

ALUMINUM COMPANY OF AMERICA

1000 HARVARD AVENUE
CLEVELAND, OHIO 44105



1992 February 24

Mr. Ken Lambert
Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Dear Mr. Lambert:

As per your request I have attached the Remcor Verification Report from the Number 3 Blower Unit, Building 65 2nd floor. The unit was decontaminated by Remcor on December 11, 1991 and the waste material was included with the bulk material excavated south of Building 71 and sent to Envirocare of Utah for storage.

In addition to the above work, I would like to inform you that Alcoa is planning to demolish the abandoned Permanent Mold facility in June 1992. We need to have the "Unconditional Release Report" from your office prior to our commencing demolition and we would greatly appreciate any effort that you would put into accelerating the processing of the Release Document. As always, please call me at (216) 641-4366 if I can be of any assistance.

Sincerely,

Mark A. Gradert
Senior Environmental Specialist

MAG/ss

cc: M. L. Bowers - Alcoa, Cleveland Works
R. G. Taylor - Alcoa, Cleveland Works

Ref: RVReport.mag

FEB 28 1992



REMCOR, Inc. • 701 Alpha Drive • P.O. Box 38310 • Pittsburgh, PA 15238-8310 • 412-963-1106

February 19, 1992

Project No. 91307

Mr. Mark A. Gradert
Senior Environmental Scientist
Aluminum Company of America
1600 Harvard Avenue
Cleveland, Ohio 44105

Letter Report
Partial Cleaning and Radiological Survey
Building 65 - Exhaust System No. 3
Aluminum Company of America
Cleveland, Ohio

Dear Mr. Gradert:

Remcor, Inc. (Remcor) is pleased to submit this letter report to the Aluminum Company of America (Alcoa) describing the partial cleaning and radiological survey of Exhaust System No. 3 in Building 65 in the Alcoa Works in Cleveland, Ohio. This work was performed under Alcoa Purchase Order No. CE 475980 CV, Change Order No. RI-7 and as specified in Remcor's letter proposal dated November 26, 1991. This work was designed to accomplish two objectives, as follows:

- Remove, using a vacuum unit and hand tools, the loose and lightly adhering dust and scale from the following areas:
 - Interior surfaces of the air handler for Exhaust System No. 3
 - Accessible portions of the interior surfaces of the Exhaust System No. 3 duct work adjacent to the air handler
 - Floor and walls around the air handler
- Survey these surfaces after this cleaning effort for fixed surface contamination using appropriate field instruments and compare the results of this survey to U.S. Nuclear Regulatory Commission (NRC) guidelines for surface contamination.

The NRC guidelines for fixed surface contamination are published by the NRC under the title, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Materials" dated August 1987. The NRC guidelines for Thorium-232 (Th-232) are 1,000 disintegration per 100 square centimeters (dpm/100 cm²) average over the surface being surveyed and 3,000 dpm/100 cm² maximum for an area of not more than 100 cm². The guidelines for Uranium-238 (U-238) are 5,000 dpm/100 cm² average and 15,000 dpm/100 cm² maximum. Alcoa directed Remcor to use the more conservative guidelines for Th-232.

BACKGROUND

In November 1991, preliminary characterization surveys of Exhaust System No. 3 were conducted by Remcor for Alcoa and by the Oak Ridge Associated Universities (ORAU) for the NRC. The Remcor survey was limited to one bulk sample, one direct radiation measurement, and one wipe sample. Analytical results for the bulk sample were reported as 72 picoCuries per gram (pCi/g) of Th-232, 184 pCi/g of U-238, and 11 pCi/g of Cesium-137 (Cs-137). The direct radiation measurement, made with a pancake-type Geiger-Mueller (GM) detector, was reported as 6,600 dpm/100 cm². The wipe sample was tested for alpha and beta/gamma radiation; both were reported as less than the minimum detectable activities (MDA) of 39 and 314 dpm/100 cm², respectively.

The quantitative results of the ORAU survey work have not yet been made available to Alcoa. However, the NRC verbally informed Alcoa that the ORAU data indicated the presence of radioactive contamination in and around the air handler for Exhaust System No. 3. Based on this verbal direction from the NRC, as confirmed by the data collected by Remcor, Alcoa directed Remcor to clean and survey the interior of the air handler, the interior surfaces of the accessible duct work, and the adjacent floor and walls.

