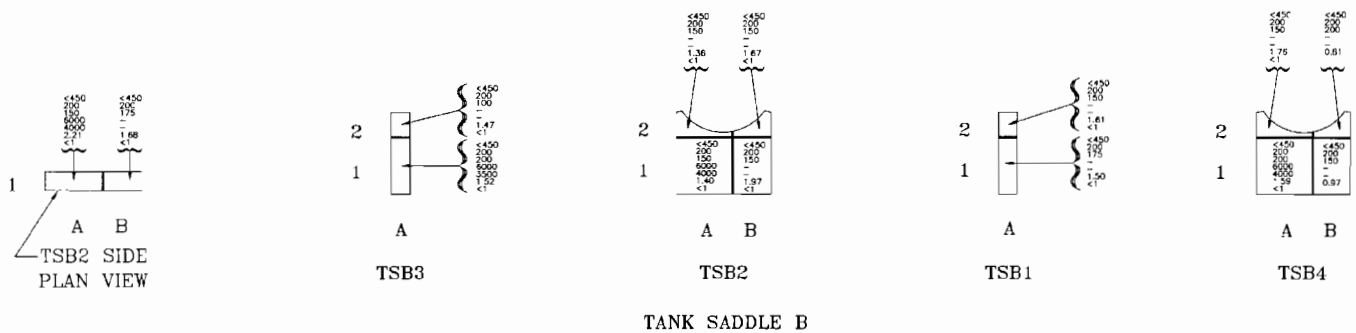


Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area

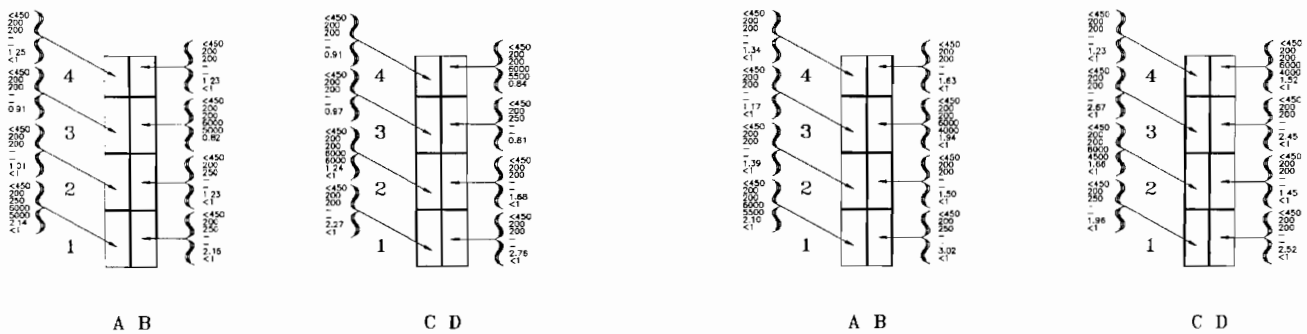


Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area

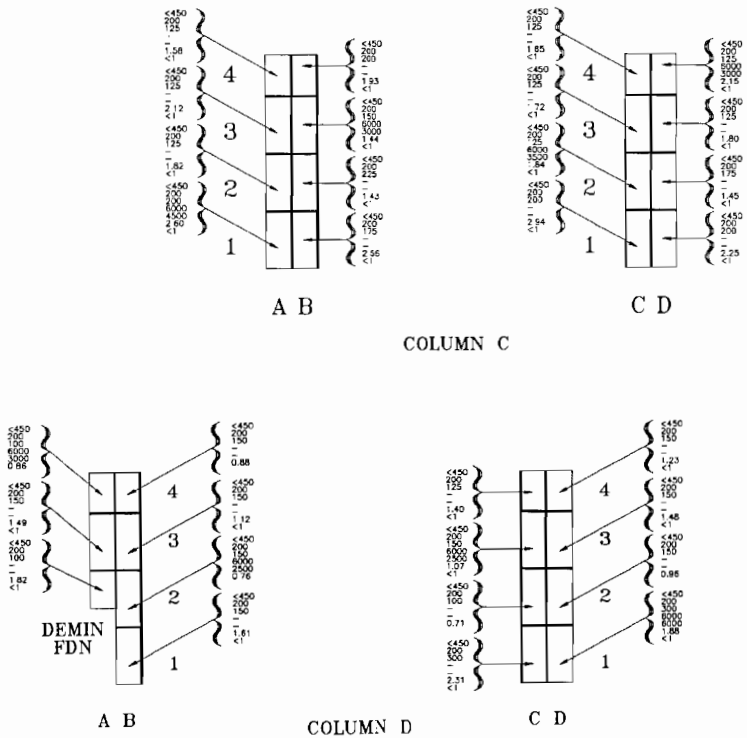


Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area

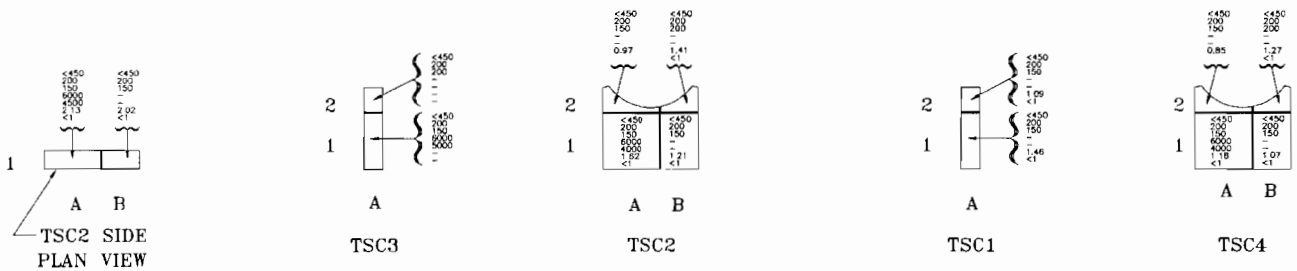


Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area



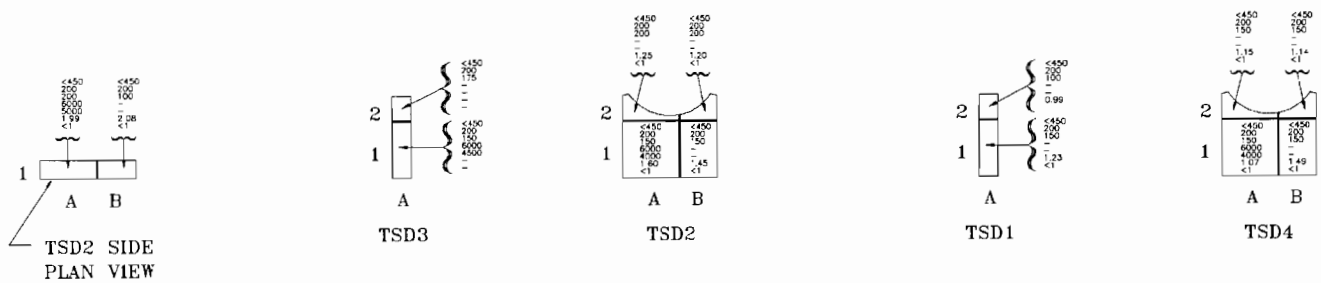
TANK SADDLE C

Sample Data

<450 – IM-247/PD Results [μCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area



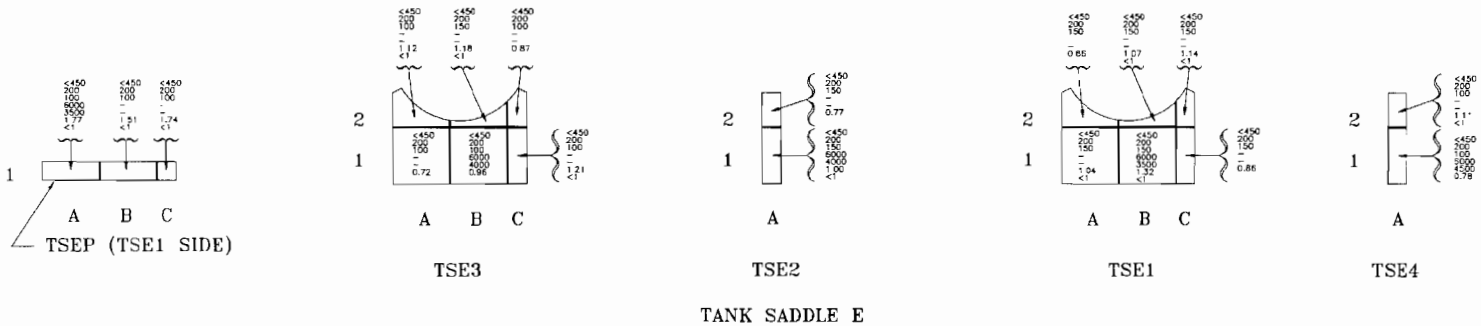
TANK SADDLE D

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area



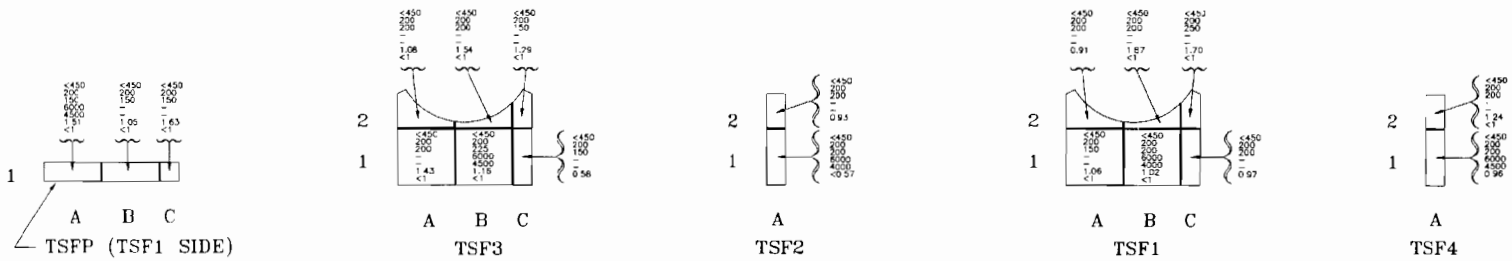
TANK SADDLE E

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area



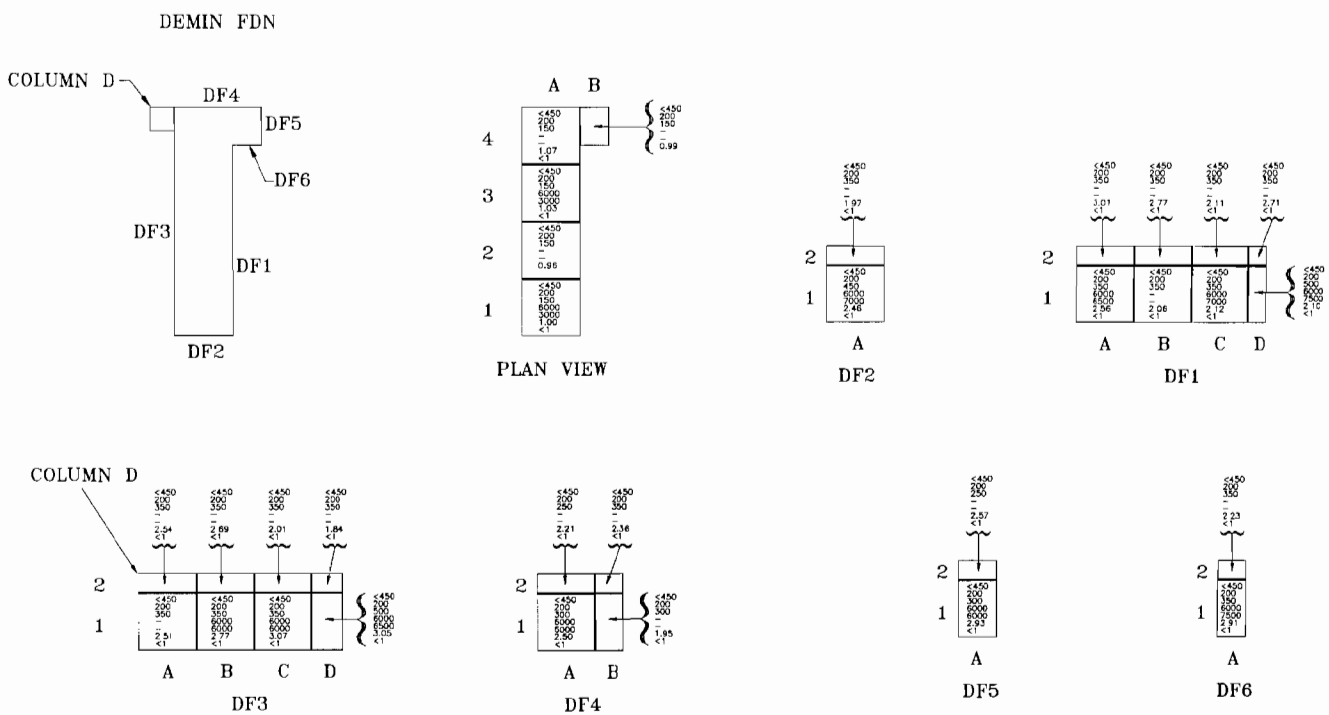
TANK SADDLE F

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
500 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 001, General Area



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

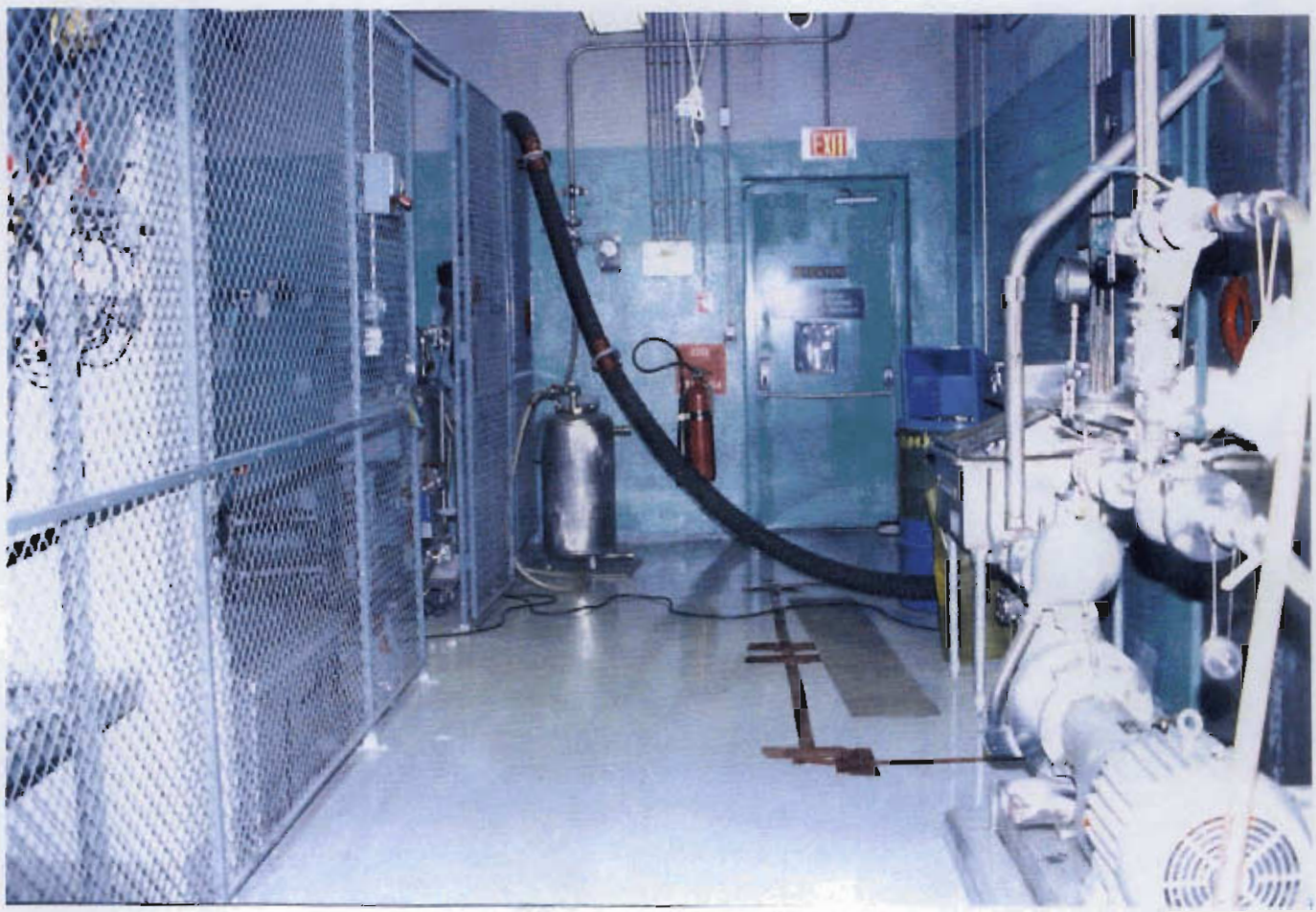
10. Bldg. 222, Basement Group 4

c. Prior to Photographs, Room 001, General Area

Viewing toward decon room vestibule

10. Bldg. 222, Basement Group 4

c. Prior to Photographs, Room 001, General Area



Viewing toward emergency exit door

10. Bldg. 222, Basement Group 4

c. After Photographs, Room 001, General Area

Viewing toward Demin FDN

10. Bldg. 222, Basement Group 4

c. After Photographs, Room 001, General Area

Viewing toward Wall-5

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 002, Effluent Tank Area

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
7	<450 200 200 6000 5000 0.61	<450 100 200 – – 0.41	<450 200 200 6000 4500 <0.40	<450 200 200 – – <0.39	<450 200 100 6000 5500 0.63	<450 200 175 – – 0.75	<450 200 150 6000 3500 <0.35	<450 200 150 – – 0.93	<450 200 175 6000 3500 0.48	<450 200 175 – – 0.47	<450 200 150 6000 3500 0.34	<450 200 175 – – 0.50	<450 200 150 6000 4500 0.37	<450 200 200 – – 0.46	<450 200 200 6000 4000 1.82 <1	<450 200 200 – – 0.79	<450 200 150 – – 0.75	<450 100 100 6000 4000 <0.42	<450 200 150 6000 4000 0.47	<450 200 150 – – 0.41	<450 200 200 6000 4000 <0.32	<450 200 200 – – <0.40
6	<450 200 150 – – 0.87	<450 200 200 – – <0.33	<450 200 200 – – <0.38	<450 200 200 – – <0.40	<450 200 200 – – 0.77	<450 200 200 – – 0.44	<450 200 200 – – 0.57	<450 200 200 – – 0.53	<450 200 150 – – 0.40	<450 200 150 – – 0.67	<450 200 150 – – 0.78	<450 200 150 – – 0.51	<450 200 150 – – <0.34	<450 200 150 – – 0.60	<450 200 150 – – <0.30	<450 200 150 – – 0.68	<450 200 200 6000 4000 0.44	<450 200 150 – – <0.40	<450 200 200 – – 0.95	<450 200 150 – – 0.51	<450 200 200 – – 0.45	<450 200 150 – – 0.37
5	<450 200 175 6000 4500 0.45	<450 200 200 – – 0.33	<450 200 200 6000 4500 0.45	<450 200 200 – – 0.62	<450 200 200 6000 4000 0.59	<450 200 200 – – 0.92	<450 200 200 6000 3500 <0.36	<450 200 200 – – <0.31	<450 200 175 6000 4000 0.98	<450 200 150 – – 0.45	<450 200 200 6000 4000 0.68	<450 200 200 – – 0.64	<450 200 200 6000 4000 0.49	<450 200 150 – – 0.51	<450 200 150 6000 4000 <0.33	<450 200 200 6300 4300 0.45	<450 200 150 – – 0.42	<450 200 150 – – 0.46	<450 200 100 6000 3500 0.64	<450 200 150 – – 0.69	<450 200 200 6000 3500 0.34	<450 200 200 – – <0.31
4	<450 200 175 – – 0.40	<450 200 200 – – 0.94	<450 200 200 – – <0.30	<450 200 200 – – <0.39	<450 200 200 – – 0.74	<450 200 200 – – 0.62	<450 200 200 – – <0.38	<450 200 200 – – 1.22 <1	<450 200 200 – – 0.69	<450 200 150 – – <0.33	<450 200 150 – – 0.57	<450 200 200 – – 1.28 <1	<450 200 200 – – <0.34	<450 200 150 – – <0.35	<450 200 150 – – 0.36	<450 200 200 – – 0.60	<450 200 150 – – 0.51	<450 200 150 6000 4000 0.60	<450 200 150 – – 0.76	<450 200 150 – – 0.53	<450 200 150 – – 0.36	<450 200 200 – – <0.35
3	<450 200 175 6000 4500 0.87	<450 200 200 – – 0.49	<450 200 200 6000 4500 <0.31	<450 200 200 – – <0.34	<450 200 200 6000 3500 0.69	<450 200 200 – – 0.57	<450 200 200 6000 3500 0.54	<450 200 150 6300 4300 <0.37	<450 200 200 6000 4500 0.79	<450 200 200 – – 0.50	<450 200 150 5000 4000 0.82	<450 200 150 – – 0.37	<450 200 200 5300 4300 0.37	<450 200 150 – – 0.64	<450 200 150 6000 3500 <0.33	<450 200 150 – – 0.43	<450 200 150 6000 3500 0.52	<450 200 150 – – 0.31	<450 200 150 6000 3000 0.64	<450 200 150 – – 0.62	<450 200 150 6000 4000 <0.32	<450 200 150 – – <0.33
2												STOOP & STAIRS		<450 200 150 – – 0.70	<450 200 150 – – 0.54	<450 200 150 6300 4300 0.50	<450 200 150 – – 0.52	<450 200 150 – – 0.89	SUMP PIT			
1														<450 200 150 – – 0.69	<450 200 150 – – 1.21 <1	<450 200 150 – – <0.35	<450 200 150 – – 0.76	<450 200 150 – – 1.23 <1				

