HARMON ENGINEERING ASSOCIATES, INC.

HE Project No. 352-10

RCRA CLOSURE
CERTIFICATION REPORT
SHIELDS ROAD YARD
NASA - MSFC

Prepared For

FACILITIES ENGINEERING
NASA
Marshall Space Flight Center, Al 35602

June 1986

Prepared By

HARMON ENGINEERING ASSOCIATES, INC.
1550 Pumphrey Avenue
Auburn, Alabama 36830

SECTION 1

CERTIFICATION LETTER

HARMON ENGINEERING ASSOCIATES, INC.
CONSULTING ENGINEERS & SCIENTISTS

June 3, 1986

Mr. Marshall Corlew
NASA
Marshall Space Flight Center, AL 35812

Re: Independent Certification of Shields Road Yard Closure
Contract No. NAS8-35465
Amendment No. 5
HE Project No. 352-10

Dear Mr. Corlew:

Harmon Engineering Associates, Inc. (HE) was contracted by NASA-MSFC to conduct inspection, sampling and analysis related to the MSFC-directed closure of the Shields Road yard. It is our understanding that this area had previously been used for the temporary storage of RCRA-regulated wastes. The closure plan was prepared by MSFC and approved by Region IV EPA.

HE inspected the site and collected the samples specified in the closure plan. All samples were analyzed in HE's laboratory using EPA SW-846 methods listed in the enclosed report. All results of all tests indicated the absence of significant concentrations of waste residuals.

The inspection revealed that NASA had removed all wastes and containers from the site. This action, combined with the absence of waste residuals in the soil indicates a successful closure. Thus, based on these data, and my questioning of personnel involved in obtaining them, I hereby certify that MSFC completed the Shields Road Closure according to the approved plan.

Sincerely,

HARMON ENGINEERING ASSOCIATES

Joseph R. Duncan

Joseph R. Duncan, P.E.
Vice President
Environmental Division

JRD:vn

ALABAMA REGISTERED No. 9480 PROFESSIONAL ENGINEER JOSEPH ROBERT DUNCAN

1550 PUMPHREY AVE. AUBURN, AL 36830-4399 (205) 821-9250

SECTION 2

ANALYTICAL RESULTS AND DATA

METHODS AND DETECTION LIMITS

METHODS AND DETECTION LIMITS

All testing reported in this closure certification report were performed by Harmon Engineering Associates in accordance with the MSFC closure plan; all methods conform to those in EPA SW-846 (2nd Edition).

Detection limits for those compounds listed as N.D. (non-detectable) are as follows:

EP Toxicity Metals	As Listed
Volatiles	10 ug/kg
Amine Compounds	0.1 mg/kg
PCB	5 mg/kg
Cyanide	0.5 mg/kg
Sulfate	1.0 mg/kg

Quality control was performed throughout the study by the use of duplicates and standard additions. All results were found to be within acceptable ranges.

EP TOXICITY AND PH

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

EP TOXICITY LEACHATES (ALL VALUES IN MG/L, EXCEPT pH)

HE I.D. NUMBER	As	Ba	Cd	Cr	Pb	Hg	Se	Ag	Ni	pH
5545	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8
5546	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.2
5547	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.2
5548	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.7
5549	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.2
5550	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.2
5551	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.8
5552	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.7
5553	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.7
5554	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.4
5555	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.2
5556	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.1
5557	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.8
5558	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.9
5559	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.5
5560	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.5
5561	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	4.8
5562	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	4.6
5563	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.1
5564	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.1
5565	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.3
5566	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.1
5567	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.1
5568	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.3
5569	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8
5570	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8.1
5571	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.1
5572	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8
5573	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.5
5574	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7
5575	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.2
5576	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.6
5577	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.7
5578	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.4
5579	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.4
5580	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7
5581	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.9
5582	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.8
5583	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	4.7
5584	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.2
5585	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.7
5586	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	4.8

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

EP TOXICITY LEACHATES (ALL VALUES IN MG/L, EXCEPT pH)

HE I.D. NUMBER	As	Ba	Cd	Cr	Pb	Hg	Se	Ag	Ni	pH
5587	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.9
5588	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.2
5589	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.7
5590	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.2
5591	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	4.8
5592	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	4.8
5593	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8
5594	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6
5595	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.5
5596	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.6
5597	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.2
5598	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.9
5599	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.9
5600	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6
5601	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.5
5602	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8.2
5603	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.9
5604	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.9
5605	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.2
5606	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.7
5607	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.3
5608	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.7
5609	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.1
5610	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6
5611	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.9
5612	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.1
5613	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.3
5614	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7
5615	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.9
5616	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.2
5617	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.8
5618	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.7
5619	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	4.9
5620	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8.1
5621	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.2
5622	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.5
5623	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.8
5624	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.3
5625	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.9
5626	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.8
5627	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.8
5628	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.4

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

EP TOXICITY LEACHATES (ALL VALUES IN MG/L, EXCEPT pH)

HE I.D. NUMBER	As	Ba	Cd	Cr	Pb	Hg	Se	Ag	Ni	pH
5629	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8
5630	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.7
5631	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	4.6
5632	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.7
5633	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.4
5634	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.5
5635	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8.4
5636	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8.4
5637	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8.3
5638	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8.2
5639	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8.1
5640	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8.2
5641	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.8
5642	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.6
5643	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5
5644	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.6
5645	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.4
5646	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.1
5647	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.6
5648	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.7
5649	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.4
5650	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7
5651	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.2
5652	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.6
5653	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.6
5654	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.9
5655	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.6
5656	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.7
5657	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7
5658	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	4.8
5659	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.5
5660	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	4.5
5661	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.1
5662	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.9
5663	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.5
5664	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.1
5665	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8.1
5666	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.8
5667	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.9
5668	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.7
5669	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.6
5670	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.3

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

EP TOXICITY LEACHATES (ALL VALUES IN MG/L, EXCEPT pH)

HE I.D. NUMBER	As	Ba	Cd	Cr	Pb	Hg	Se	Ag	Ni	pH
5671	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.6
5672	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.5
5673	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.1
5674	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.6
5675	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.2
5676	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.5
5677	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8.2
5678	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.8
5679	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.8
5680	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8
5681	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7
5682	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.2
5683	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.9
5684	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.3
5685	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	4.4
5686	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.9
5687	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.6
5688	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.6
5689	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.2
5690	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.7
5691	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.6
5692	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.9
5693	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.9
5694	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.5
5695	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8.1
5696	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8
5697	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7
5698	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.3
5699	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.9
5700	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.1
5701	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.1
5702	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.6
5703	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.4
5704	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	8
5705	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.5
5706	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	6.8
5707	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.7
5708	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.2
5709	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.8
5710	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7.6
5711	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	7
5712	<0.1	<1.0	<0.01	<0.1	<0.1	<0.005	<0.02	<0.1	<0.1	5.9

HARMON ENGINEERING ASSOCIATES, INC.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