METHODS

Mobilization

Remcor mobilized to the site on December 9, 1991 with a four-man crew and the appropriate tools, instruments, and supplies. The crew included a radiation control technician (RCT), a supervising geologist, a site superintendent, and a laborer. The RCT was supplied by Hilbert Associates (Hilbert) of Saratoga Springs, New York.

Hilbert provided the instrumentation for determining radioactivity in the field. The specific instruments that were used for these surveys are as follows:

- Ludlum ESP-1 scaler counter with a GM pancake probe detector
- Ludlum 2221 scaler counter with a 100 cm² Ludlum 43-68 gas proportional detector.

The tools included cutting tools, scrapers, wire brushes, a vacuum unit equipped with a high-efficiency particulate air (HEPA) filter, and a HEPA filter-equipped exhaust air machine. The supplies included HEPA/fume-filtered respirators, personal protective clothing, and containment construction materials.

Pre-Cleaning

Remcor executed the following tasks prior to cleaning the unit:

- Provide lighting for the work area
- Construct a containment structure around the work area to minimize fugitive dust
- Conduct a pre-cleaning survey.

Two quartz trouble lights and flashlights were used for lighting the area. Power for the lights and other electrical equipment was provided by a 9,000-watt gasoline-powered generator supplied by Remcor.

The containment structure was made by hanging polyethylene sheeting (poly) from a wooden framework. The containment consisted of three walls and a ceiling with the cinder block wall being the fourth side. Dimensions of the enclosure were 15 by 12 feet by approximately 9 feet high. The containment enclosed the air handler for Exhaust System No. 3 and the adjacent floor and wall areas.

Dust control inside the containment enclosure was maintained by operation of the electric-powered exhaust air machine. This machine extracted air from inside the enclosure and discharged that air through an integral HEPA filter unit to the general building air. The exhaust air machine was operated during cleaning to minimize fugitive dust.

A pre-cleaning survey was conducted using the GM detector to obtain general levels of activity so that the effectiveness of the cleaning operation could be evaluated. Measured activities were greatest within the unit itself, and the measurement of direct, fixed surface contamination ranged from 8,000 to 20,000 dpm/100 cm². Measured activities on the outside of the unit and on the surrounding floor were less than the minimum detectable activity (MDA) for the GM detector, which was 1,900 dpm/100 cm². Copies of the field notes for the pre-cleaning survey are presented as Attachment 1.

HEPA Filters
Leak Test

Cleaning

The internal surfaces of the air handler, the inside surfaces of the accessible sections of the adjacent duct work, and the adjacent floor and walls were cleaned by scraping these surfaces with putty knives and wire brushes and vacuuming the resultant material with the HEPA filter-equipped industrial vacuum. Access to some portions of the air handler and the duct work was achieved through cutting using an electric saw and an acetylene cutting torch. In compliance with Alcoa's health and safety rules, Remcor obtained a plant hot-work permit before initiating these cutting activities.

Personnel entering the containment area during cleaning operations wore Level C protection with combination HEPA/fume-filtered respirator cartridges. Tyvek® coveralls, boot covers, and gloves were worn by Remcor personnel working in the containment.

Air monitoring samples were collected continuously during cleaning. Air monitoring results from the two days of cleaning were less than the allowable NRC permissible level for inhalation for Th-232 of 1×10^{-12} microcurie per cubic centimeter of breathing zone air. Air monitoring data are presented in Attachment 2.

In addition, personnel working in the containment were assigned thermoluminescent detectors (TLDs). Each worker submitted urine samples for bioassay at the beginning and completion of the project. The TLD and bioassay are not yet available.

The full vacuum bags from the cleaning activities were placed in 5-gallon steel containers. Used HEPA filter cartridges from the exhaust air machine and the vacuum, discarded personal protective clothing and equipment, and the sheeting from the containment were placed in garbage bags and then into 55-gallon drums. Five of the 5-gallon containers were used and two garbage bags of discarded clothing, equipment, and sheeting were generated. This material was stored south of Building 71. The contents of the 5-gallon containers were disposed of at Envirocare of Utah, Inc., along with the material from the Th-232 remediation south of Building 71. The discarded filter cartridges, clothing, equipment, and sheeting were scanned for elevated radiation; contaminated items were included with the materials sent to Utah for disposal.

The uncontaminated clothing, equipment, and sheeting were disposed as ordinary trash. The disassembled pieces of the Exhaust System No. 3 air handler were stacked beside the air handler unit after the radiological survey of the cleaned surfaces.