N

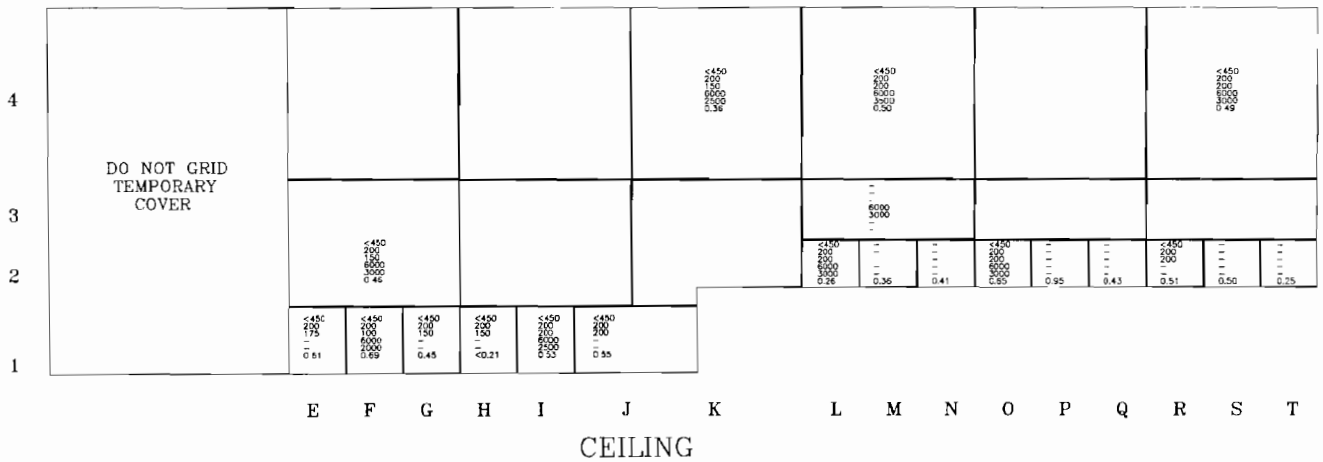
FLOOR

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 002, Effluent Tank Area

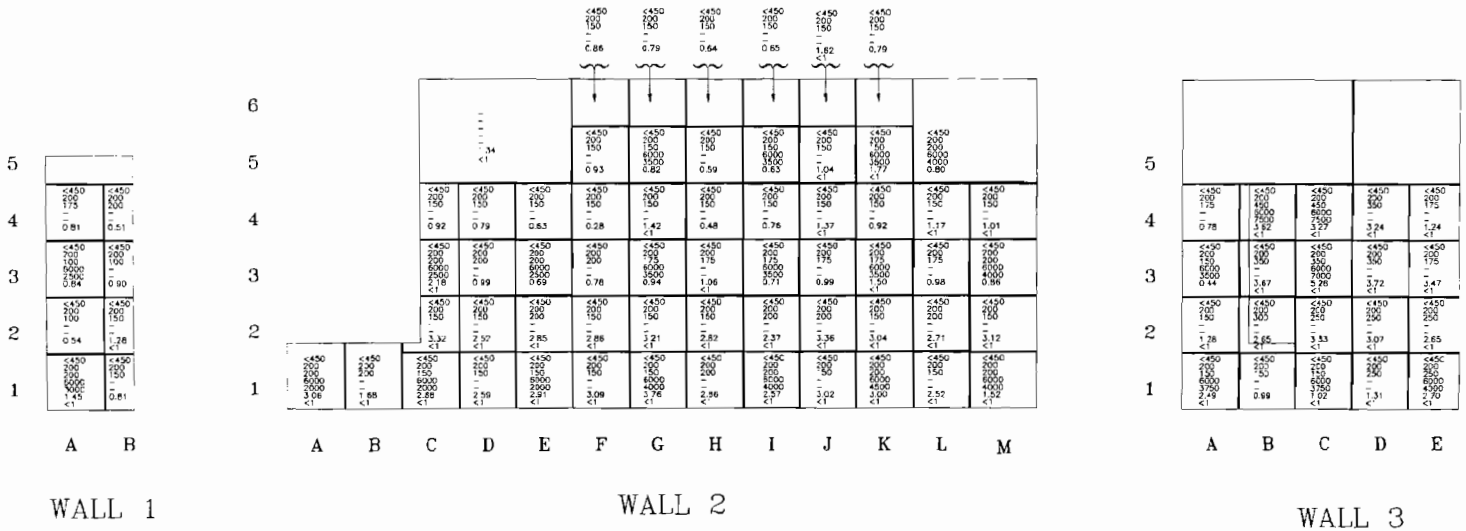


Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 002, Effluent Tank Area



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 002, Effluent Tank Area

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
5					2.65 <1			<450 200 250 – – –												<450 200 150 600C 400C 2.97 <1		
4	<450 200 175 – – 2.74 <1	<450 200 175 – – 3.60 <1	<450 200 175 – – 3.16 <1	<450 200 175 – – 2.98 <1	<450 200 175 – – 2.71 <1	<450 200 175 – – 2.97 <1	<450 200 200 6000 4500 1.91 <1	<450 200 150 – – 1.93 <1	<450 200 150 – – 1.74 <1	<450 200 150 – – 1.70 <1	<450 200 150 – – 1.33 <1	<450 200 150 – – 1.66 <1	<450 200 150 – – 3.69 <1	<450 200 150 – – 3.12 <1	<450 200 150 – – 2.76 <1	<450 200 150 – – 3.22 <1	<450 200 150 – – 2.12 <1	<450 200 150 – – 3.37 <1	<450 200 200 – – 2.85 <1	<450 200 150 – – 2.96 <1	<450 200 150 – – 3.78 <1	<450 200 150 – – 2.97 <1
3	<450 200 250 6000 4500 2.84 <1	<450 200 250 – – 3.12 <1	<450 200 250 6000 4000 3.39 <1	<450 200 200 – – 2.87 <1	<450 200 200 6000 4000 3.24 <1	<450 200 250 – – 2.03 <1	<450 200 250 6000 4000 3.27 <1	<450 200 200 – – 1.97 <1	<450 200 200 6000 3500 2.04 <1	<450 200 200 – – 2.19 <1	<450 200 200 6000 4000 1.27 <1	<450 200 200 – – 1.58 <1	<450 200 200 6000 4000 3.55 <1	<450 200 200 – – 2.33 <1	<450 200 200 6000 4000 3.22 <1	<450 200 150 – – 1.66 <1	<450 200 150 6000 4000 0.93	<450 200 150 – – 1.73 <1	<450 200 150 6000 4000 3.22 <1	<450 200 150 – – 1.80 <1	<450 200 150 6000 4000 1.96 <1	<450 200 150 – – 1.52 <1
2	<450 300 300 – – 2.31 <1	<450 200 200 – – 2.41 <1	<450 200 225 – – 2.99 <1	<450 200 200 – – 2.18 <1	<450 200 200 – – 1.81 <1	<450 200 200 6000 4000 1.63 <1	<450 200 250 – – 1.84 <1	<450 200 200 – – 1.30 <1	<450 200 200 – – 1.03 <1	<450 200 150 – – 2.07 <1	<450 200 125 – – 1.24 <1	<450 200 150 6000 3500 1.26 <1	<450 200 150 – – 1.42 <1	<450 200 150 – – 2.07 <1	<450 200 150 – – 2.20 <1	<450 200 150 – – 1.23 <1	<450 200 150 – – 0.92	<450 200 150 6000 3500 1.10 <1	<450 200 150 – – 1.26 <1	<450 200 150 – – 2.49 <1	<450 200 200 – – 1.07 <1	<450 200 150 – – 0.61
1	<450 200 250 6000 4500 2.31 <1	<450 200 225 – – 1.71 <1	<450 200 200 6000 3750 2.81 <1	<450 200 200 6000 4000 2.23 <1	<450 200 200 – – 2.85 <1	<450 200 200 – – <0.38	<450 200 200 6000 4000 1.88 <1	<450 200 250 – – 1.29 <1	<450 200 250 6000 3750 1.66 <1	<450 200 150 6000 4500 1.07 <1	<450 200 150 – – 1.35 <1	<450 200 150 – – 1.38 <1	<450 200 150 6000 4000 1.55 <1	<450 200 150 – – 1.43 <1	<450 200 150 6000 4000 2.96 <1	<450 200 150 – – 2.14 <1	<450 200 150 6000 4000 3.14 <1	<450 200 150 – – 2.37 <1	<450 200 150 6000 4000 2.66 <1	<450 200 150 – – 2.62 <1	<450 200 150 6000 4000 1.87 <1	<450 200 200 – – 0.92

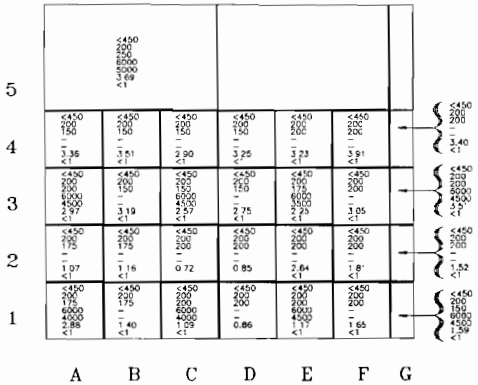
WALL 4

Sample Data

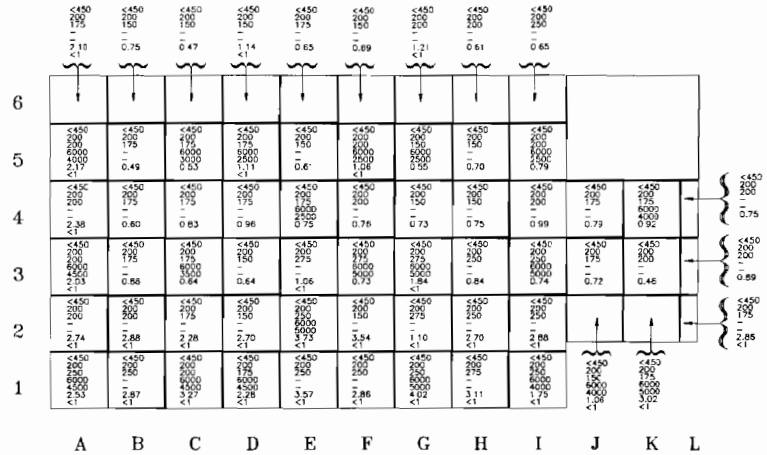
<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

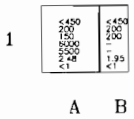
c. Grid Map, Room 002, Effluent Tank Area



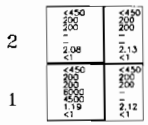
WALL 5



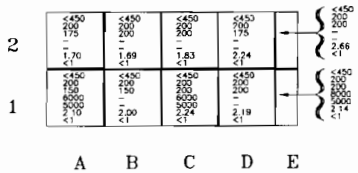
WALL 6



WALL 7



WALL 8



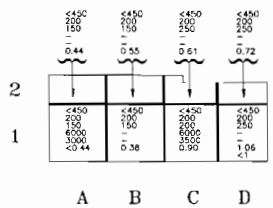
WALL 9

Sample Data

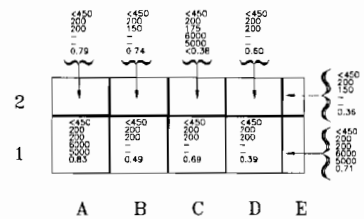
< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

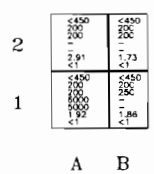
c. Grid Map, Room 002, Effluent Tank Area



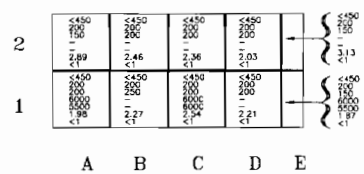
STOOP & STAIRS



PIT FLOOR



WALL 10



WALL 11

Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-¹ PHA) [bkg.]
300 – IM-253/PD (HV-¹ PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Prior to Photographs, Room 002, Effluent Tank Area

Viewing stoop & stairs

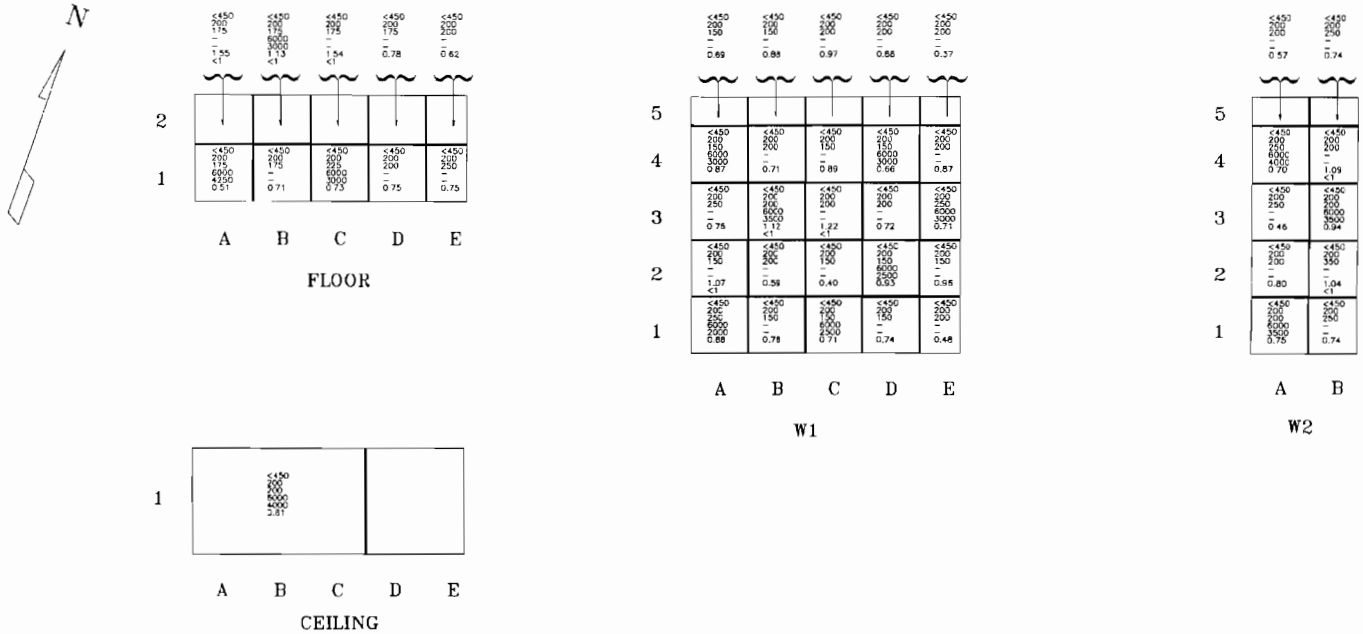
10. Bldg. 222, Basement Group 4

c. After Photographs, Room 002, Effluent Tank Area

Viewing Wall-3

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 006, Waste Packer Annex

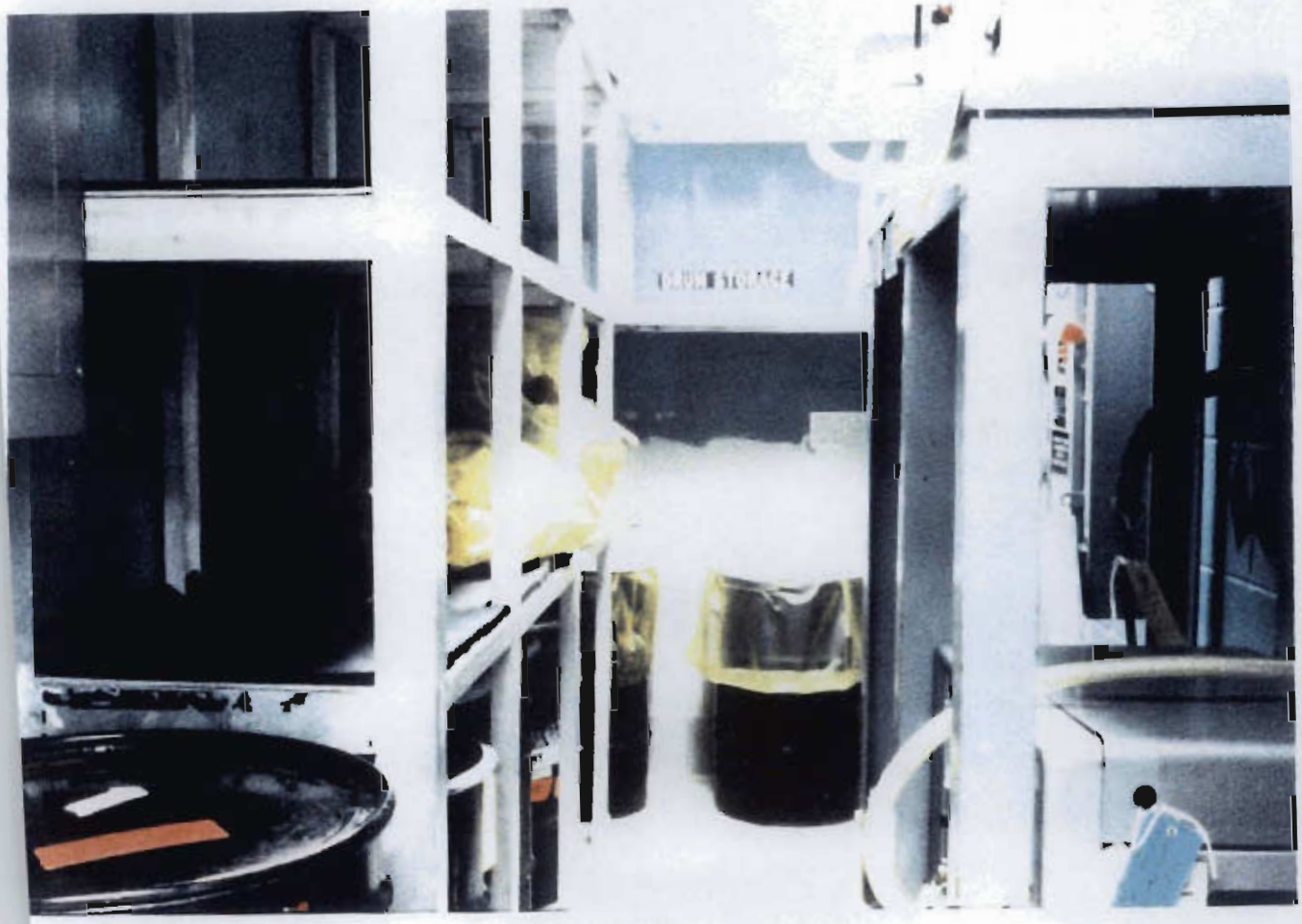


Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pC./g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Prior to Photographs, Room 006, Waste Packer Annex



Viewing Wall-2

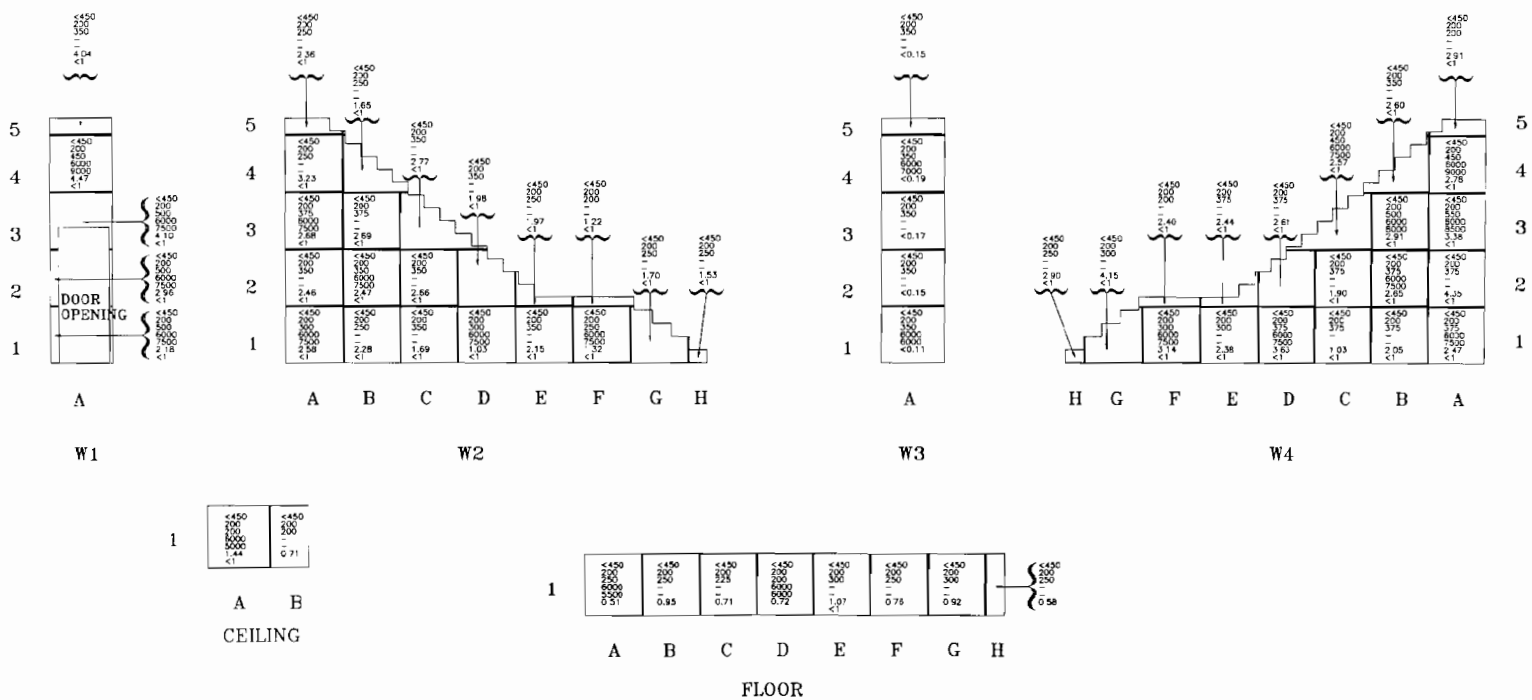
10. Bldg. 222, Basement Group 4

c. After Photographs, Room 006, Waste Packer Annex

Viewing toward Wall-2

10. Bldg. 222, Basement Group 4

c. Grid Map, Room 011, Under Stairs Storage



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Prior to Photographs, Room 011, Under Stairs Storage

