

Rocky Flats Environmental Technology Site

Building 776/777

Area V

Final Survey

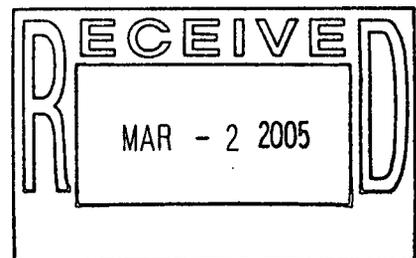
Report

Survey Units:

776010

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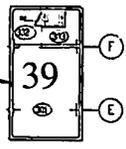
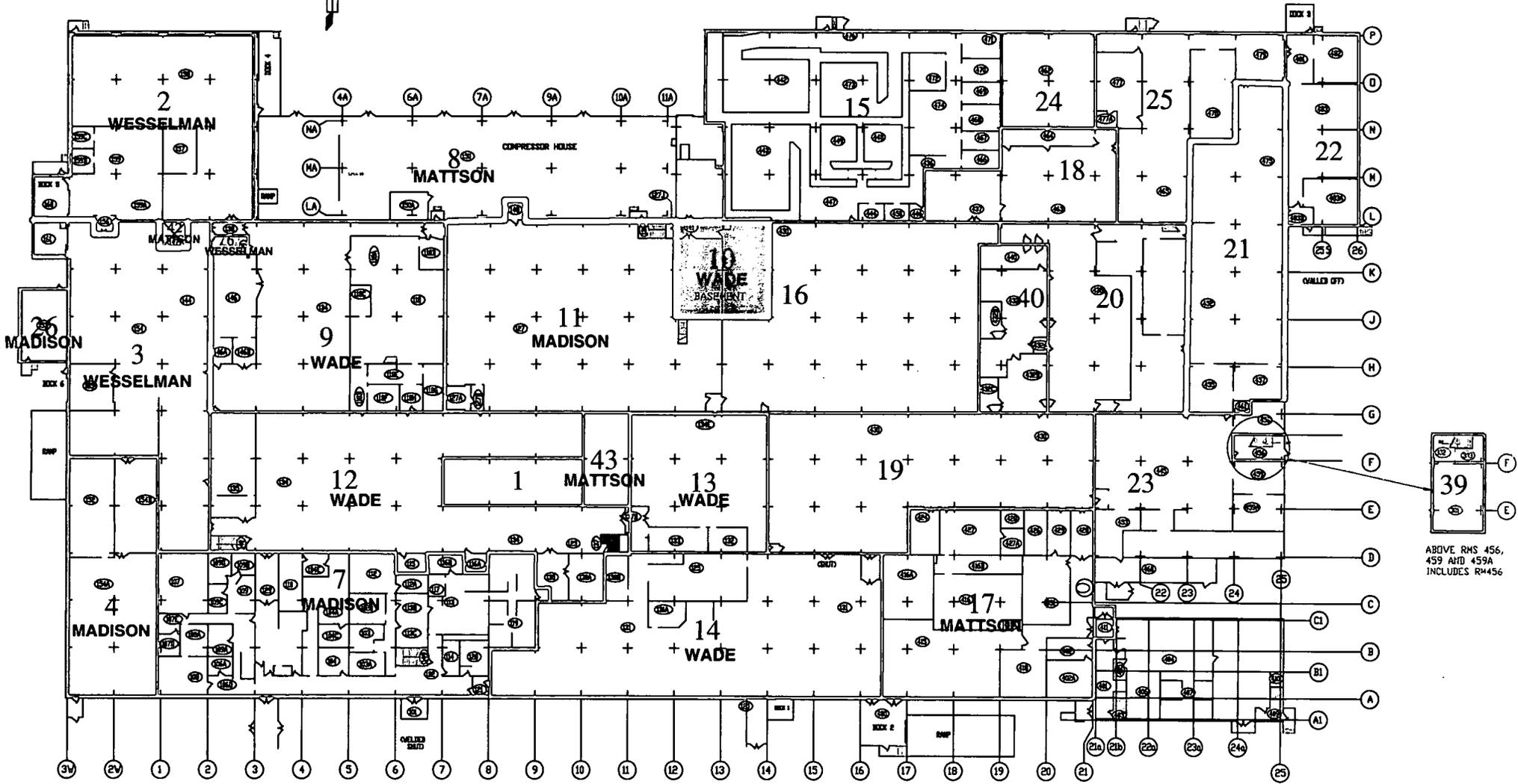
August 2004



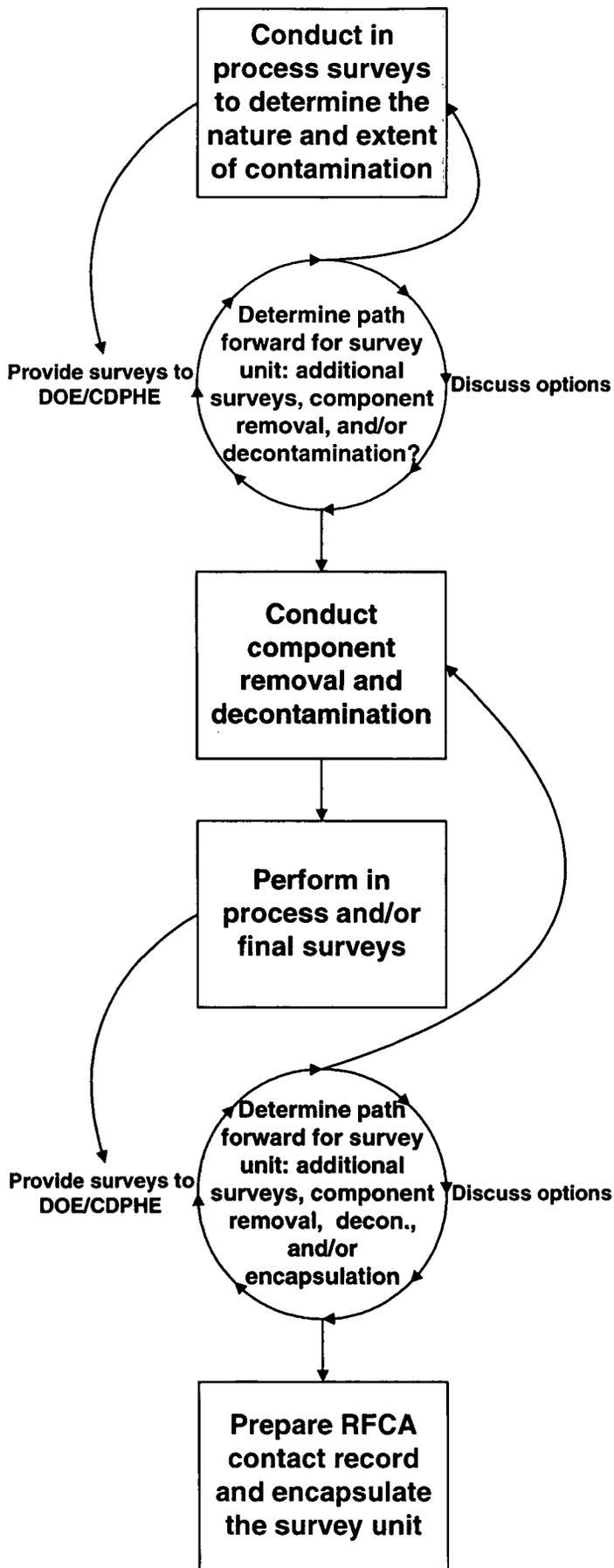
ADMIN RECORD

B776/777 SURVEY UNITS

1st FLOOR



ABOVE RMS 456,
459 AND 459A
INCLUDES R4456



Survey Instructions

Building 776 Area V

Survey Unit 776010

Purpose:

This instruction provides guidance for collecting gross gamma and removable contamination data to quantify the amount of residual contamination in Survey Unit 776010 prior to demolition. NaI measurements are performed in accordance with "INS-535-Ludlum2350-1 with Sodium Iodide Detector".

Equipment and materials:

1. A Ludlum 44-17 attached to a Ludlum 2350-1 set to collect five-minute counts that will be displayed on its LCD window.
2. A Bicon G-5 attached to a Ludlum 2350-1 set to collect five-minute counts that will be displayed on its LCD window.
3. One Electra with attached DP-6, calibrated and daily response checked.
4. Two probe holders, one for the G-5 and one for the 44-17 with tin shielding.
5. Calibrated and daily response checked SAC-4.
6. Measuring tape or laser range finder.

Note: The NE Electra with DP-6 probe and the Eberline SAC-4 shall be used in accordance with RSP- 7.01 and 7.02

Procedure:

1. Inspect instrument for obvious damage and ensure battery voltage is equal to or greater than 4.6 volts. If battery voltage is less than 4.6 volts change the batteries.
2. Complete daily performance checks for Sodium Iodide detectors to ensure the instrument is functioning properly by using Americium-241 source TS-912. Record results on Sodium Iodide Data Sheet.
3. For all background measurements, perform a 300-second background count with a Bicon G-5 for floors or Ludlum 44-17 for walls at background location designated on the attached map. Record background counts next to "Bkg Floor", "Bkg Concrete Wall" and "Bkg Ceiling" in background column of attached "Sodium Iodide Data Collection" sheets as needed.
4. Mark the sample locations on the surfaces to be measured. Take all measurements on contact with the marked surface using tin side shields on the Bicon G-5 and tin side and back shields on the Ludlum 44-17. All Sodium Iodide readings shall have 300 second count times.
5. Collect sodium Iodide, total surface activity and removable surface activity measurements at all locations marked on the attached map.
6. Record the NaI and NE Electra measurements on the attached sheet. Note any items or conditions that may have affected the measurement in the "remarks" section.
7. Count swipes for 60 seconds with a SAC-4, record result on attached sheet for removable contamination.