Radiological Survey

After the cleaning, a radiological survey was made in the cleaned areas of the inside of the air handler, the interior of the accessible duct work, and the floor and walls inside the dust

containment enclosure. This survey was conducted with the gas proportional detector having an MDA of 230 dpm/100 cm². The detector was passed over the entire surface being surveyed in an effort to identify areas of relatively elevated surface activity. This scanning did not identify any areas of elevated activity on the surfaces cleaned by Remcor. In the absence of areas of elevated activity, random points were selected on each cleaned surface and survey measurements were taken and recorded at those points. The areas surveyed and the number of measurements made in each area are summarized as follows:

- Interior of the air handler fan housing - 16 readings
- Fan blade drum - 6 readings
- Interior of the upper exhaust plenum - 15 readings
- Interior of the lower exhaust plenum - 14 readings
- Interior of the inlet plenum - 20 readings
- Outside surfaces of fan and ducts and floor areas - 30 readings.

In total, 101 surface activity measurements were made on the cleaned areas; all of these readings were less than the MDA of 230 dpm/100 cm² for the gas proportional detector. The surveyed areas and the readings are summarized in Attachment 3.

While making the post-cleaning survey of the inlet duct to the air handler, random readings were taken beyond the areas of the interior surfaces of the duct that was accessible for cleaning. These random readings indicated the presence of surface activity in excess of the NRC criteria on interior surfaces of the ducts beyond the areas cleaned by Remcor. At the direction of the Alcoa project manager, Remcor personnel made openings at other locations in the duct work for Exhaust System No. 3. Scans and point measurements were made with the gas proportional detector at 23 locations in this duct work. These locations and measurements are being presented to Alcoa in another letter report.

During this additional survey work, the containment enclosure was dismantled and the plastic sheeting packaged for disposal as noted above. The nondisposable tools and equipment were cleaned and surveyed for release from the work zone. This work was completed on December 13, 1991.

CLOSING

Based on the measurements reported from the post-cleaning radiological survey, it appears that the surfaces cleaned by Remcor meet the NRC criteria for unrestricted release. This includes the interior of the air handler, the accessible portions of the exhaust plenum and the inlet duct, and the floor adjacent to the air handler.

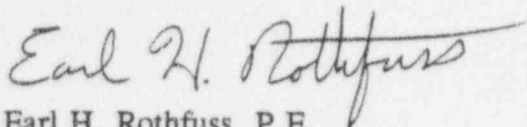
Mr. Mark A. Gradert

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February 19, 1992

We trust that this letter report and the three attachments are clear, complete, and responsive to your needs. If you have any questions or concerns, please contact us.

Respectfully submitted,



Earl H. Rothfuss, P.E.
Senior Project Manager

EHR:rmv
Attachments

ATTACHMENT 2
AIR MONITORING DATA

AIR SAMPLE ANALYSIS REPORT

LOCATION OF AIR SAMPLE: ALCOA/BUILDING 65
DATE OF AIR SAMPLE: 12/11/91
VOLUME OF AIR SAMPLE: 10000 LITERS
SAMPLE IDENTIFICATION: VENT SYSTEM DECON
DATE OF REPORT: 01-21-1992

INSTRUMENTATION

	BETA-GAMMA	ALPHA
INSTRUMENT MODEL	LUDLUM M.2929 DUAL CHANNEL SCALER	
INSTRUMENT S/N	50718	
INSTRUMENT CAL DATE	02/18/91	
EFFICIENCY SOURCE	TC99	TH320
EFFICIENCY(cpm/dpm)	.114	.341
SELF-SHIELD FACTOR	1	1.2
GEOMETRY FACTOR	1	1
BACKGROUND COUNT TIME(min)	3	3
SAMPLE COUNT TIME(min)	3	3

ANALYSIS RESULTS

	BETA-GAMMA	ALPHA
BACKGROUND COUNT RATE	56.6	.33
SAMPLE COUNT RATE	52.5	.66
NET SAMPLE COUNT RATE	-4.099998	.33
MIN DETECTABLE COUNT RATE	61.59291	5.626692
ACT CONC (uCi per cc)	9.803729E-15	1.536088E-13
MDAC (uCi per cc)	9.803729E-15	1.536088E-13

AIR SAMPLE ANALYSIS REPORT

LOCATION OF AIR SAMPLE: ALCOA/BUILDING 65
DATE OF AIR SAMPLE: 12/10/91
VOLUME OF AIR SAMPLE: 3200 LITERS
SAMPLE IDENTIFICATION: VENT SYSTEM DECON
DATE OF REPORT: 01-21-1992