Viewing into room

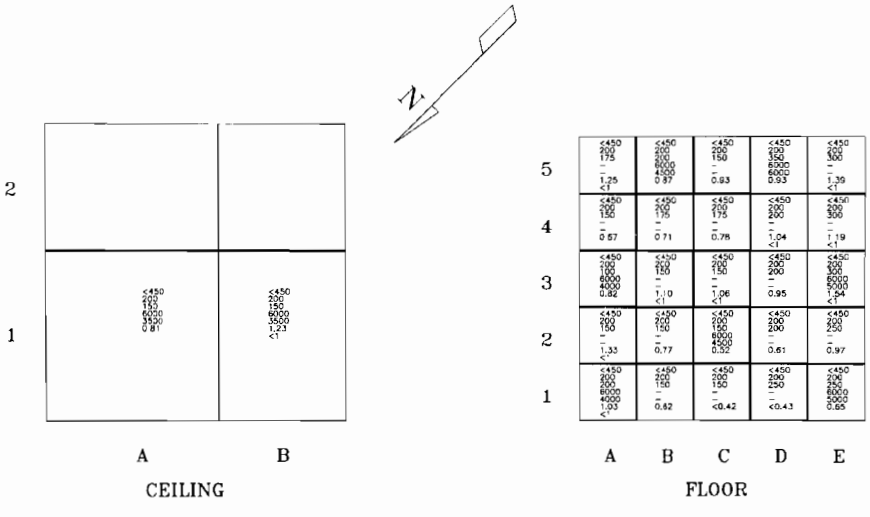
10. Bldg. 222, Basement Group 4

c. After Photographs, Room 011, Under Stairs Storage

Viewing into room

10. Bldg. 222, Basement Group 4

c. Grid Map, High Rad Fort

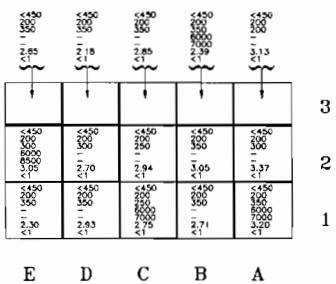


Sample Data

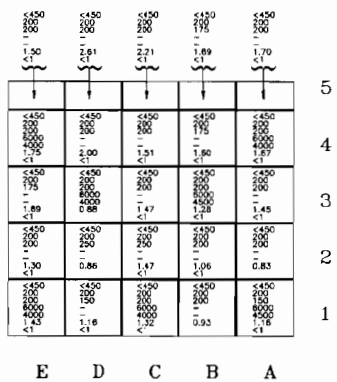
<450 – IM-247/PD Results [$\mu\mu$Ci/20cm^2]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

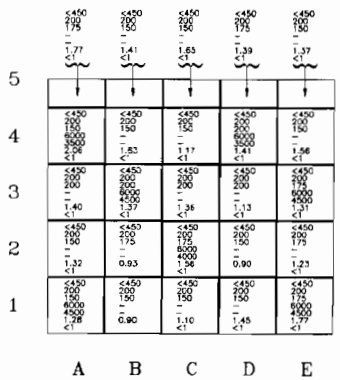
c. Grid Map, High Rad Fort



WALL 2



WALL 3



WALL 4

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. During Photograph, High Rad Fort

Viewing entrance

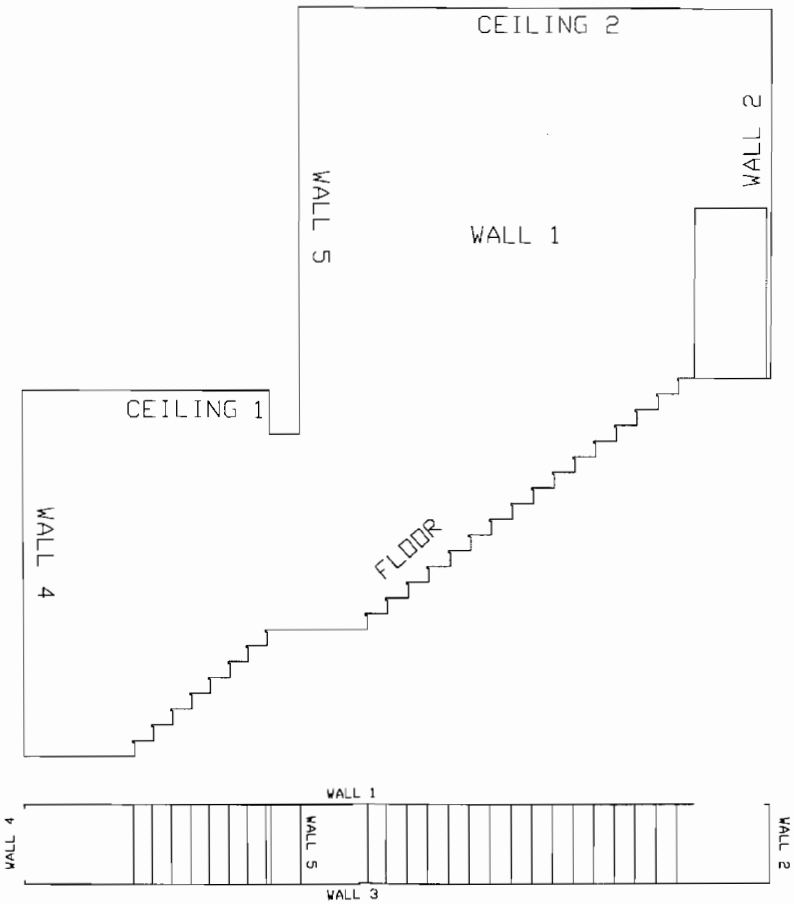
10. Bldg. 222, Basement Group 4

c. After Photographs, High Rad Fort

Viewing Wall-3

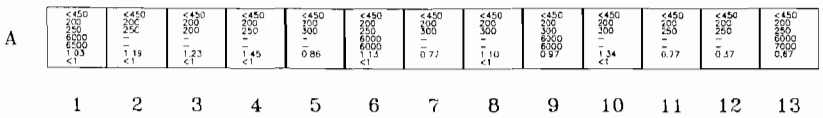
10. Bldg. 222, Basement Group 4

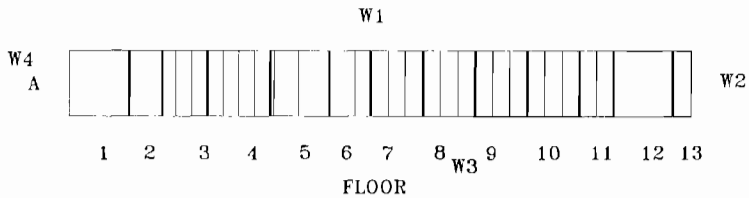
b. Site Map, Basement to First Floor Stairs

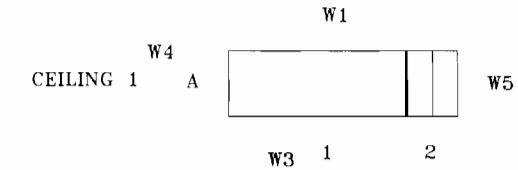


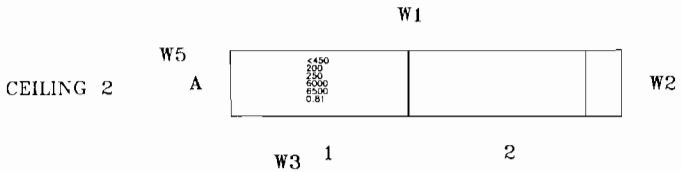
10. Bldg. 222, Basement Group 4

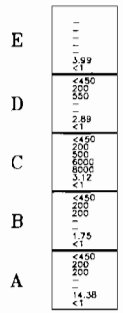
c. Grid Map, Basement to First Floor Stairs

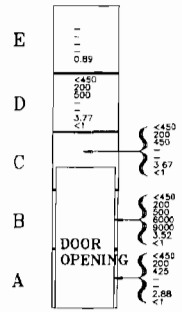


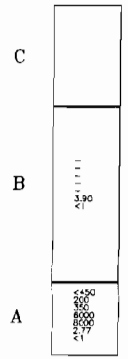










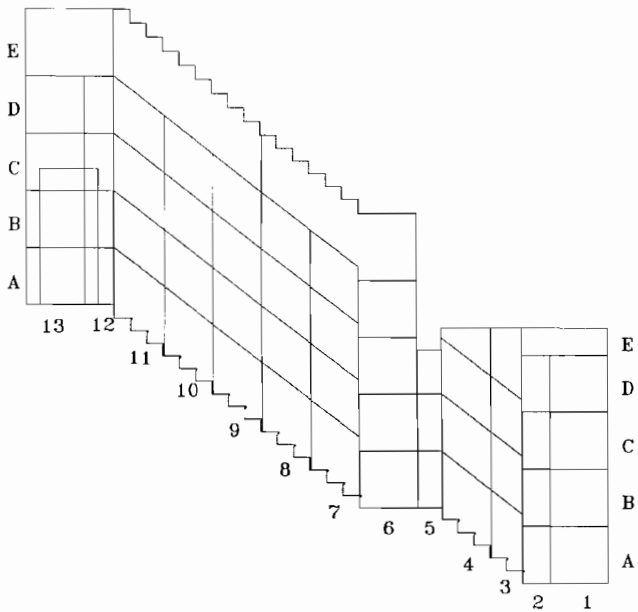


Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Grid Map, Basement to First Floor Stairs



	1	2	3	4	5	6	7	8	9	10	11	12	13
F													
E							<450 200 400 6000 12500 2.51 <1						
D	<450 200 272 – – 2.68 <1	<450 200 350 – – 1.60 <1	<450 200 300 – – 2.37 <1	<450 200 250 – – 2.08 <1		<450 200 350 – – 2.59 <1	<450 200 400 – – 2.57 <1	<450 200 450 – – 2.53 <1	<450 200 500 – – 3.06 <1	<450 200 500 6000 12500 3.22 <1	<450 250 550 – – 0.84	<450 250 500 – – 2.21 <1	<450 200 400 6000 10000 3.00 <1
C	<450 200 272 6000 6000 2.9 <1	<450 200 300 – – 1.85 <1	<450 200 250 – – 2.67 <1	<450 200 275 6000 6500 3.02 <1	<450 200 250 – – 2.98 <1	<450 200 300 6000 6500 2.75 <1	<450 200 350 6000 6000 2.92 <1	<450 200 450 – – 3.20 <1	<450 200 450 – – 2.79 <1	<450 200 500 – – 2.90 <1	<450 200 550 – – 2.83 <1	<450 200 350 – – 3.26 <1	<450 200 350 – – 4.11 <1
B	<450 200 300 – – 2.47 <1	<450 200 250 – – 2.09 <1	<450 200 300 – – 3.19 <1	<450 200 300 – – 3.13 <1	<450 200 250 – – 2.99 <1	<450 200 300 – – 2.56 <1	<450 200 275 – – 2.19 <1	<450 200 300 – – 2.61 <1	<450 200 350 6000 7000 2.46 <1	<450 200 450 – – 2.30 <1	<450 200 450 – – 2.95 <1	<450 200 450 – – 3.13 <1	<450 200 300 – – 1.11 <1
A	<450 200 400 6000 7000 1.72 <1	<450 200 300 – – 1.60 <1	<450 200 300 – – 1.57 <1	<450 200 275 7300 6500 1.77 <1	<450 200 250 – – 1.04 <1	<450 200 275 6000 6000 1.47 <1	<450 200 300 – – 2.54 <1	<450 200 275 5000 7300 1.36 <1	<450 200 300 – – 2.71 <1	<450 200 450 – – 1.85 <1	<450 250 450 6000 8000 2.29 <1	<450 250 450 6000 8000 1.90 <1	<450 200 300 – – 1.27 <1

GRID DOES NOT EXIST

WALL 1

Sample Data

<450 – IM-247/PD Results [μCI/29cm^2]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

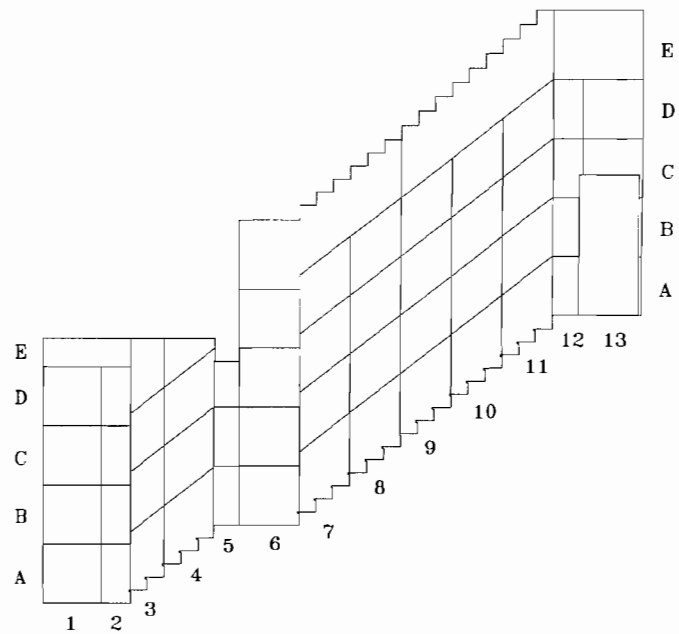
10. Bldg. 222, Basement Group 4

c. Grid Map, Basement to First Floor Stairs

	1	2	3	4	5	6	7	8	9	10	11	12	13
F				<450 200 400 8000 8500 3.04 <1						<450 200 400 6000 8500 3.44 <1			
E													
D	<450 200 450 – 3.19 <1	<450 200 425 – 3.54 <1	<450 200 500 – 3.26 <1	<450 200 450 – 3.07 <1		<450 200 350 – 2.65 <1	<450 200 350 – 3.48 <1	<450 200 450 – 3.22 <1	<450 200 400 – 2.79 <1	<450 200 500 6000 9500 2.46 <1	<450 200 450 – 2.73 <1	<450 200 450 – 3.72 <1	<450 200 500 6000 8500 3.24 <1
C	<450 200 450 6000 7500 3.76 <1	<450 200 475 – 3.65 <1	<450 200 450 – 3.87 <1	<450 200 425 6000 8500 3.99 <1	<450 200 425 – 3.27 <1	<450 200 450 6000 8500 3.48 <1	<450 200 350 6000 7500 0.34	<450 200 350 – 3.39 <1	<450 200 350 – 3.53 <1	<450 200 500 – 2.87 <1	<450 200 450 – 3.04 <1	<450 200 400 – 3.32 <1	<450 200 400 – 2.90 <1
B	<450 200 450 – 2.23 <1	<450 200 500 – 2.63 <1	<450 200 500 – 3.01 <1	<450 200 500 – 3.10 <1	<450 200 450 – 3.18 <1	<450 200 450 – 3.07 <1	<450 200 300 – 3.36 <1	<450 200 300 – 3.14 <1	<450 200 300 6000 8000 1.44 <1	<450 200 450 – 3.44 <1	<450 200 450 – 2.81 <1	<450 200 450 – 2.83 <1	<450 200 200 – – –
A	<450 200 450 6000 7000 2.16 <1	<450 200 450 – 2.95 <1	<450 200 450 – 5.37 <1	<450 200 400 6000 8500 2.74 <1	<450 200 450 – 2.00 <1	<450 400 350 6000 7500 2.73 <1	<450 200 300 – 2.81 <1	<450 200 300 6000 7000 2.40 <1	<450 200 300 – 2.99 <1	<450 200 375 – 2.38 <1	<450 200 450 6000 8000 2.51 <1	<450 200 450 6000 8000 3.31 <1	<450 200 250 – 1.59

GRID DOES NOT EXIST

WALL 3



Note:
Solid samples taken from grid W3-A13 consist of paint and has a limit of 3 pCi/g.

Sample Data
<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

10. Bldg. 222, Basement Group 4

c. Prior to Photographs, Basement to First Floor Stairs

Looking down stairwell

10. Bldg. 222, Basement Group 4

c. After Photographs, Basement to First Floor Stairs

Looking down stairwell

11. Bldg. 222, Basement Group 5

a. Report

(1) Description:

The basement Group 5 areas involved rooms 004, 005 and the elevator shaft. These areas are of concrete construction.

(2) Discussion:

The Group 5 areas were divided into 500 grids. The floor grids were divided into 3' by 3' grids. The walls and ceilings were divided into grids 3' by 3', up to 12' high, then 6' by 6' grids above 12'. The elevator shaft was divided into 9' by 9' grids above 12' on the walls and ceiling due to a lower radiological potential. Each grid was identified with its unique designation.

One hundred percent of all 3' by 3' grids were surveyed using the IM-247/PD and the IM-253/PD (HV-1 PHA). A minimum of 25 percent of all 3' by 3' grids were surveyed using the IM-253/PD (HV-2 GROSS). A minimum of 25 percent of the ceiling 6' by 6' grids and 50 percent of the wall 6' by 6' grids were surveyed using the IM-247/PD and IM-253/PD (HV-1 PHA and HV-2 GROSS). One solid material sample was taken from within each 3' by 3' grid, a minimum of 50 percent of 6' by 6' wall grids, and a minimum of 25 percent of 6' by 6' ceiling grids. Additionally, solid material samples were taken from selected structural joints and crevices. Results from these samples were incorporated into the report by utilizing the higher of the normal grid sample or the joint/crevice sample result.

The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the Group 5 floors, walls, and ceiling were 40, 200, and 6000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 1720 and Building 1635.

A total of 496 solid material samples were taken. Each solid sample was removed from the grid location indicating the area of highest potential. The following naturally occurring radionuclides were typical isotopes identified during analysis of solid material samples: lead 212, lead 214, thallium 208, and potassium 40.

(3) Summary:

Surveys performed with the IM-247/PD did not detect areas greater than 450 $\mu\mu Ci/20cm^2$.

Surveys performed with the IM-253/PD (HV-1 PHA) detected 65 areas greater than or equal to twice background.

11. Bldg. 222, Basement Group 5

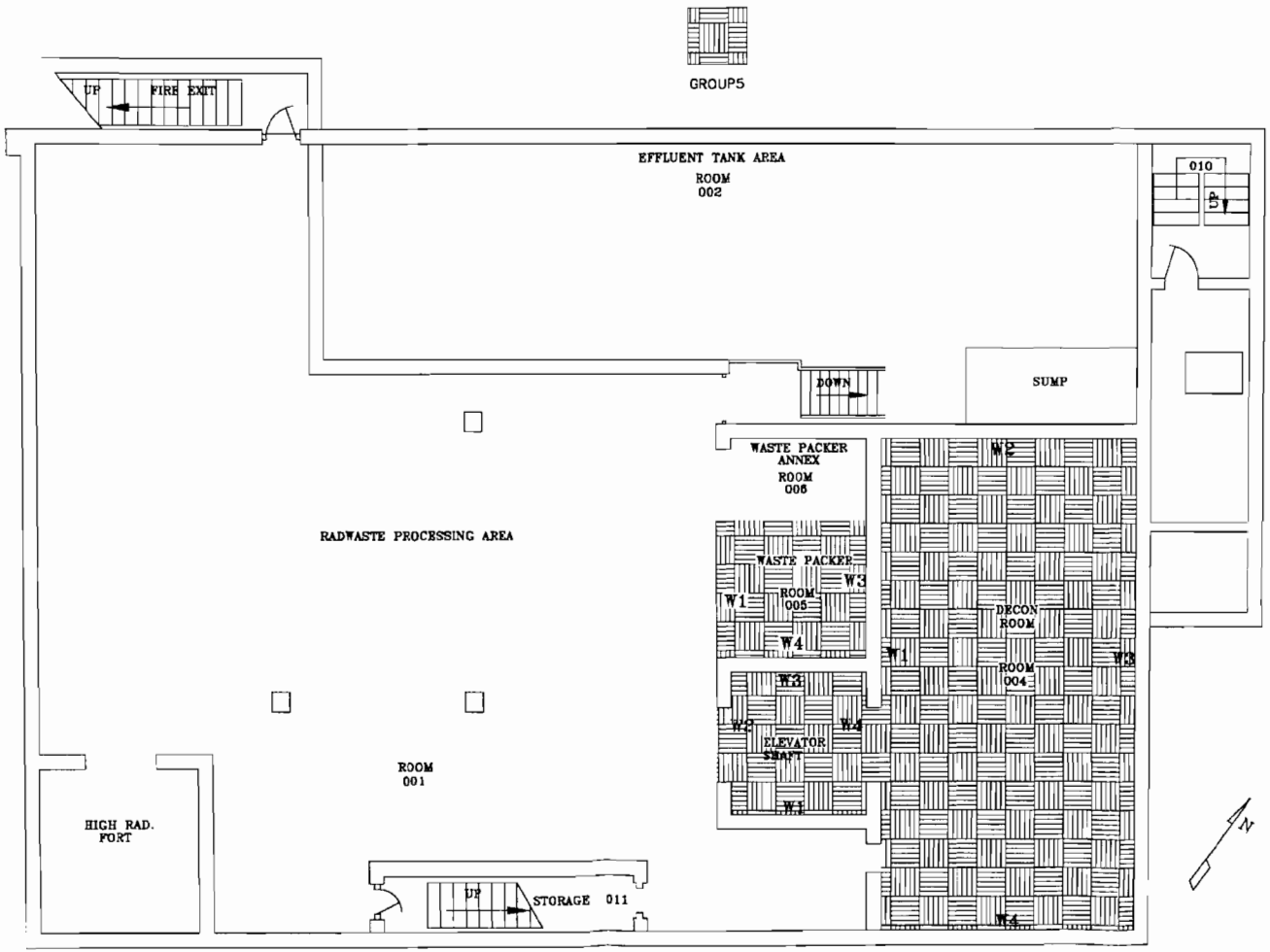
Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) detected gross gamma equivalent cobalt 60 levels ranging from a low of 0.29 pCi/g to a high of 15.31 pCi/g.

Analysis performed on solid material samples with the MCA for specific cobalt 60 indicated that all solid material samples were less than 1 pCi/g and showed no traces of cobalt 60 with the exception of samples from room 004, 005, and the Elevator Shaft. The extent of the areas containing cobalt 60 was identified by taking additional solid material samples from the surrounding vicinity. These areas were remediated by the excavation of concrete to a minimum depth of 1/2" using scabbling equipment and in some situations by the removal of a wall. Following remediation, additional solid material samples taken from the remediated areas were less than 1 pCi/g for specific cobalt 60. No traces of cobalt 60 were identified.