EP TOXICITY DATA FORM

HE SAMPLE I.D.	INT. pH	ACID ADDED 1	2	3	4	5	6	7	8	9	10	11	Total Acid Added	Final pH
I-5545	8.0	3.0	1.0	1.0	6.0	1.0	6.5	0					18.5	4.8
I-5546	7.2	3.0	0	0	0	0							3.0	4.5
I-5547	6.2	0	1.0	0	0	1.0	0						2.0	5.1
I-5548	7.2	2.0	6.0	1.0	10.0	3.5	4.0	0					21.5	5.0
I-5549	5.2	0.2	0.2	0.2	0	0.4	0	1.2	0	0	0		2.2	5.2
I-5550	5.2	0.2	0.2	0	0	1	0	0	0.6	0	0		2	5.1
I-5551	6.8	1.0	2.4	4.0	0	1.8	0	1.0	2.2	0	0		12.4	5.1
I-5552	5.7	0.2	0.2	0.2	0	0	0	0	0.6	0	0		1.2	5.1
I-5553	5.7	0.2	1.0	1.6	0	1.2	0	0.4	0.6	0	0		5	5.1
I-5554	7.4	2.0	3.0	5.0	0	2.0	1.4	2.0	1.0	0	0		16.4	5.1
I-5555	7.2	2.0	5.0	10.0	0	4.0	3.0	3.6	5.0	0	0		32.6	5.1
I-5556	5.1	0.2	0.4	1.0	0	2.0	0	0.4	1.6	0	0		5.6	5.0
I-5557	7.8	5.2	7.4	15.2	5.0	6.0	4.0	1.6	0	0	0		44.4	5.17
I-5558	5.9	1.0	0.8	2.0	0	1.0	0	1.0	1.0	0.8	0		7.6	5.2
I-5559	5.5	0.2	1.0	3.0	0	1.0	1.0	1.0	2.0	0	0		9.2	5.2
I-5560	7.5	5.0	5.0	10.0	0	3.0	4.0	0.6	0	0	0		27.6	5.15
I-5561	4.8	0	0	0	0	0	0	0.6	0	0	0		0.6	4.6
I-5562	4.6	0	0	0	0	0.6	0	0	0	0	0		0.6	4.4
I-5563	7.1	3.0	3.0	9.0	0	0	0	1.2	0	0	0		16.2	5.2
I-5564	6.1	1.0	0.4	2.0	0	0.6	1.0	1.4	0	0	0		6.4	5.3
I-5565	6.3	1.5	1.0	1.0	3.0	2.0	10.0	0					18.5	4.9
I-5566	7.1	2.0	1.0	0	2.0	7.0	0						12.0	4.6
I-5567	6.1	1.0	1.0	0	0	0	5.0	0					7.0	4.3
I-5568	6.2	2.0	0	0	0	0							2.0	5.1
I-5569	8.0	3.0	1.0	1.0	1.0	1.4	6.0	0	0	0			13.4ml	5.1
I-5570	8.1	9.0	5.0	10.2	10.0	16.0	22.8	27.0					100ml	5.0
I-5571	6.1	.2	.4	.2	.2	.6	1.4	1.0	0	2.0	3.0		9.0ml	5.0
I-5572	8.0	8.2	5.0	8.0	10.0	13.2	20.4	21.2	14.0	0			100ml	5.0
I-5573	5.5	.2	0	0	0	.4	1.0	0	0	0			1.6ml	4.8
I-5574	7.0	.8	.4	.4	.2	.2	2.2	1.0	0	0	0		5.2ml	5.1
I-5575	7.2	2.5	1.0	1.0	1.0	1.0	8.0	0					14.5	4.6
I-5576	6.6	2.0	2.0	1.0	3.0	2.0	10.0	0					20.0	4.8
I-5577	5.7	2.0	0	0	0	0							2.0	4.8
I-5578	7.4	2.0	1.0	1.0	4.5	5.0	0						13.5	5.2
I-5579	7.4	2.0	0	0	0	1.0	0						3.0	4.8
I-5580	7.0	2.0	1.0	2.0	0	2.0	6.0						13.0	4.9
I-5581	5.9	1.0	1.0	0	0	0	1.0	0	0				3.0	5.0
I-5582	5.8	1.0	0	0	0	3.0	0						4.0	4.5
I-5583	4.7	0	0	0	0	0	.2	.2	0	0			0.4ml	4.8
I-5584	6.2	1.0	0	0	1.0	3.0	6.0	0					11.0	4.7
I-5585	5.7	1.0	0	0	0	0							1.0	5.0
I-5586	4.8	0	0	0	1.0	0							1.0	4.8
I-5587	5.9	1.0	1.0	1.0	0	4.0	0						7.0	4.7
I-5588	7.2	2.0	0	0	1.5	3.0	0						6.5	4.7

HARMON ENGINEERING ASSOCIATES, INC.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

EP TOXICITY DATA FORM

HE SAMPLE I.D.	INT. pH	ACID ADDED 1	2	3	4	5	6	7	8	9	10	11	Total Acid Added	Final pH
5589	5.7	1.0	0	0	0	0	0						1.0	7.7
5590	7.8	2.5	1.5	1.0	5.0	3.0	5.0	0					18.0	5.2
5591	6.8	2.5	1.0	1.0	2.0	3.0	5.0	0					14.5	4.8
5592	6.7	1.0	1.0	1.0	5.0	0	1.0	5.0	0				14.0	4.9
5593	8.0	3.0	2.5	1.0	5.0	14.0	10.0	0					35.5	5.1
5594	6.0	1.0	1.0	1.0	2.0	2.0	4.0	0	0				11.0	
5595	5.5	1.0	0	1.0	0	0	3.0	0					5.0	4.9
5596	6.6	1.0	1.0	1.0	1.0	1.0	5.0	0					10.0	4.8
5597	5.2	0	1.7	0	0	0							1.7	5.1
5598	5.9	1.0	0	0	0.5	15.0	0						16.5	4.0
5599	7.9	1.0	2.0	1.0	2.0	2.5	10.0	0					18.5	5.0
5600	6.0	1.0	1.0	0	2.0	1.0	0						5.0	5.0
5601	5.5	1.0	0	0	0	0							1.0	5.2
5602	8.2	2.5	2.0	1.0	25.0	2.0	V0.5	11.0	0				54.0	6.0
5603	7.9	2.0	2.0	1.0	4.0	2.0	12.0	0					24.0	5.0
5604	6.9	1.5	2.0	1.0	0	15.0	4.0	0					23.5	5.1
5605	7.2	2.0	1.0	2.0	0	2.0	12.0	0					19.0	4.9
5606	5.7	1.5	0	1.0	0	2.0	0						4.5	5.0
5607	6.3	1.5	0	0	0	0							1.5	4.5
5608	7.7	2.0	1.7	2.0	10.0	3.0	6.0	0					24.7	5.2
5609	7.1	2.0	1.0	1.0	2.0	1.5	5.0	0					12.5	4.8
5610	6.0	1.0	0	0	0	1.0	0						2.0	4.9
5611	7.9	3.0	2.0	1.0	5.0	2.0	10.0	0					23.0	5.1
5612	7.1	2.0	1.0	1.0	1.0	10.0	0						15.0	4.8
5613	6.3	1.0	1.0	1.0	2.0	5.0	0						10.0	4.7
5614	7.0	2.2	1.0	1.0	2.0	2.0	5.0	0					13.2	5.0
5615	6.9	1.0	0	0	0.5	5.0	0						6.5	4.5
5616	5.2	0	1.0	0	0	0							1.0	4.6
5617	7.8	6.0	1	4.0	5.8	1.0	7.8	3.6	0	0	0		29.2	5.0
5618	6.7	.6	.6	2.0	4.0	4.0	8.0	6.2	6.0	9.0	59.6		100 ml	4.8
5619	4.9	0	1.0	0	0	4.0	0						5.0	4.5
5620	8.1	3.0	2.0	2.0	10.0	5.0	10.0	5.0	2.0	0			40.0	5.2
5621	7.2	6.0	0	0	0	1.0	3.0	1.0	0	0	0		11 ml	5.0
5622	7.5	2.0	1.0	1.0	10.0	0	1.5	4.0	0				19.5	5.1
5623	6.8	2.0	1.0	2.0	2.0	10.0	0						17.0	4.8
5624	6.3	.4	.2	1.0	1.0	.8	6.0	0	0	0			9.4 ml	5.2
5625	5.9	.4	.4	.8	1.0	3.0	5.4	4.0	5.0	3.0	20.0		43 ml	4.8
5626	7.8	3.6	3	3.4	8.0	13.0	21.6	20.8	4.0	5.0	17.6		100 ml	4.8
5627	7.8	3.0	3.2	5.0	8.0	12.0	30.0	13.0	8.2	17.6			100 ml	5.0
5628	5.4	.2	.4	.2	.2	.2	4.0	3.0	0	1.0	20.6		29.8 ml	4.8
5629	8.0	3.0	1.0	1.0	5.0	0	3.5	3.0	0				16.5	5.1
5630	6.7	.8	0	0	0	0	.2	.2	0	0	0		1.2 ml	4.9
5631	4.6	0	0	0	0	0	.2	0	0	0			.2 ml	4.9
5632	7.7	2.0	2.0	1.0	10.0	0	V0.0	0					25.0	4.9

HARMON ENGINEERING ASSOCIATES, INC.

