

ALUMINUM COMPANY OF AMERICA  
1000 HARVARD AVENUE  
CLEVELAND, OHIO 44105



1993 May 5

Mr. Ken Lambert  
U.S. Nuclear Regulatory Commission  
799 Roosevelt Road  
Glynn, IL 60137

**Ref: Building 65 Radiation Remediation Project**

Dear Mr. Lambert:

The attached analytical and field measurements were taken from the roof of Building 65 and are a follow-up to the information that was faxed to you on April 28, 1993. In addition to the original survey information I have included some additional survey results taken since the last fax transmission on April 28. If you have any questions regarding the data, please feel free to contact me at (216) 641-4366 and I will try to get your questions answered.

Sincerely,

A handwritten signature in cursive script, appearing to read "Mark Gradert".

M. A. GRADERT

MAG/ss

cc: D. Ryan

Ref: 65RRP.mag

MAY 7 1993

9707070308 930505  
PDR ADCCK 04000501  
C FDR

SURVEYOR Darin McElaney  
REVIEWER P. J. J.

DATE 4-19-93

TIME 1600

## SURVEY METERS

MODEL L-2220

SERIAL # 50062

CAL DUE 12-8-93

EFFICIENCY 0.21

TYPE Bf

BKG 50 cpm

MDA 861

MODEL L-2220

SERIAL # 48409


CAL DUE 9-9-93

EFFICIENCY 0.13

TYPE α

BKG 0.5 CPM

MDA 79

MODEL 

SERIAL # \_\_\_\_\_

CAL DUE

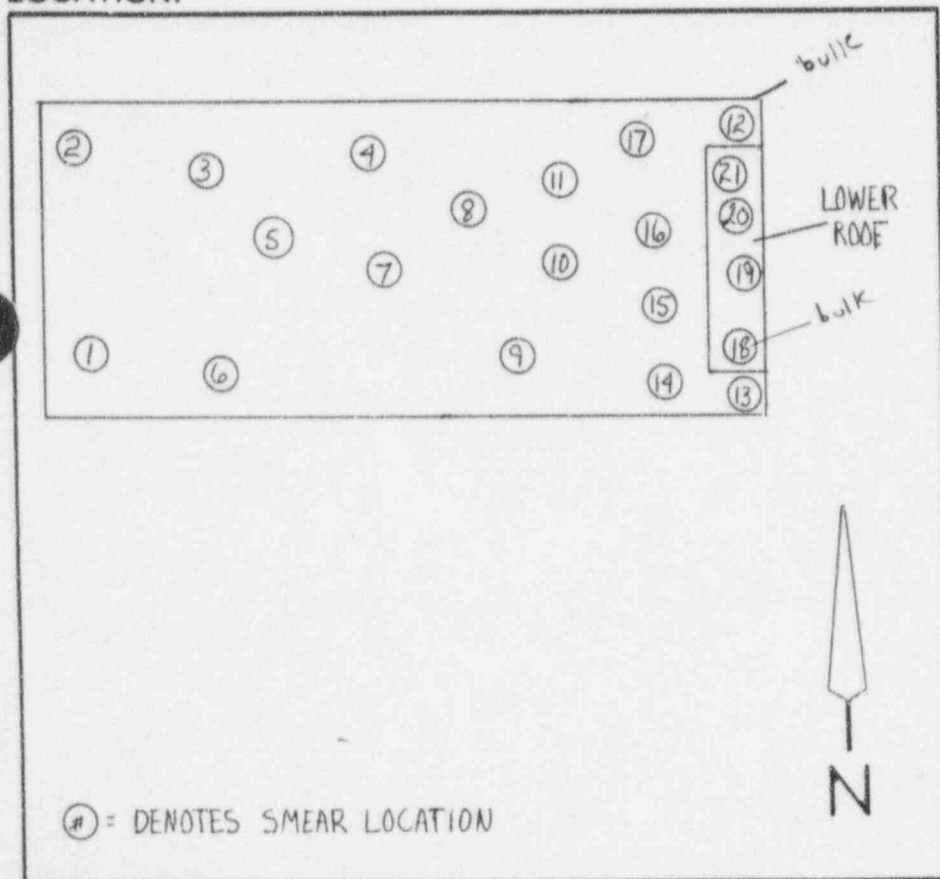
EFFICIENCY \_\_\_\_\_

TYPE NA

BKG \_\_\_\_\_

MDA \_\_\_\_\_

LOCATION:



NOTE: Smear results in dpm/100 cm<sup>2</sup> unless otherwise noted. (1) denotes smear location. An \* followed by a number in dpm (i.e., \* 100 dpm) denotes direct probe readings in dpm/100 cm<sup>2</sup>. # denotes dose rates in mR/hr.

PURPOSE: PRE DECON

[illegible]

\* SEE ATTACHED SHEET

## AVERAGE CONTAMINATION SURVEY RESULTS

DATE: 4-19-93LOCATION: BLDG. 65 ROOFINSTRUMENT: L-2220 50062  
MODEL NUMBERPROBE: 44-9 <sup>serial #</sup> 042929 EFF: 0.21  
MODEL

BX

LOCATION NUMBER	dpm/100cm <sup>2</sup>	LOCATION NUMBER	dpm/100cm <sup>2</sup>
1	2794	20	14603
2	4064	21	5492
3	4984		
4	4825		
5	3587		
6	5810		
7	6159		
8	3683		
9	10698		
10	8127		
11	6476	N	A
12	11873		
13	8381		
14	5841		
15	10825		
16	9492		
17	9460		
18	10667		
19	10540		

Average Background counts per minute 50  
MDA (dpm/100cm<sup>2</sup>) 861

$$\frac{\text{dpm}}{100\text{cm}^2} = \frac{(\text{gross count rate}) - (\text{background count rate})}{(\text{efficiency}) (\text{probe area})}$$

100cm<sup>2</sup>

SURVEYOR D. M. LongSUPERVISOR A. J. [Signature]

DATE: 4-19-93

LOCATION: BLDG. 65 ROOF

INSTRUMENT. L-2220 48409  
MODEL NUMBER

PROBE: 43-51 <sup>serial "</sup> 037509 EFF: 0.13  
MODEL

 $\alpha$ 

LOCATION NUMBER

dpm/100cm<sup>2</sup>

LOCATION NUMBER

dpm/100cm<sup>2</sup>

9

100

12

100

15

69

20

146

NVA

N/A

Average Background counts per minute 0.5  
MDA (dpm/100cm<sup>2</sup>) 79

$$\frac{\text{dpm}}{100\text{cm}^2} = \frac{(\text{gross count rate}) - (\text{background count rate})}{(\text{efficiency}) \times \frac{(\text{probe area})}{100\text{cm}^2}}$$

## SURVEYOR

SUPERVISOR



## REMOVABLE CONTAMINATION

DATE: 4-19-93 LOCATION: BUILDING 65 ROOF  
 COUNTER: L2929 69660 EFFICIENCY: 0.37 0.22  
 Model Number Alpha Beta/Gamma

DPM/100cm <sup>2</sup>			DPM/100cm <sup>2</sup>			DPM/100cm <sup>2</sup>		
LOCATION	βy	α	LOCATION	βy	α	LOCATION	βy	α
1	<MDA	<MDA	21	<MDA	<MDA			
2			22					
3			23					
4			24	✓	✓			
5								
6								
7								
8								
9								
10								
11								N.A.
12					N.A.			
13								
14								
15								
16								
17								
18								
19								
20	✓	✓						