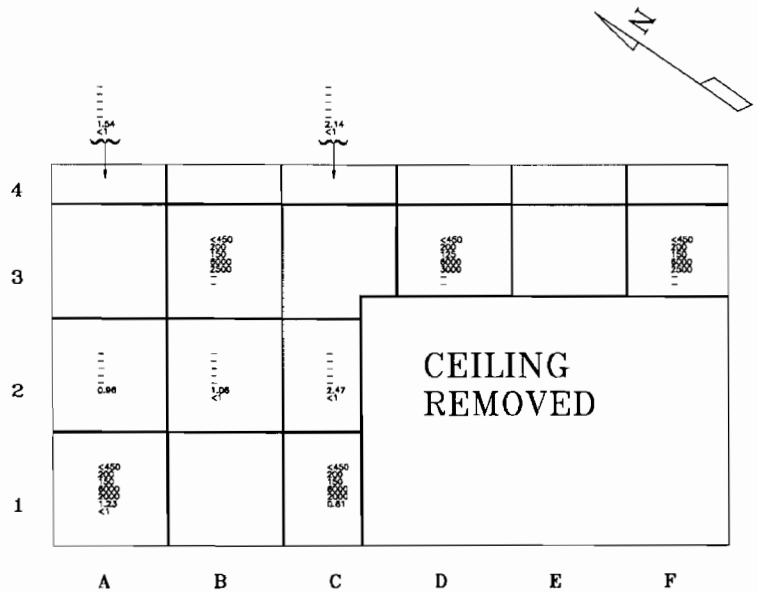
11. Bldg. 222, Basement Group 5

b. Group 5 Site Map

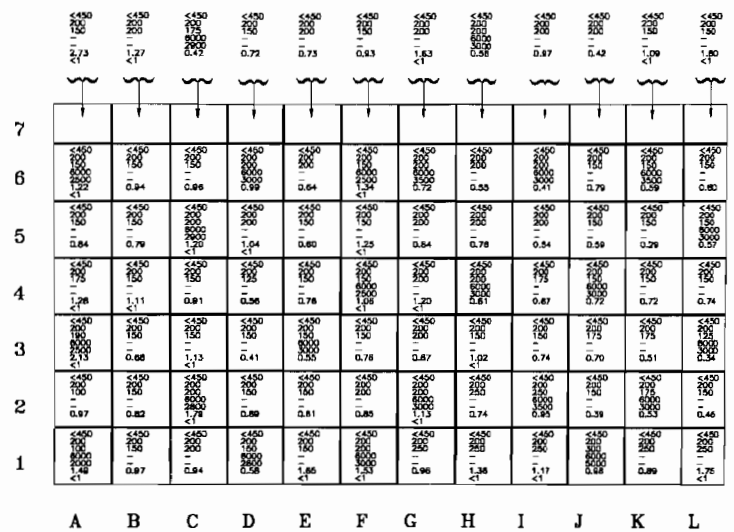


11. Bldg. 222, Basement Group 5

c. Grid Map, Room 004, Decon Room



CEILING



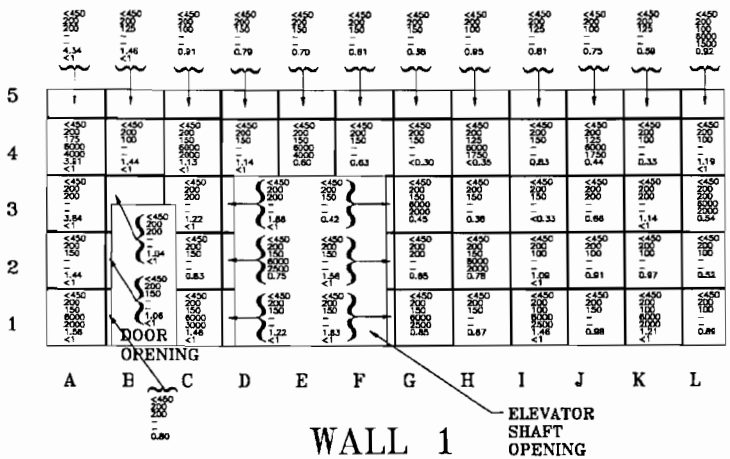
FLOOR

Sample Data

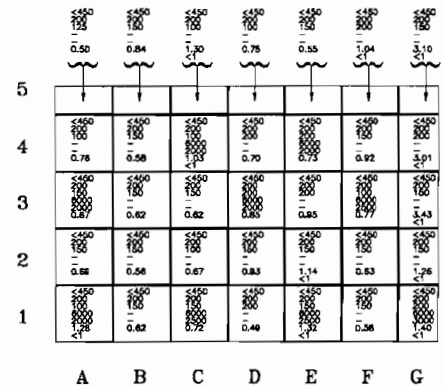
<450 -- IM-247/PD Results [μCi/20cm²]
200 -- IM-253/PD (HV-1 PHA) [bkg.]
300 -- IM-253/PD (HV-1 PHA) [cpm]
7000 -- IM-253/PD (HV-2 GROSS) [bkg.]
7300 -- IM-253/PD (HV-2 GROSS) [cpm]
1.82 -- MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 -- MCA Specific Co-60 Results [pCi/g]

11. Bldg. 222, Basement Group 5

c. Grid Map, Room 004, Decon Room



WALL 1



WALL 2

Sample Data

< 450 – IM-247/PD Results [μC/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<' – MCA Specific Co-60 Results [pCi/g]

11. Bldg. 222, Basement Group 5

c. Grid Map, Room 004, Decon Room

	A	B	C	D	E	F	G	H	I	J	K	L
5	<450 200 200 – 1.50 <1	<450 200 175 – 4.13 <1	<450 200 200 – 2.95 <1	<450 200 200 – 2.89 <1	<450 200 200 – 2.79 <1	<450 200 125 – 0.95 –	<450 200 122 – 0.59 –	<450 200 150 – 0.85 –	<450 200 150 – 1.11 <1	<450 200 150 – 1.85 <1	<450 200 200 – 2.21 <1	<450 200 150 – 1.82 <1
4	<450 200 225 – 0.98 <1	<450 200 200 – 0.92 –	<450 200 200 6000 4000 3.25 <1	<450 200 200 – 3.21 <1	<450 200 200 6000 4000 2.64 <1	<450 200 150 – 0.92 –	<450 200 150 6000 4000 1.74 <1	<450 200 150 – 1.03 <1	<450 200 150 6000 4000 1.19 <1	<450 200 150 – 1.27 <1	<450 200 200 – 2.22 <1	<450 200 150 6000 4000 2.70 <1
3	<450 200 150 6000 4000 1.24 <1	<450 200 150 – 3.95 <1	<450 200 200 – 3.28 <1	<450 200 200 6000 4000 3.49 <1	<450 200 200 – 1.49 <1	<450 200 175 6000 4000 1.90 <1	<450 200 150 – 1.09 <1	<450 200 150 – 0.81 –	<450 200 150 – 0.81 –	<450 200 150 6000 4000 1.48 <1	<450 200 150 – 1.33 <1	<450 200 150 – 2.85 <1
2	<450 200 200 – 1.89 <1	<450 200 150 – 1.78 <1	<450 200 200 – 1.72 <1	<450 200 150 – 1.96 <1	<450 200 200 6000 4000 1.27 <1	<450 200 150 – 0.86 –	<450 200 200 – 1.28 <1	<450 200 150 – 0.99 –	<450 200 150 – 0.75 –	<450 200 150 – 1.57 <1	<450 200 150 – 1.03 <1	<450 200 150 – 1.82 <1
1	<450 200 150 6000 4000 1.38 <1	<450 200 150 – 1.18 <1	<450 200 150 6000 4000 1.83 <1	<450 200 150 – 1.28 <1	<450 200 150 – 1.33 <1	<450 200 150 – 0.74 –	<450 200 150 6000 4000 1.07 <1	<450 200 150 – 0.84 –	<450 200 150 6000 4000 1.43 <1	<450 200 150 – 1.37 <1	<450 200 150 6000 4000 1.56 <1	<450 200 150 – 1.76 <1

WALL 3

	A	B	C	D	E	F	G
5	<450 200 200 – 2.97 <1	<450 200 175 – 3.15 <1	<450 200 175 – 13.31 <1	<450 200 150 – 1.38 <1	<450 200 150 – 3.45 <1	<450 200 125 – 3.01 <1	<450 200 175 – 3.13 <1
4	<450 200 200 6000 4000 2.36 <1	<450 200 200 – 2.24 <1	<450 200 150 – 3.22 <1	<450 200 150 6000 4000 3.33 <1	<450 200 150 6000 4000 3.74 <1	<450 200 175 – 1.43 <1	<450 200 200 6000 4000 2.49 <1
3	<450 200 150 – 2.76 <1	<450 200 150 – 3.43 <1	<450 200 150 – 3.21 <1	<450 200 150 – 2.40 <1	<450 200 150 – 3.02 <1	<450 200 150 – 3.01 <1	<450 200 150 – 2.66 <1
2	<450 200 200 – 2.10 <1	<450 200 150 – 1.92 <1	<450 200 150 6000 0.99 –	<450 200 200 – <0.30 –	<450 200 150 – 1.23 <1	<450 200 150 6000 1000 1.83 <1	<450 200 150 – 1.59 <1
1	<450 200 150 6000 4000 1.50 <1	<450 200 150 – 1.21 <1	<450 200 150 – 1.14 <1	<450 200 150 6000 4000 1.22 <1	<450 200 150 6000 4000 1.39 <1	<450 200 150 – 1.09 <1	<450 200 150 – 1.87 <1

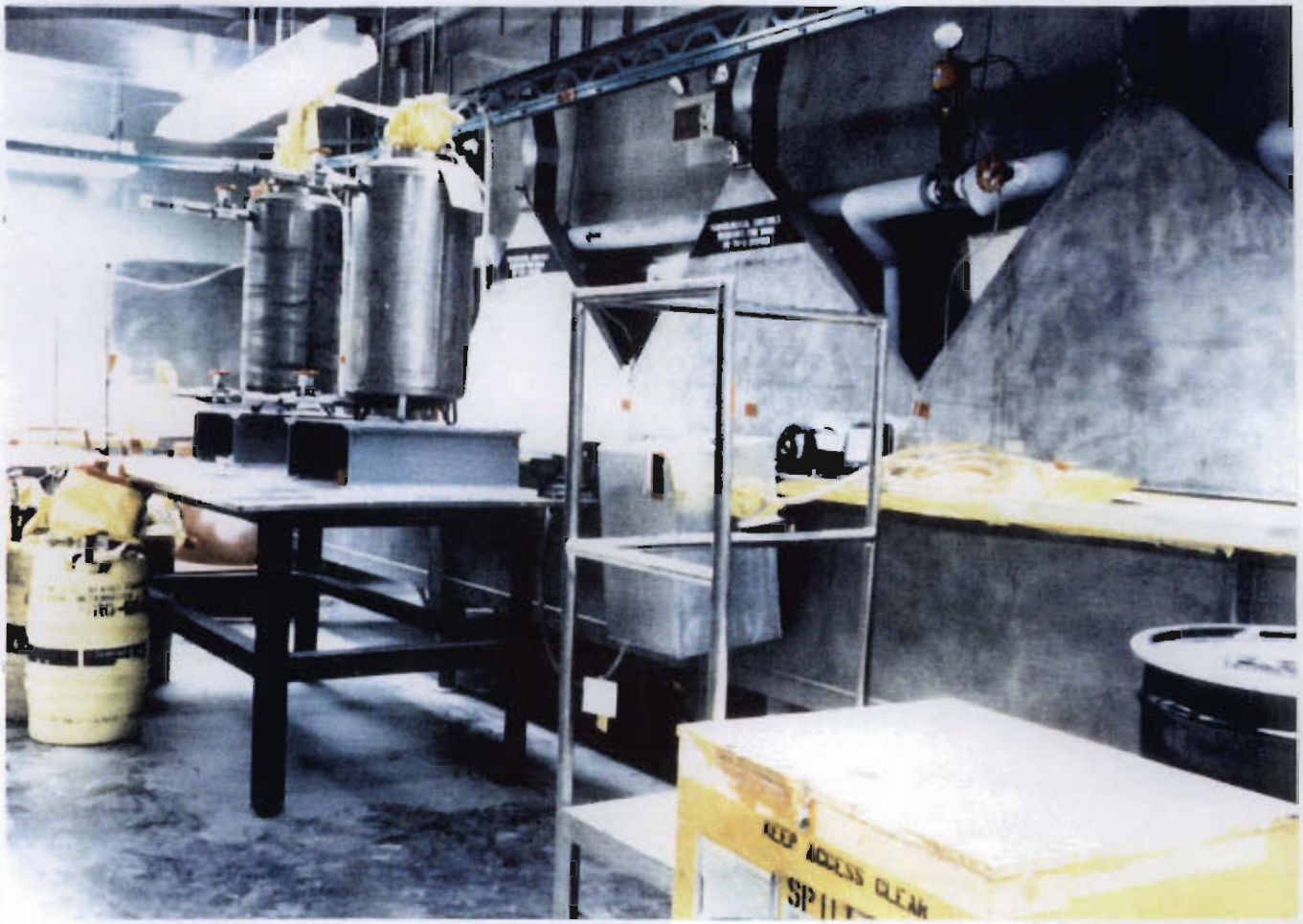
WALL 4

Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

11. Bldg. 222, Basement Group 5

c. Prior to Photographs, Room 004, Decon Room



Viewing Wall-3

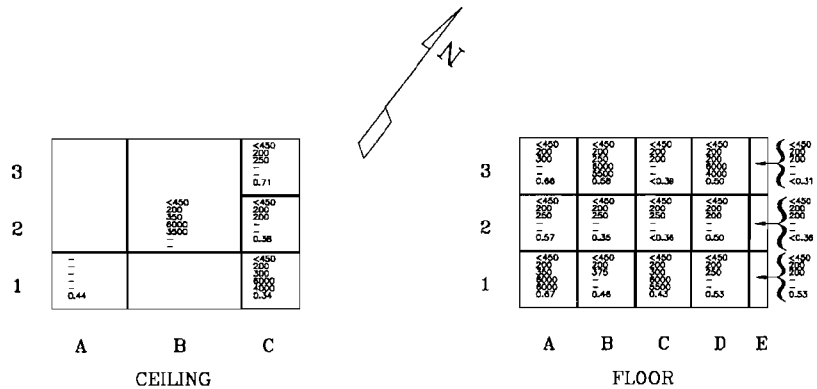
11. Bldg. 222, Basement Group 5

c. After Photographs, Room 004, Decon Room

Viewing Wall-4

11. Bldg. 222, Basement Group 5

c. Grid Map, Room 005, Waste Packer

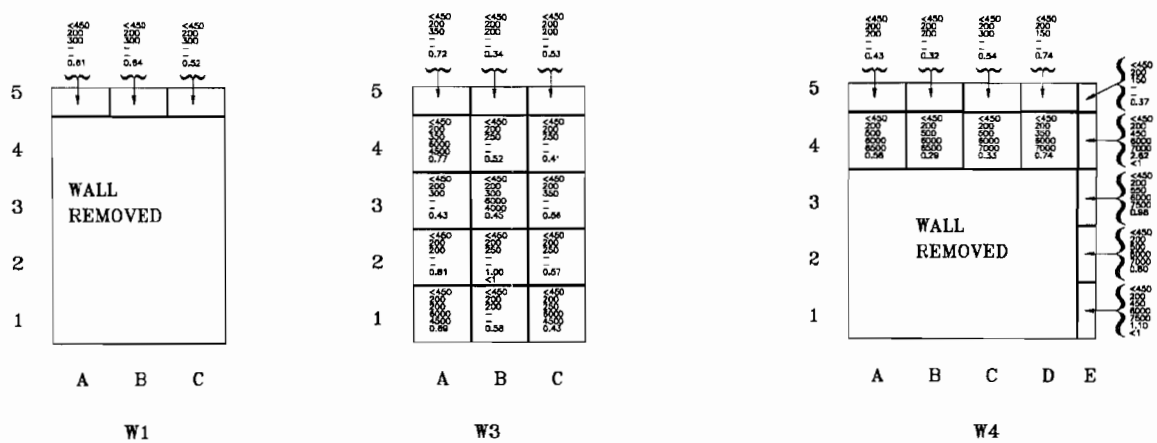


Sample Data

< 450 -- IM-247/PD Results [μμCi/20cm²]
200 -- IM-253/PD (HV-1 PHA) [bkg.]
300 -- IM-253/PD (HV-1 PHA) [cpm]
7000 -- IM-253/PD (HV-2 GROSS) [bkg.]
7300 -- IM-253/PD (HV-2 GROSS) [cpm]
1.82 -- MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 -- MCA Specific Co-60 Results [pCi/g]

11. Bldg. 222, Basement Group 5

c. Grid Map, Room 005, Waste Packer

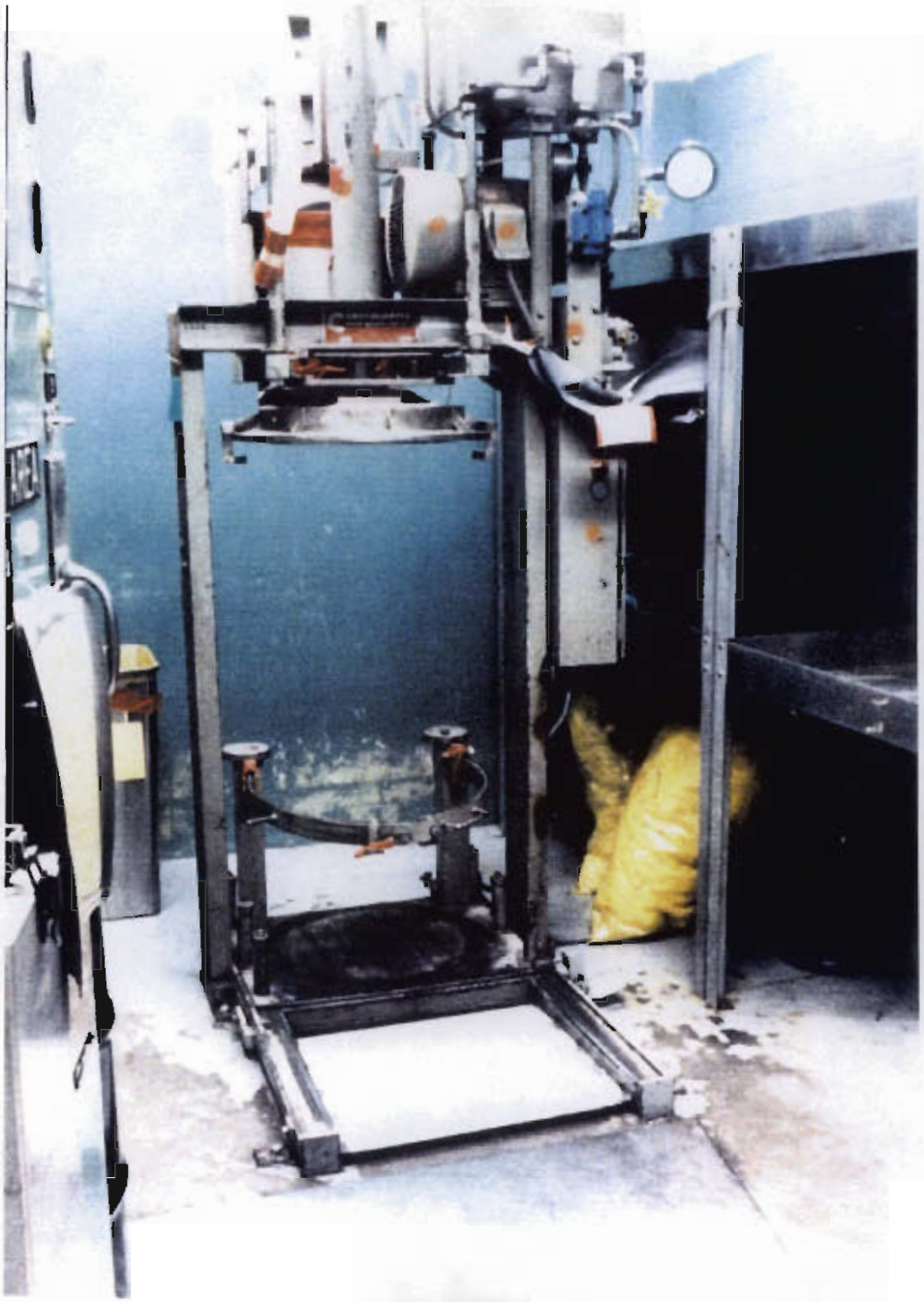


Sample Data

<450 -- IM-247/PD Results [μμCi/20cm²]
200 -- IM-253/PD (HV-1 PHA) [bkg.]
300 -- IM-253/PD (HV-1 PHA) [cpm]
7000 -- IM-253/PD (HV-2 GROSS) [bkg.]
7300 -- IM-253/PD (HV-2 GROSS) [cpm]
1.82 -- MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 -- MCA Specific Co-60 Results [pCi/g]

11. Bldg. 222, Basement Group 5

c. Prior to Photographs, Room 005, Waste Packer



Viewing waste packer

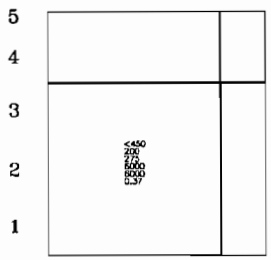
11. Bldg. 222, Basement Group 5

c. After Photographs, Room 005 Waste Packer

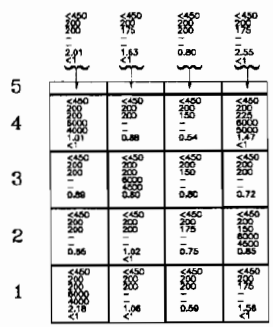
Viewing Wall-3

11. Bldg. 222, Basement Group 5

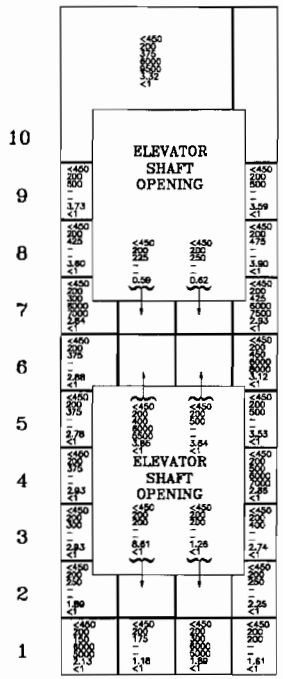
c. Grid Map, Elevator Shaft



CEILING



FLOOR



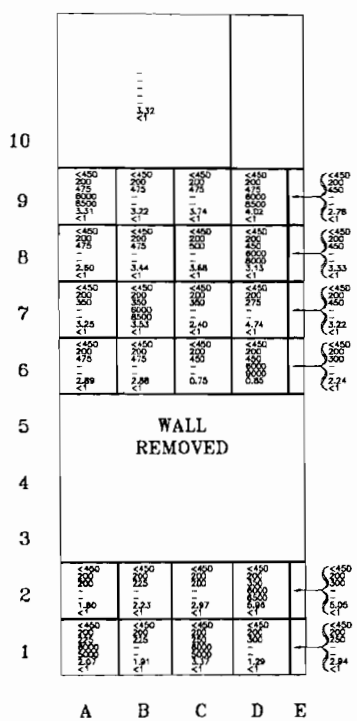
WALL 1

Sample Data

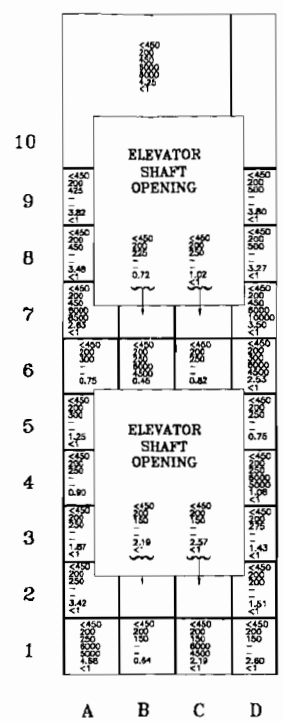
<450 – IM-247/PD Results [μCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [ppm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [ppm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

11. Bldg. 222, Basement Group 5

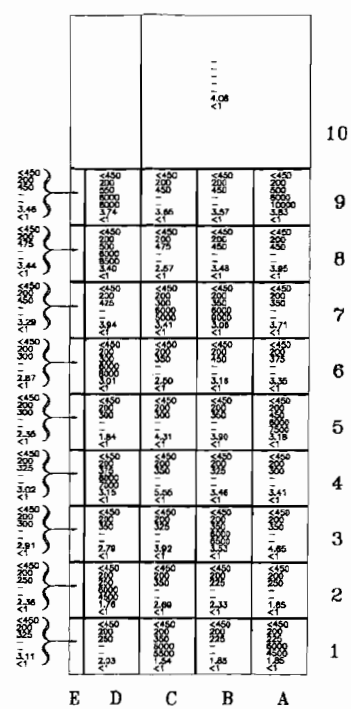
c. Grid Map, Elevator Shaft



WALL 2



WALL 3



WALL 4

Sample Data

<450 -- IM-247/PD Results [μμCi/20cm²]
200 -- IM-253/PD (HV-1 PHA) [bkg.]
300 -- IM-253/PD (HV-1 PHA) [cpm]
7000 -- IM-253/PD (HV-2 GROSS) [bkg.]
7300 -- IM-253/PD (HV-2 GROSS) [cpm]
1.82 -- MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 -- MCA Specific Co-60 Results [pCi/g]

11. Bldg. 222, Basement Group 5

c. During Photograph, Elevator Shaft

Viewing bottom of shaft

11. Bldg. 222, Basement Group 5

c. After Photographs, Elevator Shaft

Viewing bottom of shaft

12. Bldg. 222, Miscellaneous Areas Group 2

a. Report

(1) Description:

The miscellaneous Group 2 areas consisted of a 20' Perimeter Area which surrounds portions of Building 222. Ground covering is cement and asphalt.