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MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

EP TOXICITY DATA FORM

HE SAMPLE I.D.	INT. pH	ACID ADDED 1	2	3	4	5	6	7	8	9	10	11	Total Acid Added	Final pH
5633	6.4	.6	.4	.4	1.0	1.0	3.2	1.0	1.0	0	0		8.6	5.2
5634	6.5	.6	.4	1.0	1.4	.8	3.0	3.0	0	0	0		10.8	4.9
5635	8.4	30.0	37.2	32.8	0	0	0						100ml	6.1
5636	8.4	33.0	28.0	39.0	0	0	0						100ml	6.0
5637	8.3	30.0	20.0	35.0	0	0	15.0						100ml	6.0
5638	8.2	30.0	20.0	20.0	0	15.4	14.6						100ml	5.9
5639	8.1	2.0	2.8	5.0	6.0	2.0	3.0	6.0	30	5.2	36.0		71ml	4.8
5640	8.2	4.0	4.0	6.0	8.0	12.0	20.0	10.0	6.0	9.0	21.0		100ml	4.9
5641	7.8	2.0	2.0	2.6	6.2	5.0	7.0	7.4	10.2	0	0		42.4	5.1
5642	6.6	1.0	0.2	0.4	1.0	0	0	0.4	0.6	0	0		3.6	5.0
5643	5.0	0	0	0.2	0.4	0	0	0					0.6	5.2
5644	7.6	1.6	1.0	0.8	2.6	1.0	0.6	0.6	1.6	0	0		9.8	5.0
5645	7.4	2.0	0.8	0.6	2.6	1.0	0.4	0.6	2.8	0	0		9.8	5.1
5646	6.1	1.0	0	1.0	0	1.0	0						3.0	4.9
5647	7.6	2.0	1.0	1.0	1.0	1.0	4.0	4.0	0				14.0	4.8
5648	6.7	2.0	0	0	0	2.0	0						4.0	4.5
5649	5.4	1.0	0	0	0	0							1.0	5.2
5650	7.0	2.0	1.0	1.0	0	6.0	0						10.0	4.5
5651	7.4	2.0	1.0	1.0	2.0	3.0	4.0	0					13.0	4.9
5652	5.6	1.0	0	0	0	2.0	0						3.0	4.4
5653	7.6	3.0	1.0	2.0	4.0	3.0	10.0	0					23.0	5.1
5654	6.9	2.0	1.0	0	2.0	6.0	0						11.0	4.8
5655	5.6	1.5	0	0	0	0							1.5	4.3
5656	7.7	2.0	2.0	1.0	5.0	4.0	5.0	0					19.0	5.2
5657	7.0	2.0	0	0	0	0							2.0	4.4
5658	4.8	0	0	0	0.2	0	0	0	0				0.2	5.1
5659	6.5	2.0	1.2	0.8	2.0	0.6	0.2	0.4	0.4	0.4	0		7.9	5.1
5660	4.5	0	0	0	0	0	0						0	4.8
5661	5.1	0	0	0	0	0	0	0					0	5.1
5662	6.9	1.2	1.4	2.0	2.2	1.2	1.2	0	1.0	0.6	0		10.5	5.1
5663	5.5	0.4	0	0.4	0.6	0	0	0	0				1.4	5.2
5664	5.1	0	0	0.2	0	0	0	0					0.2	5.2
5665	8.1	3.0	1.0	1.0	5.0	8.0	0						18.0	5.0
5666	7.8	2.0	1.0	1.0	2.0	3.0	5.0	0					14.0	5.0
5667	5.9	1.0	1.0	1.0	1.0	1.0	5.0	0					10.0	4.9
5668	7.7	2.0	2.0	1.5	5.0	5.0	17.0	0					32.5	5.2
5669	7.6	2.0	2.0	1.0	2.0	17.0	0						24.0	4.7
5670	5.3	0.4	0	0	1.4	0	0	0.6	0.6	0	0		3.0	5.1
5671	7.6	2.2	1.2	1.4	3.0	1.6	1.0	2.8	0	0	0		13.2	5.1
5672	5.5	0.6	0	0	0.6	0	0	0.4	0	0	0		1.6	5.2
5673	5.1	0	0.2	0	0.6	0	0	0					0.8	5.0
5674	7.6	2.0	0	0	0	4.0	0						6.0	4.5
5675	7.2	2.0	0	1.0	0	1.5	0						4.5	4.8
5676	7.5	2.0	1.0	1.0	2.0	2.0	0						8.0	5.1

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RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

EP TOXICITY DATA FORM

HE SAMPLE I.D.	INT. pH	ACID ADDED 1	2	3	4	5	6	7	8	9	10	11	Total Acid Added	Final pH
5677	5.2	2.0	1.0	1.0	5.0	15.0	2.0	5.0	0				31.0	5.2
5678	6.8	1.0	1.0	1.0	2.0	4.0	0						9.0	5.0
5679	5.8	1.0	1.0	1.0	1.0	2.0	0						6.0	5.2
5680	8.0	3.0	1.0	1.0	2.0	10.0	0	0					17.0	4.8
5681	7.0	2.0	1.0	0	1.0	10.0	0						14.0	4.3
5682	5.2	0	1.0	0	0	0							1.0	5.0
5683	6.9	2.0	2.0	1.0	10.0	15.0	15.0						45.0	
5684	7.3	2.0	2.0	1.0	3.0	12.0	5.0	0					25.0	5.1
5685	4.4	0	1.0	0	0	0							1.0	4.7
5686	7.9	3.0	2.0	1.0	5.0	16.0	15.0	10.0	0				52.0	5.6
5687	7.6	3.5	2.0	1.0	5.0	4.0	10.0	0					25.5	5.1
5688	5.6	0.5	0	0	0	0							0.5	4.9
5689	7.2	2.0	1.0	1.0	2.0	3.0	3.0	0					12.0	5.1
5690	6.7	2.0	1.0	1.0	1.0	5.0	0						10.0	4.8
5691	5.6	1.0	0	0	2.0	0							3.0	4.6
5692	7.9	3.0	2.0	2.0	4.0	11.0	10.0	3.0	0				35.0	5.5
5693	6.9	2.0	1.0	1.0	2.0	2.0	10.0	0					18.0	4.6
5694	5.5	1.0	1.0	1.0	0	1.0	5.0						9.0	4.5
5695	8.1	2.0	2.0	1.0	25.0	10.0	10.0	10.0	0				60.0	5.9
5696	8.0	3.0	2.0	1.0	5.0	15.0	4.0	5.0	0				35.0	5.[illegible]
5697	7.0	2.0	2.0	1.0	3.0	5.0	10.0	0					23.0	4.9
5698	7.3	2.5	0	0	2.0	7.0	0						11.5	4.5
5699	6.9	2.0	0	0	0	10.0	0						12.0	4.2
5700	5.1	0	1.0	0	0	0							1.0	5.1
5701	7.1	2.0	2.0	1.0	4.0	13.0	7.0	6.0	0				35.0	5.3
5702	6.6	1.5	1.0	1.0	3.0	2.0	5.0	0					13.5	5.0
5703	5.4	3.0	1.0	0	0	0							4.0	4.8
5704	5.0	3.0	2.0	1.0	4.0	7.0	5.0	0					22.0	5.4
5705	6.5	2.0	0	0	0	1.0	0						3.0	4.8
5706	6.8	2.0	1.0	1.0	3.0	10.0	3.0	0					20.0	5.0
5707	7.7	2.0	1.0	1.0	4.0	3.5	2.0	3.0	10.0	0			32.5	4.9
5708	7.2	3.0	1.0	1.0	10.0	0	0						13.0	5.2
5709	5.8	2.0	1.0	1.0	2.0	2.0	3.0	0					11.0	5.1
5710	7.6	3.0	1.0	1.0	2.0	3.5	0						10.5	5.1
5711	7.0	2.0	0	0	0	3.0	0						5.0	4.4
5712	5.9	1.0	0	0	0	0							1.0	4.7

VOLATILES

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

HE I.D. NUMBER	Trichloro-ethylene ug/kg	Chloro-form ug/kg	Methylene Chloride ug/kg	Perchloro-ethylene ug/kg	111-TCE ug/kg	Toluene ug/kg	Xylene ug/kg
5545	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5546	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5547	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5548	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5549	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5550	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5551	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5552	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5553	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5554	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5555	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5556	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5557	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5558	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5559	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5560	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5561	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5562	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5563	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5564	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5565	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5566	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5567	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5568	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5569	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5570	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5571	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5572	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5573	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5574	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5575	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5576	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5577	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5578	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5579	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5580	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5581	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5582	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5583	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5584	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5585	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5586	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5587	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5588	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