ALPHA BKG COUNT RATE: 0.57BETA/GAMMA BKG COUNT RATE: 38α MDA (dpm/100cm<sup>2</sup>) 13βy MDA (dpm/100cm<sup>2</sup>) 106SURVEYOR J. MojicaSUPERVISOR P. Jua

# EXPOSURE RATE SURVEY RESULTS

DATE: 4-28-93

LOCATION: BLDG. 65 ROOF

INSTRUMENT: L-19 PR062196  
MODEL NUMBER

CAL DUE: 3-17-94

EXPOSURE RATE			EXPOSURE RATE		
LOCATION NUMBER	$\mu$ R/h		LOCATION NUMBER	$\mu$ R/h	
1	8 c	8 lm	20	13 c	13 lm
2	8 c	8	21	13 c	13
3	10 c	10	N A	c	
4	10 c	10		c	
5	9 c	9		c	
6	10 c	10		c	
7	10 c	10		c	
8	10 c	10		c	
9	10 c	10		c	
10	10 c	10		c	
11	10 c	10		c	
12	10 c	10		c	
13	14 c	12		c	
14	12 c	10		c	
15	10 c	10		c	
16	9 c	9		c	
17	10 c	10		c	
18	15 c	14		c	
19	12 c	12		c	

MEASUREMENTS TAKEN AT 1m ABOVE THE FLOOR. & CONTACT

SURVEYOR P. Dwyer  
SUPERVISOR P. Dwyer



SCIENTECH, INC.

2105 LUNA ROAD, SUITE 390 ■ CARROLLTON, TX 75006 ■ PHONE: 214-247-1714 ■ FAX: 214-247-0268

REPORT OF ANALYSIS  
ANL JOB# 93-00471  
4/28/93

NES

MATRIX: ROOF MAT.

LAB ID: AA21087  
SAMPLE ID: AL002 - LOCATION 12

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Th-232	0.00 E+0	+ -	0.00 E+0	3 E+1	pCi/g
U-238 (PA-234)	2.51 E+1	+ -	4.52 E+0	3 E+0	pCi/g
CS-137	4.64 E-1	+ -	3.11 E-2	5 E-2	pCi/g
K-40	3.16 E+0	+ -	2.97 E-1	3 E-1	pCi/g

\* - Analyzed by Gamma Spec.

Joe Sikes / Karl Surface  
Radiochemistry Managers



SCIENTECH, INC.

2105 LINA ROAD, SUITE 390 ■ CARROLLTON, TX 75006 ■ PHONE: 214-247-1714 ■ FAX: 214-247-0268

REPORT OF ANALYSIS  
ANL JOB# 93-00471  
4/28/93

NES

MATRIX: ROOF MAT.

LAB ID: AA21088  
SAMPLE ID: AL003 - Location 18

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Th-232	0.00 E+0	+-	0.00 E+0	3 E+1	pCi/g
U-238 (Pa-234)	2.84 E+1	+-	4.99 E+0	3 E+0	pCi/g
Cs-137	3.36 E-1	+-	2.69 E-2	6 E-2	pCi/g
K-40	2.93 E+0	+-	2.63 E-1	3 E-1	pCi/g

\* - Analyzed by Gamma Spec.

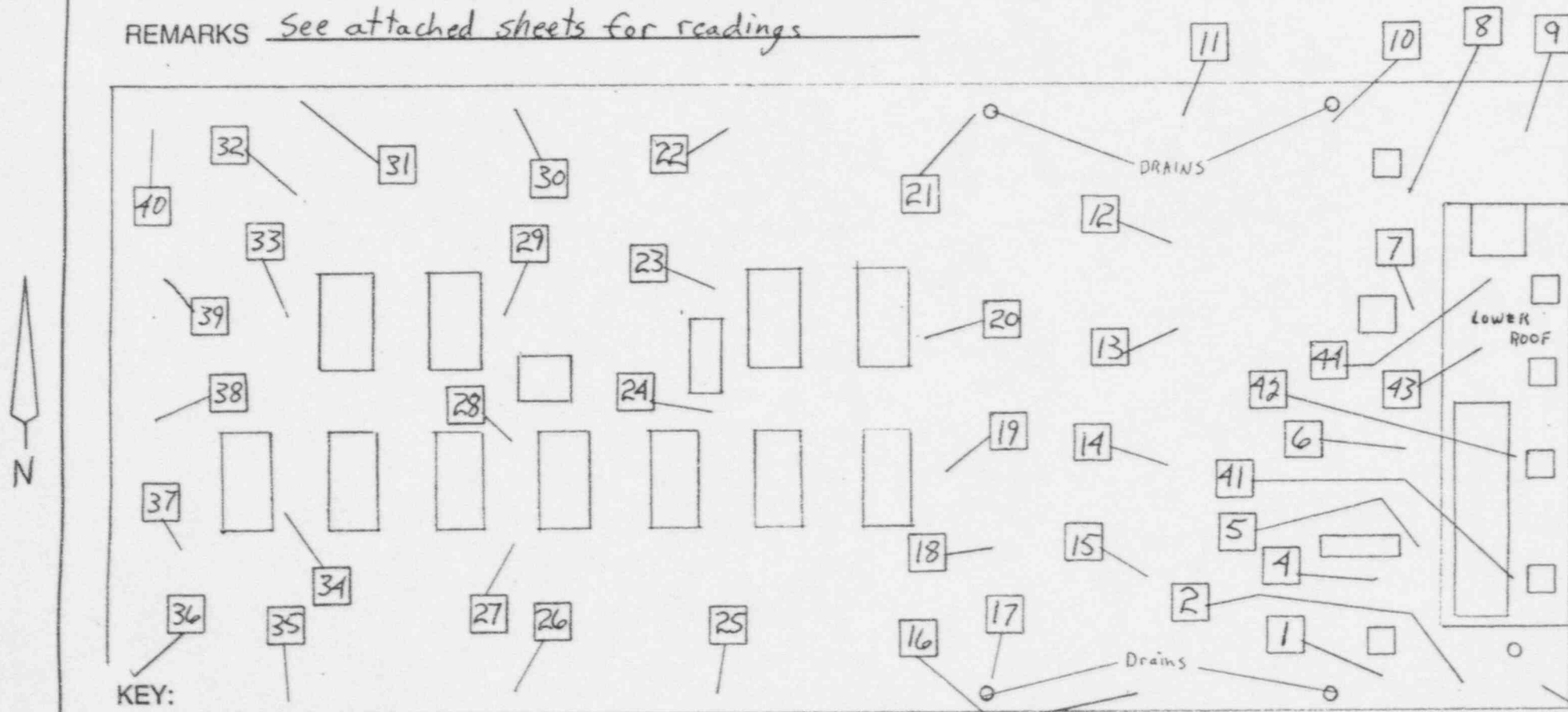
Joe Sikes / Kert Surface  
Radiochemistry Managers

FIELD SURVEY MAP LOCATION BLDG. 6S / AREA ROOF

DATE 5-3-93 TIME \_\_\_\_\_ REASON FOR SURVEY \_\_\_\_\_

INSTRUMENT USED L-2220/L-2220 SERIAL NO. 50062/48409

REMARKS See attached sheets for readings



KEY:

☒ = DIRECT MEASUREMENT

NOTE: ALL AREAS SCANNED 100%. ELEVATED AREA USED AS DIRECT MEASUREMENT LOCATION

SURVEYED BY: *[Signature]*

REVIEWED BY: *[Signature]*  
SIGNATURE

/ DATE 5-3-93



# ELEVATED READINGS CONTAMINATION RESULTS

DATE: 5-3-93

LOCATION: BLDG 65 Roof

INSTRUMENT: L-2220 #50062

PROBE: 44-9/042929 EFF: 0.21

Model

## PRE-DECONTAMINATION RESULTS

## POST-DECONTAMINATION RESULTS

GRID NUMBER	CPM	dpm/100cm <sup>2</sup>	GRID NUMBER	CPM	dpm/100cm <sup>2</sup>
1	271	8603			
2	359	11397			
3	233	7397			
4	221	7016			
5	527	16730			
6	325	10318			
7	261	8286			
8	149	4730			
9	453	14381			
10	303	9619			
11	273	8667			
12	137	4349			
13	301	9556			
14	177	5619			
15	179	5683			
16	309	9810			
17	475	15079			
18	217	6889			

Average background counts per min. 49

NOTE: DPM/100 cm<sup>2</sup> calculated as follows:

$$\frac{\text{gross count rate} - (\text{background count rate})}{\text{efficiency} \times \frac{\text{probe area}}{100\text{cm}^2}} = \text{DPM/100 cm}^2$$

SURVEYOR

SUPERVISOR

*[Signature]*  
*[Signature]*

# ELEVATED READINGS CONTAMINATION RESULTS

DATE: 5-3-93

LOCATION: BLDG. 65 Roof

INSTRUMENT: L-2220 #50062

PROBE: 44-9/042929 EFF: 0.21  
Model

## PRE-DECONTAMINATION RESULTS

## POST-DECONTAMINATION RESULTS

GRID NUMBER	CPM	dpm/100cm <sup>2</sup>	GRID NUMBER	CPM	dpm/100cm <sup>2</sup>
19	259	8222			
20	185	5873			
21	233	7397			
22	317	10064			
23	309	9810			
24	195	6191			
25	267	8476			
26	181	5746			
27	137	4349			
28	113	3587			
29	185	5873			
30	169	5365			
31	95	3016			
32	147	4667			
33	87	2762			
34	205	6508			
35	107	3397			
36	71	2254			

Average background counts per min. 49

NOTE: DPM/100 cm<sup>2</sup> calculated as follows:

$$\frac{\text{(gross count rate)} - \text{(background count rate)}}{100\text{cm}^2 \times \text{(efficiency)} \times \frac{\text{(probe area)}}{100\text{cm}^2}}$$

SURVEYOR Jim M. U.  
SUPERVISOR P. Dupont

## ELEVATED READINGS CONTAMINATION RESULTS

DATE: 5-3-93

LOCATION: BLDG. 65 Roof

STRUMENT: L-2220 #50062

PROBE: 11-9/042929 EFF: 0.21  
Model

### PRE-DECONTAMINATION RESULTS

### POST-DECONTAMINATION RESULTS

[illegible]

Average background counts per min. 49

NOTE: DPM/100 cm<sup>2</sup> calculated as follows:

$$\frac{\text{cpm}}{100\text{cm}^2} = \frac{(\text{gross count rate}) - (\text{background count rate})}{(\text{efficiency}) \frac{(\text{probe area})}{100\text{cm}^2}}$$

SURVEYOR Don M. [Signature]

SUPERVISOR H. J. Jensen

## ELEVATED READINGS CONTAMINATION RESULTS

DATE: 5-3-93

## ALPHA READINGS

LOCATION:

BLDG. 65 Roof

STRUMENT: 2220 # 48409

PROBE: 43-5/<sup>st</sup>037509

EFF: 0.13

Model

### PRE-DECONTAMINATION RESULTS

### POST-DECONTAMINATION RESULTS

[illegible]

Average background counts per min.

0.5

NOTE: DPM/100 cm<sup>2</sup> calculated as follows:

$$\frac{10^{-2}}{10^{-2}} = \frac{(\text{gross count rate}) - (\text{background count rate})}{(\text{efficiency}) \frac{(\text{probe area})}{100 \text{ cm}^2}}$$

## SURVEYOR

SUPERVISOR



2105 LUNA ROAD, SUITE 391 ■ CARROLLTON, TX 75006 ■ PHONE: 214-347-1714 ■ FAX: 214-347-0368

REPORT OF ANALYSIS  
ANL JOB# 93-00471  
4/28/93

NES

MATRIX: ROOF MAT.

LAB ID: AA21087  
SAMPLE ID: AL002

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Th-232	0.00 E+0	+-	0.00 E+0	3 E+1	pCi/g
U-238 (PA-234)	2.61 E+1	+-	4.52 E+0	3 E+0	pCi/g
CS-137	4.64 E-1	+-	3.11 E-2	5 E-2	pCi/g
K-40	3.16 E+0	+-	2.97 E-1	3 E-1	pCi/g

Location No 12.

\* - Analyzed by Gamma Spec.

*Kent Surface*

Joe Sikes / Kent Surface  
Radiochemistry Managers

2 samples of roofing material collected  
week of 4/19/93

Location 12 + 18

Location 18, Sample AL003

Th-232 0.00  
U-238 2.94 E<sup>-1</sup> 29  
Cs-137 3.36 E<sup>-1</sup>  
K-40 2.95 E<sup>-1</sup>



**SCIENTECH, INC.**

2105 LENA ROAD, SUITE 500 ■ CARROLLTON, TX 75006 ■ PHONE: 214-347-1714 ■ FAX: 214-347-0268

REPORT OF ANALYSIS  
ANL JOB# 93-00471  
4/28/93

NES

MATRIX: ROOF MAT.

LAB ID: AA21088

SAMPLE ID: AL003 -- Location 18

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Th-232	0.00 E+0	+-	0.00 E+0	3 E+1	pCi/g
U-238 (Pa-234)	2.94 E+1	+-	4.99 E+0	9 E+0	pCi/g
Ce-137	3.36 E-1	+-	2.69 E-2	6 E-2	pCi/g
K-40	2.93 E+0	+-	2.63 E-1	3 E-1	pCi/g

\* - Analyzed by Gamma Spec.

Joe Sikes / Kent Surface  
Radiochemistry Managers

SURVEYOR Darin McEleneey  
REVIEWER P. J. J.