(2) Discussion:

Group 2 surveys of the Perimeter areas were divided into 71 10' by 10' grids. Where physically possible, each grid was subdivided into two 3' by 3' subsections which were located in areas of highest potential for contamination. One of these subsections was surveyed using the IM-247/PD and the other using the IM-253/PD (HV-1 PHA). Solid material samples were not required except from each grid that resulted in greater than 450 $\mu\mu Ci/20cm^2$ with an IM-247/PD or greater than twice background with an IM-253/PD.

The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the cement were 40, 225, and 6500 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 233. The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the asphalt were 60, 300, and 8000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 1601 Parking Lot.

The following naturally occurring radionuclides were typical isotopes identified during analysis of solid material samples: lead 212, lead 214, and bismuth 214.

(3) Summary:

Surveys performed with the IM-247/PD did not detect areas greater than 450 $\mu\mu Ci/20cm^2$.

Surveys performed with the IM-253/PD (HV-1 PHA) detected one area greater than or equal to twice background.

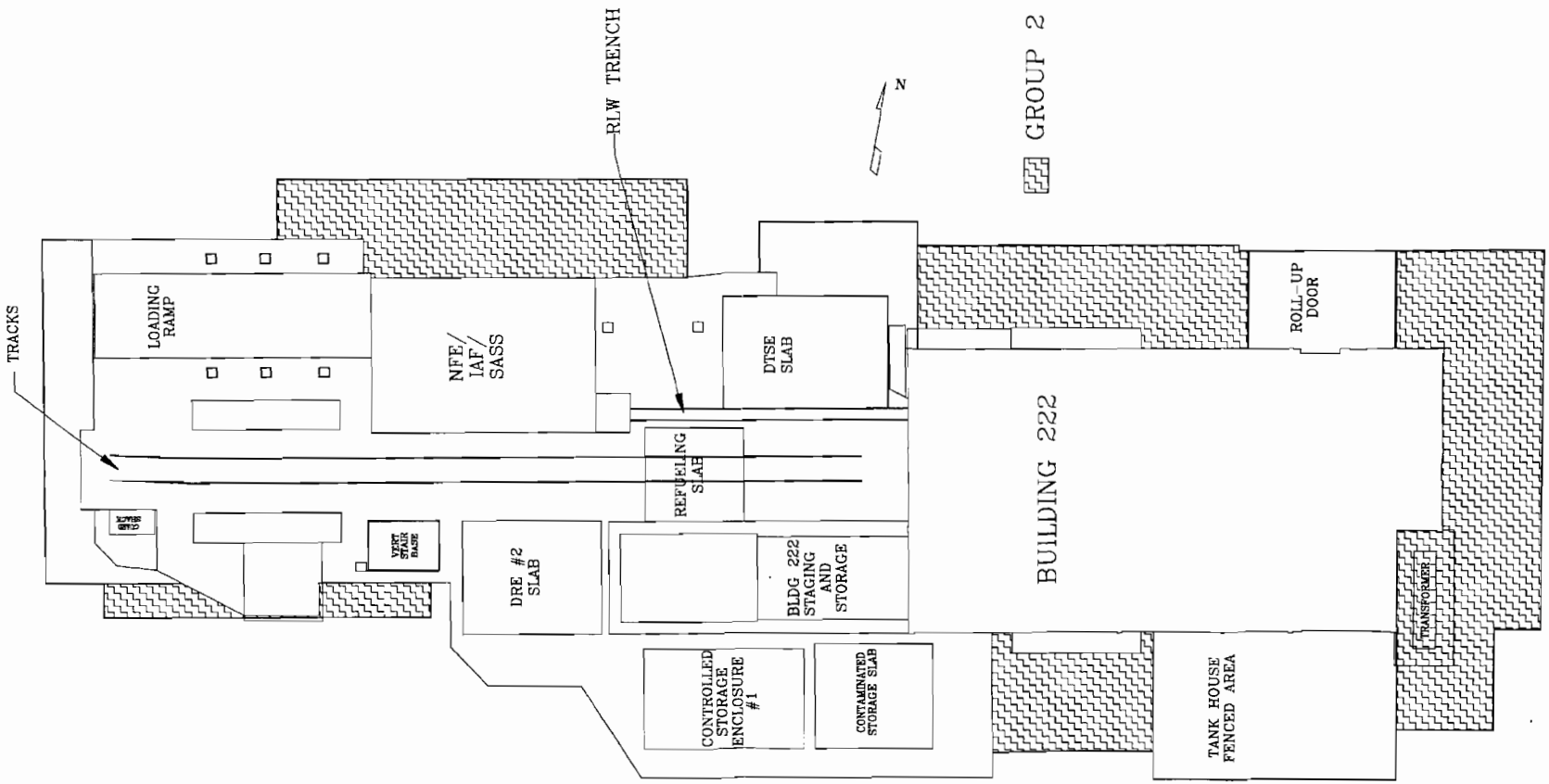
Surveys performed with the IM-253/PD (HV-2 GROSS) detected one area greater than or equal to twice background.

Analysis performed on the sole solid material sample with the multi-channel analyzer (MCA) detected a gross gamma equivalent cobalt 60 level of 2.82 pCi/g.

Analysis performed on the solid material sample with the MCA for specific cobalt 60 indicated that all solid material samples were less than 1 pCi/g.

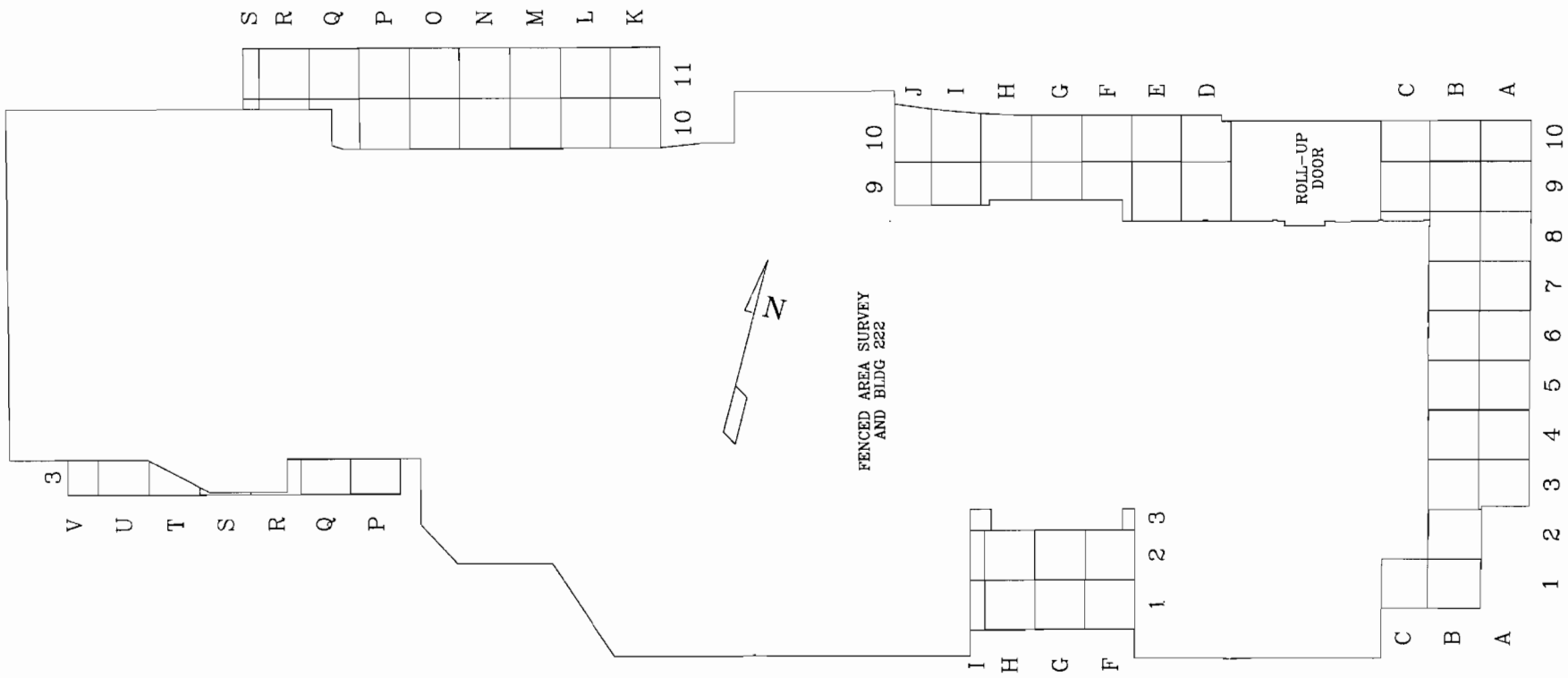
12. Bldg. 222, Miscellaneous Areas Group 2

b. Site Map



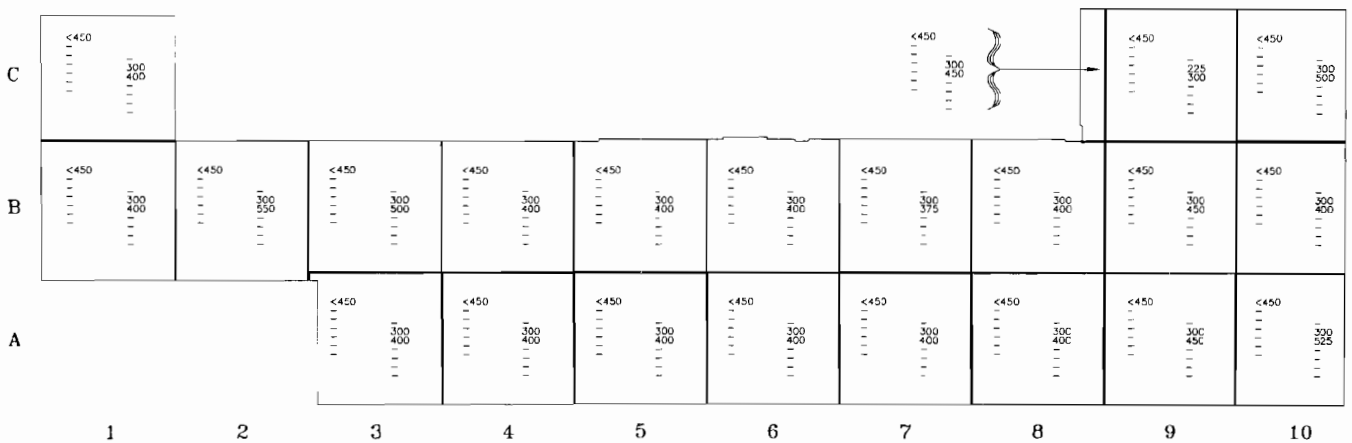
12. Bldg. 222, Miscellaneous Areas Group 2

b. Overall Perimeter Grid Map



12. Bldg. 222, Miscellaneous Areas Group 2

c. Grid Map, 20' Perimeter

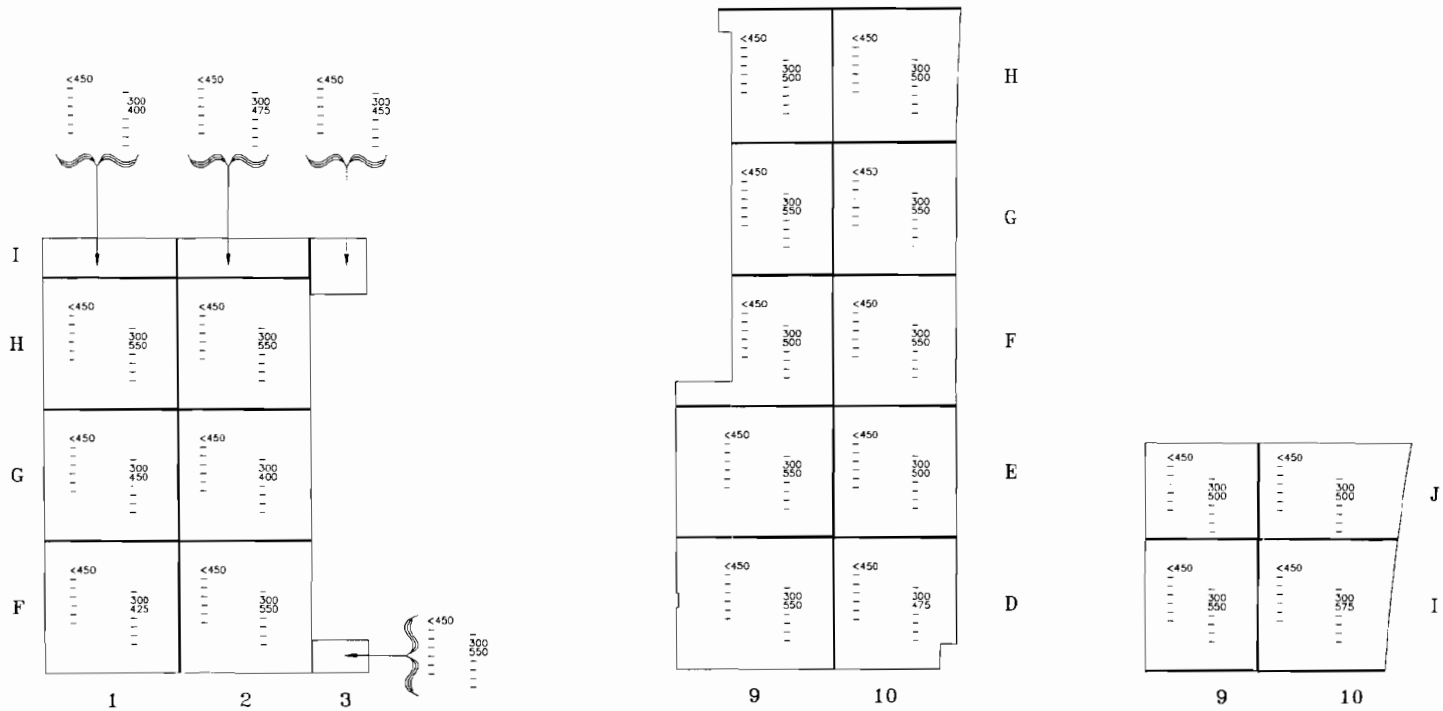


Sample Data

<450 – IM-247/PD Results [μμC/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

12. Bldg. 222, Miscellaneous Areas Group 2

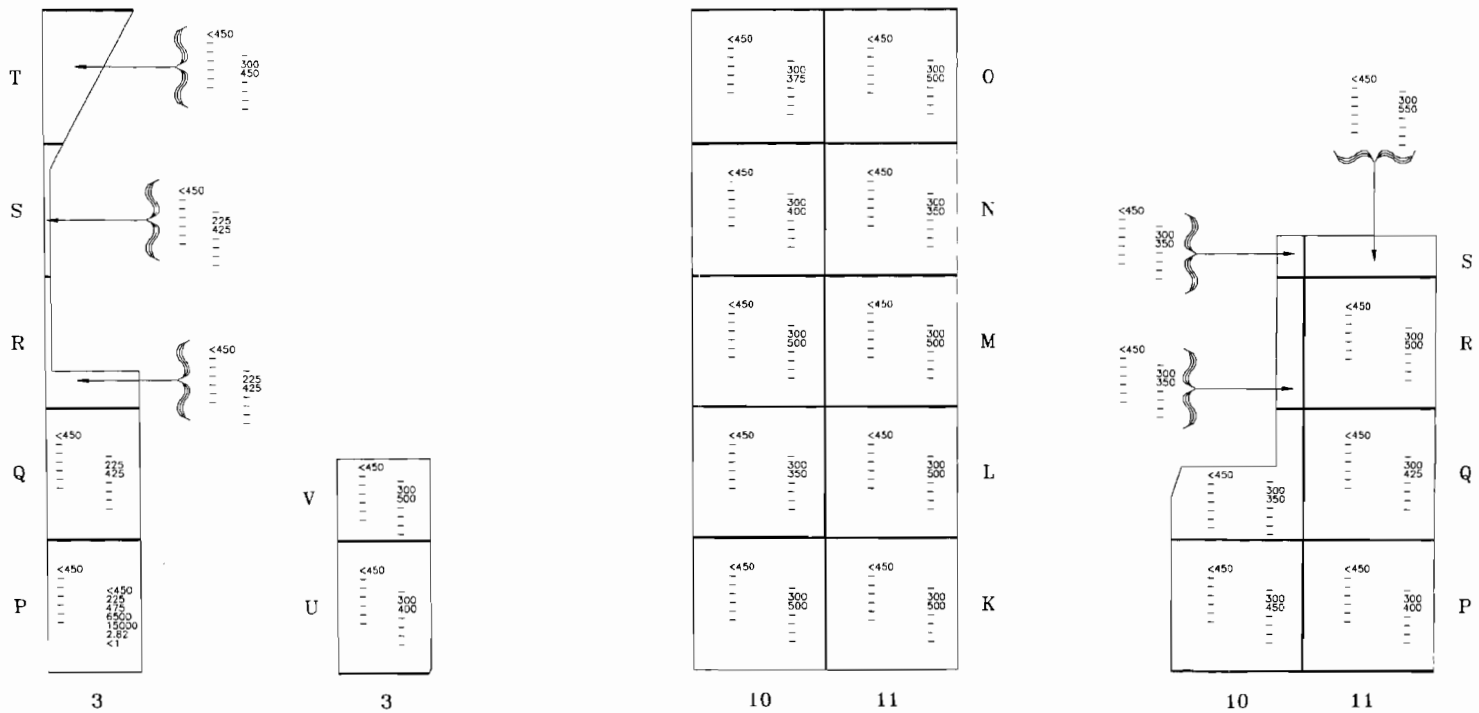
c. Grid Map, 20' Perimeter



Sample Data
<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

12. Bldg. 222, Miscellaneous Areas Group 2

c. Grid Map, 20' Perimeter



Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

12. Bldg. 222, Miscellaneous Areas Group 2

c. Prior to Photographs, 20' Perimeter

Viewing southeast corner

12. Bldg. 222, Miscellaneous Areas Group 2

c. Prior to Photographs, 20' Perimeter

Viewing northwest corner

12. Bldg. 222, Miscellaneous Areas Group 2

c. Prior to Photographs, 20' Perimeter

Viewing southwest corner

12. Bldg. 222, Miscellaneous Areas Group 2

c. After Photographs, 20' Perimeter

Viewing west along south side of Bldg 222

12. Bldg. 222, Miscellaneous Areas Group 2

c. After Photographs, 20' Perimeter

North side of perimeter looking east

12. Bldg. 222, Miscellaneous Areas Group 2

c. After Photographs, 20' Perimeter

East end of Bldg 222 looking north

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

a. Report

(1) Description:

The Building 222 Miscellaneous Group 3 areas consisted of the Tank House Fenced Area, the Roll Up Door Area, and the Fenced Area. The ground covering is cement and asphalt and the walls are brick and concrete construction. The Fenced Area Radioactive Liquid Waste (RLW) piping trench is cement construction.

(2) Discussion:

The Group 3 areas were divided into 708 5' by 5' floor grids and 5' by 6' wall grids up to 6' in height where physically possible. One hundred percent of all grids were surveyed using the IM-247/PD and the IM-253/PD (HV-1 PHA). A minimum of 25 percent of all grids were surveyed using the IM-253/PD (HV-2 GROSS). Additionally, solid material samples were taken from each wall and floor grid. These samples were removed from the area indicating the highest potential within each grid.

The RLW piping trench was divided into approximately 12 5' long grids which included the wall surfaces. One hundred percent of all grids were surveyed using the IM-247/PD and the IM-253/PD (HV-1 PHA). A minimum of 25 percent of all grids were surveyed using the IM-253/PD (HV-2 GROSS). Additionally, solid material samples were taken from each grid. Solid material core samples were taken from 25 percent of the grids.

The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the cement were 40, 225, and 6500 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 233. The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the asphalt were 60, 300, and 8000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 1601 Parking Lot. The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the brick were 50, 300, and 9000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 664. The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the metal were 55, 275, and 6750 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 1884.