Survey Instructions
 Building 776 Area V
 Survey Unit 776010

Table 776010-1: Survey Requirements

Surface	Type of Survey	Probe	Placement	Count Time
Floor	Total Alpha Activity	Bicron G-5	On contact	300 seconds
All Surfaces	Total Alpha Activity	Electra with DP-6	On contact	60 seconds
Block walls	Total Alpha Activity	Bicron G-5 or Ludlum 44-17	On contact	300 seconds
All Surfaces	Removable Alpha	SAC-4	Swipe in placed in tray	60 seconds
Ceiling	Total Alpha Activity	Ludlum 44-17	On Contact	300 seconds
Block Walls	Background measurement	Bicron G-5 or Ludlum 44-17	On contact with wall in room 119 near column C-9	300 seconds
Floors and cement walls	Background measurement	Bicron G-5 or Ludlum 44-17	On contact with floor in room 119 near column C-9	300 seconds
Metal ceilings	Background measurement	Ludlum 44-17	Probe waist high, pointed toward ceiling with sheet metal plate on end in room 119 near column C-9	300 seconds

FINAL SURVEY REPORT

Survey Unit 776010

1) Introduction and Scope

A pre-demolition radiological survey (PDS) is performed prior to building demolition to define the radiological conditions of a facility. A PDS survey for survey unit 776010 has been completed in accordance with guidelines outlined in the "Radiological Pre-Demolition Survey Plan Building 776/777". Based on the results it is recommended that no further remediation is needed, and that the survey unit may be encapsulated in preparation for demolition. Isolation controls shall be put in place to prevent recontamination of the area. This report has been prepared in accordance with sections 3 and 8 of the "Radiological Pre-Demolition Survey Plan Building 776/777".

Building 776 room 001 is bounded by column lines 12-14 and J-L. This area is part of the original building. At the time of the 1969 fire this area contained several gloveboxes that supported plutonium foundry, fabrication and inspection operations. By 1974 all gloveboxes were removed from the area and it was used for drum storage. A sump is located in the northwest corner of room 001. The sump was filled with Rashcig rings and was used for collection of infiltrating ground water.

2) PDS Methods and Techniques

The PDS survey results determine the Average Surface Contamination Value (ASCV_u) and source term for the survey unit. These parameters are used determine whether the building may be demolished within the limits outlined in the "Radiological Pre-Demolition Survey Plan Building 776/777".

To obtain a statistically powerful number of data points, a minimum of 30 survey points were selected per survey unit. A random start, systematic grid method was used to identify the survey point locations. Three types of surveys are performed at each survey point as follows:

- a) Painted surfaces are evaluated for potential contamination under coatings using sodium iodide (NaI) gamma detectors attached to a single channel analyzer windowed for the 59 keV gamma-ray (Am^{241}). The standard location in room 119 was not used. Conditions in this survey unit are unique in the building. The only appropriate background location for this unit is located in the survey unit. The selected location was found to have the lowest readings during the in-process survey. The location was verified to have no significant amounts of contamination using low-resolution gamma spectroscopy and alpha surveys. The location is on the lower southeast corner of wall 4-A.
- b) Direct alpha surface contamination measurements are performed using a NE Electra survey instrument with attached DP-6 probe. This data may be compared to the NaI survey data to show the fraction of contamination that is directly on the surface verses imbedded in the material matrix.
- c) Removable surface alpha contamination surveys were performed by swiping the survey point with a 47mm filter paper then counting the filter paper on a SAC-4 alpha counter. This data may be used to gauge the effectiveness of encapsulation following the PDS.

To conservatively determine the final Average Surface Contamination Value (ASCV_u) for the survey unit, the source term associated with inaccessible areas of the survey unit (as

FINAL SURVEY REPORT

Survey Unit 776010

described in section 4 of this report) is added to the source term calculated by the PDS survey.

3) ALARA Post Remediation Surveys

In addition to the PDS used to determine the Average Surface Contamination Value (ASCV_w) and source term for the survey unit, surveys were taken to determine the effectiveness of remediation efforts. Remediation is performed to demonstrate a reasonable best effort is made to maintain releases to the environment and doses to the workers ALARA. Remediation may include decontamination, or removal of parts of the structure such as block wall removal.

a) Floors

The in-process surveys showed widespread contamination associated with the floors in this survey unit. The decision was made to shave the entire floor surface and re-survey. A summary of remediation results is shown below in Table 1. The sump located in the northwest corner of the room (survey grid point 776010-01) was remediated by chipping out the concrete surfaces and is described in the inaccessible areas section of this report. The data collected indicates a highly successful decontamination factor (DF) of 146 or a 99% reduction in source term.

**Table 1:
Floor Remediation Results**

	Pre-Remediation (In-process)	Post-Remediation (Follow-up)
Maximum (dpm/100cm²)	96,082,279*	328,501
Minimum (dpm/100cm²)	360,918*	50,527
Average (dpm/100cm²)	13,446,426*	92,391
Average (μCi/m²)	605.69*	4.16
Source Term (μCi)	90,247.81*	620.10

*Denotes data corrected from in-process survey

b) Stairs

The in-process survey showed high amounts of contamination on the steel kick plates on the stairs leading down from room 127 into room 001. The decision was made to remove the steel kick plates and remediate the under-laying concrete as necessary. The painted surfaces of all steps were removed with a chipping hammer. Data collected indicates a decontamination factor (DF) of 177 or a 99% reduction in source term.

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Survey Unit 776010

**Table 2:
Stair Remediation Results**

	Pre-Remediation (In-process)	Post-Remediation (Follow-up)
Maximum (dpm/100cm²)	144,551,025	559,913
Minimum (dpm/100cm²)	310,366	28,853
Average (dpm/100cm²)	27,606,030	155,923
Average (μCi/m²)	1,243.51	7.02
Source Term (μCi)	20,317.79	114.76

c) Walls

“High density” NaI surveys was performed on walls in Area III to develop a risk-based classification of walls. Additionally, a series of holes were made in the hollow block to provide internal contamination levels. The general trend of contamination levels showed the highest levels at the top and the lowest levels at the bottom. This data along with the identification of load-bearing walls provided the basis for classification of building 776 area V walls into three categories:

- i) Type I – Structural or non-structural wall with average contamination levels ranging from < MDA to approximately 100,000 dpm/100 cm². These walls require no further remediation.
- ii) Type II – Structural or non-structural wall with average contamination levels that range from >100,000 dpm/100cm² to <1,000,000 dpm/100cm². Some of the type II walls are structural and it has been determined by Engineering that removal is not allowed. For non-structural type II walls partial removal was performed to eliminate the inaccessible area at the top of wall. This will allow additional engineering controls to be applied to minimize the risk of a localized airborne event during demolition.
- iii) Type III - Structural or non-structural wall with average contamination levels that exceed >1,000,000 dpm/100cm². Some of the type III walls are structural and it has been determined by Engineering that no remediation is allowed. Additional mitigating techniques will be utilized to minimize the potential of a localized airborne event during demolition. For non-structural type III walls partial removal was performed to eliminate the inaccessible area at the top of wall. This will allow additional engineering controls to be applied to minimize the risk of a localized airborne event during demolition.

Walls of survey unit 776010 consist of structural poured concrete. Due to the construction of the walls no intrusive remediation was possible. During the initial characterization walls were measured with a Ludlum 44-17 single channel analyzer windowed for the 59.5 KeV gamma produced by Am-241. Because of the soil behind the walls it was hypothesized that the measurements were biased high due to the 44-17 detecting naturally occurring radioactive materials in the soil. An MCA-465 multi-channel analyzer was used to determine if any significant amount of Am-241 was present. This background was used for the wall measurements. The MCA-465 was placed at the background location and a ten-minute count was collected. The region of

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the spectrum that is affected by the Am-241 59.5 KeV gamma was analyzed and no Am-241 above background was detected. The MDA of this assay is lower than the MDA of the 44-17.

The remediation effort and background adjustment associated with walls resulted in reducing the total source term from 2,298.43 μCi to 623.48 μCi providing a source term reduction of approximately 73%. Initial and Final Data from survey unit 776010 walls is summarized in Table 3. Source term from walls is summarized in Table 4.

Table 3
B776/777 Survey Unit 10, Area V Wall Summary

Wall	Section	Structural	Initial Characterization			Follow-up Characterization		
			Type 1	Type 2	Type 3	Type 1	Type 2	Type 3
776010-1	A	X						
776010-1	B	X						
776010-2	A	X						
776010-2	B	X						
776010-3	A	X						
776010-3	B	X						
776010-4	A	X						
776010-4	B	X						
776010-5	A	X						
776010-6	A	X						
776010-7	A	X						
776010-8	A	X						
776010-9	A	X						
776010-10	A	X						
776010-11	A	X						
776010-12	A	X						
	Type 1: <100,000 dpm/100 cm2							
	Type 2: >100,000 dpm/100 cm2 to <1,000,000 dpm/100 cm2							
	Type 3: >1,000,000 dpm/100 cm2							

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Table 4
B776/777 Survey Unit 776010, Area V Wall Source Term

Wall Section Designation	Wall Type	Area (ft ²)	Area (m ²)	Pre-remediation Wall Section Average dpm/100cm ²	Pre-remediation Wall Section Activity (uCi)	Comments	Remediated Wall Section Average dpm/100cm ²	Remediated Wall Section Activity (uCi)
776010-1A	II	340	31.587	228,602	325.26	Structural	101,974	145.09
776010-1B	I	340	31.587	188,396	268.06	Structural	61,891	88.06
776010-2A	I	340	31.587	176,592	251.26	Structural	52,639	74.90
776010-2B	I	340	31.587	118,405	168.47	Structural	14,508	20.64
776010-3A	I	340	31.587	143,026	203.50	Structural	27,095	38.55
776010-3B	I	340	31.587	111,857	159.15	Structural	6,285	8.94
776010-4A	I	340	31.587	110,751	157.58	Structural	7,791	11.09
776010-4B	I	315.5	29.311	181,401	239.51	Structural	55,213	72.90
776010-5A	I	69.4	6.449	153,195	44.50	Structural	90,795	26.38
776010-6A	I	44.2	4.11	104,524	19.35	Structural	81,124	15.02
776010-7A	I	74.3	6.907	202,336	62.95	Structural	61,938	19.27
776010-8A	I	46.8	4.343	120,203	23.52	Structural	14,754	2.89
776010-9A	I	122.1	11.342	178,667	91.28	Structural	47,952	24.50
776010-10A	I	187.021	17.375	188,083	147.20	Structural	54,577	42.71
776010-11A	I	113.056	10.503	181,895	86.06	Structural	45,646	21.60
776010-12A	I	71.542	6.646	169,584	50.77	Structural	35,226	10.55
		Total Area (ft²)	Total Area (m²)	Pre-remediation Average dpm/100cm²	Pre-remediation Total Activity (uCi)		Remediated Average dpm/100cm²	Remediated Total Activity (uCi)
		3,423.92	318.10	159,845	2,298.43		47,463	623.08

d) Ceilings

The In-Process NaI survey of the ceilings found fifteen locations exceeding 100,000 dpm/100cm².