DATE 4-19-93  
TIME 1600

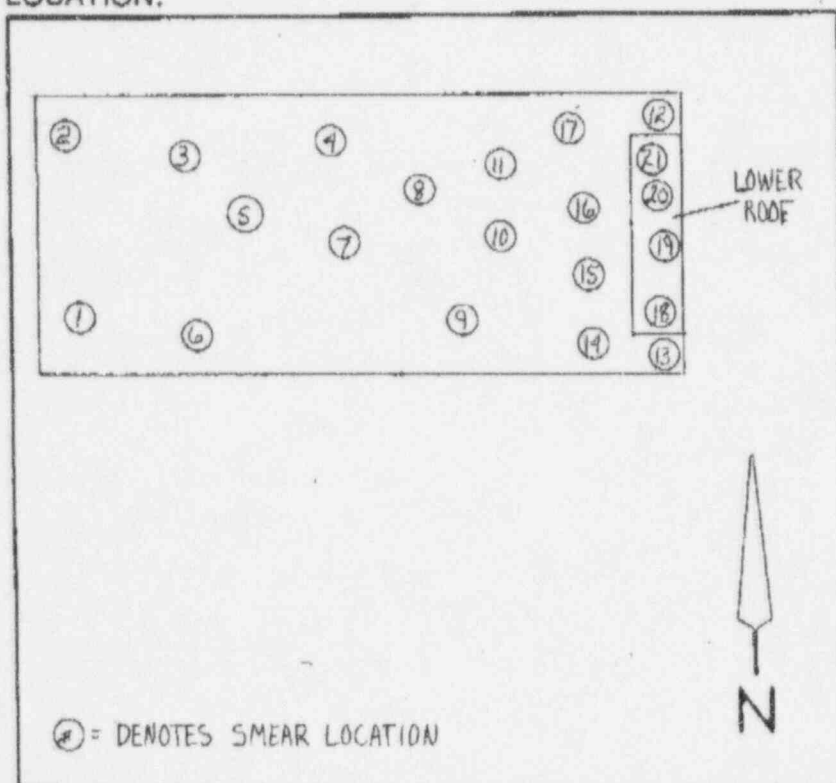
## SURVEY METERS

MODEL L-2220  
SERIAL # 50062  
CAL DUE 12-8-93  
EFFICIENCY 0.21  
TYPE BR  
BKG 50 CPM  
MDA 861

MODEL L-2220  
SERIAL # 48409  
CAL DUE 9-9-93  
EFFICIENCY 0.13  
TYPE  $\alpha$   
BKG 0.5 CPM  
MDA 79

MODEL \_\_\_\_\_  
SERIAL # \_\_\_\_\_  
CAL DUE \_\_\_\_\_  
EFFICIENCY \_\_\_\_\_  
TYPE NA \_\_\_\_\_  
BKG \_\_\_\_\_  
MDA \_\_\_\_\_

LOCATION:



NOTE: Smear results in dpm/100 cm<sup>2</sup> unless otherwise noted. (1) denotes smear location. An \* followed by a number in dpm (i.e., \* 100 dpm) denotes direct probe readings in dpm/100 cm<sup>2</sup>. # denotes dose rates in mR/hr.

PURPOSE: PRE DECON

[illegible]

\* SEE ATTACHED SHEET

## AVERAGE CONTAMINATION SURVEY RESULTS

DATE: 4-19-93LOCATION: BLDG. 65 ROOFINSTRUMENT: L-2220 50062  
MODEL NUMBERPROBE: 44-9 <sup>serial #</sup>092929 EFF: 0.21  
MODEL

BX

LOCATION NUMBER	dpm/100cm <sup>2</sup>	LOCATION NUMBER	dpm/100cm <sup>2</sup>
1	2799	* 20	14603/196
2	4064	21	5492
3	4984		
4	4825		
5	3587		
6	5810		
7	6159		
8	3683		
* 9	10698/100		
10	8127		
11	6476	N	A
* 12	11873/100		
13	8381		
14	5841		
+ 15	10825/69		
16	9492		
17	9460		
18	10667		
19	10540		

Average Background counts per minute 50  
MDA (dpm/100cm<sup>2</sup>) 861

\* alpha readings also taken

no removable identified

$$\frac{\text{dpm}}{100\text{cm}^2} = \frac{(\text{gross count rate}) - (\text{background count rate})}{(\text{efficiency}) (\text{probe area})}$$

100cm<sup>2</sup>

SURVEYOR TS-M'UgSUPERVISOR P. J. ...

## AVERAGE CONTAMINATION SURVEY RESULTS

DATE: 4-19-93

LOCATION: BLDG. 65 ROOF

INSTRUMENT. L-2220 48409  
MODEL NUMBER

PROBE: 43-5/037504 <sup>Serial #</sup> EFF: 0.13  
MODEL

 $\alpha$ 

LOCATION NUMBER

dpm/100cm<sup>2</sup>

LOCATION NUMBER

dpm/100cm<sup>2</sup>

9

100

12

100

15

69

20

196

N/A

NVA

Average Background counts per minute 0.5  
MDA (dpm/100cm<sup>2</sup>) 79

$$\frac{\text{dpm}}{100\text{cm}^2} = \frac{(\text{gross count rate}) - (\text{background count rate})}{(\text{efficiency}) \left( \frac{\text{probe area}}{100\text{cm}^2} \right)}$$

SURVEYOR D. M. Hughes

SUPERVISOR P. Egan

## REMOVABLE CONTAMINATION

DATE: 4-19-93LOCATION: BUILDING 65 ROOFCOUNTER: L2929 69660  
Model NumberEFFICIENCY: 0.37 0.22  
Alpha Beta/Gamma

DPM/100cm <sup>2</sup>			DPM/100cm <sup>2</sup>			DPM/100cm <sup>2</sup>		
LOCATION	By	$\alpha$	LOCATION	By	$\alpha$	LOCATION	By	$\alpha$
1	<MDA	<MDA	21	<MDA	<MDA			
2			22					
3			23					
4			24	✓	✓			
5								
6								
7								
8								
9								
10								
11								N.A.
12				N.A.				
13								
14								
15								
16								
17								
18								
19								
20	✓	✓						

ALPHA BKG COUNT RATE: 0.57BETA GAMMA BKG COUNT RATE: 38 $\alpha$  MDA (dpm/100cm<sup>2</sup>) 13 $\beta\gamma$  MDA (dpm/100cm<sup>2</sup>) 106

SURVEYOR

SUPERVISOR

J. Mojica  
P. Jua



## EXPOSURE RATE SURVEY RESULTS

DATE: 4-28-93LOCATION: BLDG. 65 ROOFINSTRUMENT: L-19 PR062196  
MODEL NUMBERCAL DUE: 3-17-94

LOCATION NUMBER		EXPOSURE RATE $\mu$ R/h		LOCATION NUMBER		EXPOSURE RATE $\mu$ R/h	
1		8 c	8 lm	20		13 c	13 lm
2		8 c	8	21		13 c	13
3		10 c	10	N A		c	
4		10 c	10			c	
5		9 c	9			c	
6		10 c	10			c	
7		10 c	10			c	
8		10 c	10			c	
9		10 c	10			c	
10		10 c	10			c	
11		10 c	10			c	
12		10 c	10			c	
13		14 c	12			c	
14		12 c	10			c	
15		10 c	10			c	
16		9 c	9			c	
17		10 c	10			c	
18		15 c	14			c	
19		12 c	12			c	

MEASUREMENTS TAKEN AT 1m ABOVE THE FLOOR. &amp; CONTACT

SURVEYOR

SUPERVISOR



# INTEGRATED ENVIRONMENTAL SERVICES

A Division of ~~TRW~~ and  
Unit of The Penn Central Corporation  
44 Shelter Rock Road  
Danbury, CT 06810

Deliver to: KEN LAMBERT

Date: 6/2/93

Number of Pages (including this cover sheet) 4Time: 1320

Fax Number: 708 - 790 - 5665

Fax Number: (203) 792-3168

From: F. ZEBALAN

Phone: (203) 796-5224

Comments:

**INTEGRATED ENVIRONMENTAL SERVICES**

A DIVISION OF ~~THE~~  
44 SHELTER ROCK ROAD  
DANBURY, CT 06810  
(203) 796-5279

June 2, 1993

Refer to: ESR-4906

Mr. Tim Johnson  
United States Regulatory Commission  
Mail Stop No. 5E2  
11555 Rockville Pike  
Rockville, MD 20852

Subject: Utilization of U-238 Release Limits for On-going ALCOA Remediation Work

Dear Mr. Johnson:

Samples of ventilation system dirt/dust (ALCOA-001) and roofing material (ALCOA-002 and 003) were sent to two independent laboratories for analysis. The results indicate elevated levels of U-238 to be present in all of the samples and are therefore the isotope which caused the elevated direct survey measurements discovered during the roof survey. We are currently using the release limits for thorium for the roof remediation.