HE I.D. NUMBER	Trichloro-ethylene ug/kg	Chloro-form ug/kg	Methylene Chloride ug/kg	Perchloro-ethylene ug/kg	111-TCE ug/kg	Toluene ug/kg	Xylene ug/kg
5589	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5590	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5591	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5592	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5593	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5594	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5595	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5596	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5597	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5598	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5599	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5600	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5601	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5602	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5603	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5604	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5605	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5606	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5607	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5608	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5609	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5610	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5611	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5612	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5613	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5614	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5615	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5616	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5617	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5618	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5619	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5620	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5621	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5622	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5623	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5624	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5625	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

HE I.D. NUMBER	Trichloro-ethylene ug/kg	Chloro-form ug/kg	Methylene Chloride ug/kg	Perchloro-ethylene ug/kg	111-TCE ug/kg	Toluene ug/kg	Xylene ug/kg
5626	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5627	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5628	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5629	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5630	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5631	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5632	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5633	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5634	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5635	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5636	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5637	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5638	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5639	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5640	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5641	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5642	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5643	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5644	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5645	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5646	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5647	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5648	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5649	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5650	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5651	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5652	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5653	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5654	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5655	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5656	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5657	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5658	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5659	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5660	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5661	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5662	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5663	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5664	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5665	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5666	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5667	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5668	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5669	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

HE I.D. NUMBER	Trichloro-ethylene ug/kg	Chloro-form ug/kg	Methylene Chloride ug/kg	Perchloro-ethylene ug/kg	111-TCE ug/kg	Toluene ug/kg	Xylene ug/kg
5670	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5671	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5672	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5673	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5674	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5675	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5676	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5677	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5678	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5679	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5680	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5681	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5682	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5683	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5684	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5685	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5686	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5687	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5688	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5689	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5690	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5691	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5692	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5693	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5694	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5695	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5696	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5697	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5698	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5699	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5700	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5701	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5702	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5703	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5704	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5705	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5706	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5707	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5708	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5709	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5710	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5711	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
5712	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

AMINE COMPOUNDS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

HE SAMPLE NUMBER	Aniline mg/kg	Diphenyl-amine mg/kg	Nitro-benzene mg/kg	Phenylene diamine mg/kg
5545	N.D.	N.D.	N.D.	N.D.
5546	N.D.	N.D.	N.D.	N.D.
5547	N.D.	N.D.	N.D.	N.D.
5548	N.D.	N.D.	N.D.	N.D.
5549	N.D.	N.D.	N.D.	N.D.
5550	N.D.	N.D.	N.D.	N.D.
5551	N.D.	N.D.	N.D.	N.D.
5552	N.D.	N.D.	N.D.	N.D.
5553	N.D.	N.D.	N.D.	N.D.
5554	N.D.	N.D.	N.D.	N.D.
5555	N.D.	N.D.	N.D.	N.D.
5556	N.D.	N.D.	N.D.	N.D.
5557	N.D.	N.D.	N.D.	N.D.
5558	N.D.	N.D.	N.D.	N.D.
5559	N.D.	N.D.	N.D.	N.D.
5560	N.D.	N.D.	N.D.	N.D.
5561	N.D.	N.D.	N.D.	N.D.
5562	N.D.	N.D.	N.D.	N.D.
5563	N.D.	N.D.	N.D.	N.D.
5564	N.D.	N.D.	N.D.	N.D.
5565	N.D.	N.D.	N.D.	N.D.
5566	N.D.	N.D.	N.D.	N.D.
5567	N.D.	N.D.	N.D.	N.D.
5568	N.D.	N.D.	N.D.	N.D.
5569	N.D.	N.D.	N.D.	N.D.
5570	N.D.	N.D.	N.D.	N.D.
5571	N.D.	N.D.	N.D.	N.D.
5572	N.D.	N.D.	N.D.	N.D.
5573	N.D.	N.D.	N.D.	N.D.
5574	N.D.	N.D.	N.D.	N.D.
5575	N.D.	N.D.	N.D.	N.D.
5576	N.D.	N.D.	N.D.	N.D.
5577	N.D.	N.D.	N.D.	N.D.
5578	N.D.	N.D.	N.D.	N.D.
5579	N.D.	N.D.	N.D.	N.D.
5580	N.D.	N.D.	N.D.	N.D.
5581	N.D.	N.D.	N.D.	N.D.
5582	N.D.	N.D.	N.D.	N.D.
5583	N.D.	N.D.	N.D.	N.D.
5584	N.D.	N.D.	N.D.	N.D.
5585	N.D.	N.D.	N.D.	N.D.
5586	N.D.	N.D.	N.D.	N.D.
5587	N.D.	N.D.	N.D.	N.D.
5588	N.D.	N.D.	N.D.	N.D.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

HE SAMPLE NUMBER	Aniline mg/kg	Diphenyl-amine mg/kg	Nitro-benzene mg/kg	Phenylene diamine mg/kg
5589	N.D.	N.D.	N.D.	N.D.
5590	N.D.	N.D.	N.D.	N.D.
5591	N.D.	N.D.	N.D.	N.D.
5592	N.D.	N.D.	N.D.	N.D.
5593	N.D.	N.D.	N.D.	N.D.
5594	N.D.	N.D.	N.D.	N.D.
5595	N.D.	N.D.	N.D.	N.D.
5596	N.D.	N.D.	N.D.	N.D.
5597	N.D.	N.D.	N.D.	N.D.
5598	N.D.	N.D.	N.D.	N.D.
5599	N.D.	N.D.	N.D.	N.D.
5600	N.D.	N.D.	N.D.	N.D.
5601	N.D.	N.D.	N.D.	N.D.
5602	N.D.	N.D.	N.D.	N.D.
5603	N.D.	N.D.	N.D.	N.D.
5604	N.D.	N.D.	N.D.	N.D.
5605	N.D.	N.D.	N.D.	N.D.
5606	N.D.	N.D.	N.D.	N.D.
5607	N.D.	N.D.	N.D.	N.D.
5608	N.D.	N.D.	N.D.	N.D.
5609	N.D.	N.D.	N.D.	N.D.
5610	N.D.	N.D.	N.D.	N.D.
5611	N.D.	N.D.	N.D.	N.D.
5612	N.D.	N.D.	N.D.	N.D.
5613	N.D.	N.D.	N.D.	N.D.
5614	N.D.	N.D.	N.D.	N.D.
5615	N.D.	N.D.	N.D.	N.D.
5616	N.D.	N.D.	N.D.	N.D.
5617	N.D.	N.D.	N.D.	N.D.
5618	N.D.	N.D.	N.D.	N.D.
5619	N.D.	N.D.	N.D.	N.D.
5620	N.D.	N.D.	N.D.	N.D.
5621	N.D.	N.D.	N.D.	N.D.
5622	N.D.	N.D.	N.D.	N.D.
5623	N.D.	N.D.	N.D.	N.D.
5624	N.D.	N.D.	N.D.	N.D.
5625	N.D.	N.D.	N.D.	N.D.
5626	N.D.	N.D.	N.D.	N.D.
5627	N.D.	N.D.	N.D.	N.D.
5628	N.D.	N.D.	N.D.	N.D.
5629	N.D.	N.D.	N.D.	N.D.
5630	N.D.	N.D.	N.D.	N.D.
5631	N.D.	N.D.	N.D.	N.D.
5632	N.D.	N.D.	N.D.	N.D.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