As stated in the In-Process Report, it was suspected that "shine" from the highly contaminated floors was causing these high readings. These areas were investigated further after the floor was shaved removing a significant portion of the source term.

The fifteen elevated areas were re-surveyed duplicating the In-Process technique. The results confirm that the floor was a major contributor as shown in Table 5 below.

Survey grids 10-24, 10-26, 10-31, and 10-33 were elevated due to measurements being collected on contaminated cracks. Five additional measurements were collected in each of these grids to prove that the high measurements were due to the contaminated cracks. The measurements collected directly on the cracks were re-classified as inaccessible areas and the results are summarized in table 6.

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The remediation effort resulted in reducing the source term from 90,247.81 μCi to 948.68 μCi providing a source term reduction of approximately 99%.

**Table 5:
Ceiling Remediation Results**

	Pre-Remediation (In-process)	Post-Remediation
Maximum (dpm/100cm ²)	96,082,279*	964,933
Minimum (dpm/100cm ²)	360,918*	51,906
Average (dpm/100cm ²)	13,446,426*	141,348
Average ($\mu\text{Ci}/\text{m}^2$)	605.69*	6.37
Source Term (μCi)	90,247.81*	948.68

*Denotes data corrected from in-process survey

4) Inaccessible Areas

Note:

This report reflects the results of the remediation of inaccessible areas greater than 1,000,000 dpm/100cm².

a) Floors

Concrete shaving of the contaminated sections of the floors uncovers cracks and concrete seams including floor and column expansion joints as well as imbedded bolts in the floor. These seams and bolts trap contamination and can contain significant source term. Upon completion of the shaving effort, NaI readings along the seams showed higher levels of contamination than the general floor area.

The In-Process Survey Report for survey unit 776010 did not account for all of this added floor activity. In order to calculate a more realistic decontamination factor (DF), this activity will be added to the source term reported in the 776010 In-Process Report, and then compared to the post remediation source term. Approximately 92 linear feet of expansion joint were removed at a depth of up to 4 inches. 65 bolts were removed.

Areas greater than 1,000,000 dpm/100cm² were remediated. The result of the remediation effort for the inaccessible areas of the floor is summarized in Table 6 below.

b) Sump

The sump located in survey grid 10-01 was remediated by chipping away the entire concrete surface. The sump is constructed with one side providing footer support for the north and west walls and column L-12. Remediation was completed to the fullest extent possible without influencing support of the walls and column.

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Survey Unit 776010

c) Stairs

One inaccessible area was identified on the stairs during the post-remediation survey. The area was directly under the base of a hand-rail and was ineligible for remediation due to safety concerns.

d) Walls

No inaccessible survey areas were identified on the walls of survey unit 776010.

e) Ceilings

Significant levels of contamination were found at points on the ceiling where cracks exist between the ceiling surface and the floor or room 127 above. These cracks were unable to be remediated because of the structural impact that remediation would have on the floor of room 127.

f) Summary

The inaccessible area remediation effort resulted in reducing the source term from 223,290 μCi to 1,671 μCi providing a source term reduction of approximately 99%.

**Table 6:
Inaccessible Area Remediation Results**

	Pre-Remediation (In-process) **	Post-Remediation
Seam/Crack Maximum (dpm/100cm ²)	189,781,533	124,474
Seam/Crack Minimum (dpm/100cm ²)	1,046	13,598
Seam/Crack Average (dpm/100cm ²)	22,679,367	55,139
Seam/Crack Average ($\mu\text{Ci}/\text{m}^2$)	1,021.59	2.48
Seam/Crack Source Term (μCi)	11,400.98	14.01
DF	-	814
Source Term Reduction (%)	-	99%
Bolt/Floor Maximum (dpm/100cm ²)	182,114,876	948,722
Bolt/Floor Minimum (dpm/100cm ²)	45,812,708	32,426
Bolt/Floor Average (dpm/100cm ²)	113,963,792	490,574
Bolt/Floor Average ($\mu\text{Ci}/\text{m}^2$)	5,133.50	22.10
Bolt/Floor Source Term (μCi)	600.62	2.59
DF	-	232
Source Term Reduction (%)	-	99%
Sump Maximum (dpm/100cm ²)	155,784,190	658,457
Sump Minimum (dpm/100cm ²)	8,704	5,230
Sump Average (dpm/100cm ²)	77,896,447	331,844
Sump Average ($\mu\text{Ci}/\text{m}^2$)	3,508.85	14.95
Sump Source Term (μCi)	210,530.94	896.87

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Survey Unit 776010

	Pre-Remediation (In-process) **	Post-Remediation
DF	-	235
Source Term Reduction (%)	-	99%
Stair Maximum (dpm/100cm ²)	30,839,977	30,839,977
Stair Minimum (dpm/100cm ²)	30,839,977	30,839,977
Stair Average (dpm/100cm ²)	30,839,977	30,839,977
Stair Average (μCi/m ²)	1,389.19	1,389.19
Stair Source Term (μCi)	129.06	129.06
DF	-	0
Source Term Reduction (%)	-	0.00
Ceiling Maximum (dpm/100cm ²)	49,707,784	49,707,784
Ceiling Minimum (dpm/100cm ²)	125,309	125,309
Ceiling Average (dpm/100cm ²)	13,039,828	13,039,828
Ceiling Average (μCi/m ²)	587.37	587.37
Ceiling Source Term (μCi)	628.49	628.49
DF	-	0
Source Term Reduction (%)	-	0.00%
Total Source Term (μCi)	223,290.09	1,671.02
Total DF	-	134
Total Source term Reduction (%)	-	99%

** - Includes all activity from cracks, expansion joints, and seams not accounted for in the In-Process Survey Report.

5) Room 118 Rubble

Due to the necessity of floor removal in survey unit 776009 the walls of room 118 were removed and placed in survey unit 776010. The rubble accounts for 821.5 m² of surveyed surface area. Source term inventory was assigned to these walls using data collected during the 776009 Final PDS survey.

The average contamination value for the rubble is 35,704 dpm/100 cm². This yields a source term for the rubble of 1,321.2 uCi.

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Survey Unit 776010

6) PDS Survey Results Summary

Note:
This report reflects the results of the remediation of floor expansion joint areas greater than 1,000,000 dpm/100cm².

The values for the accessible areas and inaccessible areas were summed and divided by the total area for the survey unit to calculate the "Average Surface Contamination Value" (ASCV_u) and source term for the survey unit. The results are summarized in Table 7 below:

**Table 7:
PDS Final Results**

	Final Results
776010 Source Term Inaccessible Areas (μCi)	1,671.02
776010 Source Term Accessible Areas (μCi)	872.5
Rubble Source Term (μCi)	1,321.2
776010 Total Source Term (μCi)	3,864.7
Survey Unit Area (m²)	650.49
Rubble Surface Area (m²)	821.47
ASCV_u (μCi/m²)	3.91
ASCV_u (dpm/100cm²)	86,806
ASCV_{RUBBLE} (uCi/m²)	1.61
ASCV_{RUBBLE} (dpm/100cm²)	35,704

Table 7 Notes:

- a) Inaccessible areas source term from Section 4, Table 6 of this report.
- b) Accessible area source term is the sum of source terms attributed to floors, walls, ceiling and columns as determined by the final PDS survey.
- c) Total Source Term equals the sums of the source terms of Inaccessible Area + Accessible Area. Total Source Term = (1,671.02 + 872.5) μCi = 2,543.52 μCi
- d) Average Surface Contamination for the Survey Unit (ASCV_u) in dpm/100cm² equals:

$$ASCV_u = (2,543.52 \mu Ci) / (650.49 m^2) = 3.91 \mu Ci/m^2$$

$$ASCV_u = (3.91 \mu Ci/m^2) \times (22,200 dpm/100cm^2 / 1 \mu Ci/m^2) = 86,806 dpm/100cm^2$$

**ENGINEERING CALCULATION SHEET
CALCULATION COVER SHEET
Page 1 of 1**

Title Method for calculating Average Surface contamination Values

Calculation No. 04-RS-776-0003 **Revision No.** 0 **Date:** 01/07/2005

Originator : Michael Wesselman **Peer Reviewed** _____ **Date** _____

Project B776/B777 Demolition **Bldg.** B776

Analyzed System Characterization Surveys **Supersedes Calc. No.** N/A

Other Documents Supported by this Calculation

Final Characterization Survey Reports for survey units in B776

Calculation Summary:

Documents formal method for calculating ASCV .

Originator:	/	/	/
_____	Signature	Employee #	Date
Name (print)			
Peer Reviewer:	/	/	/
_____	Signature	Employee #	Date
Name (print)			
Approval:	/	/	/
_____	Signature	Employee #	Date
Name (print)			

Calculation # 05-RS-776-0001

Title: Standard Method for Calculating the ASCV

Discussion:

This sheet demonstrates the generic method for calculating the ASCV for each survey unit in building 776/777.

Prerequisites:

- 1) Final survey map for the survey unit
- 2) PDS survey results
- 3) Survey information used to estimate activities in inaccessible areas;
- 4) Survey information for any structural members or elevated regions not represented by the PDS survey.

Conversions:

1 square meter (m^2) = $100 \times 100 \text{ cm}^2$

1 microcurie (μCi) = $2.22 \times 10^6 \text{ dpm}$

$1 (\mu\text{Ci}/m^2) = 22,200 \text{ dpm}/100\text{cm}^2$ evenly distributed over one square meter.

12 inches = 1 foot = .305 meters

Calculations:

Calculating Inventory for Accessible Areas

- 1) Obtain total surface activity data from PDS survey.
- 2) Average the values for the 30 points selected using a random start grid method
- 3) Convert the average contamination value from step 2 from " $\text{dpm}/100\text{cm}^2$ " to " $\mu\text{Ci}/m^2$ "

Example: $22,200 \text{ dpm}/100\text{cm}^2 \times (100 \times 100 \text{ cm}^2/m^2) \times (1\mu\text{Ci}/2.22 \times 10^6 \text{ dpm}) = 1 \mu\text{Ci}/m^2$

- 4) Obtain surface area of survey unit from title box of final survey map. This is reported in square meters.