INSTRUMENTATION

	BETA-GAMMA	ALPHA
INSTRUMENT MODEL	LUDLUM M.2929 DUAL CHANNEL SCALER	
INSTRUMENT S/N	50718	
INSTRUMENT CAL DATE	02/18/91	
EFFICIENCY SOURCE	TC99	TH320
EFFICIENCY(cpm/dpm)	.114	.341
SELF-SHIELD FACTOR	1	1.2
GEOMETRY FACTOR	1	1
BACKGROUND COUNT TIME(min)	3	3
SAMPLE COUNT TIME(min)	3	3

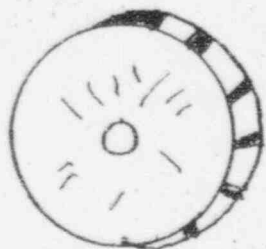
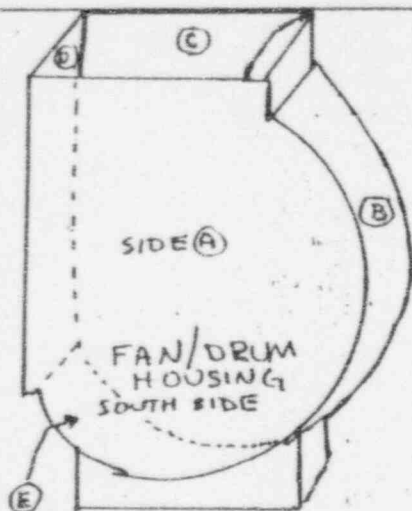
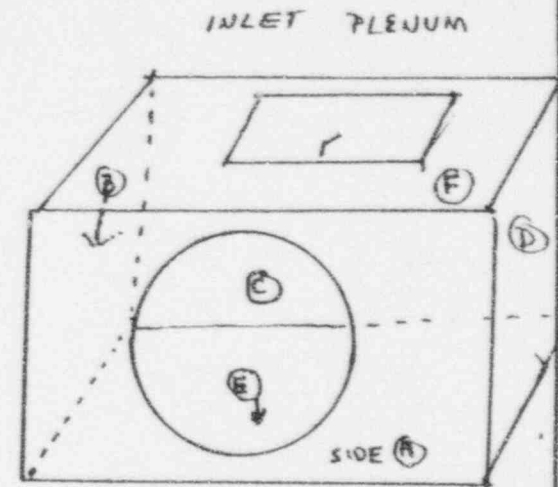
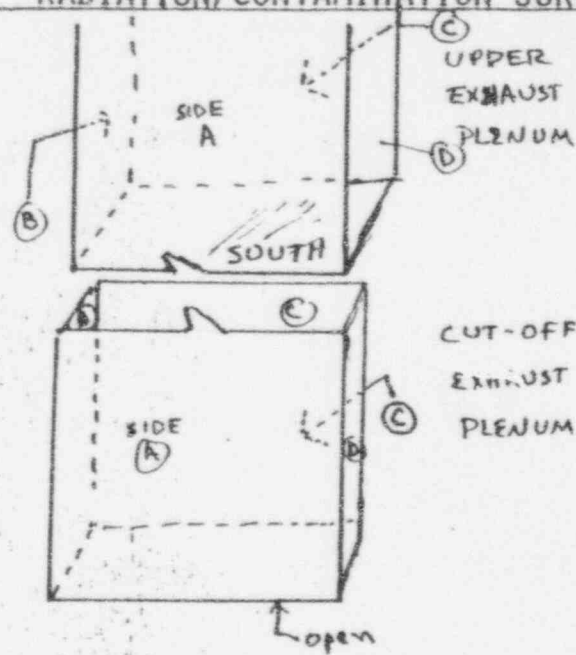
ANALYSIS RESULTS

	BETA-GAMMA	ALPHA
BACKGROUND COUNT RATE	56.6	.33
SAMPLE COUNT RATE	54.3	1.33
NET SAMPLE COUNT RATE	-2.299999	1
MIN DETECTABLE COUNT RATE	61.59291	5.626692
ACT CONC (uCi per cc)	3.063665E-14	2.476817E-13
MDAC (uCi per cc)	3.063665E-14	4.800276E-13