HE SAMPLE NUMBER	Aniline mg/kg	Diphenyl-amine mg/kg	Nitro-benzene mg/kg	Phenylene diamine mg/kg
5633	N.D.	N.D.	N.D.	N.D.
5634	N.D.	N.D.	N.D.	N.D.
5635	N.D.	N.D.	N.D.	N.D.
5636	N.D.	N.D.	N.D.	N.D.
5637	N.D.	N.D.	N.D.	N.D.
5638	N.D.	N.D.	N.D.	N.D.
5639	N.D.	N.D.	N.D.	N.D.
5640	N.D.	N.D.	N.D.	N.D.
5641	N.D.	N.D.	N.D.	N.D.
5642	N.D.	N.D.	N.D.	N.D.
5643	N.D.	N.D.	N.D.	N.D.
5644	N.D.	N.D.	N.D.	N.D.
5645	N.D.	N.D.	N.D.	N.D.
5646	N.D.	N.D.	N.D.	N.D.
5647	N.D.	N.D.	N.D.	N.D.
5648	N.D.	N.D.	N.D.	N.D.
5649	N.D.	N.D.	N.D.	N.D.
5650	N.D.	N.D.	N.D.	N.D.
5651	N.D.	N.D.	N.D.	N.D.
5652	N.D.	N.D.	N.D.	N.D.
5653	N.D.	N.D.	N.D.	N.D.
5654	N.D.	N.D.	N.D.	N.D.
5655	N.D.	N.D.	N.D.	N.D.
5656	N.D.	N.D.	N.D.	N.D.
5657	N.D.	N.D.	N.D.	N.D.
5658	N.D.	N.D.	N.D.	N.D.
5659	N.D.	N.D.	N.D.	N.D.
5660	N.D.	N.D.	N.D.	N.D.
5661	N.D.	N.D.	N.D.	N.D.
5662	N.D.	N.D.	N.D.	N.D.
5663	N.D.	N.D.	N.D.	N.D.
5664	N.D.	N.D.	N.D.	N.D.
5665	N.D.	N.D.	N.D.	N.D.
5666	N.D.	N.D.	N.D.	N.D.
5667	N.D.	N.D.	N.D.	N.D.
5668	N.D.	N.D.	N.D.	N.D.
5669	N.D.	N.D.	N.D.	N.D.
5670	N.D.	N.D.	N.D.	N.D.
5671	N.D.	N.D.	N.D.	N.D.
5672	N.D.	N.D.	N.D.	N.D.
5673	N.D.	N.D.	N.D.	N.D.
5674	N.D.	N.D.	N.D.	N.D.
5675	N.D.	N.D.	N.D.	N.D.
5676	N.D.	N.D.	N.D.	N.D.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

HE SAMPLE NUMBER	Aniline mg/kg	Diphenyl-amine mg/kg	Nitro-benzene mg/kg	Phenylene diamine mg/kg
5677	N.D.	N.D.	N.D.	N.D.
5678	N.D.	N.D.	N.D.	N.D.
5679	N.D.	N.D.	N.D.	N.D.
5680	N.D.	N.D.	N.D.	N.D.
5681	N.D.	N.D.	N.D.	N.D.
5682	N.D.	N.D.	N.D.	N.D.
5683	N.D.	N.D.	N.D.	N.D.
5684	N.D.	N.D.	N.D.	N.D.
5685	N.D.	N.D.	N.D.	N.D.
5686	N.D.	N.D.	N.D.	N.D.
5687	N.D.	N.D.	N.D.	N.D.
5688	N.D.	N.D.	N.D.	N.D.
5689	N.D.	N.D.	N.D.	N.D.
5690	N.D.	N.D.	N.D.	N.D.
5691	N.D.	N.D.	N.D.	N.D.
5692	N.D.	N.D.	N.D.	N.D.
5693	N.D.	N.D.	N.D.	N.D.
5694	N.D.	N.D.	N.D.	N.D.
5695	N.D.	N.D.	N.D.	N.D.
5696	N.D.	N.D.	N.D.	N.D.
5697	N.D.	N.D.	N.D.	N.D.
5698	N.D.	N.D.	N.D.	N.D.
5699	N.D.	N.D.	N.D.	N.D.
5700	N.D.	N.D.	N.D.	N.D.
5701	N.D.	N.D.	N.D.	N.D.
5702	N.D.	N.D.	N.D.	N.D.
5703	N.D.	N.D.	N.D.	N.D.
5704	N.D.	N.D.	N.D.	N.D.
5705	N.D.	N.D.	N.D.	N.D.
5706	N.D.	N.D.	N.D.	N.D.
5707	N.D.	N.D.	N.D.	N.D.
5708	N.D.	N.D.	N.D.	N.D.
5709	N.D.	N.D.	N.D.	N.D.
5710	N.D.	N.D.	N.D.	N.D.
5711	N.D.	N.D.	N.D.	N.D.
5712	N.D.	N.D.	N.D.	N.D.

PCB/CYANIDE/SULFATE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

HE SAMPLE NUMBER	PCB mg/kg	CYANIDE mg/kg	SULFATES mg/kg
5545	N.D.	N.D.	3
5546	N.D.	N.D.	<1
5547	N.D.	N.D.	14
5548	N.D.	N.D.	5
5549	N.D.	N.D.	17
5550	N.D.	N.D.	8
5551	N.D.	N.D.	8
5552	N.D.	N.D.	10
5553	N.D.	N.D.	7
5554	N.D.	N.D.	4
5555	N.D.	N.D.	18
5556	N.D.	N.D.	20
5557	N.D.	N.D.	13
5558	N.D.	N.D.	18
5559	N.D.	N.D.	2
5560	N.D.	N.D.	11
5561	N.D.	N.D.	15
5562	N.D.	N.D.	1
5563	N.D.	N.D.	9
5564	N.D.	N.D.	12
5565	N.D.	N.D.	5
5566	N.D.	N.D.	4
5567	N.D.	N.D.	4
5568	N.D.	N.D.	<1
5569	N.D.	N.D.	3
5570	N.D.	N.D.	9
5571	N.D.	N.D.	5
5572	N.D.	N.D.	3
5573	N.D.	N.D.	8
5574	N.D.	N.D.	3
5575	N.D.	N.D.	7
5576	N.D.	N.D.	8
5577	N.D.	N.D.	<1
5578	N.D.	N.D.	<1
5579	N.D.	N.D.	8
5580	N.D.	N.D.	5
5581	N.D.	N.D.	3
5582	N.D.	N.D.	<1
5583	N.D.	N.D.	<1
5584	N.D.	N.D.	4
5585	N.D.	N.D.	2
5586	N.D.	N.D.	1
5587	N.D.	N.D.	3
5588	N.D.	N.D.	<1
5589	N.D.	N.D.	1

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

HE SAMPLE NUMBER	PCB mg/kg	CYANIDE mg/kg	SULFATES mg/kg
5590	N.D.	N.D.	8
5591	N.D.	N.D.	5
5592	N.D.	N.D.	10
5593	N.D.	N.D.	10
5594	N.D.	N.D.	17
5595	N.D.	N.D.	3
5596	N.D.	N.D.	6
5597	N.D.	N.D.	10
5598	N.D.	N.D.	2
5599	N.D.	N.D.	6
5600	N.D.	N.D.	7
5601	N.D.	N.D.	2
5602	N.D.	N.D.	3
5603	N.D.	N.D.	3
5604	N.D.	N.D.	20
5605	N.D.	N.D.	8
5606	N.D.	N.D.	11
5607	N.D.	N.D.	3
5608	N.D.	N.D.	9
5609	N.D.	N.D.	13
5610	N.D.	N.D.	3
5611	N.D.	N.D.	9
5612	N.D.	N.D.	6
5613	N.D.	N.D.	4
5614	N.D.	N.D.	9
5615	N.D.	N.D.	7
5616	N.D.	N.D.	<1
5617	N.D.	N.D.	<1
5618	N.D.	N.D.	18
5619	N.D.	N.D.	4
5620	N.D.	N.D.	6
5621	N.D.	N.D.	1
5622	N.D.	N.D.	4
5623	N.D.	N.D.	5
5624	N.D.	N.D.	5
5625	N.D.	N.D.	1
5626	N.D.	N.D.	11
5627	N.D.	N.D.	9
5628	N.D.	N.D.	1
5629	N.D.	N.D.	2
5630	N.D.	N.D.	<1
5631	N.D.	N.D.	8
5632	N.D.	N.D.	8
5633	N.D.	N.D.	6
5634	N.D.	N.D.	1