- 5) Calculate inventory for accessible areas

Example: $22,200 \text{ dpm}/100\text{cm}^2 \times (100 \times 100 \text{ cm}^2/m^2) \times (1\mu\text{Ci}/2.22 \times 10^6 \text{ dpm}) = 1 \mu\text{Ci}/m^2$

The surface area from a survey unit map title box is 1,000 square meters and the average contamination level from the 30 PDS points is $22,200 \text{ dpm}/100\text{cm}^2$.

$1,000 m^2 \times 22,200 \text{ dpm}/100\text{cm}^2 \times (100 \times 100 \text{ cm}^2/m^2) \times (1\mu\text{Ci}/2.22 \times 10^6 \text{ dpm}) = 1,000 \mu\text{Ci}$

Estimating Inventory for inaccessible areas

- 1) Document methods used to estimate contamination levels and potential inventory in seams, cracks or other surfaces in the final survey report. Provide an estimated remaining inventory for each item/area in the report.

Example:

There are 20 feet of seams contaminated to an average level of 2,220,000 dpm/100 cm². Each seam has two sides. The total inventory can be estimated assuming the contamination levels measured at the top of the seam extend down each side of the seam. The depth of the seam can be determined from design drawings or from direct observation as the seam is chipped away. If a seam is determined to be 4 inches deep, then the inventory of the seam can be calculated as follows:

The contaminated area of the seam is:

$$(20 \text{ feet} \times .305 \text{ m/ft}) \cdot (0.3 \text{ feet} \times 0.305 \text{ m/ft}) = .61 \text{ m}^2 \times 2 \text{ sides} = 1.22 \text{ m}^2$$

Therefore the inventory in the seam in μCi is:

$$1.22 \text{ m}^2 \cdot (2,220,000 \text{ dpm}/100 \text{ cm}^2) \cdot (10,000 \text{ cm}^2/\text{m}^2) \cdot \mu\text{Ci} / 2.22\text{E}6 \text{ dpm} = 122 \mu\text{Ci}$$

Calculating the ASCV

- 1) Sum the inventories from the inaccessible areas with the inventory for the accessible area to obtain a total inventory for the survey unit.

Total Inventory = Accessible Inventory + Inaccessible inventory + Inventory items/ areas not represented by other inventories listed (i.e. Stairs, columns, etc)

Example: $1000\mu\text{Ci} + 122\mu\text{Ci} = 1112.2\mu\text{Ci}$

- 2) Divide the total inventory for the survey unit by the accessible area of the survey unit obtained from the final survey map.

Example: $1112.2\mu\text{Ci}/1,000 \text{ m}^2 = 1.11 \mu\text{Ci} / \text{m}^2$

$$1.11 \mu\text{Ci} / \text{m}^2 \cdot (1\text{m}^2 / (100 \cdot 100 \text{ cm}^2)) \cdot (2.22\text{E}6 \text{ dpm}/\mu\text{Ci}) = 24,642 \text{ dpm} / 100\text{cm}^2$$

References:

PRO-267-RSP-17.01, "Conduct of Radiological Engineering"

Originator: _____ Date: _____

Reviewer: _____ Date: _____

Survey Unit 776010 Nal Data

Location #	Column letter	Column Number	North	East	Gross Counts	BKG	pre-remediation dpm/100cm2	post-remediation dpm/100cm2
FLOOR								
10-1	K	12	19	0	4886	2150	96,082,279	158,704
10-2	K	12	18	14	3287	2150	5,015,750	65,781
10-3	K	13	14	3	3398	2150	3,091,484	27,015
10-4	K	13	15	15	3810	2150	7,580,948	65,541
10-5	K	13	17	17	3123	2150	1,832,883	15,856
10-6	K	13	7	1	3374	2150	4,539,766	78,981
10-7	K	12	1	19	3388	2150	42,969,324	1,177,111
10-8	K	12	1	8	3037	2150	1,565,444	1,177,111
10-9	J	12	11	1	4241	2150	20,813,548	1,177,111
10-10	J	12	3	8	3541	2150	8,640,855	1,177,111
10-11	J	13	16	3	3403	2150	3,296,465	1,177,111
10-12	J	13	19	10	3298	2150	360,918	1,177,111
10-13	J	13	5	13	3356	2150	967,268	1,177,111
10-14	J	13	8	3	3198	2150	1,052,991	1,177,111
10-15	J	12	7	15	3320	2150	1,771,263	1,177,111
10-16	J	12	3	8	3541	2150	5,048,236	1,177,111
10-17	H	12	20	5	8050	2150	23,959,824	1,177,111

CEILING

10-18	K	12	13	4	247	100	226,150	1,177,111
10-19	K	12	18	13	272	100	201,252	1,177,111
10-20	K	13	14	4	228	100	193,645	1,177,111
10-21	K	13	17	15	207	100	186,037	1,177,111
10-22	K	13	3	17	235	100	206,093	1,177,111
10-23	K	13	4	5	243	100	153,533	1,177,111
10-24	K	12	5	13	350	121	535,981	1,177,111
10-25	K	12	5	4	231	121	186,729	1,177,111
10-26	J	12	12	3	4942	121	70,099	1,177,111
10-27	J	12	15	14	263	121	185,346	1,177,111
10-28	J	13	17	5	264	100	237,907	1,177,111
10-29	J	13	17	17	260	100	153,533	1,177,111
10-30	J	13	4	17	264	121	159,757	1,177,111
10-31	J	13	8	4	319	121	53,717	1,177,111
10-32	J	12	5	15	279	100	172,897	1,177,111
10-33	J	12	4	4	144678	100	23,756,766	1,177,111
10-34	H	12	18	5	265	100	193,645	1,177,111

STAIRS

1	NA	NA	NA	NA	370	275	8,820,855	39,725
2	NA	NA	NA	NA	350	275	7,765,777	31,362
3	NA	NA	NA	NA	1238	275	36,737,503	402,686
4	NA	NA	NA	NA	391	275	31,317,695	48,506
5	NA	NA	NA	NA	403	275	51,426,871	53,524

Survey Unit 776010 Nal Data

Location #	Column letter	Column Number	North	East	Gross Counts	BKG	pre-remediation dpm/100cm2	post-remediation dpm/100cm2
6	NA	NA	NA	NA	389	275	26,355,429	
7	NA	NA	NA	NA	344	275	NO DATA	
8	NA	NA	NA	NA	996	275	NO DATA	
9	NA	NA	NA	NA	621	275	57,511,038	
10	NA	NA	NA	NA	388	275	NO DATA	
11	NA	NA	NA	NA	388	275	NO DATA	
12	NA	NA	NA	NA	1614	275	72,635,305	
13	NA	NA	NA	NA	364	275	NO DATA	
14	NA	NA	NA	NA	428	275	1,691,626	
15	NA	NA	NA	NA	546	275	NO DATA	
16	NA	NA	NA	NA	384	275	NO DATA	
17	NA	NA	NA	NA	443	275	5,145,614	
18	NA	NA	NA	NA	1234	275	NO DATA	
19	NA	NA	NA	NA	944	275	NO DATA	
20	NA	NA	NA	NA	590	275	30,613,573	
21	NA	NA	NA	NA	420	275	NO DATA	
22	NA	NA	NA	NA	1389	275	NO DATA	
23	NA	NA	NA	NA	446	275	7,994,409	
24	NA	NA	NA	NA	592	275	NO DATA	
25	NA	NA	NA	NA	925	275	7,905,497	

*Pre-remediation stair data is an average of two measurements collected on the horizontal and vertical surface of each surveyed step. NO DATA indicates that the step was not surveyed during pre-remediation surveys.

2

Unit 776010 Wall 1 Section B Date 5/3/04
522004

Column #	Row Average #DIV/0!	Row Average #DIV/0!	Row Average					
K-12	5,993	5,993	5,993	5,993	5,993	161,838	5,993	31,967
L-12	5,993	5,993	5,993	5,993	5,993	149,389	5,993	50,487
12	5,993	5,993	5,993	5,993	5,993	31,814	5,993	45,877
9	5,993	5,993	5,993	5,993	5,993	110,658	5,993	56,943
6	5,993	5,993	5,993	5,993	5,993	186,736	5,993	124,163
3	5,993	5,993	5,993	5,993	5,993		5,993	
0	5,993	5,993	5,993	5,993	5,993		5,993	

Section Average	61,891		
Section Average	dpm/100cm ²		
Count Time (s)	30		
Probe# 1	209090	Background 1	446
Efficiency 1	260	RCT 1	E. Bartolomy
Contact Eff. 1	0.0824		
Probe# 2	209090	Background 2	446
Efficiency 2	260	RCT 2	Fessenden
Contact Eff. 2	0.0824		

NOTE ON CONTACT

Date 5/3/04

Section A

Wall 2

Unit 776010

Row Average #DIV/01

Column #

L-13

Row Average 68,700

Row Average 42,956

Row Average 54,791

Row Average 40,190

Row Average 56,559

Section Average 52,639

dpm/100cm²

Count Time (s) 30

Column #	#DIV/01	ELEV. (ft)										
L-12												190,886
12												127,257
9												106,509
6												199,185
3												35,964
0												5,993

17,982

5,993

5,993

5,993

5,993

5,993

5,993

15,216

5,993

5,993

66,395

5,993

5,993

5,993

5,993

62,245

5,993

5,993

5,993

5,993

5,993

66,395

199,185

127,257

185,353

113,425

150,772

66,395

106,509

190,886

27,665

63,629

66,395

62,245

5,993

113,425

Fessenden

RCT 2

Efficiency 2 260

Probe# 2 209090

Background 2 446

RCT 1

E. Barolomy

Efficiency 1 260

Probe# 1 209090

Background 1 446

Contact Eff. 2 0.0824

Contact Eff. 1 0.0824

5/8/04
5/19/04
Date 5/3/04

Section B

Wall 3

Unit 776010

Row Average
#DIV/0!
#DIV/0!
#DIV/0!
Column #
J-14

Column #
K-14

Row Average 5,993	5,993	5,993	5,993	5,993	5,993	5,993
Row Average 5,993	5,993	5,993	5,993	5,993	5,993	5,993
Row Average 5,993	5,993	5,993	5,993	5,993	5,993	5,993
Row Average 6,147	5,993	6,916	5,993	5,993	5,993	5,993
Row Average 7,299	5,993	5,993	5,993	5,993	5,993	13,832

Section Average
6,285
dpm/100cm²
Count Time (e) 30

Probe# 2 209090 Background 2 446
Efficiency 2 260 RCT 2 D.Harvey
Contact Eff. 2 0.0824

Probe# 1 209090 Background 1 446
Efficiency 1 260 RCT 1 E.Barolomy
Contact Eff. 1 0.0824

ELEV. (ft)
0
3
6
9
12

ST804
Date 5/3/04

Section A

Wall 4

Unit 776010

Row Average
#DIV/0!
#DIV/0!
#DIV/0!