It is requested that the higher release limits for U-238 specifically 5,000 dpm/100cm<sup>2</sup>, average (over 1 m<sup>2</sup>) fixed plus removable contamination, 1,000 dpm/100cm<sup>2</sup> removable contamination and 15,000 dpm/100cm<sup>2</sup>, maximum (not more than 100cm<sup>2</sup>) fixed plus removable contamination be used as the release criteria for any future remediation. Copies of the sample analysis sheets are attached.

If you have any further comments you may contact me at (203) 796 5221.

Sincerely,

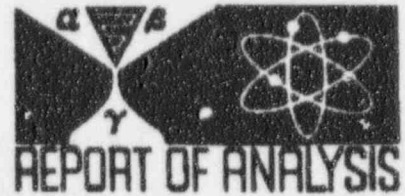
A handwritten signature in cursive script that reads 'Frank Rebmann'.

Frank Rebmann  
Section Manager  
Radiological Services

cc:

D. Ryan ALCOA  
K. Lambert USNRC Region III

CUSTOMER: Integrated Environmental Service  
ATTENTION: Frank Rehmann  
ADDRESS: 44 Shelter Rock Road  
CITY: Danbury CT 06810  
W.O. NO.: 93-04-059



4/06/93  
SAMPLES RECEIVED

Customer Identification	Date Collected	Type of Analysis	pci/g
ALCOA-001	04/02/93	Cs137	0.51±0.08
		K40	5.41±0.84
		Th232	1.04±0.25
		U238	22.5±2.5

☐ REPORTED VIA TELEPHONE

☐ FAX

PAGE 1 OF 1

**TMA Eberline**  
Thermo Analytical Inc.

7021 PAN AMERICAN FREEWAY, N.E.  
ALBUQUERQUE, NEW MEXICO 87109  
PHONE (505) 345-3461  
FAX (505) 261-5416

APPROVED BY Cliff Gravel, Data Analyst

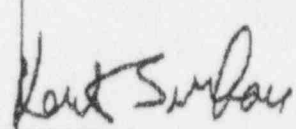
DATE

**SCIENCETECH, INC.**

3105 LUNA ROAD, SUITE 300 ■ CARROLLTON, TX 75006 ■ PHONE: 214-247-1714 ■ FAX: 214-247-9264

**REPORT OF ANALYSIS**  
**ANL JOB# 93-00471**  
**4/28/93****NES****MATRIX: ROC<sup>®</sup> MAT.****LAB ID: AA21087**  
**SAMPLE ID: AL002**

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Th-232 (Ac-228)	8.18 E-1	+-	1.03 E-1	9 E-2	pCi/g
U-238 (Pa-234)	2.51 E+1	+-	4.62 E+0	3 E+0	pCi/g
Ce-137	4.64 E-1	+-	9.11 E-2	6 E-2	pCi/g
K-40	3.16 E+0	+-	2.97 E-1	3 E-1	pCi/g

\* - Analyzed by Gamma Spec.  
Joe Sikes / Kent Surface  
Radiochemistry Managers



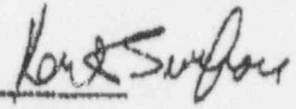

**SCIENTECH, INC.**

2105 LUNA ROAD, SUITE 390 ■ CARROLLTON, TX 75006 ■ PHONE: 214-247-1714 ■ FAX: 214-247-0268

**REPORT OF ANALYSIS**  
**ANL JOB# 93-00471**  
**4/28/93**
**NES**
**MATRIX: ROOF MAT.**
**LAB ID: AA21088**  
**SAMPLE ID: AL003**

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Th-232 (Ac-228)	9.92 E-1	+-	1.22 E-1	9 E-2	pCi/g
U-238 (Pb-234)	2.94 E+1	+-	4.99 E+0	9 E-2	pCi/g
Ce-137	9.36 E-1	+-	2.59 E-2	5 E-2	pCi/g
K-40	2.99 E+0	+-	2.63 E-1	3 E-1	pCi/g

\* - Analyzed by Gamma Spec.

  
 Joe Sikas / Kent Surface  
 Radiochemistry Managers



# INTEGRATED ENVIRONMENTAL SERVICES

A Division of ~~NEU~~ and  
Unit of The Penn Central Corporation  
44 Shelter Rock Road  
Danbury, CT 06810

Deliver to: KEN LAMBERT

Date: 6/4/93

Number of Pages (including this cover sheet) 10

Time: 0815

Fax Number: 208-770-5665

Fax Number: (203) 792-3168

From: F REBHANN

Phone: (203) 796-5221

Comments: DEAR KEN

HERE ARE 9 ADDITIONAL SAMPLE ANALYSIS  
SHEETS OF ALCOA BUILDING 65 ROOF  
MATERIAL. PLEASE COMBINE THESE WITH  
THE THREE ATTACHED TO MY LETTER OF  
6/2/93. ANY QUESTIONS PCS CALL

FRANK

**SCIENTECH, INC.**

1105 LENA ROAD, SUITE 100 • CARROLLTON, TX 75006 • PHONE: 214-247-1714 • FAX: 214-247-0260

**REPORT OF ANALYSIS**  
**ANL JOB# 93-00557**  
**6/1/93****ALCOA****MATRIX: ROOF MAT.****LAB ID: AA22223****SAMPLE ID: AL004**

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Th-232 (Ac-228)	1.16 E+0	+-	1.49 E-1	1 E-1	pCi/g
U-236 (Pa-234)	1.86 E+1	+-	3.54 E+0	4 E+0	pCi/g
Ce-137	5.88 E-1	+-	9.80 E-2	6 E-2	pCi/g
K-40	9.65 E+0	+-	6.28 E-1	4 E-1	pCi/g

\* - Analyzed by Gamma Spec.

Joe Skuse / Kent Surface  
Radiochemistry Managers



SCIENTECH, INC.

3105 LITKA ROAD, SUITE 200 W. KANSAS CITY, MO 64114 PHONE: 314-347-1714 FAX: 314-347-0260

REPORT OF ANALYSIS  
ANL JOB# 93-00557  
6/1/93

ALCOA

LAB ID: AA22225  
SAMPLE ID: AL005

MATRIX: ROOF MAT.

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Th-232 (Ac-228)	1.11 E+0	+-	1.54 E-1	6 E-2	pCi/g
U-238 (Pa-234)	2.94 E+1	+-	4.28 E+0	4 E+0	pCi/g
Ce-137	8.54 E-1	+-	8.18 E-2	4 E-2	pCi/g
K-40	9.28 E+0	+-	2.98 E-1	8 E-1	pCi/g

\* - Analyzed by Gamma Spec.

*Karl Surface*  
Joe Sikes / Karl Surface  
Radiochemistry Managers


**SCIENTECH, INC.**

7101 LUNA ROAD, SUITE 300 • CANNONVILLE, UT 84005 • PHONE 314-345-0734 • FAX 314-347-0360

**REPORT OF ANALYSIS**  
**ANL JOB# 93-00557**  
**6/1/93**
**ALCOA**
**MATRIX: ROOF MAT.**
**LAB ID: AA22224**  
**SAMPLE ID: ALD06**

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Th-232 (Ac-228)	1.08 E+0	+-	1.40 E-1	8 E-2	pCi/g
U-238 (Pa-234)	2.38 E+1	+-	4.24 E+0	4 E+0	pCi/g
Ce-137	5.92 E-1	+-	9.66 E-2	8 E-2	pCi/g
K-40	3.64 E+0	+-	3.11 E-1	3 E-1	pCi/g

\* - Analyzed by Gamma Spec.