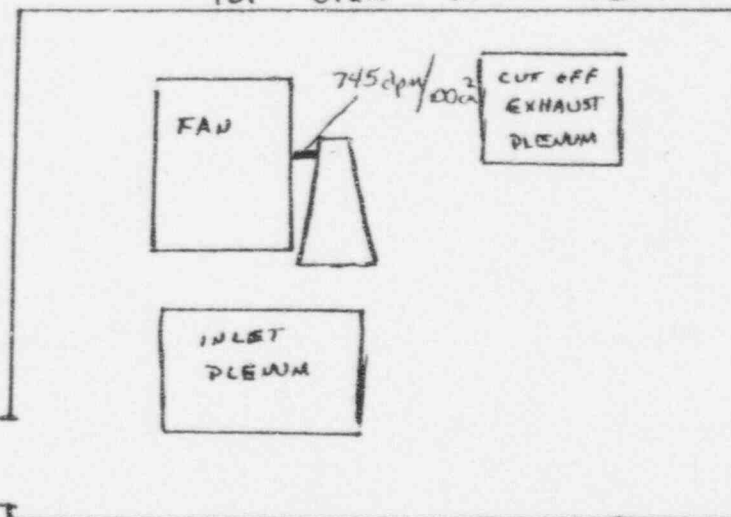
ATTACHMENT 3

POST-CLEANING RADIOLOGICAL SURVEY FIELD DATA

RADIATION/CONTAMINATION SURVEY MAP

FAN BLADE
DRUM

TOP VIEW DECON TENT



INSTRUMENTATION

TYPE & S/N	Ludlum 2221 # 86314
TYPE & S/N	Ludlum 43-6B # 82373
TYPE & S/N	
TYPE & S/N	

eff = 0.188

Bkg = 75 cpm

MDA = 230 dpm/100cm²

LOCATION DESCRIPTION EXHAUST FAN 3 Release Post - Decon

PREPARED BY

DATE 12-13-91 and
PREPARED 12-16-91

FAN/DRUM HOUSING

16 readings

all < MDA

$$eff = .188$$

$$Bkg = 75 \text{ cpm}$$

$$MDA = 230 \text{ dpm}/100 \text{ cm}^2$$

FAN BLADE DRUM

6 readings

all < MDA

UPPER EXHAUST PLENUM

15 readings

all < MDA

LOWER EXHAUST (CUT-OFF) PLENUM

14 readings

all < MDA

INLET PLENUM

20 readings

all < MDA

GENERAL AREA of Decm Tent, Floor,
OUTER SURFACE AREAS OF EQUIP.

30 readings

all but one < MDA

fan motor pedestal 745 dpm/100 cm²

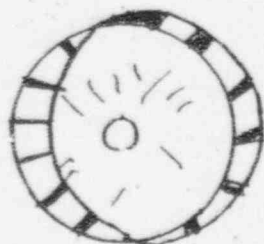
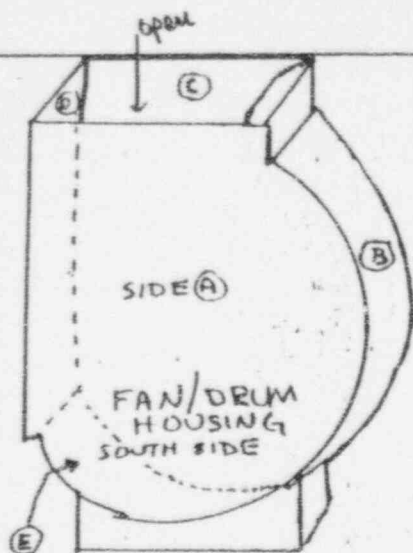
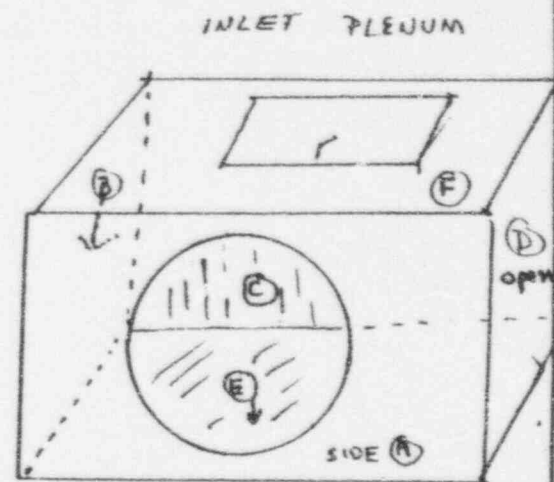
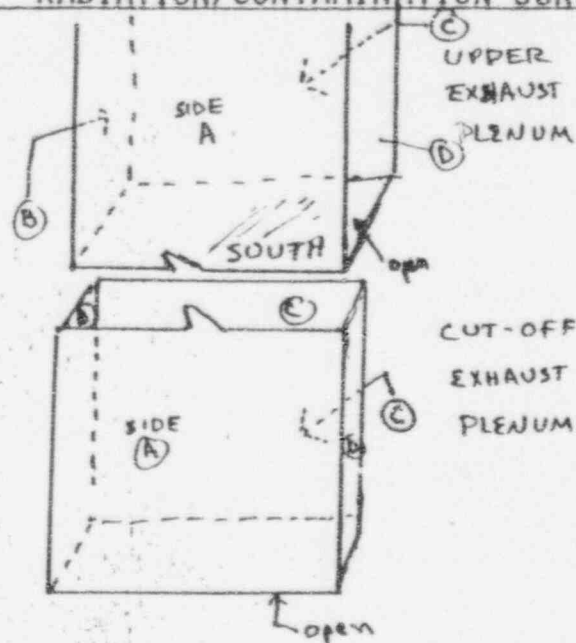
BB200