Column #
J-13

Row Average	Column #	J-14	ELEV. (ft)	12	9	6	3	0
Row Average 5,993			5,993	5,993	5,993	5,993	5,993	5,993
Row Average 5,993			5,993	5,993	5,993	5,993	5,993	5,993
Row Average 7,530			15,216	5,993	5,993	5,993	5,993	5,993
Row Average 12,679			5,993	5,993	27,665	8,299	22,132	5,993
Row Average 6,762			5,993	5,993	5,993	5,993	5,993	5,993

Section Average
7,791
dpm/100cm²
Count Time (s) 30

Probe# 2 209090
Background 2 446
Efficiency 2 260
RCT 2
Fessenden

Contact Eff. 2 0.0824

Probe# 1 209090
Background 1 446
Efficiency 1 260
RCT 1
E Barolomy

Contact Eff. 1 0.0824

5/3/04 Date

Section B

Wall 4

Unit 776010

S1904
S2004

Row Average
#DIV/0!
#DIV/0!
#DIV/0!

Column #
J-12

Row Average	Column #	J-13	J-12	12	9	6	3	0
ELEV. (ft)								
103,818 Row Average			5,993	5,993	5,993	5,993	5,993	5,993
5,993 Row Average			5,993	5,993	5,993	5,993	5,993	5,993
93,675 Row Average			219,934	175,670	5,993	42,880	85,760	31,814
40,205 Row Average				177,054	5,993	5,993	5,993	5,993
24,805 Row Average				5,993	85,760	15,216	11,066	5,993

Section Average
55,213

dpm/100cm²

Count Time (s)
30

Probe# 2	209090	Background 2	446
Efficiency 2	260	RCT 2	Fessenden
Contact Eff. 2	0.0824		

Probe# 1	209090	Background 1	446
Efficiency 1	260	RCT 1	E. Bartolomy
Contact Eff. 1	0.0824		

Unit 776010

Wall 5
WEST WALL ON TOP

Section A

Date 4/29/04

Column #						Column #
		74,694	66,823 <small>NOTE: ON CONTACT</small>	54,673 <small>NOTE: ON CONTACT</small>	109,898 <small>NOTE: ON CONTACT</small>	
ELEV. (ft)						
12		48,413	121,724	160,706 <small>NOTE: ON CONTACT</small>		
9		102,359	77,868 <small>NOTE: ON CONTACT</small>			
6						
3						
0						

Row Average #DIV/0!
Row Average #DIV/0!

Row Average 76,522

Row Average 110,281

Row Average 90,114

Row Average #DIV/0!

Row Average #DIV/0!

Probe# 1	209090	Background 1	446
Efficiency 1	260	RCT 1	A.Merezko
Contact Eff. 1	0.0824		

Probe# 2		Background 2	
Efficiency 2		RCT 2	
Contact Eff. 2			

Section Average 90,795

dpm/100cm²

Count Time (s) 30

29

Unit 776010

Wall 6
EAST WALL OF STAIRS

Section A

Date 4/29/04

Column #							Column #
		133,093 <small>NOTE ON CONTACT</small>	69,032 <small>NOTE ON CONTACT</small>	33,687 <small>NOTE ON CONTACT</small>			Row Average #DIV/0!
ELEV. (ft)							Row Average #DIV/0!
12			69,032 <small>NOTE ON CONTACT</small>	110,658			Row Average 78,604
9				71,241 <small>NOTE ON CONTACT</small>			Row Average 89,845
6							Row Average 71,241
3							Row Average #DIV/0!
0							Row Average #DIV/0!

Probe# 1	209090	Background 1	446
Efficiency 1	260	RCT 1	A.Merezko
Contact Eff. 1	0.0824		

Probe# 2		Background 2	
Efficiency 2		RCT 2	
Contact Eff. 2			

Section Average 81,124

dpm/100cm²

Count Time (s) 30

Unit 776010

Wall 7

Section A

Date 4/29/04

SOUTH WALL TOP OF STAIRS

Column #	1	2	3	4	5	6	Row Average #DIV/0!
12	26,281	8,299	27,665				20,748
9	56,712	67,778	27,665				50,718
6	74,694	167,371	100,976				114,347
3							#DIV/0!
0							#DIV/0!

Probe# 1	209090	Background 1	446
Efficiency 1	260	RCT 1	A.Merezko
Contact Eff. 1	0.0824		

Probe# 2		Background 2	
Efficiency 2		RCT 2	
Contact Eff. 2			

Section Average 61,938

dpm/100cm²

Count Time (s) 30

Sample Location Number	Nal Activity Measurements				
	Measurement Used	Comment	Surface	Coating	(dpm/100 cm ²)
1	Sodium Iodide	N/A	wall	Thin/No Paint	10,311.0
2	Sodium Iodide	N/A	Floor	Thin/No Paint	14,077.0
3	Sodium Iodide	N/A	Floor	Thin/No Paint	3,908.0
4	Sodium Iodide	N/A	Floor	Thin/No Paint	3,908.0
5	Sodium Iodide	N/A	wall	Thin/No Paint	33,460.0
6	Sodium Iodide	N/A	wall	Thin/No Paint	310,475.0
7	Sodium Iodide	N/A	Floor	Thin/No Paint	3,908.0
8	Sodium Iodide	N/A	Floor	Thin/No Paint	40,846.0
9	Sodium Iodide	N/A	Floor	Thin/No Paint	24,446.0
10	Sodium Iodide	N/A	wall	Thin/No Paint	10,311.0
11	Sodium Iodide	N/A	wall	Thin/No Paint	10,208.0
12	Sodium Iodide	N/A	wall	Thin/No Paint	10,208.0
13	Sodium Iodide	N/A	wall	Thin/No Paint	12,889.0
14	Sodium Iodide	N/A	Floor	Thin/No Paint	39,664.0
15	Sodium Iodide	N/A	Floor	Thin/No Paint	91,348.0
16	Sodium Iodide	N/A	Floor	Thin/No Paint	40,214.0
17	Sodium Iodide	N/A	wall	Thin/No Paint	10,208.0
18	Sodium Iodide	N/A	wall	Thin/No Paint	11,223.0
19	Sodium Iodide	N/A	wall	Thin/No Paint	10,311.0
20	Sodium Iodide	N/A	wall	Thin/No Paint	10,311.0
21	Sodium Iodide	N/A	wall	Thin/No Paint	10,208.0
22	Sodium Iodide	N/A	wall	Thin/No Paint	10,311.0
23	Sodium Iodide	N/A	wall	Thin/No Paint	10,311.0
24	Sodium Iodide	N/A	Ceiling	Thin/No Paint	25,779.0
25	Sodium Iodide	N/A	Ceiling	Thin/No Paint	10,311.0
26	Sodium Iodide	N/A	Ceiling	Thin/No Paint	10,208.0
27	Sodium Iodide	N/A	Ceiling	Thin/No Paint	10,208.0
28	Sodium Iodide	N/A	Ceiling	Thin/No Paint	10,311.0
29	Sodium Iodide	N/A	Ceiling	Thin/No Paint	27,890.0
30	Sodium Iodide	N/A	Ceiling	Thin/No Paint	65,558.0
				MIN	3,908
				MAX	310,475
				AVERAGE	29,778
				SD	56,467

Data and Sodium Iodide Instrument Information

Survey Area:	V	Survey Unit:	776010	Survey Date(s):	09/27/04
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Instrument Specifications

Instrument #	1	2
Meter Model:	Ludlum 2350-1	Ludlum 2350-1
Meter Serial #:	192614	192614
Detector Model:	Bicron G-5	Ludlum 44-17
Detector #:	B716T	209090
Detector Size (cm ²):	125	17.8
Calibration Due Date:	12/10/04	10/20/04
Count Time (min)	5	5
Contact Efficiency	6.40%	8.24%

Ratio Used

Pu to Am - 241	8.1
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Comments

In cases where the critical level is greater than the calculated dpm/100cm², the critical level will be used for statistical analysis.

Count Times for backgrounds and samples are equal.

Attenuation Factors: Based on observation of Walls and Ceilings. Epoxy on Floor determined by chip sampling.

Background (Gross)

Instrument #	1	2
Gamma (Ceilings)	N/A	1591
Gamma (Floors)	6798	N/A
Gamma (Block Walls)	N/A	1591
Gamma (Solid Walls)	N/A	1591

Background (cpm)

Instrument #	1	2
Gamma (Ceilings)	N/A	318.2
Gamma (Floors)	1359.6	N/A
Gamma (Block Walls)	N/A	318.2
Gamma (Metal Walls)	N/A	318.2

Efficiencies (cpm/dpm)

Instrument #	1	2
Thin/No Paint	0.064	0.082
Epoxy	0.052	0.066
Other	0.061	0.078

Coatings

	Thickness (inches)
Thin/No Paint	0.007
Epoxy	0.250
Other	0.06

Total Activity Estimates Using Sodium Iodide Instruments

Survey Area:	V	Survey Unit:	776010	Survey Date(s):	09/27/04
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Sample Location #	RCT ID #	Instrument #	Gross Counts	Critical Level (dpm/cm2)	Total Alpha (dpm/cm2)
1	1	2	1602	10,311	10,311
2	1	1	7,489	3,908	14,077
3	1	1	6,657	3,908	3,908
4	1	1	6340	3,908	3,908
5	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A
7	1	1	6,796	3,908	3,908
8	1	1	8,803	3,908	40,846
9	1	1	7,998	3,908	24,446
10	1	2	1,579	10,311	10,311
11	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A
13	1	2	1,707	10,311	12,889
14	1	1	8,745	3,908	39,664
15	1	1	11,282	3,908	91,348
16	1	1	8,772	3,908	40,214
17	N/A	N/A	N/A	N/A	N/A
18	1	2	1692	10,311	11,223
19	1	2	1622	10,311	10,311
20	1	2	1,527	10,311	10,311
21	N/A	N/A	N/A	N/A	N/A
22	1	2	1601	10,311	10,311
23	1	2	1555	10,311	10,311
24	1	2	1823	10,311	25,779
25	1	2	1361	10,311	10,311
26	N/A	N/A	N/A	N/A	N/A
27	N/A	N/A	N/A	N/A	N/A
28	1	2	1408	10,311	10,311
29	1	2	1842	10,311	27,890
30	1	2	2181	10,311	65,558

Estimate Data and Sodium Iodide Instrument Information

Survey Area:	V	Survey Unit:	776010	Survey Date(s):	09/30/04
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Instrument Specifications

Instrument #	1	2
Meter Model:	Ludlum 2350-1	N/A
Meter Serial #:	192614	N/A
Detector Model:	Ludlum 44-17	N/A
Detector #:	209090	N/A
Detector Size (cm ²):	17.8	N/A
Calibration Due Date:	10/20/04	N/A
Count Time (min)	5	N/A
Contact Efficiency	8.24%	N/A

Ratio Used

Pu to Am - 241	8.1
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Comments

In cases where the critical level is greater than the calculated dpm/100cm², the critical level will be used for statistical analysis.