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

HE SAMPLE NUMBER	PCB mg/kg	CYANIDE mg/kg	SULFATES mg/kg
5635	N.D.	N.D.	<1
5636	N.D.	N.D.	6
5637	N.D.	N.D.	<1
5638	N.D.	N.D.	4
5639	N.D.	N.D.	<1
5640	N.D.	N.D.	6
5641	N.D.	N.D.	13
5642	N.D.	N.D.	8
5643	N.D.	N.D.	<1
5644	N.D.	N.D.	5
5645	N.D.	N.D.	12
5646	N.D.	N.D.	<1
5647	N.D.	N.D.	1
5648	N.D.	N.D.	2
5649	N.D.	N.D.	3
5650	N.D.	N.D.	5
5651	N.D.	N.D.	5
5652	N.D.	N.D.	8
5653	N.D.	N.D.	17
5654	N.D.	N.D.	6
5655	N.D.	N.D.	<1
5656	N.D.	N.D.	7
5657	N.D.	N.D.	1
5658	N.D.	N.D.	12
5659	N.D.	N.D.	10
5660	N.D.	N.D.	13
5661	N.D.	N.D.	4
5662	N.D.	N.D.	4
5663	N.D.	N.D.	9
5664	N.D.	N.D.	<1
5665	N.D.	N.D.	6
5666	N.D.	N.D.	7
5667	N.D.	N.D.	2
5668	N.D.	N.D.	8
5669	N.D.	N.D.	3
5670	N.D.	N.D.	<1
5671	N.D.	N.D.	12
5672	N.D.	N.D.	22
5673	N.D.	N.D.	<1
5674	N.D.	N.D.	<1
5675	N.D.	N.D.	1
5676	N.D.	N.D.	4
5677	N.D.	N.D.	7
5678	N.D.	N.D.	6
5679	N.D.	N.D.	7

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

HE SAMPLE NUMBER	PCB mg/kg	CYANIDE mg/kg	SULFATES mg/kg
5680	N.D.	N.D.	2
5681	N.D.	N.D.	4
5682	N.D.	N.D.	7
5683	N.D.	N.D.	14
5684	N.D.	N.D.	19
5685	N.D.	N.D.	<1
5686	N.D.	N.D.	13
5687	N.D.	N.D.	33
5688	N.D.	N.D.	<1
5689	N.D.	N.D.	5
5690	N.D.	N.D.	2
5691	N.D.	N.D.	1
5692	N.D.	N.D.	10
5693	N.D.	N.D.	12
5694	N.D.	N.D.	6
5695	N.D.	N.D.	7
5696	N.D.	N.D.	8
5697	N.D.	N.D.	16
5698	N.D.	N.D.	6
5699	N.D.	N.D.	3
5700	N.D.	N.D.	3
5701	N.D.	N.D.	12
5702	N.D.	N.D.	6
5703	N.D.	N.D.	<1
5704	N.D.	N.D.	5
5705	N.D.	N.D.	2
5706	N.D.	N.D.	6
5707	N.D.	N.D.	5
5708	N.D.	N.D.	4
5709	N.D.	N.D.	7
5710	N.D.	N.D.	6
5711	N.D.	N.D.	2
5712	N.D.	N.D.	10

SECTION 3

SAMPLE NO's vs FIELD LOCATIONS

HARMON ENGINEERING ASSOCIATES, INC.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