 Joe Gikes / Kent Surface  
 Radiochemistry Managers





SCIENTECH, INC.

2101 LITEX ROAD, SUITE 100 IN COLUMBIA, TN 38406 • PHONE: 214-247-1714 • FAX: 214-247-0889

REPORT OF ANALYSIS  
ANL JOB# 93-00357  
8/1/83

ALCOA

MATRIX: ROOF MAT.

LAB ID: AA22226  
SAMPLE ID: AL007

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Th-232 (Ac-228)	9.42 E-1	+-	1.22 E-1	1 E-1	pCi/g
U-235 (Pa-234)	2.89 E+1	+-	6.20 E+1	4 E+0	pCi/g
Cs-137	1.08 E+0	+-	6.46 E-2	8 E-2	pCi/g
K-40	3.94 E+0	+-	3.28 E-1	4 E-1	pCi/g

\* - Analyzed by Gamma Spec.

*Karl Surface*  
Joe Sikes / Karl Surface  
Radiochemistry Managers

**SCIENTECH, INC.**

2104 LUNA ROAD, SUITE 390 • CARROLLTON, TX 75006 • PHONE: 214-347-1734 • FAX: 214-347-0238

**REPORT OF ANALYSIS**

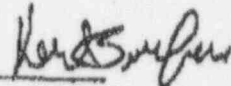
ANL JOB# 93-00557

6/1/93

**ALCOA****MATRIX: ROOF MAT.****LAB ID: AA22227****SAMPLE ID: AL008**

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Th-232 (Ac-228)	1.40 E+0	+-	1.38 E-1	1 E-1	pCi/g
U-238 (Pa-234)	4.12 E+1	+-	7.00 E+0	4 E+0	pCi/g
Ce-137	1.18 E+0	+-	8.97 E-2	5 E-2	pCi/g
K-40	3.91 E+0	+-	3.52 E-1	4 E-1	pCi/g

\* - Analyzed by Gemma Spec.

  
Joe Sikes / Kart Surface  
Radiochemistry Ma.


**SCIENTECH, INC.**

2106 LITKA ROAD, SUITE 100 • FARMINGTON, TX 78046 • PHONE: 314-347-1714 • FAX: 314-347-0286

**REPORT OF ANALYSIS**  
**ANL JOB# 93-00557**  
**8/1/93**
**ALCOA**
**MATRIX: ROOF MAT.**
**LAB ID: AA22228**  
**SAMPLE ID: AL008**

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Th-232 (Ac-228)	1.07 E+0	+-	1.38 E-1	1 E-1	pCi/g
U-238 (Pa-234)	4.88 E+1	+-	7.78 E+0	4 E+0	pCi/g
Ce-137	1.04 E+0	+-	8.28 E-2	8 E-2	pCi/g
K-40	4.52 E+0	+-	4.07 E-1	4 E-1	pCi/g

\* - Analyzed by Gamma Spec.

*Kent Surface*

Joe Sikes / Kent Surface  
Radiochemistry Managers



2105 LUNA ROAD SUITE 100 • CARROLLTON, VA 22024 • PHONE: 214-247-1714 • FAX: 214-247-0268

REPORT OF ANALYSIS  
ANL JOB# 83-00557  
8/1/93

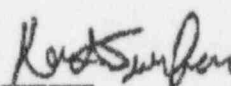
ALCOA

LAB ID: AA22229  
SAMPLE ID: AL010

MATRIX: ROOF MAT.

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Tl-232 (Ac-228)	1.08 E+0	+-	1.80 E-1	1 E-1	pCi/g
U-238 (Pa-234)	4.22 E+1	+-	7.17 E+0	4 E+0	pCi/g
Ce-137	1.08 E+0	+-	6.48 E-2	8 E-2	pCi/g
K-40	5.17 E+0	+-	4.85 E-1	4 E-1	pCi/g

\* Analyzed by Gamma Spec.

  
Joe Biles / Karl Surfas  
Radiochemistry Managers

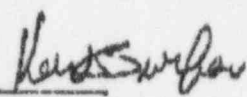
**SCIENTECH, INC.**

2304 LENA ROAD, SUITE 100 • CARROLLTON, TX 75006 • PHONE: 214-347-1714 • FAX: 214-347-0168

**REPORT OF ANALYSIS**  
**ANL JOB# 93-00557**  
**6/1/93****ALCOA****MATRIX: ROOF MAT.****LAB ID: AA22230**  
**SAMPLE ID: AL011**

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Th-232 (Ac-228)	1.08 E+0	+-	1.37 E-1	8 E-2	pCi/g
U-238 (Pa-234)	4.73 E+1	+-	8.04 E+0	4 E+0	pCi/g
Ce-137	8.15 E-1	+-	4.88 E-2	8 E-2	pCi/g
K-40	4.60 E+0	+-	4.08 E-1	3 E-1	pCi/g

\* - Analyzed by Gamma Spec.

  
Joe Stiles / Kent Surface  
Radiochemistry Managers



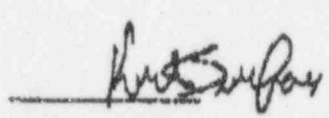
**SCIENTECH, INC.**

2104 LENA ROAD, SUITE 100 • CAMBRIDGE, TX 77905 • PHONE: 214-247-1711 • FAX: 214-247-8384

**REPORT OF ANALYSIS**  
**ANL JOB# 93-00557**  
**8/1/93****ALCOA****MATRIX: ROOF MAT.****LAB ID: AA22231**  
**SAMPLE ID: AL012**

ANALYSIS *	ACTIVITY		ERROR EST.	MDA	UNITS
Th-232 (Ac-228)	1.06 E+0	+-	1.27 E-1	6 E-2	pCi/g
U-238 (Pa-234)	1.91 E+1	+-	8.44 E+0	3 E 0	pCi/g
Ce-137	7.17 E-1	+-	4.30 E-2	4 E-2	pCi/g
K-40	9.30 E+0	+-	2.97 E-1	3 E-1	pCi/g

\* - Analyzed by Gamma Spec.

  
Joe Bikes / Kent Surace  
Radiochemistry Managers



# INTEGRATED ENVIRONMENTAL SERVICES

A Division of ~~TRUSE~~ and  
Unit of The Penn Central Corporation  
44 Shelter Rock Road  
Danbury, CT 06810

Deliver to: KEN LAMBERT

Date: 6/4/93

Number of Pages (including this cover sheet) 2

Time: 0915

Fax Number: 203-290-5605

Fax Number: (203) 792-3168

From: F. REBHANN

Phone: (203) 796-5221

Comments: KEN:

THIS IS A COPY OF THE ANALYSIS OF THE  
WASTE STREAM MAT'L FROM THE VENTILATION  
SYSTEM REMEDIATION. M. GRADERT THOUGHT  
IT MIGHT BE USEFUL DATA IN CONNECTION  
WITH THE DATA YOU ALREADY HAVE.  
ANY QUESTIONS PLS CALL

FRANK

2-Jun-93

INTEGRATED ENVIRONMENTAL SERVICES  
44 Shelter Rock Road  
Danbury, CT 06810

Page: R-2  
Copy: 1 of 1

Attn:  
Project: ALCOA/2240

Received: 12-May-93 15:20  
PO #: N21083

Job: 937092E

Status: Final

## Sample Type: Solids

	Th-228 Total pCi/g $\pm 2\sigma$	Th-230 Total pCi/g $\pm 2\sigma$
Sample Id		
BA-001, BA-002	1.4 $\pm 1.1$	3.0 $\pm 1.2$
	Th-232 Total pCi/g $\pm 2\sigma$	U-234 Total pCi/l $\pm 2\sigma$
Sample Id		
BA-001, BA-002	0.8 $\pm 0.9$	2.9 $\pm 0.8$
	U-235 Total pCi/l $\pm 2\sigma$	U-238 Total pCi/l $\pm 2\sigma$
Sample Id		
BA-001, BA-002	0.1 $\pm 0.3$	12 $\pm 1$