Count Times for backgrounds and samples are equal.

Attenuation Factors: Based on observation of Walls and Ceilings. Contamination assumed to be under thin layer of fixative on all surfaces

Background (Gross)

Instrument #	1	2
Gamma (Ceilings)	1558	N/A
Gamma (Floors)	N/A	N/A
Gamma (Walls)	1558	N/A

Background (cpm)

Instrument #	1	2
Gamma (Ceilings)	311.6	N/A
Gamma (Floors)	N/A	N/A
Gamma (Walls)	311.6	N/A

Efficiencies (cpm/dpm)

Instrument #	1	2
Thin/No Paint	0.082	N/A
Epoxy	0.078	N/A
Other	N/A	N/A

Coatings

	Thickness (Inches)
Thin/No Paint	0.008
Epoxy	0.060
Other	N/A

Total Activity Using Sodium Iodide Instruments (Cont'

Survey Area:	V	Survey Unit:	776010	09/30/04
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Sample Location #	RCT ID #	Instrument #	Gross Counts	Total Alpha (dpm/100cm2)
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
5	1	1	1,859	33,460
6	1	1	4,270	301,475
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
11	1	1	1,424	10,208
12	1	1	1,486	10,208
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
17	1	1	1,626	10,208
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
21	1	1	1,632	10,208
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
26	1	1	1,463	10,208
27	1	1	1,372	10,208
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

40

Removable Activity

Survey Area:		V	Survey Unit:		776010
Dates Counted:	9/27,9/30/04				
A priori MDA:	16				
Efficiency (c/d)	0.333				
Smear Location Number	Smear Results				
	RCT ID #	Serial Number	Gross (cpm)	Bkg.	(dpm/100 cm ²)
1	1	1	1	0.1	3
2	1	2(9/30)	255	0.5	764
3	1	1	3	0.1	9
4	1	3	1	0.0	3
5	1	1(9/30)	4	0.2	11
6	1	2(9/30)	7	0.2	20
7	1	2	19	0.5	56
8	1	2	7	0.5	20
9	1	2	4	0.5	11
10	1	2	0	0.5	-2
11	1	1(9/30)	0	0.2	-1
12	1	2(9/30)	7	0.2	20
13	1	1	5	0.1	15
14	1	1	7	0.1	21
15	1	3	4	0.0	12
16	1	1	7	0.1	21
17	1	3(9/30)	12	0.0	36
18	1	1	48	0.1	144
19	1	1	38	0.1	114
20	1	1	4	0.5	11
21	1	1(10/2)	111	0.1	333
22	1	1	1	0.1	3
23	1	2	0	0.5	-2
24	1	2	1	0.1	3
25	1	2	2	0.5	5
26	1	1(9/30)	0	0.2	-1
27	1	2(9/30)	11	0.2	32
28	1	1	0	0.1	0
29	1	1	0	0.1	0
30	1	2	0	0.5	-2
MIN					-1.5
MAX					764.3
MEAN					55.3
SD					149.2

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Total Surface Activity

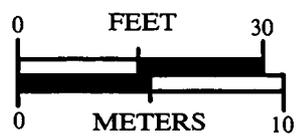
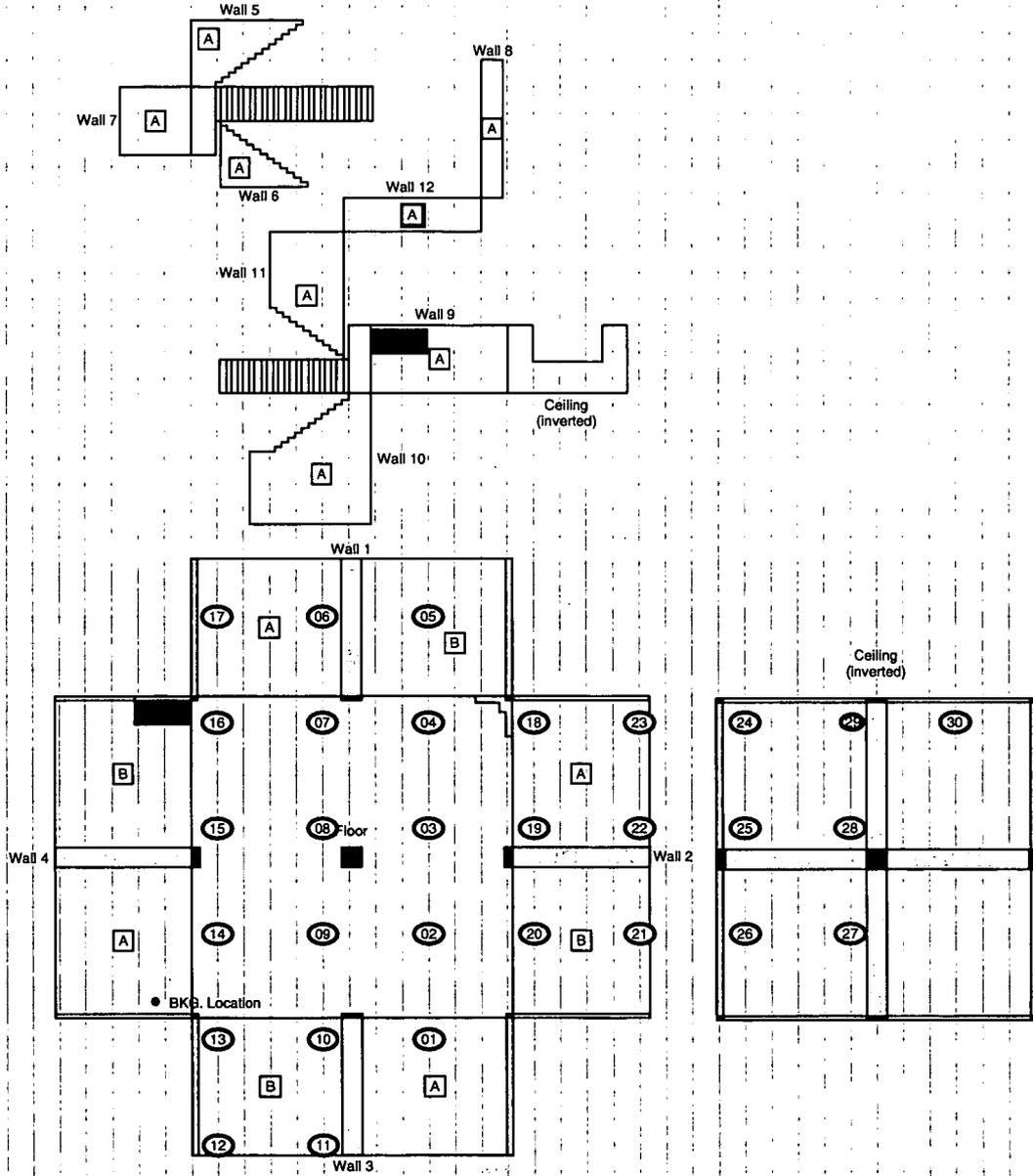
Survey Area:		V		Survey Unit:			776012	776010 WAS
Meter Model:		NE Electra w/ DP6 Probe					Dates Counted:	8/9/04
Instrument #:		1246	2341	n/a	n/a	n/a	A priori MDA:	94
Cal. Due Date:		1/26/05	3/20/05	n/a	n/a	n/a	Avg. Local Bkgd	5.4
Efficiency (c/d):		0.221	0.227	n/a	n/a	n/a	Avg. Efficiency	0.220
Sample Location #	RCT ID #	Inst. #	Instrument (cpm)	Local Bkgd (cpm)	(dpm/100 cm ²)			
1	1	1246	16	3.0	59.1			
2	1	1246	166	3.0	740.9			
3	1	1246	261	7.0	1154.5			
4	1	1246	280	5.0	1250.0			
5	1	2341	7	8.0	-4.5			
6	1	2341	6	3.0	13.6			
7	1	1246	325	7.0	1445.5			
8	1	1246	208	4.0	927.3			
9	1	1246	165	5.0	727.3			
10	1	1246	15	4.0	50.0			
11	1	2341	14	5.0	40.9			
12	1	2341	27	6.0	95.5			
13	1	1246	7	4.0	13.6			
14	1	1246	110	5.0	477.3			
15	1	1246	138	3.0	613.6			
16	1	1246	397	3.0	1790.9			
17	1	2341	17	7.0	45.5			
18	1	1246	22	11.0	50.0			
19	1	1246	35	6.0	131.8			
20	1	1246	50	8.0	190.9			
21	1	2341	401	5.0	1800.0			
22	1	1246	32	12.0	90.9			
23	1	1246	10	6.0	18.2			
24	1	1246	7	4.0	13.6			
25	1	1246	7	6.0	4.5			
26	1	2341	3	3.0	0.0			
27	1	2341	7	1.0	27.3			
28	1	1246	8	5.0	13.6			
29	1	1246	7	7.0	0.0			
30	1	1246	11	6.0	22.7			
				MIN	-4.5			
				MAX	1800.0			
				MEAN	393.5			
				SD	569.8			

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RADIOLOGICAL CLOSEOUT SURVEY FOR THE 776 CLUSTER

Survey Area: 5 Survey Unit: 776010 Classification: 2
Building: 776
Survey Unit Description: First floor
Total Floor Area: 149 sq. m Total Area: 638 sq. m Random Start Grid Size: 4 x 4 sq.m