A total of 714 solid material samples were taken. Solid samples were not taken from the Tank House Wall 1 grids A8 and A9 because the Roll Up Door was removed. Also solid samples were not taken from the north and south New Fuel Enclosure (NFE) Annex Walls 4, 5, 6, and 7 because these were unpainted metal. Paint samples were taken from the Roll Up Door Wall 1 grid A2 and from the Fenced Area Wall 19 grids A1 and A2. The following naturally

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

occurring radionuclides were typical isotopes identified during analysis of solid material samples: lead 212, lead 214, and potassium 40.

(3) Summary:

Surveys performed with the IM-247/PD did not detect areas greater than 450 $\mu\mu Ci/20cm^2$ except for grid AE-16 from the fenced area. When the solid samples were analyzed, only photopeaks of naturally occurring isotopes were found.

Surveys performed with the IM-253/PD (HV-1 PHA) detected 200 areas greater than or equal to twice background.

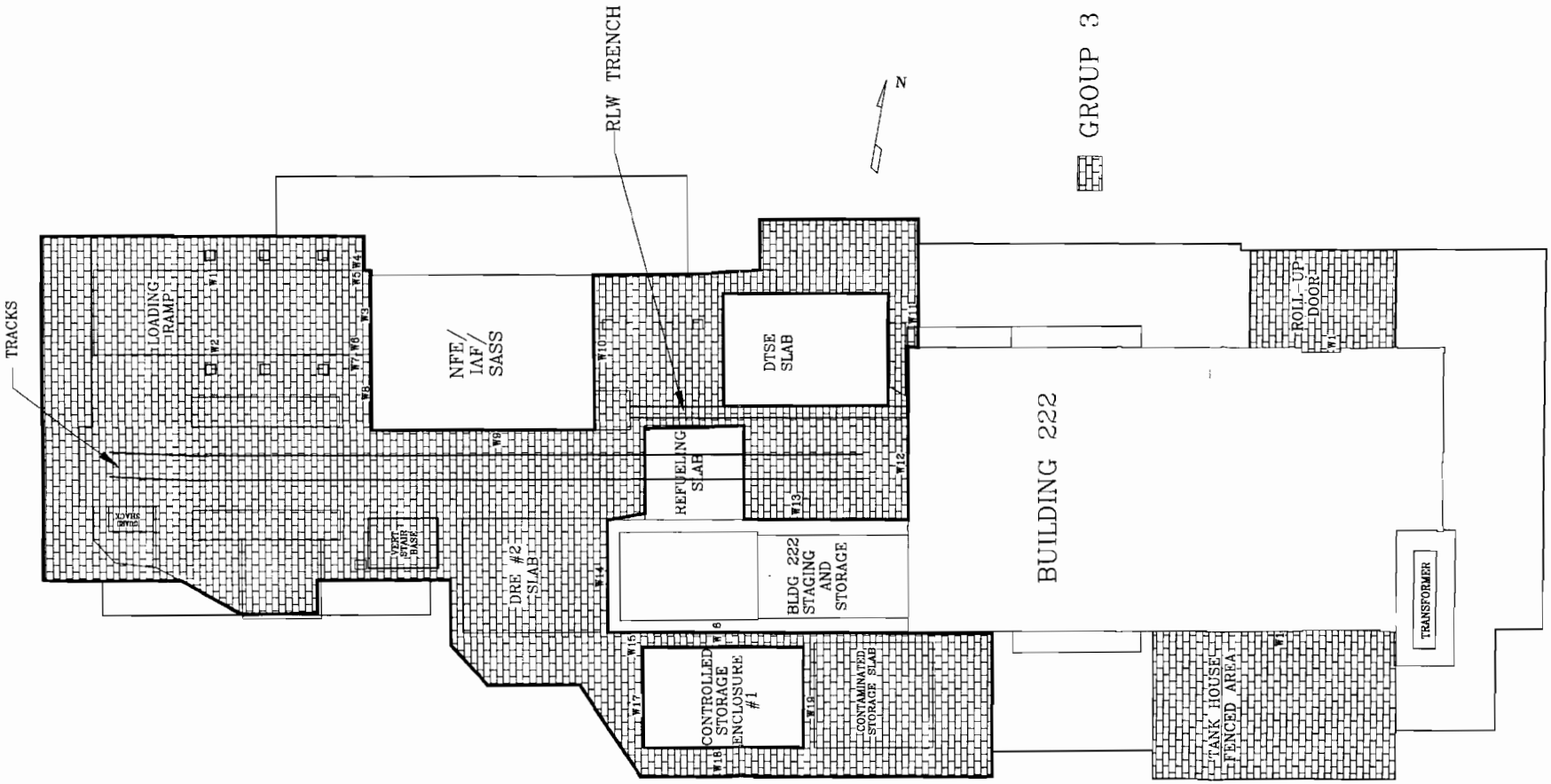
Surveys performed with the IM-253/PD (HV-2 GROSS) detected 55 areas greater than or equal to twice background.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) detected gross gamma equivalent cobalt 60 levels ranging from less than a minimum detectable activity of 0.33 pCi/g to a high of 18.18 pCi/g.

Analysis performed on solid material paint samples with the MCA for specific cobalt 60 indicated paint samples were less than 3 pCi/g and core samples were less than 1 pCi/g. Analysis performed on remaining samples with the MCA for specific cobalt 60 indicated all solid material samples were less than 1 pCi/g and showed no traces of cobalt 60 with the exception of 14 samples taken from the fenced area ground covering. The extent of the contamination was identified by taking additional solid material samples from the surrounding vicinity. Remediation consisted of the excavation of concrete to a minimum depth of 1/2" from the identified areas. Following remediation, additional solid material samples were taken from the affected areas and all were less than 1 pCi/g for specific cobalt 60. No traces of cobalt 60 were identified.

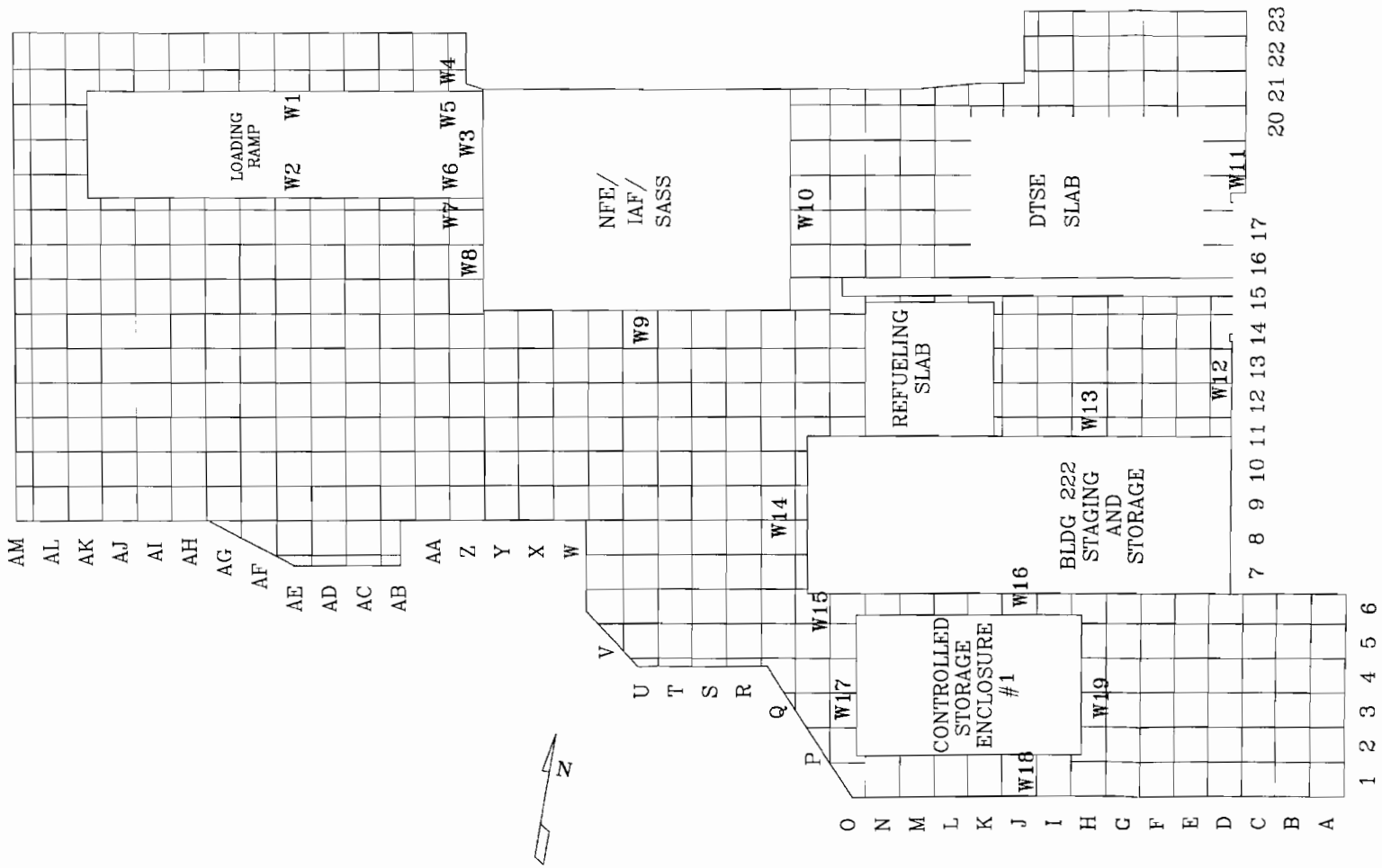
13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

b. Group 3 Site Map



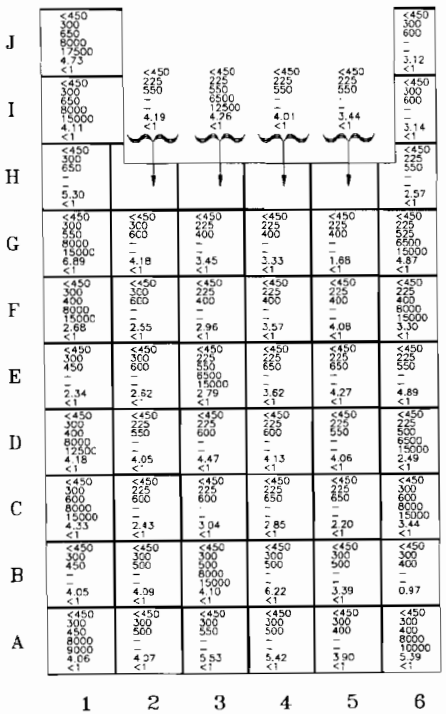
13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

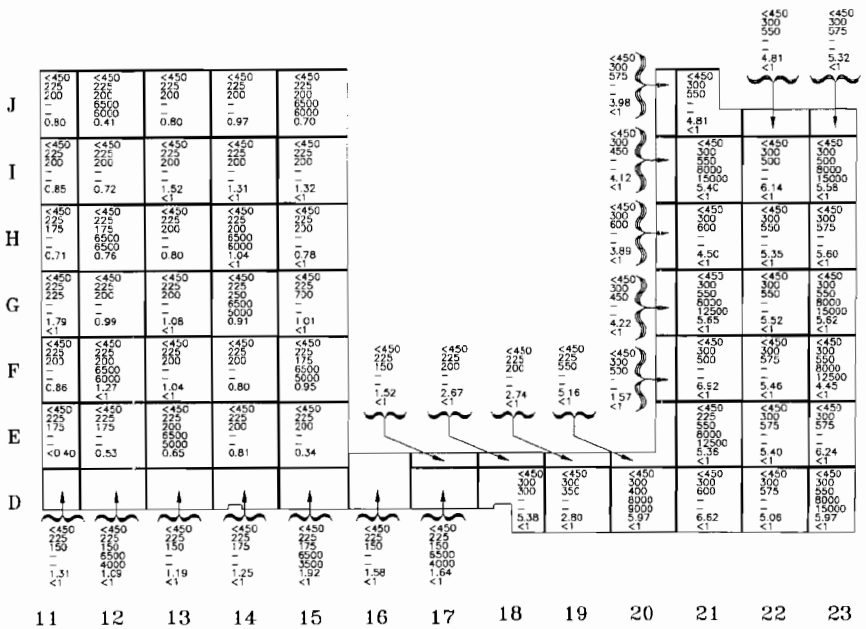
b. Overall Fenced Area Grid Map



13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. Grid Map, Fenced Area



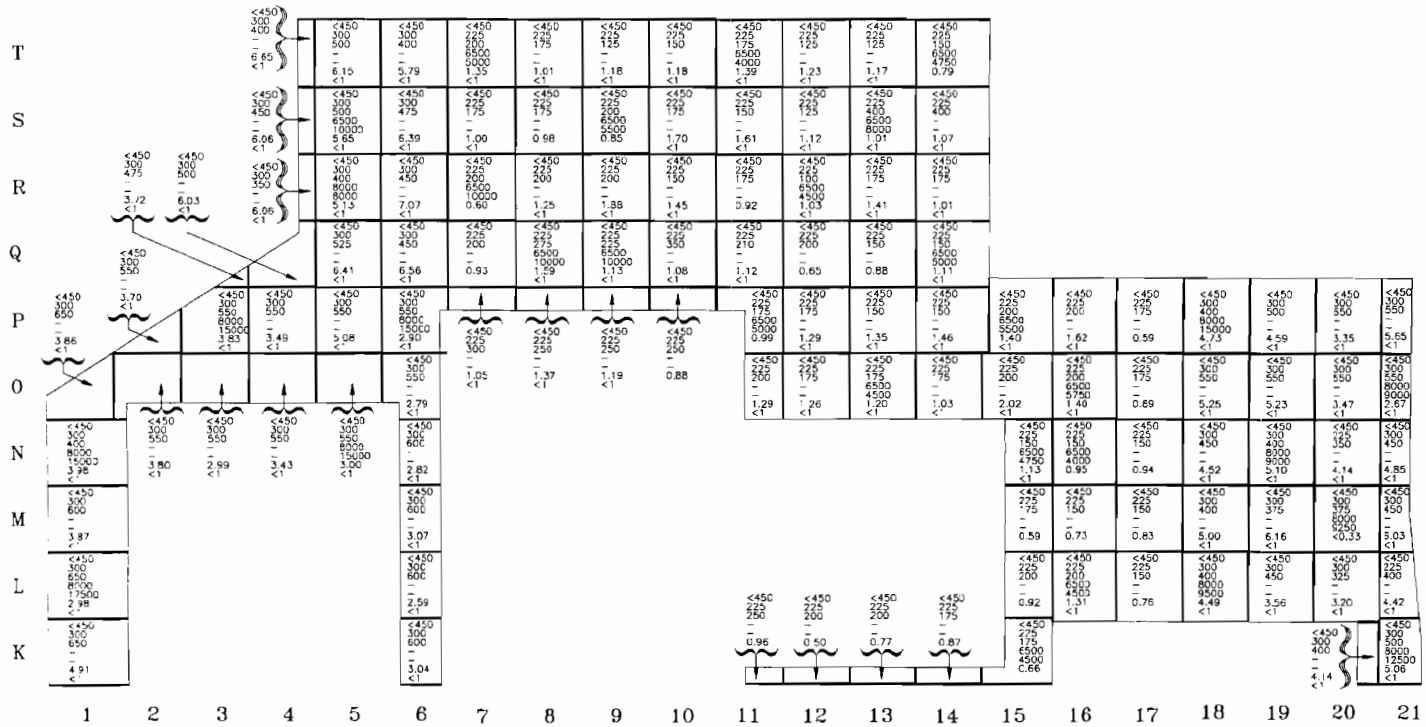


Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. Grid Map, Fenced Area

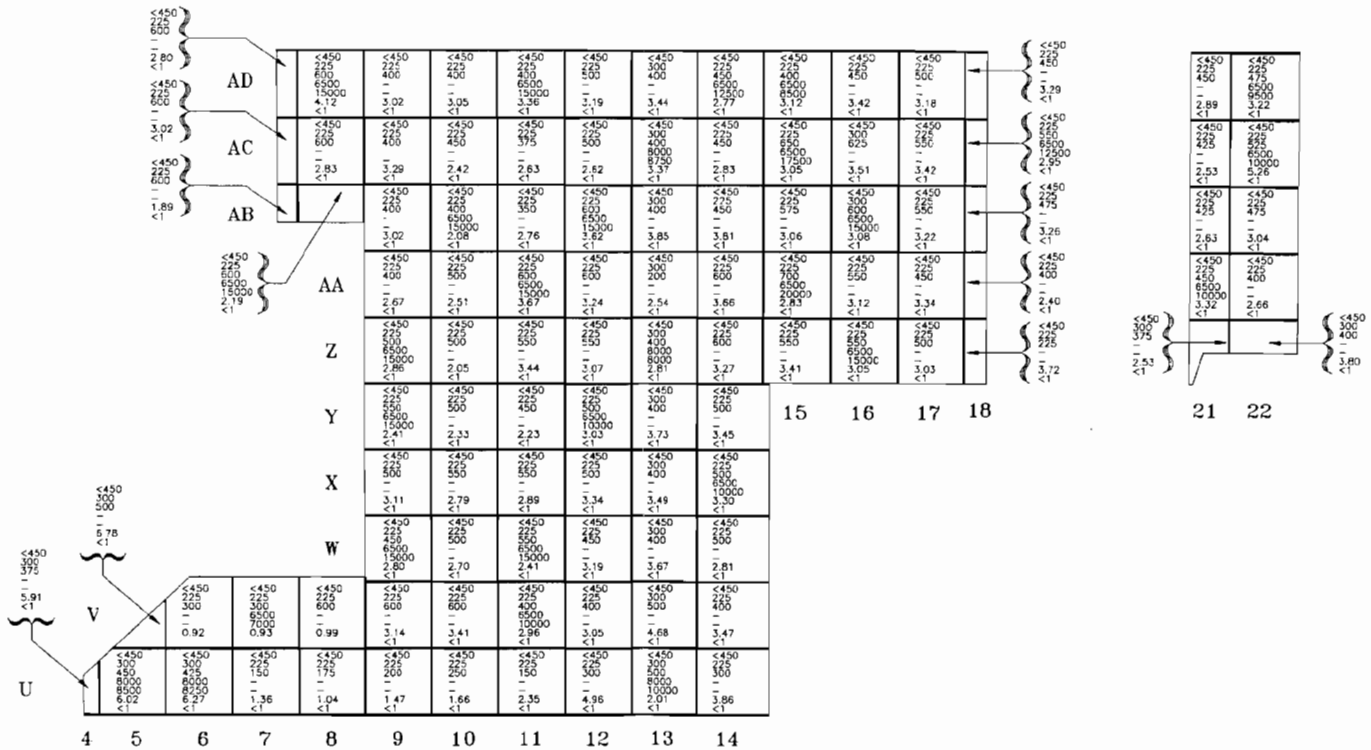


Sample Data

<450 – IM-247/PD Results [μμC/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. Grid Map, Fenced Area

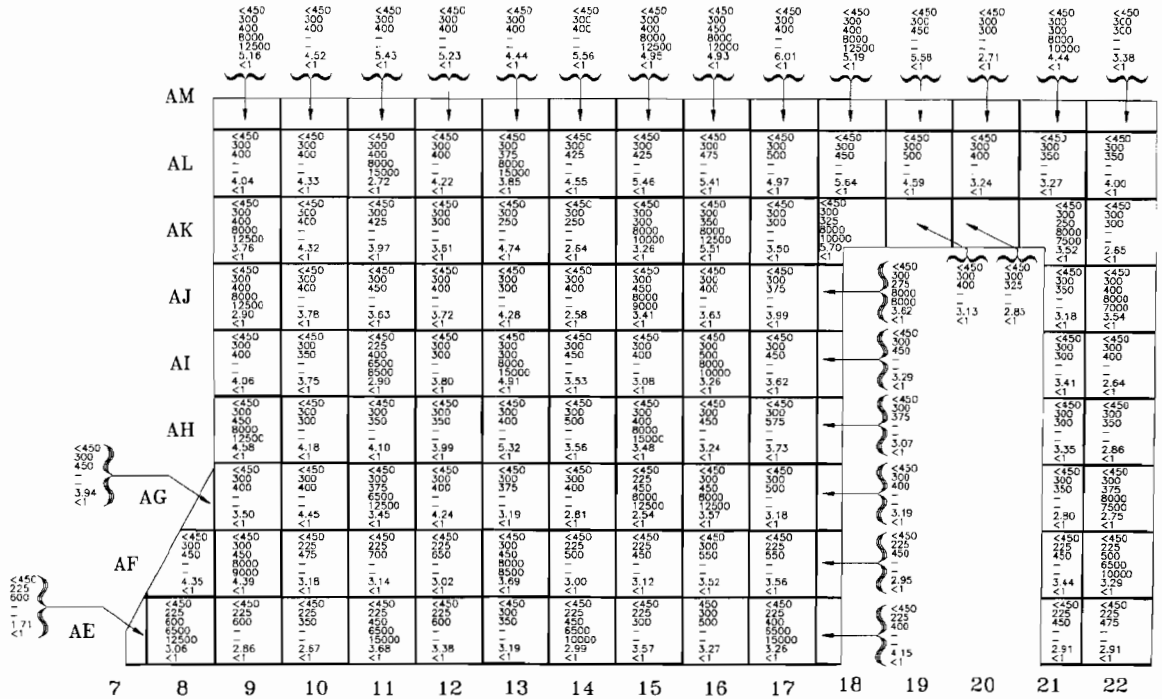


Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specfic Co-60 Results [pCi/g]

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. Grid Map, Fenced Area



Notes:

(1) Areas surveyed with an IM-247/PD, indicating detectable activity greater than or equal to 450μCi/20cm² were sampled and analyzed by spectral analysis. In these cases, analysis of the spectrum indicated only photopeaks of naturally occurring isotopes not associated with the Naval Nuclear Propulsion Program. These natural isotopes include K-40, Ra-226, Pb-212, Bi-214, Be-7, Tl-208 and Ac-228.