12-13-91

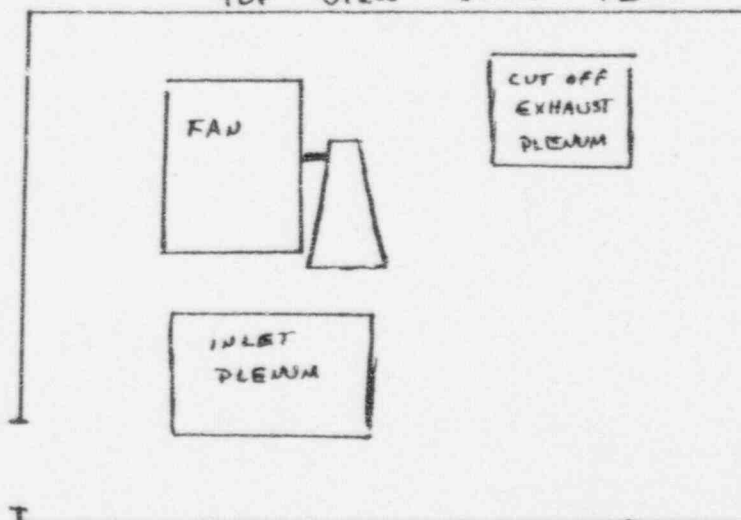
ATTACHMENT 1

PRE-CLEANING RADIOLOGICAL SURVEY FIELD DATA

RADIATION/CONTAMINATION SURVEY MAP

FAN BLADE
DRUM

TOP VIEW DECON TENT



INSTRUMENTATION

TYPE & S/N	ESP-1 / HP 260
TYPE & S/N	# 3028 / S1181
TYPE & S/N	
TYPE & S/N	

LOCATION DESCRIPTION EXHAUST FAN 3 PRE-DECON

PREPARED BY
D3200

DATE PREPARED 12-11-91

FAN HOUSING (INSIDE)		UPPER EXH. (INSIDE)		LOWER EXH. (INSIDE)		INLET PLENUM (INSIDE)		FAN DRUM	
location	net dpm/100cm ²	location	net dpm/100cm ²	location	net dpm/100cm ²	location	net dpm/100cm ²	location	net dpm
SIDE A-1	<MDA	SIDE A-1	<MDA	SIDE A-1	<MDA	NOZ A-1	<MDA	1	<MDA
2	<MDA	2		2		2		2	<MDA
3	<MDA	3		3		3		3	<MDA
4	3.4K	4		4		4		4	6K
C-1	<MDA	B-1		B-1		5			
2	<MDA	2		2		6			
3	1.9K	3		3		B-1			
D-1	<MDA	4		4		2			
2	<MDA	C-1		C-1		3			
3	4.0K	2		2	<MDA	4			
4	8.1K	3		3	1.9K	C-1			
E-1	12.6K	4		4	<MDA	2			
2	15.1K	D-1		D-1		3			
3	18.8K	2		2	<MDA	4			
		3	<MDA	3	3.6K	5			
		4	3.6K	4		6			
						E-1			
						2			
						3	<MDA		
						4	1.9K		
						F-1	<MDA		
						2	<MDA		
						3	1.9K		
						4	2.1K		

INSTRUMENTATION

NOTES:

AUG BK4

MDA = 1

$$MDA = 1.9 \text{ K dpm} / 100 \text{ cm}^2$$

INSTRUMENTATION	
TYPE & S/N	ESP-1 / HP 260 # 3028 / 51181
TYPE & S/N	
TYPE & S/N	

PREPARED BY 1330

DATE
PREPARED 12-11-91