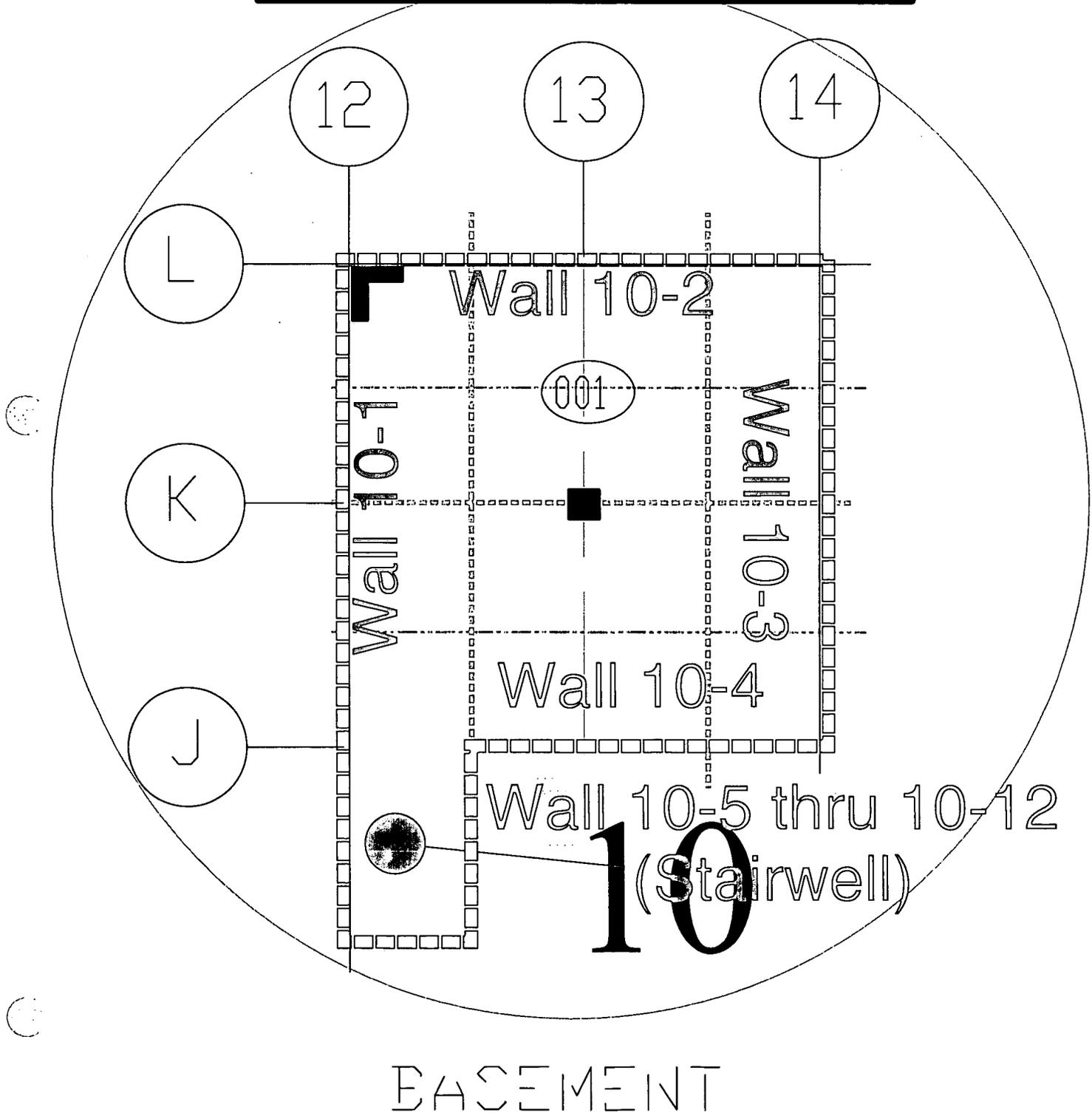
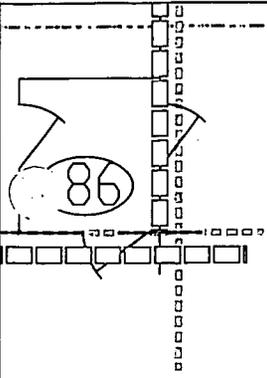
SURVEY UNIT 776010 - MAP 1 OF 1



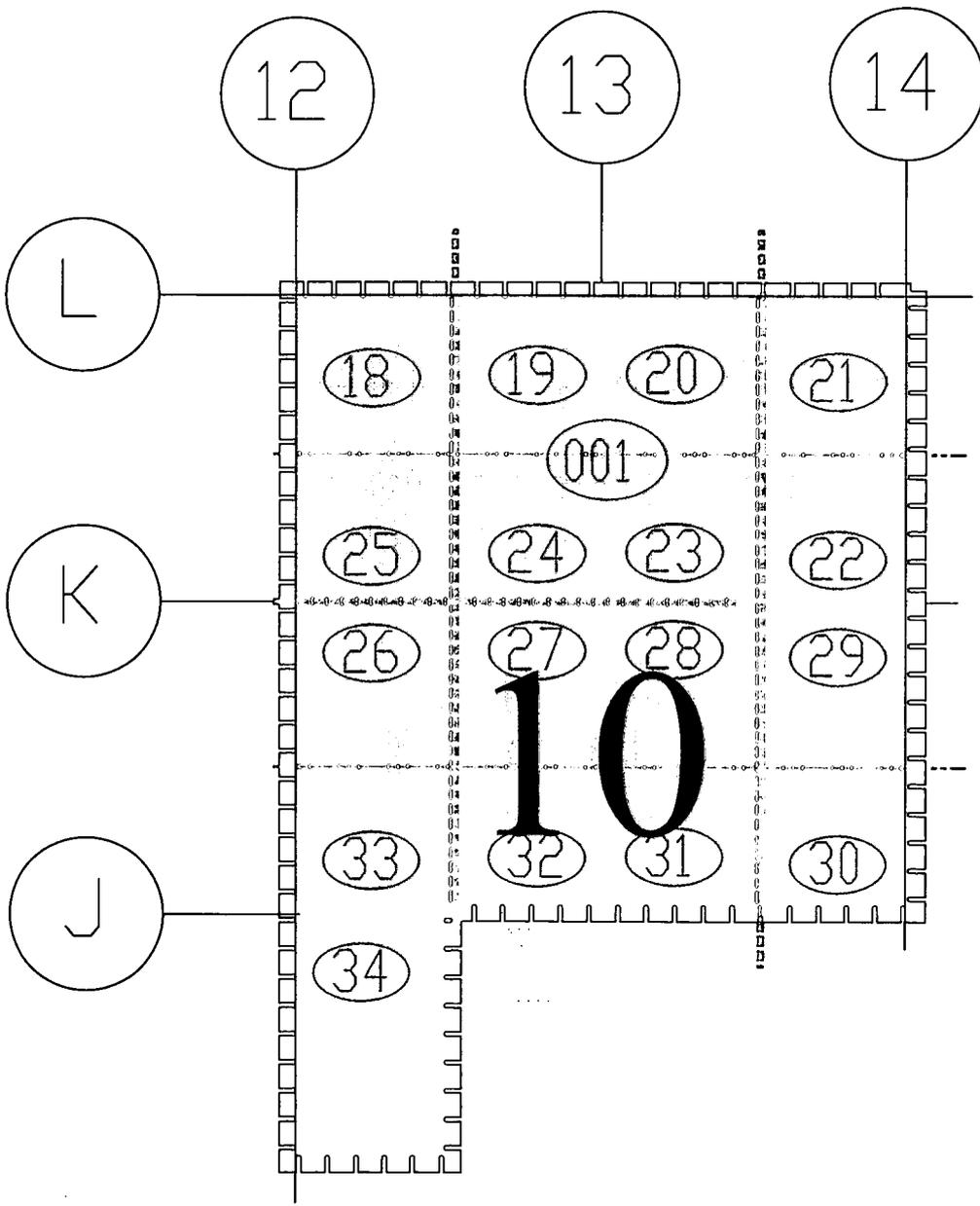
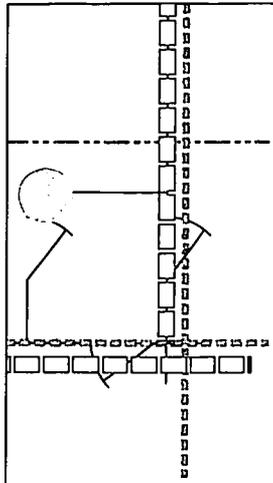
SURVEY MAP LEGEND

- ⊙ # Swee & TSC Location
- ⊙ # Swee, TSC & Sample Location
- Open/Inaccessible Area
- Area In Another Location