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

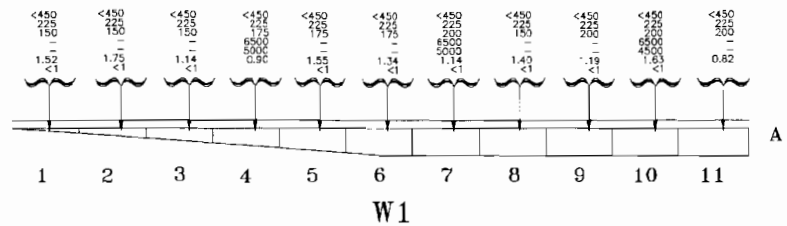
13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. Grid Map, Fenced Area

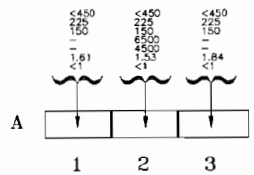
	1	2	3
I	<450 225 150 6500 5000 1.64 <1	<450 225 150 – – 1.45 <1	<450 225 150 – – 1.54 <1
H	<450 225 150 – – 1.51 <1	<450 225 150 – – 1.61 <1	<450 225 150 6500 5000 1.86 <1
G	<450 225 450 6500 12500 1.16 <1	<450 225 150 – – 1.52 <1	<450 225 150 – – 1.76 <1
F	<450 225 500 – – 0.39	<450 225 200 – – 1.64 <1	<450 225 200 – – 1.75 <1
E	<450 225 500 6500 12500 1.17 <1	<450 225 150 – – 1.40 <1	<450 225 150 – – 1.18 <1
D	<450 225 500 – – 1.08 <1	<450 225 200 – – 1.62 <1	<450 225 200 6500 5000 1.17 <1
C	<450 225 500 6500 15000 0.94	<450 225 150 – – 1.13 <1	<450 225 150 – – 0.99
B	<450 225 500 6500 – – 0.86	<450 225 150 – – 1.11 <1	<450 225 200 6500 4500 1.64 <1
A	<450 225 200 6500 5000 0.92	<450 225 150 – – 1.02 <1	<450 225 200 – – 1.03 <1

	1	2	3
K	<450 225 200 – – 1.22 <1	<450 225 200 6500 5000 1.50 <1	<450 225 150 – – 1.89 <1
J	<450 225 150 – – 1.36 <1	<450 225 150 – – 1.73 <1	<450 225 150 – – 1.56 <1

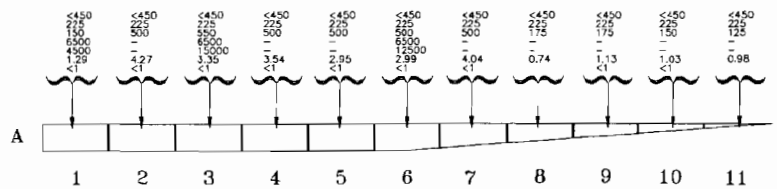
LOADING RAMP



W1



W2



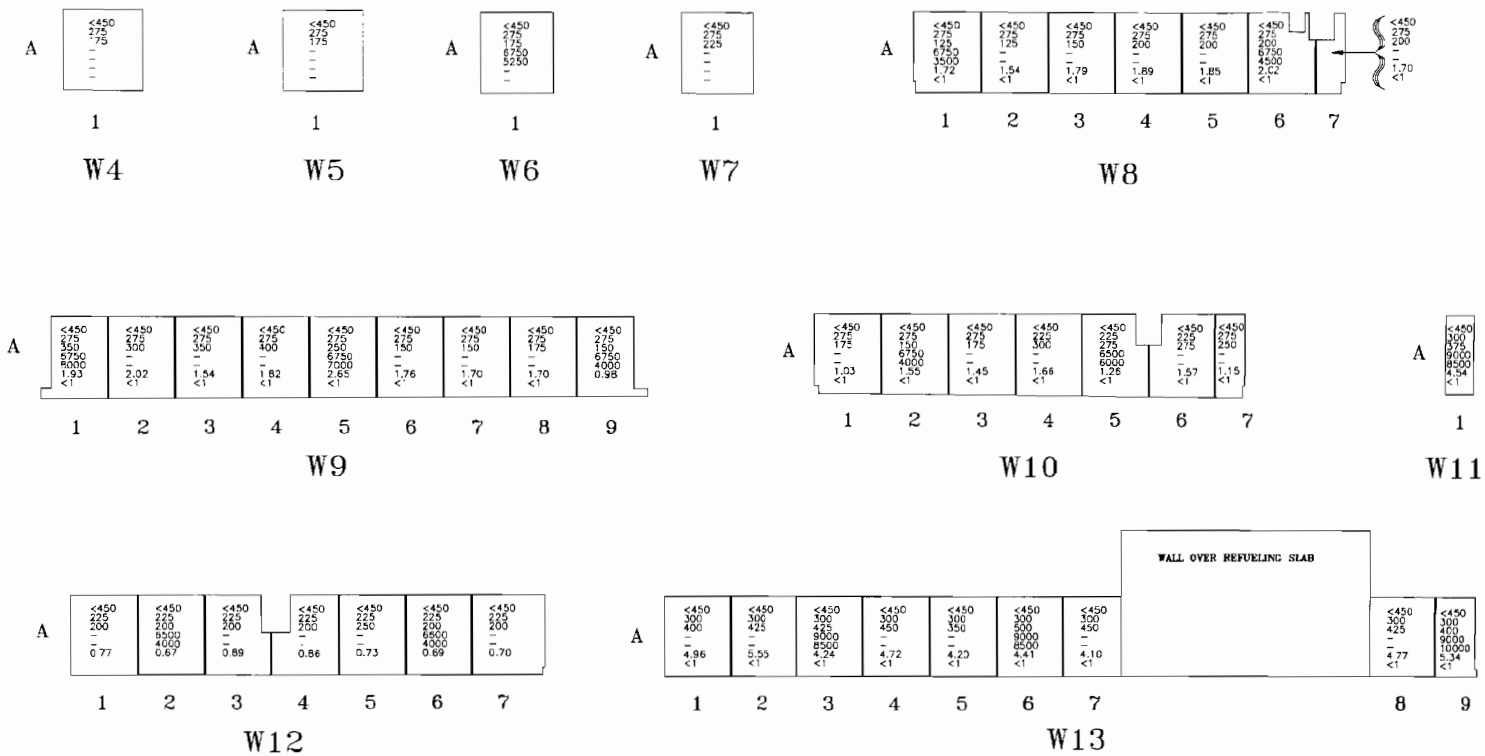
W3

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. Grid Map, Fenced Area

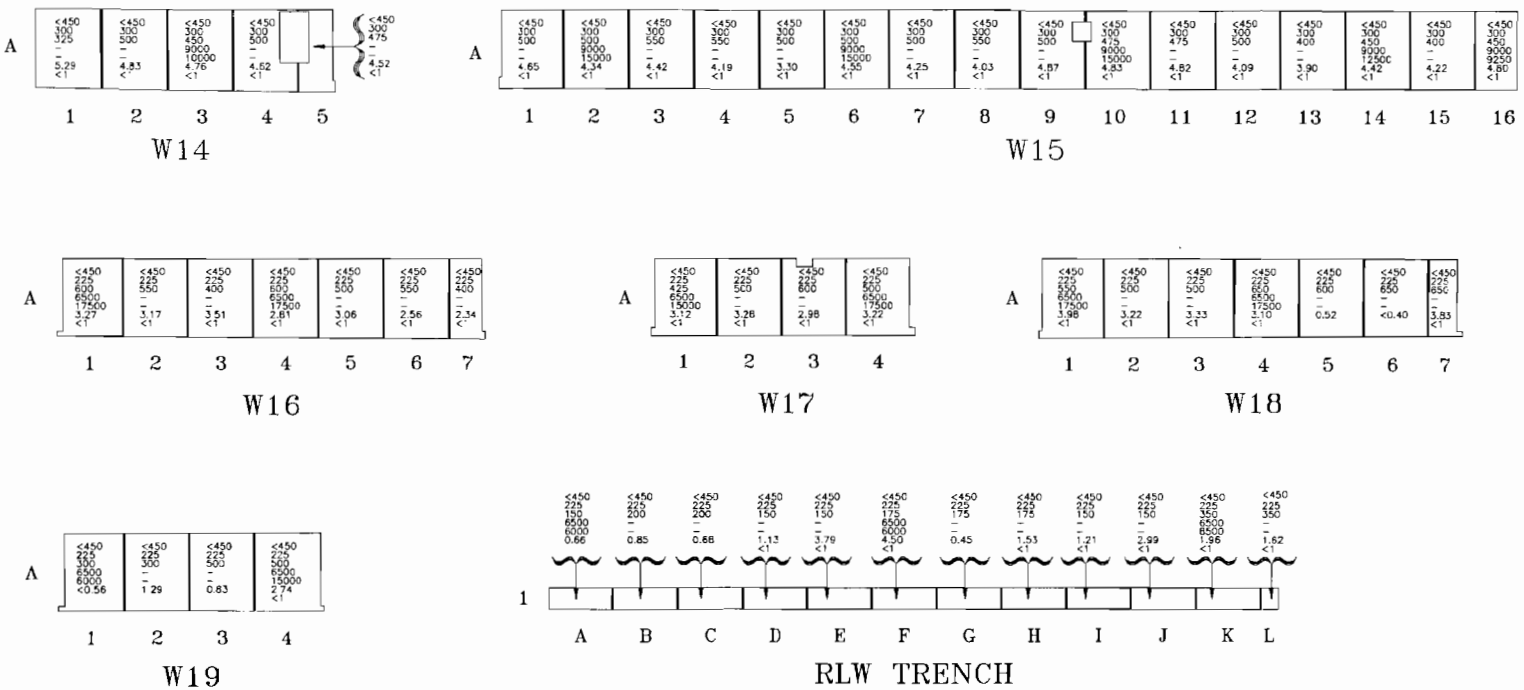


Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. Grid Map, Fenced Area



Note:
1. Solid samples taken from grids W19-A1 and W19-A2 consist of paint and have a limit of 3 pCi/g.
2. Core sample results are shown for soil from the following trench grids with gross Co60 and specific Co60 results, respectively. A1, 1.4 pCi/g, <.04 pCi/g, E1, 3.05 pCi/g, <.07 pCi/g; I1, 2.77 pCi/g, <.06 pCi/g.

Sample Data

<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

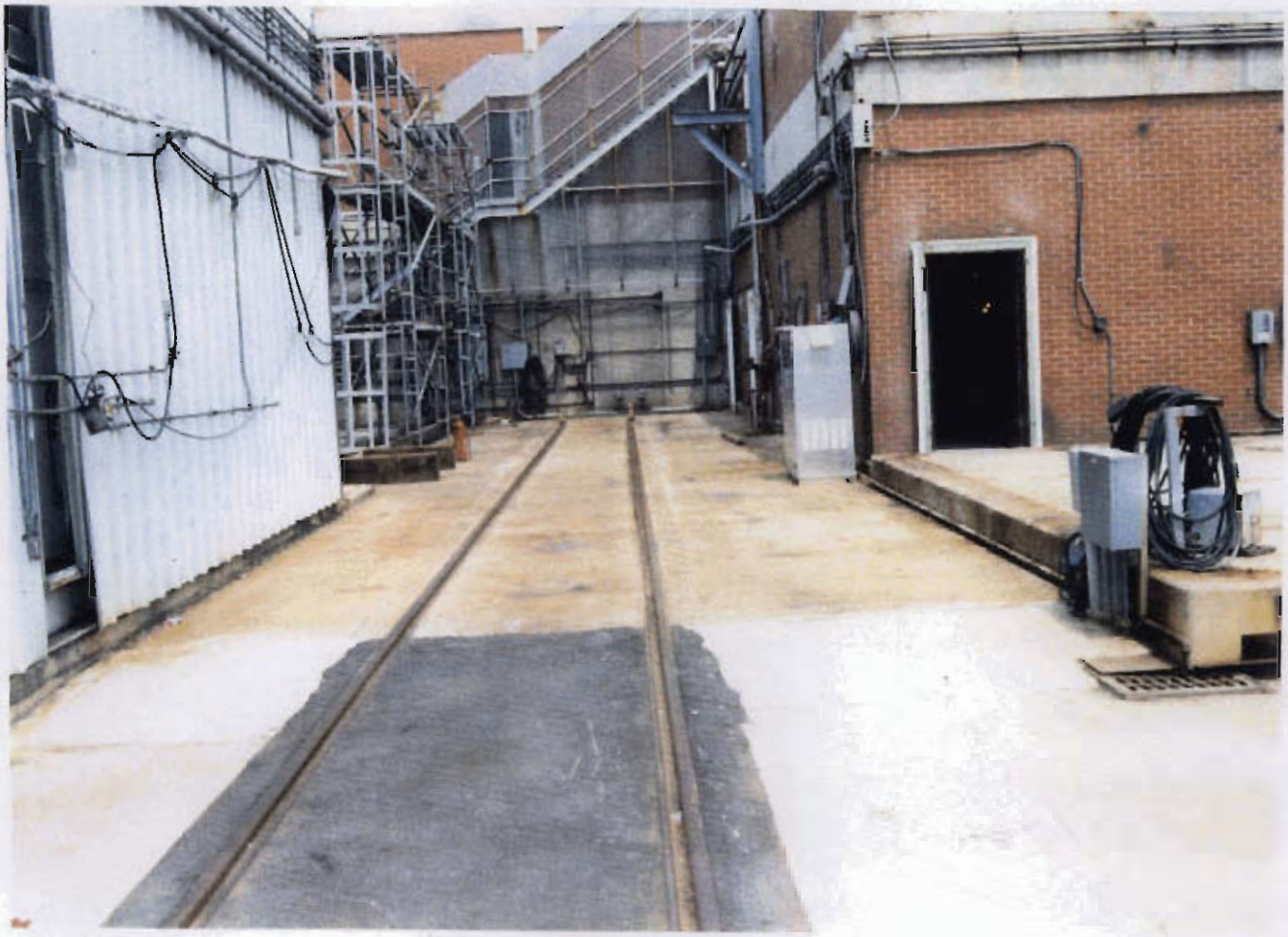
13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. During Photograph, Fenced Area

DRE #2 Slab viewing south

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

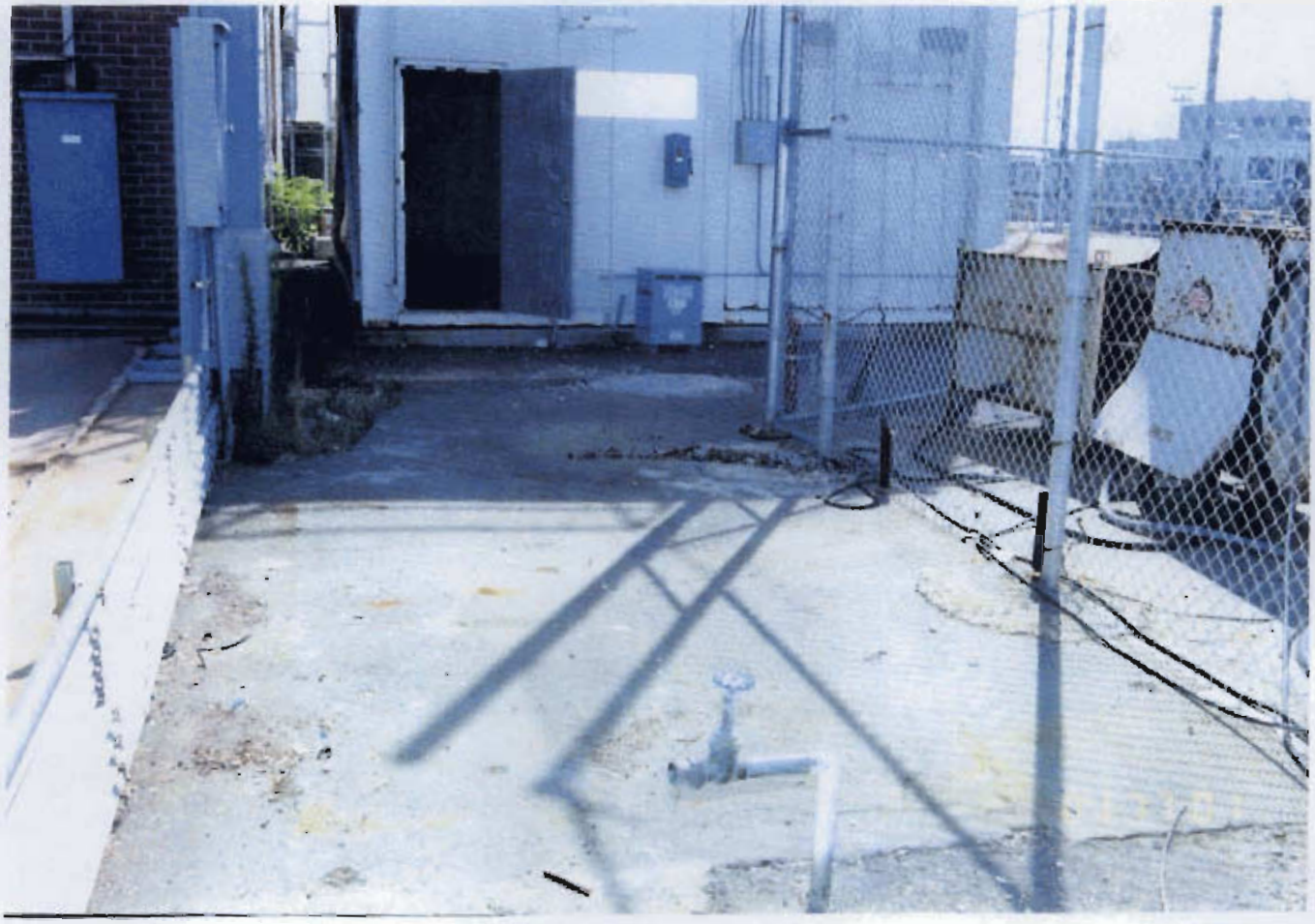
c. Prior to Photographs, Fenced Area



Viewing tracks on west side of Bldg 222

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

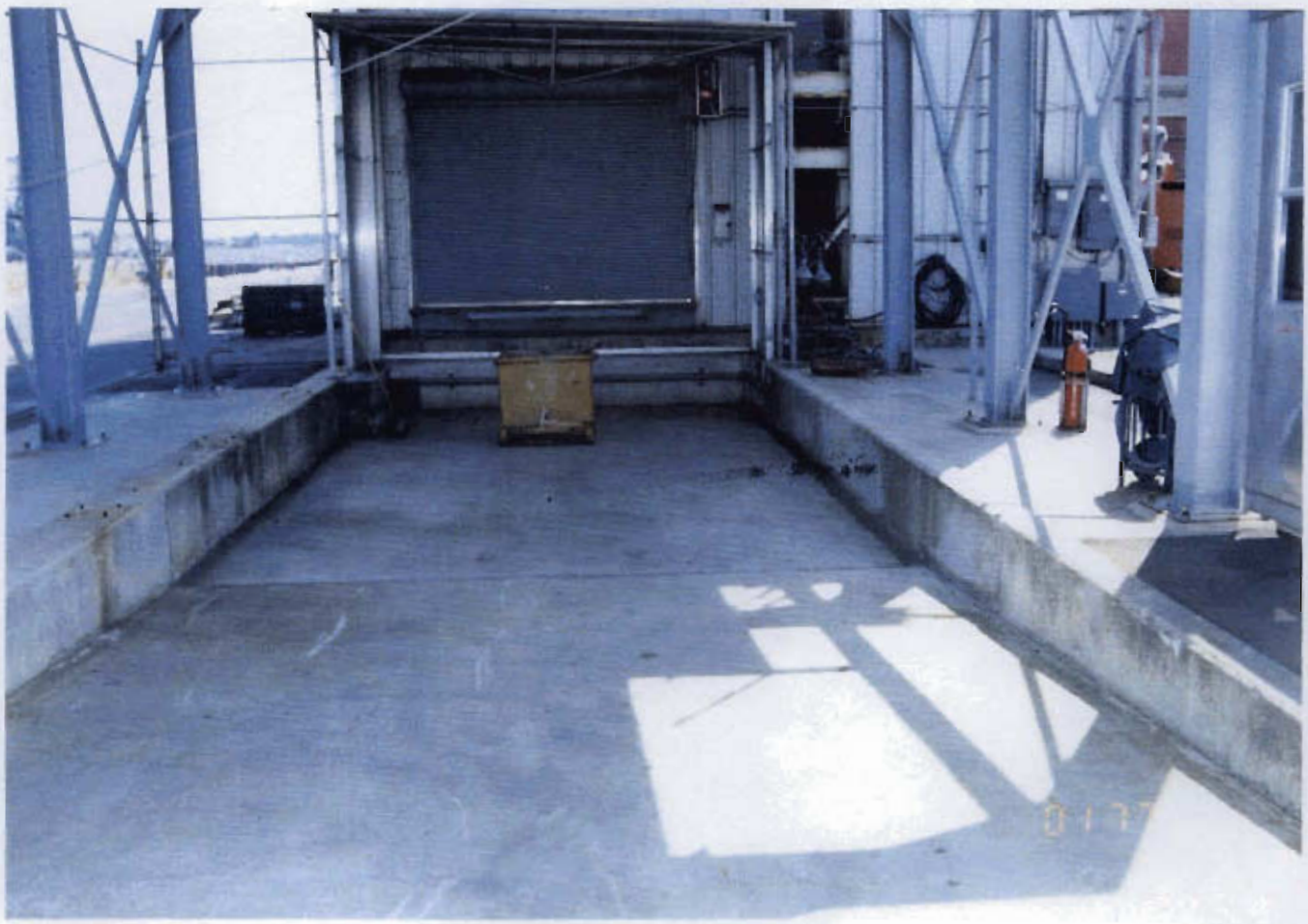
c. Prior to Photographs, Fenced Area



Viewing along south side of DRE #2 Slab

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. Prior to Photographs, Fenced Area