*K. Lambert  
Working Copy*

# ORISE

OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

September 14, 1993

John Austin  
U.S. Nuclear Regulatory Commission  
Mail Stop: 0WFN-5E4  
Washington, D.C. 20555

**SUBJECT: PROPOSED CONFIRMATORY SURVEY PLAN OF BUILDING 65,  
ROOF, LOWER ROOF, VENTILATION AND DRAINAGE  
SYSTEMS—CLEVELAND WORKS FACILITY—THE ALUMINUM  
COMPANY OF AMERICA—CLEVELAND, OHIO**

Dear Mr. Austin:

Enclosed is a copy of the subject document for your review and comment. The survey is scheduled to begin on September 20th. Please direct your questions or comments to me at (615) 576-3355 or Michele Landis at (615) 576-2908.

Sincerely,



Armin J. Ansari  
Project Leader  
Environmental Survey and  
Site Assessment Program

AJA:rdc

Enclosure

cc: T. Mo, NRC/NMSS, 6H3  
D. Tiktinsky, NRC/NMSS, 6E6  
T. Johnson, NRC/NMSS  
M. Landis, ORISE/ESSAP  
J. Berger, ORISE/ESSAP  
A. Payne, ORISE/ESSAP  
File/232

*Technical*

**PROPOSED  
CONFIRMATORY SURVEY PLAN OF  
BUILDING 65, ROOF, LOWER ROOF, VENTILATION AND  
DRAINAGE SYSTEMS  
CLEVELAND WORKS FACILITY  
THE ALUMINUM COMPANY OF AMERICA  
CLEVELAND, OHIO**

**INTRODUCTION AND SITE HISTORY**

The Cleveland Works facility, owned by the Aluminum Company of America (ALCOA), is a large multi-function aluminum refining, casting, and finishing facility, located in Cleveland, Ohio. Operations began at the plant in the early 1900's, at which time portions of the site were operated by the American Magnesium Company (AMC), a wholly owned subsidiary of the Aluminum Company of America (ALCOA). AMC was dissolved in 1954 and ALCOA was granted an AEC license authorizing the possession and use of 1,600 pounds of refined thorium, in both powder and pellet forms, for experimental purposes and the production of magnesium-thorium alloys at the Cleveland Works facility. Prior to the expiration of the license, excess thorium was returned to DOW Chemical Company, the supplier. AEC licensing records indicate that ALCOA was authorized to dispose of thorium wastes at the site in accordance with 10 CFR 20.304. In addition to the licensed activities, ALCOA personnel have indicated that thorium was used at the Cleveland Works Plant since the early 1900s by AMC. Information on the quantities and forms of thorium used at this site prior to 1954 is not available.

Limited radiological surveys were performed at the site by Oak Ridge Associated Universities (ORAU), now known as the Oak Ridge Institute for Science and Education (ORISE), in 1985, 1991, and 1992; by NUS Corporation (NUS) in 1989, and by Nuclear Energy Services (NES) in 1990. Survey results have confirmed the presence of natural thorium and depleted uranium contamination at several locations of the facility. Because ALCOA records do not indicate that the facility possessed depleted uranium, the depleted uranium is believed to have resulted

---

Prepared by the Environmental Survey and Site Assessment Program of Oak Ridge Associated Universities, Oak Ridge, TN, under interagency agreement (NRC Fin. No. A-9093 between the U.S. Nuclear Regulatory Commission and the U.S. Department of Energy.



from off-site migration from another facility. In addition, during decommissioning activities of the ALCOA-Cleveland Works east property, thorium contamination was identified in the soil. The contamination was traced to a 30 m x 12 m (100 ft x 40 ft) area located behind Building 71. REMCOR Inc., completed the decommissioning activities to remove thorium contamination from this location.

In November 1991, ORISE performed a confirmatory survey of the remediated areas, as well as a limited radiological survey of buildings where site history indicated that thorium was used or potentially disposed. The surveyed areas included Buildings 65, 71, 107, 111, 119, and 120 and the landfill.<sup>1</sup> That survey identified residual contamination in the air handling system of Building 65.

In August 1992, ORISE performed a scoping survey of the permanent Mold Facility Buildings 21, 22, 24, 25, 29, 70, and 72. That survey identified uranium contamination within a mezzanine located above Building 25.<sup>2</sup>

NES, Inc./Integrated Environmental Services (NES/IES) has recently completed the decontamination and final survey of Building 65 ventilation and drainage systems. In the licensee's final survey of the facility, the remainder of Building 65 was classified as unaffected, according to NUREG/CR 5849. The licensee's future plans for this building include demolition.

The Nuclear Regulatory Commission (NRC) has requested that the Environmental Survey and Site Assessment Program (ESSAP) of Oak Ridge Institute for Science and Education (ORISE) perform a confirmatory survey of Building 65, roof, lower roof, ventilation and drainage systems.

## SITE DESCRIPTION

ALCOA-Cleveland Works is located on Harvard Avenue in the villages of Newburgh Heights and Cuyahoga Heights, suburbs of Cleveland, Ohio. The facility is located in a mixed industrial and residential area approximately 5 km (3 miles) south of downtown Cleveland. The site

occupies approximately 37 hectares (92 acres) with approximately 14 hectares (35 acres) under roof; it is fenced to prevent unauthorized access. The facility is comprised of many production buildings which contain open bays for manufacturing. Several other buildings contain office and administration space. The property is bounded to the east by the McGean-Rohco Chemical Company, formerly Chemetron Corporation, to the south by Newburgh and South Shore Railroad, and to the west and north by other portions of the Cleveland Works facility.

Building 65 is a two level building with a basement shelter. Construction is of concrete, brick and steel foundation and frame; concrete and brick floors; and concrete block, brick, or tile walls. This building was used as a research and development laboratory and was last occupied in the early 1970's.

### OBJECTIVES

The objectives of the confirmatory process are to provide independent document reviews and radiological data, for use by the NRC in evaluating the adequacy and accuracy of the licensee's final status report, relative to established guidelines.

### RESPONSIBILITY

Work described in this survey plan will be performed under the direction of Michele Landis, Project Manager and Armin Ansari, Project Leader with ESSAP. The cognizant site supervisor has the authority to make appropriate changes to the survey procedures as deemed necessary. After consultation with the NRC site representative, the scope of the survey may be altered as the survey progresses. Deviations to the survey plan or procedures will be documented in the site log book.

### DOCUMENT REVIEW

ESSAP has reviewed the licensee's final radiological survey report. Procedures and methods utilized by the licensee were reviewed for adequacy and appropriateness. The data were

reviewed for accuracy, completeness, and compliance with guidelines and comments were provided to the NRC.

## PROCEDURES

Survey activities will be conducted in accordance with the ORISE ESSAP Survey Procedures Manual. The procedures are listed on pages 6 and 7 of this survey plan.

### Reference Grid

The reference grid system established by the licensee will be utilized. Measurement locations on ungridded surfaces will be referenced to prominent building features and/or recorded on appropriate drawings.