Unit 776010 Wall Designations

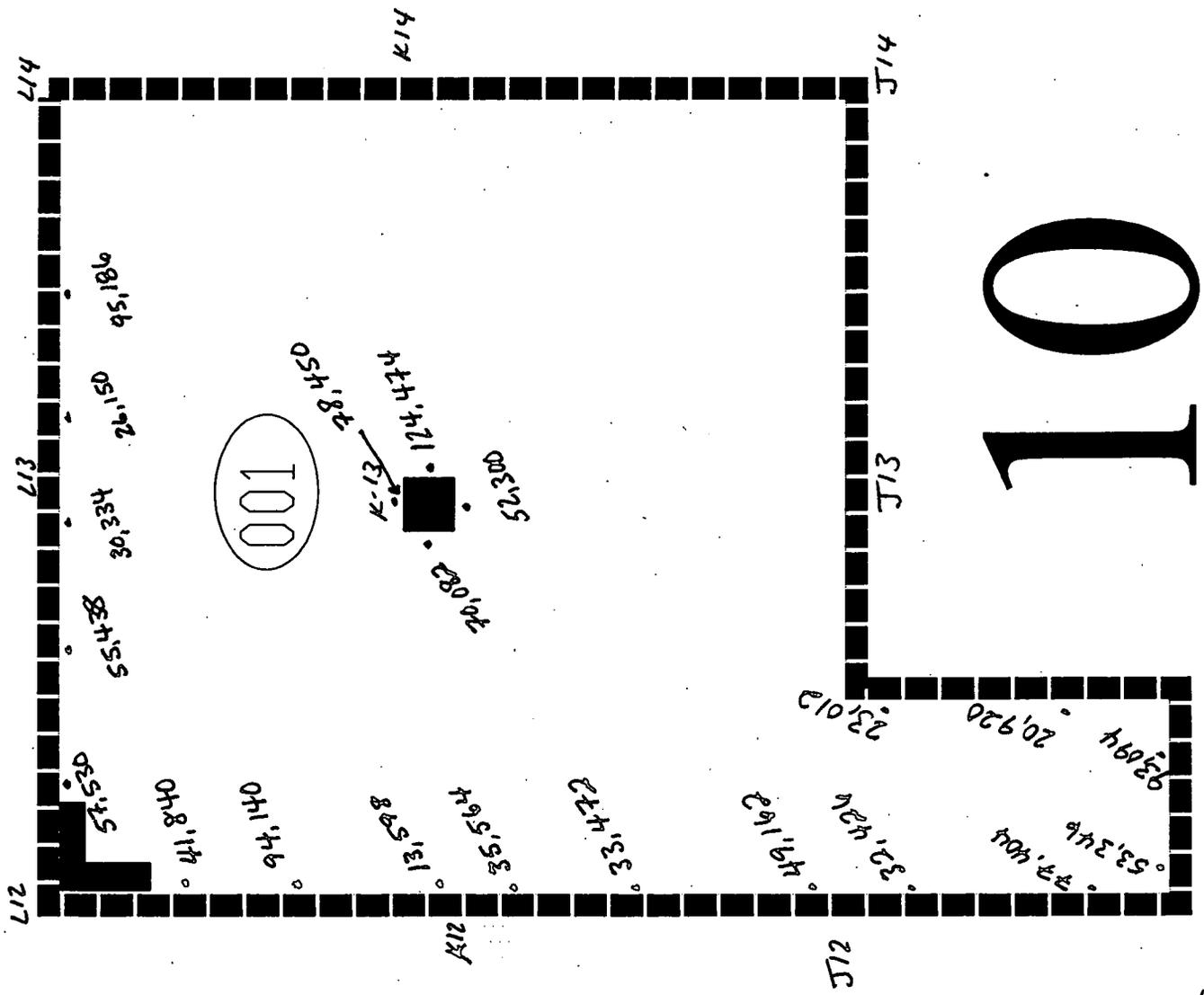


Unit 776010 ceiling Areas requiring further Investigation



BASEMENT

Expansion Int post remediation
 Results in dpm/100 cm²



P. Turner

49 ^{A11} results are listed in dpm/100 cm²

Bolts

Approx 65 bolts to be removed.

range prior to remediation:

45,812, 708
to
182,114, 876

Bolt range post remediation:

32,426
to
948,722

Stairs

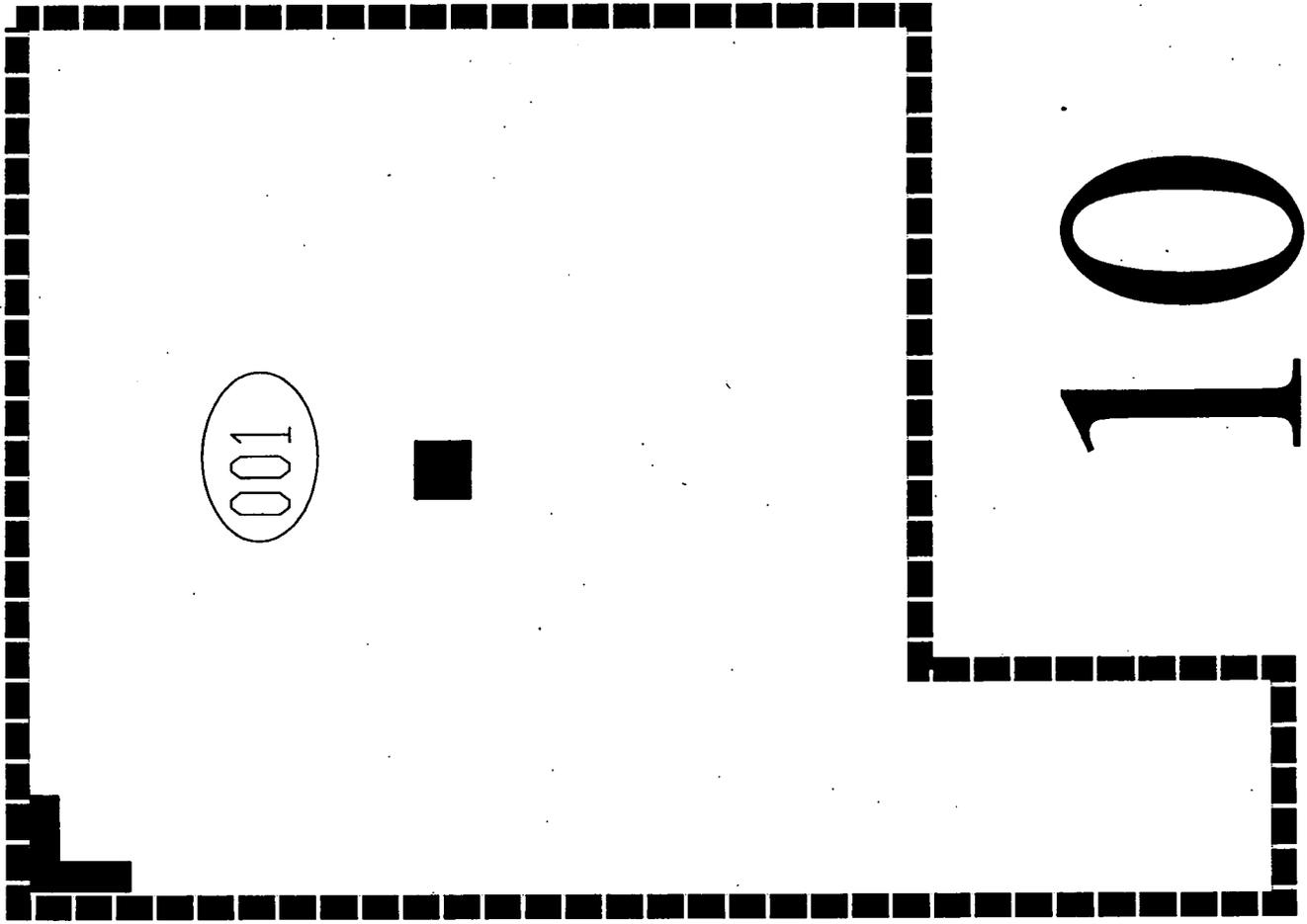
25 steps remediated

range prior to remediation:

1,761,987
to
97,970,975

Range post remediation:

53,346
to
511,494



50/50

All Results in dpm / 100 cm²

Basement Sump

sump range prior to remediation:

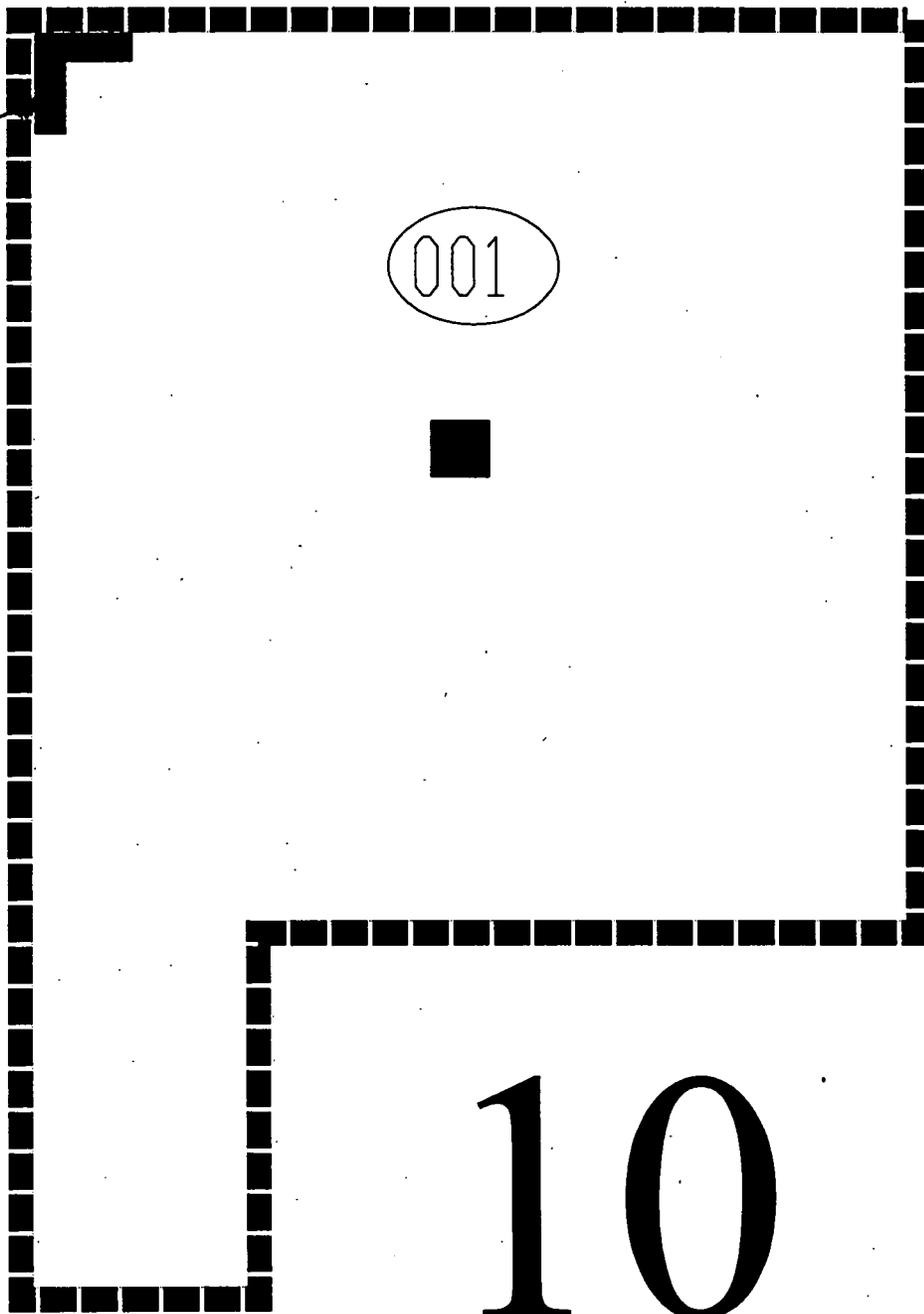
WALLS: 8,704
to
155,784,190

FLOOR: 174,080
to
10,920,256

Sump range post remediation:

WALLS: 5,230
to
569,547

Floor: 7,322
to
658,457



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P. Turner