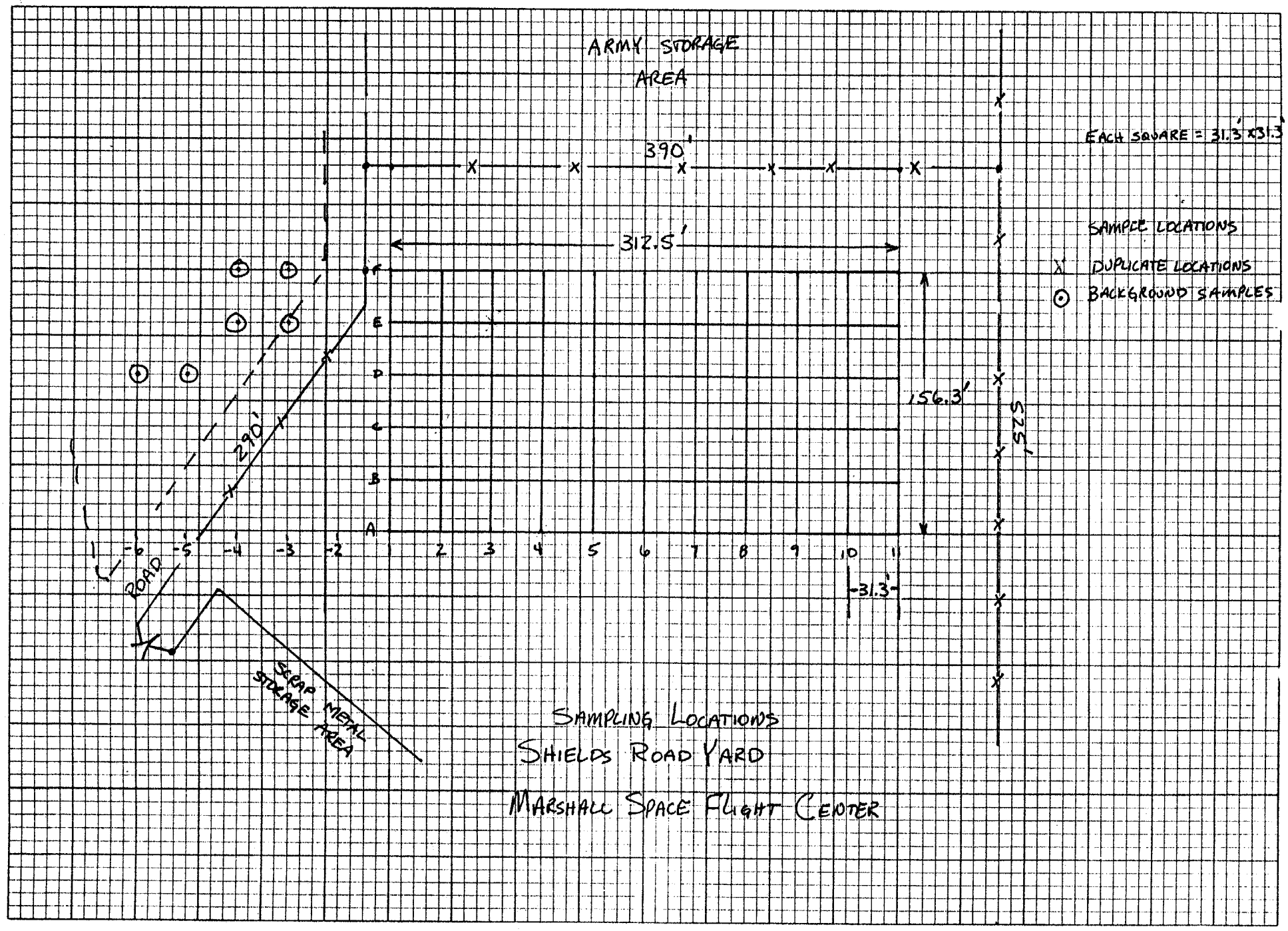
HE AND FIELD SAMPLE I.D. NUMBERS

HE SAMPLE I.D.	FIELD SAMPLE I.D.	HE SAMPLE I.D.	FIELD SAMPLE I.D.	HE SAMPLE I.D.	FIELD SAMPLE I.D.	HE SAMPLE I.D.	FIELD SAMPLE I.D.
5545	E-3-T	5587	C-9-T	5629	E-3-T DUP.	5671	B-3-T
5546	E-3-M	5588	C-9-M	5630	E-3-M DUP.	5672	B-3-M
5547	E-3-B	5589	C-9-B	5631	E-3-B DUP.	5673	B-3-B
5548	E-4-T	5590	D-8-T	5632	C-2-T DUP.	5674	B-2-T
5549	E-4-M	5591	D-8-M	5633	C-2-M DUP.	5675	B-2-M
5550	E-4-B	5592	D-8-B	5634	C-2-B DUP.	5676	B-2-B
5551	D-4-T	5593	D-6-T	5635	F(-3)BGD.	5677	B-10-T DUP.
5552	D-4-M	5594	D-6-M	5636	F(-4)BGD.	5678	B-10-M DUP.
5553	D-4-B	5595	D-6-B	5637	E(-3)BGD.	5679	B-10-B DUP.
5554	F-3-T	5596	E-6-T	5638	E(-4)BGD.	5680	D-5-T DUP.
5555	F-3-M	5597	E-6-M	5639	D(-5)BGD.	5681	D-5-M DUP.
5556	F-3-B	5598	E-6-B	5640	D(-6)BGD.	5682	D-5-B DUP.
5557	C-3-T	5599	F-6-T	5641	B-6-T	5683	A-4-T DUP.
5558	C-3-M	5600	F-6-M	5642	B-6-M	5684	A-4-M DUP.
5559	C-3-B	5601	F-6-B	5643	B-6-B	5685	A-4-B DUP.
5560	E-5-T	5602	F-4-T	5644	B-7-T	5686	A-4-T
5561	E-5-M	5603	F-4-M	5645	B-7-M	5687	A-4-M
5562	E-5-B	5604	F-4-B	5646	B-7-B	5688	A-4-B
5563	C-2-T	5605	E-10-T	5647	B-8-T	5689	F-9-T
5564	C-2-M	5606	E-10-M	5648	B-8-M	5690	F-9-M
5565	C-2-B	5607	E-10-B	5649	B-8-B	5691	F-9-B
5566	D-7-T	5608	E-9-T	5650	B-9-T	5692	E-7-T
5567	D-7-M	5609	E-9-M	5651	B-9-M	5693	E-7-M
5568	D-7=B	5610	E-9-B	5652	B-9-B	5694	E-7-B
5569	F-1-T	5611	F-11-T	5653	B-10-T	5695	C-1-T
5570	F-1-M	5612	F-11-M	5654	B-10-M	5696	C-1-M
5571	F-1-B	5613	F-11-B	5655	B-10-B	5697	C-1-B
5572	E-2-T	5614	F-10-T	5656	B-11-T	5698	B-1-T
5573	E-2-M	5615	F-10-M	5657	B-11-M	5699	B-1-M
5574	E-2-B	5616	F-10-B	5658	B-11-B	5700	B-1-B
5575	D-2-T	5617	E-8-T	5659	A-11-T	5701	C-4-T
5576	D-2-M	5618	E-8-M	5660	A-11-M	5702	C-4-M
5577	D-2-B	5619	E-8-B	5661	A-11-B	5703	C-4-B
5578	D-3-T	5620	D-9-T	5662	A-1-T	5704	C-5-T
5579	D-3-M	5621	D-9-M	5663	A-1-M	5705	C-5-M
5580	D-3-B	5622	D-9-B	5664	A-1-B	5706	C-5-B
5581	C-7-T	5623	C-10-T	5665	B-5-T	5707	D-5-T
5582	C-7-M	5624	C-10-M	5666	B-5-M	5708	D-5-M
5583	C-7-B	5625	C-10-B	5667	B-5-B	5709	D-5-B
5584	C-8-T	5626	D-10-T	5668	B-4-T	5710	C-6-T
5585	C-8-M	5627	D-10-M	5669	B-4-M	5711	C-6-M
5586	C-8-B	5628	D-10-B	5670	B-4-B	5712	C-6-B

DUP.-Duplicate samples. BGD.-Background samples.
"T"-Top "M"-Middle "B"-Bottom

SECTION 4

SAMPLING LOCATIONS



SAMPLING LOCATIONS
SHIELDS ROAD YARD
MARSHALL SPACE FLIGHT CENTER

NATIONAL 12-280 MADE IN U.S.A.
10 Squares to the Inch

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MARSHALL SPACEFLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA

SHIELDS ROAD YARD

SOIL SAMPLING LOCATIONS

FIELD MAP

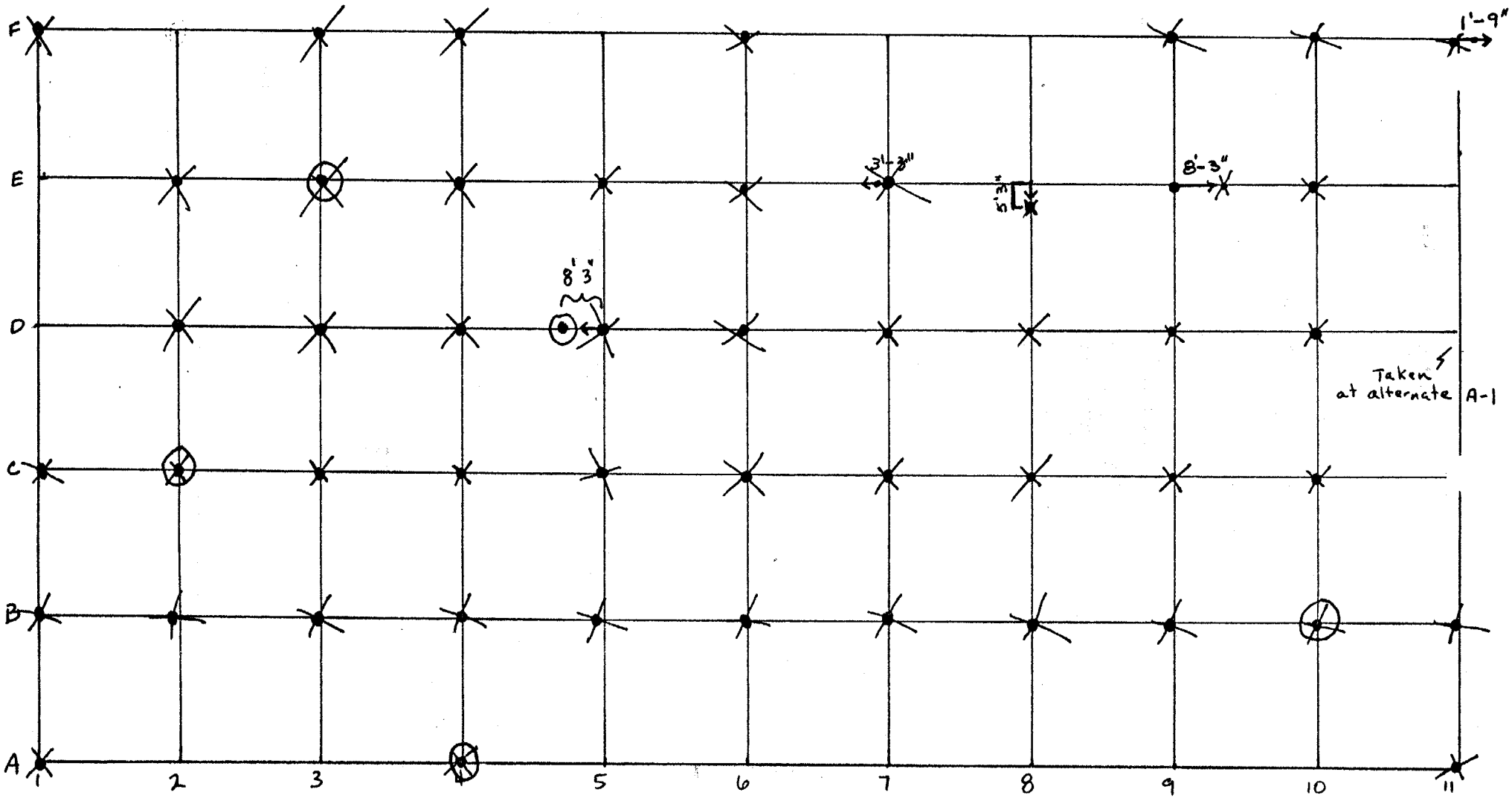
0 — 31.3'