Loading ramp viewing east

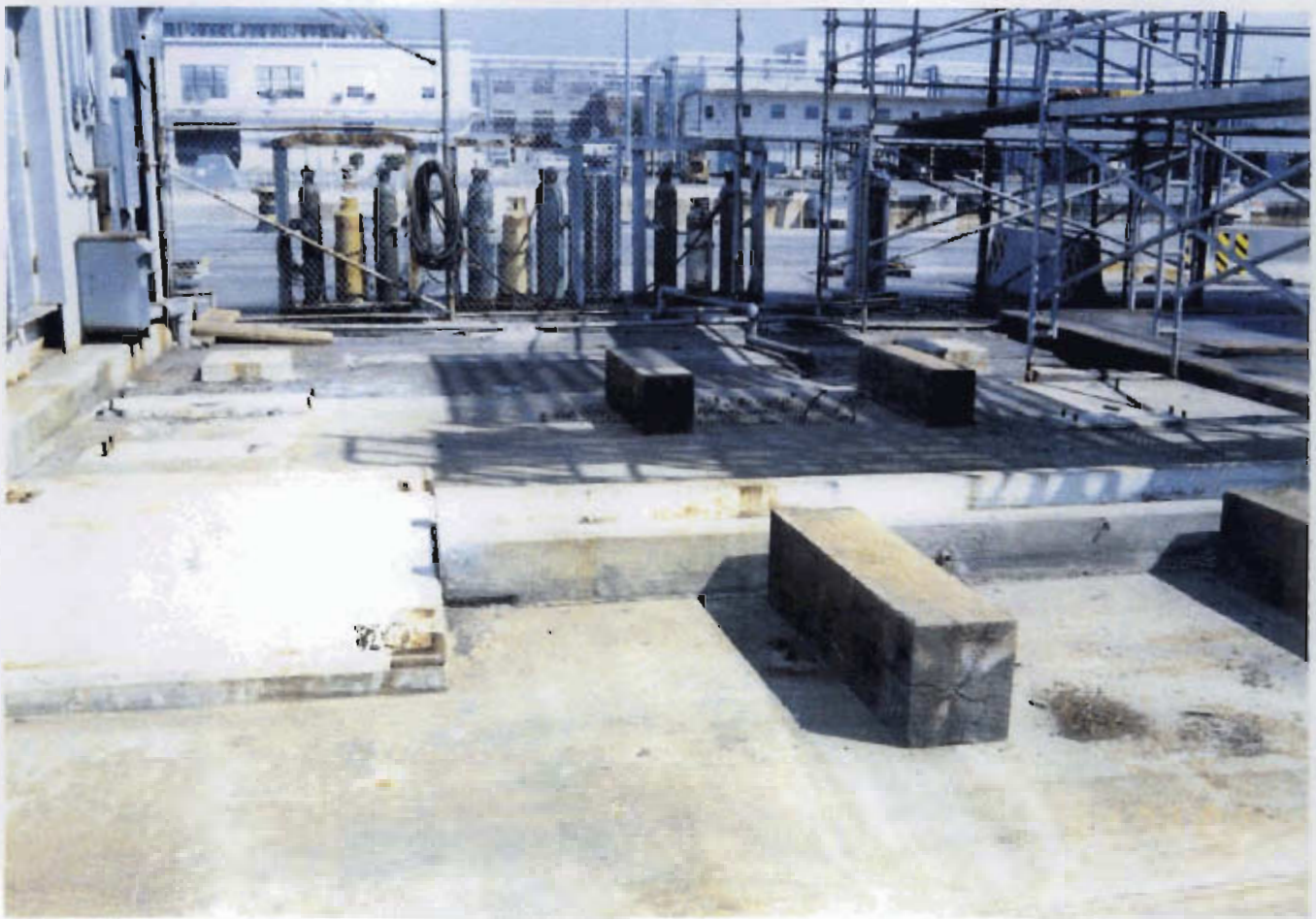
13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. During Photographs, Fenced Area

Contaminated storage enclosure viewing south

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. During Photographs, Fenced Area



RLW trough viewing north

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. After Photographs, Fenced Area

West of DTSE Slab viewing north

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. After Photographs, Fenced Area

Viewing along south side of DRE #2 Slab

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. After Photographs, Fenced Area

Loading ramp viewing east

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. After Photographs, Fenced Area

Contaminated storage enclosure viewing south

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. After Photographs, Fenced Area

DRE #2 Slab

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. Grid Map, Tank House Fenced Area

	1	2	3	4	5	6	7	8	9	10
A	<450 200 550 6000 15000 4.12 <1	<450 200 575 – – 4.23 <1	<450 200 450 – – 3.57 <1	<450 200 500 6000 14000 3.89 <1	<450 200 375 6000 10000 3.58 <1	<450 200 375 – – 3.47 <1	<450 200 375 – – 4.33 <1	<450 200 200 – – – –	<450 200 150 – – – –	<450 200 300 6000 9000 3.98 <1

W1

	1	2	3	4	5	6	7	8	9	10
F	<450 200 400 6000 12500 4.72 <1	<450 200 400 6000 12500 5.15 <1	<450 200 300 6000 11000 3.90 <1	<450 200 300 – – 4.54 <1	<450 200 350 – – 4.38 <1	<450 200 350 – – 4.77 <1	<450 200 350 – – 4.85 <1	<450 200 350 6000 12500 4.54 <1	<450 200 300 – – 2.50 <1	<450 200 300 – – 2.28 <1
E	<450 200 400 6000 10000 5.41 <1	<450 200 400 6000 12500 2.70 <1	<450 200 400 6000 12500 2.64 <1	<450 200 400 6000 12500 2.48 <1	<450 200 400 6000 11000 1.60 <1	<450 200 400 6000 11000 3.41 <1	<450 200 500 6000 12500 2.87 <1	<450 200 500 6000 12500 3.50 <1	<450 200 550 6000 12500 2.76 <1	<450 200 350 5000 11000 2.78 <1
D	<450 200 500 6000 12500 3.03 <1	<450 200 450 6000 12500 4.24 <1	<450 200 600 6000 15000 5.49 <1	<450 200 500 6000 10000 3.73 <1	<450 200 500 6000 9500 3.88 <1	<450 200 500 6000 12500 4.21 <1	<450 200 550 6000 15000 4.87 <1	<450 200 550 6000 12500 5.21 <1	<450 200 600 6000 20000 3.48 <1	<450 200 650 6000 20000 4.55 <1
C	<450 200 600 6000 12500 3.59 <1	<450 200 500 6000 12500 3.74 <1	<450 200 450 6000 10000 3.95 <1	<450 200 400 6000 10000 3.88 <1	<450 200 450 6000 10000 3.00 <1	<450 200 450 6000 10000 3.73 <1	<450 200 500 6000 10000 3.92 <1	<450 200 550 6000 10000 4.27 <1	<450 200 600 6000 20000 3.88 <1	<450 200 600 6000 20000 5.15 <1
B	<450 200 500 6000 12500 4.35 <1	<450 200 450 6000 12500 4.35 <1	<450 200 350 6000 10000 4.78 <1	<450 200 375 – – 3.60 <1	<450 200 450 6000 10000 4.71 <1	<450 200 500 6000 10000 3.67 <1	<450 200 500 6000 10000 4.46 <1	<450 200 550 6000 10000 4.19 <1	<450 200 500 – – 5.29 <1	<450 200 600 – – 4.72 <1
A	<450 200 350 6000 9000 2.78 <1	<450 200 350 – – 2.58 <1	<450 200 350 – – 3.02 <1	<450 200 350 – – 3.10 <1	<450 200 375 6000 10000 3.32 <1	<450 200 430 6000 11000 2.07 <1	<450 200 400 6000 11000 3.04 <1	<450 200 375 – – 2.54 <1	<450 200 375 – – 2.89 <1	<450 200 450 6000 10000 3.23 <1

FLOOR

Sample Data

< 450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. After Photographs, Tank House Fenced Area

Viewing south side of site

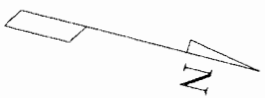
13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. After Photographs, Tank House Fenced Area

Viewing toward Wall-1

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. Grid Map, Roll-up Door



	1	2	3	4
F	<450 300 400 – – 5.62 <1	<450 300 500 – – 5.59 <1	<450 300 500 – – 5.15 <1	<450 300 500 8000 12500 4.92 <1
E	<450 300 400 – – 18.18 <1	<450 300 450 8000 10000 7.02 <1	<450 300 500 – – 6.10 <1	<450 300 500 – – 5.19 <1
D	<450 225 250 – – 1.67 <1	<450 300 550 – – 1.85 <1	<450 300 450 – – 1.33 <1	<450 225 400 6500 9500 4.91 <1
C	<450 225 250 6500 6000 1.59 <1	<450 300 500 – – 1.34 <1	<450 225 400 – – 2.02 <1	<450 225 400 – – 1.93 <1
B	<450 225 550 – – 1.19 <1	<450 225 550 – – 1.69 <1	<450 225 350 6000 12500 1.72 <1	<450 300 350 – – 1.96 <1
A	<450 300 450 8000 10000 5.00 <1	<450 300 550 – – 5.41 <1	<450 300 450 – – 3.17 <1	<450 300 550 – – 0.83

FLOOR

	1	2	3	4	5	6
A	<450 600 400 20000 10000 4.71 <1	<450 325 400 – – 17.69 <3	<450 600 550 – – 4.37 <1	<450 500 500 5500 6500 5.43 <1	<450 600 450 – – 4.70 <1	<450 600 550 – – 4.82 <1

W1

Note:
The solid sample taken from grid W1-A2 consists of paint and has a limit of 3 pCi/g

Sample Data
<450 – IM-247/PD Results [μμCi/20cm²]
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GRCSS) [bkg.]
7300 – IM-253/PD (HV-2 GRCSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

13. Bldg. 222, Miscellaneous Areas Group 3 and RLW Pipe Trench

c. After Photographs, Roll-up Door

Viewing toward roll-up door

14. Bldg. 222, Miscellaneous Areas Group 4

a. Report

(1) Description:

The Building 222 Miscellaneous Group 4 area consisted of the Refueling Slab. The ground covering is cement and the wall is brick construction.

(2) Discussion:

The Group 4 area was divided into 66, 3' by 3' floor and wall grids. The wall was divided into grids 3' by 3', up to 12' high. Each grid was identified with its unique designation.

One hundred percent of all 3' by 3' grids were surveyed using the IM-247/PD and the IM-253/PD (HV-1 PHA). A minimum of 25 percent of all 3' by 3' grids were surveyed using the IM-253/PD (HV-2 GROSS). A minimum of one solid material sample was taken from within each 3' by 3' grid.

The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the cement were 40, 225, and 6500 counts per minute respectively. These radiation levels were based upon background levels obtained from Building 233. The IM-247/PD and the IM-253/PD (HV-1 PHA and HV-2 GROSS) backgrounds used for the brick were 50, 300, and 9000 counts per minute respectively. These radiation levels were based upon background levels obtained from Building M-1133.

A total of 66 solid material samples were taken. Each solid sample was removed from the grid location indicating the area of highest potential. Additionally, solid material samples were taken from selected structural joints and crevices. Results from these samples were incorporated into the report by utilizing the higher of the normal grid sample or the joint/crevice sample result. The following naturally occurring radionuclides were typical isotopes identified during analysis of solid material samples: lead 212, lead 214, potassium 40, and bismuth 214.

(3) Summary:

Surveys performed with the IM-247/PD did not detect areas greater than 450 $\mu\mu Ci/20cm^2$.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

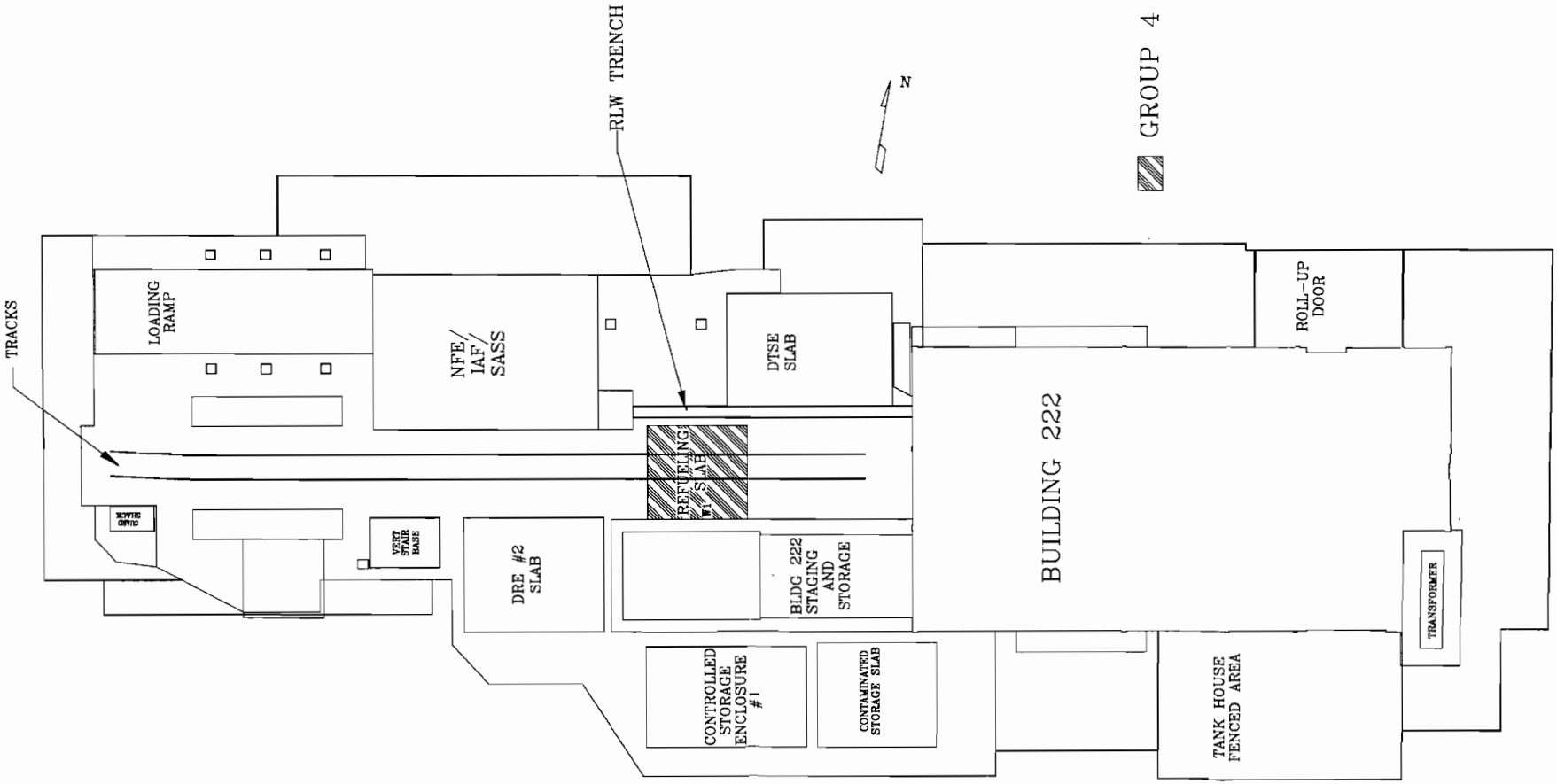
14. Bldg. 222, Miscellaneous Areas Group 4

Analysis performed on solid material samples with the multi-channel analyzer (MCA) detected gross gamma equivalent cobalt 60 levels ranging from a low of 0.65 pCi/g to a high of 5.03 pCi/g.

Analysis performed on solid material samples with the MCA for specific cobalt 60 identified two solid material samples containing traces of cobalt 60 but less than 1 pCi/g. These samples were taken from the Refueling Slab floor and wall. The extent of the areas containing trace cobalt 60 was identified by taking additional solid material samples from the surrounding vicinity. Due to the small effort involved, the shipyard removed material from each area where trace cobalt 60 radioactivity was identified. Following remediation, additional solid material samples taken from the remediated areas were less than 1 pCi/g for specific cobalt 60. No traces of cobalt 60 were identified.

14. Bldg. 222, Miscellaneous Areas Group 4

b. Site Map



14. Bldg. 222, Miscellaneous Areas Group 4

c. Grid Map, Refueling Slab

	1	2	3	4	5	6
	<450 225 500 8500 5000 1.92 <1	<450 225 150 - - 0.88	<450 225 550 - - 0.95	<450 225 550 250 - 0.72	<450 225 500 - - 0.88	<450 225 500 - - 2.90
G						
F	<450 225 225 - - 2.33 <1	<450 225 250 - - 1.12 <1	<450 225 550 8500 8500 1.00 <1	<450 225 250 - - 0.82	<450 225 225 8500 8500 0.69	<450 225 200 - - 1.14 <1
E	<450 225 550 8500 8500 0.82	<450 225 250 - - 0.95	<450 225 250 - - 1.09 <1	<450 225 250 - - 0.98	<450 225 225 8500 8500 0.86	<450 225 250 - - 1.24 <1
D	<450 225 200 - - 0.87	<450 225 250 - - 0.99	<450 225 200 - - 1.09 <1	<450 225 250 - - 0.95	<450 225 225 200 - 0.85	<450 225 250 - - 0.84
C	<450 225 550 8500 8500 0.85	<450 225 250 - - 0.88	<450 225 200 8500 8500 0.70	<450 225 250 - - 0.67	<450 225 225 8500 8500 0.71	<450 225 250 - - 0.83
B	<450 225 175 - - 1.73 <1	<450 225 200 - - 0.97	<450 225 175 - - 1.42 <1	<450 225 175 - - 1.19 <1	<450 225 200 - - 1.15 <1	<450 225 200 - - 1.68 <1
A	<450 225 200 8500 8500 1.22 <1	<450 225 175 - - 1.19 <1	<450 225 200 8500 8500 1.31 <1	<450 225 200 - - 1.35 <1	<450 225 175 8500 8500 1.50 <1	<450 225 200 - - 1.75 <1

FLOOR

	1	2	3	4	5	6
	<450 300 425 - - 4.19 <1	<450 300 400 - - 4.29 <1	<450 300 500 - - 4.45 <1	<450 300 450 - - 4.26 <1	<450 300 400 - - 4.43 <1	<450 300 425 - - 4.38 <1
D						
C	<450 300 400 8500 8500 5.03 <1	<450 300 425 - - 4.53 <1	<450 300 425 - - 4.69 <1	<450 300 400 9000 9000 4.77 <1	<450 300 425 - - 4.87 <1	<450 300 400 - - 4.52 <1
B	<450 300 425 - - 4.46 <1	<450 300 400 - - 3.80 <1	<450 300 425 9000 9000 4.43 <1	<450 300 400 - - 4.94 <1	<450 300 400 - - 4.53 <1	<450 300 425 8000 8000 4.77 <1
A	<450 300 400 8500 8500 4.14 <1	<450 300 400 - - 4.33 <1	<450 300 400 - - 1.62 <1	<450 300 400 9000 7500 3.95 <1	<450 300 400 - - 4.06 <1	<450 300 400 - - 4.26 <1

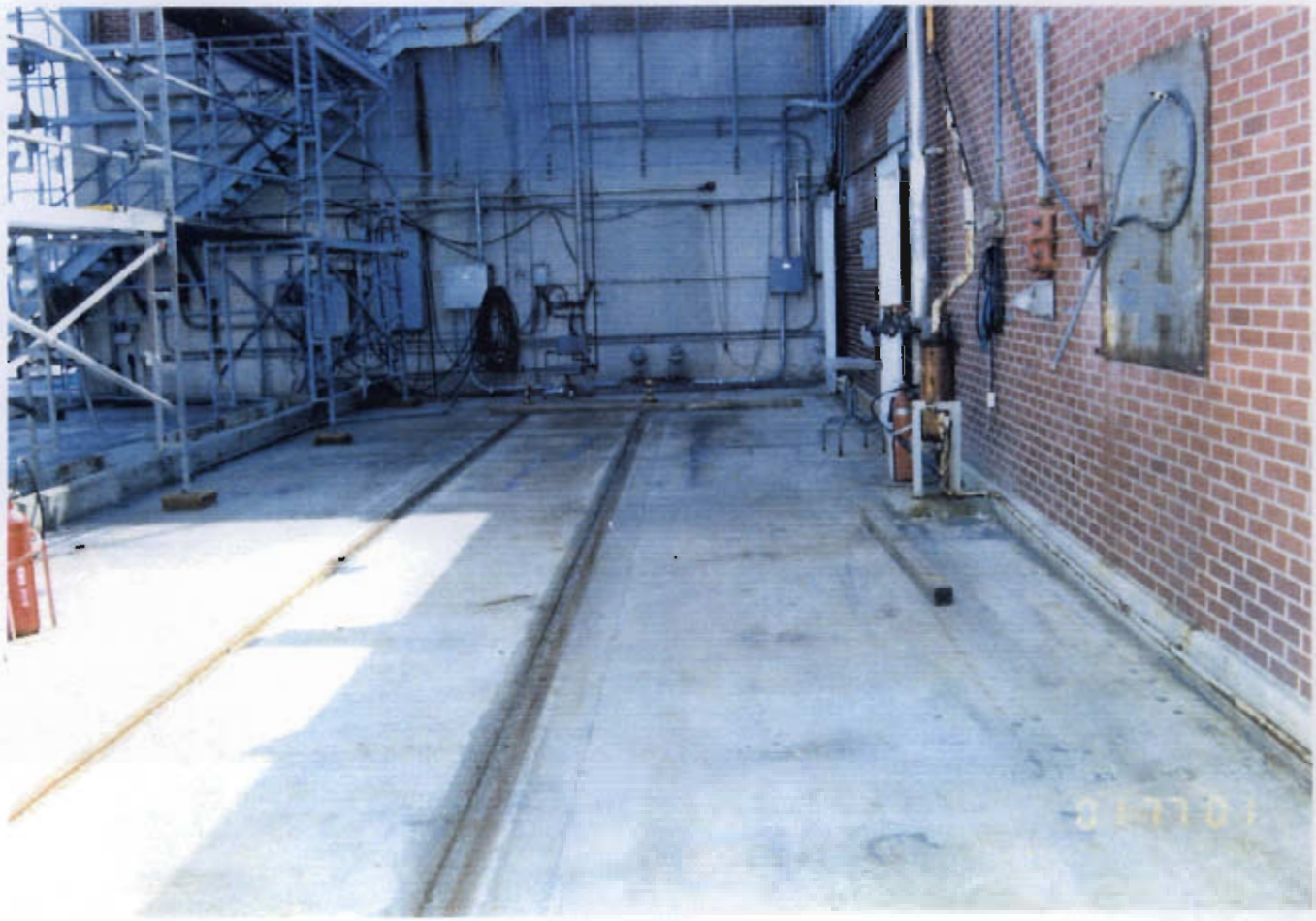
W1

Sample Data

<450 – IM-247/PD Results (µuCi/20cm²)
200 – IM-253/PD (HV-1 PHA) [bkg.]
300 – IM-253/PD (HV-1 PHA) [cpm]
7000 – IM-253/PD (HV-2 GROSS) [bkg.]
7300 – IM-253/PD (HV-2 GROSS) [cpm]
1.82 – MCA Gross Gamma Eq. Co-60 [pCi/g]
<1 – MCA Specific Co-60 Results [pCi/g]

14. Bldg. 222, Miscellaneous Areas Group 4

c. Prior to Photographs, Refueling Slab



Viewing east

14. Bldg. 222, Miscellaneous Areas Group 4

c. After Photographs, Refueling Slab

Viewing east