### Surface Scans

Surface scans for alpha and beta activity will be performed using large area gas proportional scintillation detectors coupled to ratemeter-scalers with audible indicators. Thin-window GM and ZnS scintillation detectors will be used to scan locations inaccessible with large area probes.

Surface scans for gamma activity will be performed using NaI scintillation detectors coupled to ratemeters with audible indicators. The scans will be performed on the first floor, second floor, roof, and accessible roof drains and ventilation ducts. Locations of elevated direct radiation identified by scans will be marked for further investigation.

### Surface Activity Measurements

Measurements of total and removable alpha and beta activity will be performed on approximately 10% of the floor and lower wall grid blocks. One direct measurement will be obtained from each randomly selected grid block. These measurements will be performed using gas proportional detectors, coupled to ratemeter-scalers. Removable activity levels will be determined by

*Sections 1  
10% roof  
+ 2-5% on floor  
ORISE  
plan*

*Roof 100%  
main floors 10%  
duct work 100%*

*in selected  
describes direct readings in  
unaffected areas, which were  
not gridded*

collecting a smear sample from each direct measurement location. Direct measurements and smears will also be obtained from locations of elevated activity identified by surface scans.

### Exposure Rate Measurements

Background exposure rates, determined from previous ESSAP surveys of this facility, will be used for comparison.

Exposure rate measurements will be made at 1 m above the surface at a minimum of 6 locations on Building 65 roof and at a minimum of 6 locations on the main floor. <sup>+ second floor</sup> Exposure rate measurements will be performed using a Pressurized Ionization Chamber (PIC).

### Additional Sampling

Samples will be collected from the drainage system if elevated direct radiation is indicated by the scans. *direct scans - No I detect of drain and sample.*

### SAMPLE ANALYSIS AND DATA INTERPRETATION

Samples and data will be returned to ORISE's ESSAP laboratory in Oak Ridge, TN for analysis and interpretation. Smears will be analyzed for gross alpha and gross beta activity using a low background gas proportional counter, and the results will be converted to units of disintegrations per minute per 100 cm<sup>2</sup> (dpm/100 cm<sup>2</sup>). Direct measurements for surface activity will be converted to units of dpm/100 cm<sup>2</sup>. Miscellaneous samples will be analyzed by gamma spectrometry and the results reported in pCi/g. Exposure rates will be reported in  $\mu$ R/h. The data generated will be compared with the licensee's documentation and NRC guidelines established for release to unrestricted use.<sup>3,4</sup> Results will be presented in a report and provided to the NRC for review and comment.

- 1) *Complete data sets*
- 2) *Compare to license data*
- 3) *provide opinion on difference, if any.*

*Actual data*

## GUIDELINES

Initially, thorium guidelines were applied to remediation and commissioning of Building 63 roof and ventilation systems. However, following additional sampling by NES/IES and reevaluation of previous data by REMCOR, Inc., the isotope of concern was determined by the licensee to be U-238. The approval was granted by the NRC to apply the uranium guidelines for remediation of Building 65.<sup>5,6</sup>

The surface contamination guidelines for uranium are.<sup>3</sup>

### Total Activity

5,000 dpm  $\alpha$ /100 cm<sup>2</sup>, total, averaged over a 1 m<sup>2</sup> area

15,000 dpm  $\alpha$ /100 cm<sup>2</sup>, total, maximum in a 100 cm<sup>2</sup> area

### Removable Activity

1000 dpm  $\alpha$ /100 cm<sup>2</sup>

The exposure rate limit is 5  $\mu$ R/h above background.<sup>4</sup>

## TENTATIVE SCHEDULE

Measurement and Sampling	September 21-24, 1993
Sample Analysis	October, 1993
Draft Report	November, 1993

## LIST OF CURRENT PROCEDURES

Applicable procedures from ORISE ESSAP Survey Procedures Manual (Revision 7; May 31, 1992) include:



Section 5.0	Instrument Calibration and Operational Check-Out
5.1	General Information
5.2	Electronic Calibration of Ratemeters
5.3	Gamma Scintillation Detector Check-Out and Cross Calibration
5.4	Alpha Scintillation Detector Calibration and Check-Out
5.5	GM Detector Calibration and Check-Out
5.6	Proportional Detector Calibration and Check-Out
5.7	Pressurized Ionization Chamber Calibration and Check-Out
5.9	Floor Monitor Check-Out
5.13	Field Measuring Tape Calibration
Section 7.0	Scanning and Measurement Techniques
7.1	Surface Scanning
7.3	Alpha Radiation Measurement
7.4	Beta Radiation Measurement
7.5	Gamma Radiation (Exposure Rate) Measurement
Section 8.0	Sampling Procedure
8.7	Determination of Removable Activity
8.8	Miscellaneous Sampling
8.9	Sample Identification and Labeling
Section 9.0	Integrated Survey Procedures
9.2	General Survey Approaches and Strategies
Section 10.0	Health and Safety Control of Cross Contamination
Section 11.0	Quality Assurance and Quality Control

## REFERENCES

1. "Radiological Survey of Portions of the Cleveland Works Facility, The Aluminum Company of America," ORISE, November, 1992.
2. "Radiological Scoping Survey of Buildings 21, 22, 24, 25, 26, 29, 70, and 72, Cleveland Works Facility, The Aluminum Company of America," ORISE, October, 1992.
3. "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," U.S. Nuclear Regulatory Commission, Division of Fuel Cycle and Material Safety, August 1987.
4. "Review Plan: Evaluating Decommissioning Plans for Licensees Under <sup>10</sup> CFR Parts 30, 40, and 70, Washington, D.C., 1991.
5. "Final Decommissioning Report for the Remediation of the Low Level Radioactive Contaminated Material Building 65 Ventilation System for the ALCOA Cleveland Forge Plant, Cleveland Works", NES, INC./IES, June 1993.
6. "Final Decommissioning Report for the Remediation and Release of the Building 65 Roof and Drainage System including the Characterization of Four Adjacent Roofs for the ALCOA Cleveland Forge Plant, Cleveland Works", NES, INC./IES, July 1993.

APPENDIX A  
COST ESTIMATE\*  
CONFIRMATORY SURVEY PLAN FOR  
BUILDING 65, ROOF, LOWER ROOF  
VENTILATION AND DRAINAGE SYSTEMS,  
CLEVELAND WORKS FACILITY  
THE ALUMINUM COMPANY OF AMERICA  
CLEVELAND, OHIO

Survey Preparation - 6.0K

Survey preparation includes the following activities: Document reviews, survey plan, the cost and time estimates, and trip planning and preparation (equipment calibration and packing).

On-Site Activities - \$18.5K

On-site activities will include 17 man-days at the site performing the following: surface scans, surface activity measurements, smear, and miscellaneous sampling, and exposure rate measurements. The on-site expenses also include unpacking equipment and logging in samples upon return to Oak Ridge.

Travel - \$17.7K

Travel expenses include, transportation to and from the site (airlines, government and rental vehicles), hotel expenses, and per diem.

Samples Analysis - \$850

Includes analyses of smear samples for gross alpha and beta activity and gamma spectrometry analysis of five miscellaneous samples.

Report Preparation - \$10.3K

The report preparation will include the following activities: tabulation of data, illustrations, writing and reviewing the draft and final reports, word processing and reproduction.

Total Cost Estimate - \$53.4K

*\*Estimates are for survey activities described in this survey plan. Reduction or increase in the scope of the survey would result in changes in the original estimate in the "on-site activities" and "sample analysis" categories. Major changes to the scope of the survey, if necessary, will be made only after consultation with the NRC site representative.*