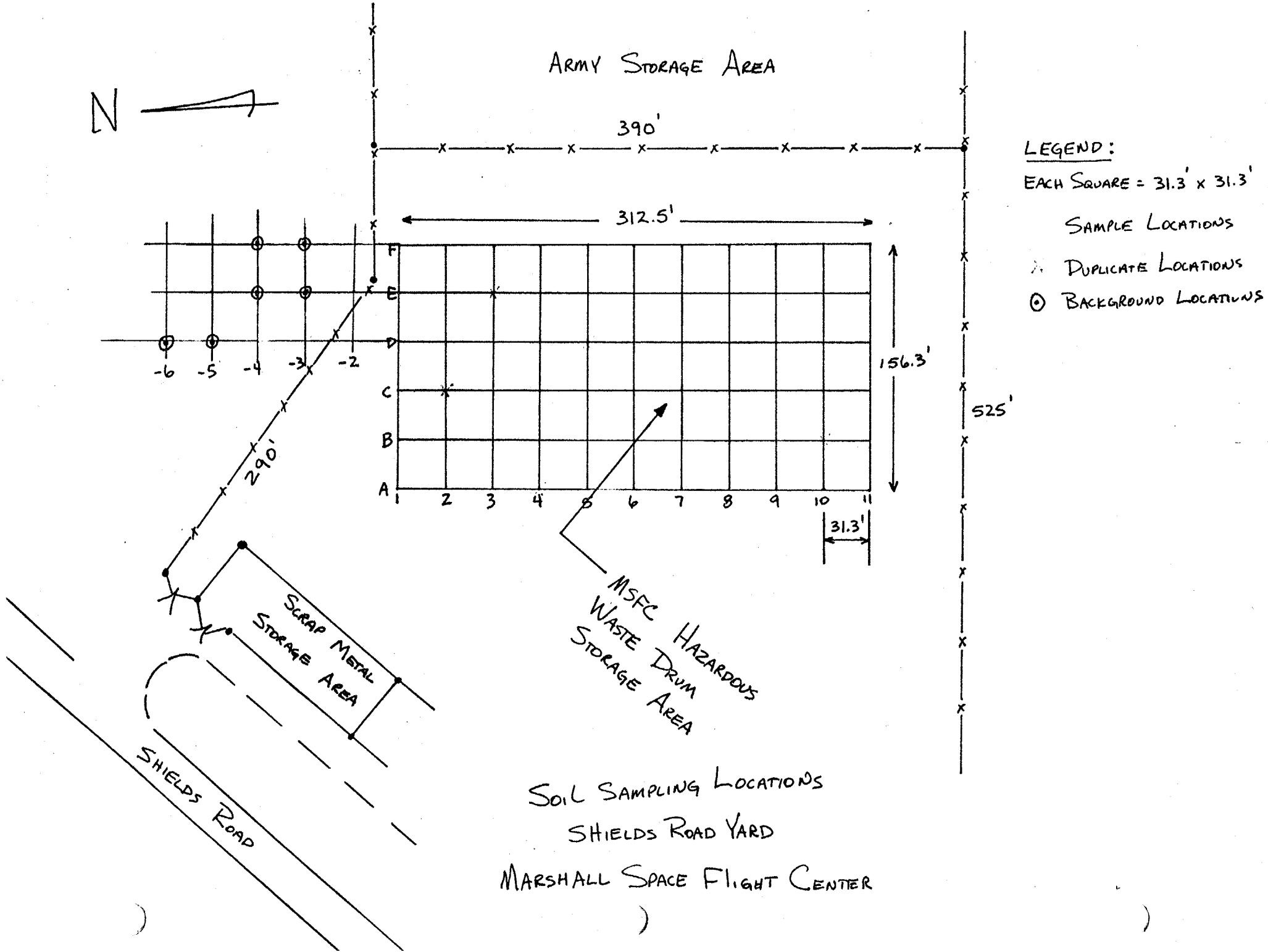
1" = 31.3'

= SAMPLING LOCATIONS

- - - = ALTERNATE LOCATIONS

○ • Duplicate Locations





SOIL SAMPLING LOCATIONS
SHIELDS ROAD YARD
MARSHALL SPACE FLIGHT CENTER

SECTION 5
FIELD SAMPLING NOTES

HARMON ENGINEERING ASSOCIATES, INC.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACEFLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

SOIL SAMPLING LOG

HE SAMPLE I.D.	COMMENTS
	SAMPLES TAKEN AT INTERSECTION OF TRANSECTS =
	36 SAMPLES. PLUS AT 13 RANDOM SAMPLES ALONG
	GRID BORDER. THESE LOCATIONS (LISTED BELOW) WERE
	PICKED USING A RANDOM # GENERATOR. TAKING THE LAST TWO
	NUMBERS IN THE NUMBER CHOSEN: RED INDICATES ALTERNATE
	SAMPLES TO BE TAKEN IN CASE RANDOM # IS NOT
1	A1 17 B11 ACCESSIBLE.
2	B1 18 C11 FIVE (5) HOLES WERE ALSO CHOSEN
3	C1 19 D11 FOR DUPLICATE ANALSIS.
4	D1 20 E11
5	E1 21 F11
6	F1 22 F2
7	A2 23 F3
8	A3 24 F4
9	A4 25 F5
10	A5 26 F6
11	A6 27 F7
12	A7 28 F8
13	A8 29 F9
14	A9 30 F10
15	A10
16	A11

HARMON ENGINEERING ASSOCIATES, INC.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACEFLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

SOIL SAMPLING LOG

HE SAMPLE I.D.	COMMENTS
	Method of sampling: The first hole (F-1) was sampled by using the power auger to drill down to the tenth (10) inch and then using the hand auger to collect the 10th, 11th and 12th inches. The same strategy was used to collect the 22nd, 23rd and 24th inches and the 34th, 35th and 36th inches. The whole operation took one (1) hour to complete, which was mainly due to the difficulty in retrieving the red clay from the auger. It was then decided, in the field, that another method for collection was needed.
	The method for sampling the soils from the remaining holes is as follows:
	Using the power auger with an eight (8) inch bit, a hole was drilled down to the 34th inch. The soil from the 10-12th inch and the 22-24th inch was collected by measuring down to the areas, using a folded ruler, and (using the sample bottles) ~~scrapped~~ scraping the soil from the side walls. The 34-36th inch was collecting using a post-hole digger.

HARMON ENGINEERING ASSOCIATES, INC.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACEFLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

SOIL SAMPLING LOG

HE SAMPLE I.D.	COMMENTS
C-10-T	RED CLAY, NO ODOR, HIGH MOISTURE
C-10-M	RED CLAY, NO ODOR, HIGH MOISTURE
C-10-B	RED CLAY, NO ODOR, HIGH MOISTURE
D-9-T	RED CLAY, NO ODOR, MED. MOISTURE
D-9-M	RED CLAY, NO ODOR, HIGH MOISTURE
D-9-B	RED CLAY, NO ODOR, HIGH MOISTURE
E-8-T	RED CLAY, NO ODOR, HIGH MOISTURE : TAKEN 5'3"
E-8-M	RED CLAY, NO ODOR, HIGH MOISTURE TOWARDS "D-8".
E-8-B	RED CLAY, NO ODOR, HIGH MOISTURE
D-7-T	RED CLAY, NO ODOR, HIGH MOISTURE
D-7-M	RED CLAY, NO ODOR, HIGH MOISTURE
D-7-B	RED CLAY, NO ODOR, HIGH MOISTURE
C-2-T	RED CLAY, NO ODOR, HIGH MOISTURE
C-2-M	RED CLAY, NO ODOR, HIGH MOISTURE
C-2-B	RED CLAY, NO ODOR, HIGH MOISTURE
E-5-T	RED CLAY, NO ODOR, HIGH MOISTURE
E-5-M	RED CLAY, " , "
E-5-B	RED CLAY, " , "
C-3-T	" , " , "
C-3-M	" , " , "
C-3-B	" , " , "

HARMON ENGINEERING ASSOCIATES, INC.

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MARSHALL SPACEFLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

SOIL SAMPLING LOG

HE SAMPLE I.D.	COMMENTS		
D-8-T	RED CLAY	NO ODOR	HIGH MOISTURE
D-8-M	"	"	"
D-8-B	"	"	"
C-9-T	"	"	"
C-9-M	"	"	"
C-9-B	"	"	"
C-8-T	"	"	"
C-8-M	"	"	"
C-8-B	"	"	"
C-7-T	RED CLAY	NO ODOR	MED. MOISTURE
C-7-M	"	"	HIGH MOISTURE
C-7-B	"	"	"
~~F-4-T~~	~~"~~	~~"~~	~~MED. MOISTURE~~
~~F-4-M~~	~~"~~	~~"~~	~~HIGH MOISTURE~~
~~F-4-B~~	~~"~~	~~"~~	~~"~~
F-6-T	"	"	"
F-6-M	"	"	"
F-6-B	"	"	"
E-6-T	"	"	"
E-6-M	"	"	"
E-6-B	"	"	"

HARMON ENGINEERING ASSOCIATES, INC.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACEFLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

SOIL SAMPLING LOG

HE SAMPLE I.D.	COMMENTS
F-3-T	RED CLAY, NO ODOR, HIGH MOISTURE
F-3-M	RED CLAY, NO ODOR, HIGH MOISTURE
F-3-B	RED CLAY, NO ODOR, HIGH MOISTURE
F-4-T	RED CLAY, NO ODOR, HIGH MOISTURE
F-4-M	RED CLAY W/ BLACK PARTICLES, NO ODOR, HIGH MOISTURE
F-4-B	RED CLAY, NO ODOR, HIGH MOISTURE
C-4-T	RED CLAY, NO ODOR, LOW MOISTURE
C-4-M	RED CLAY, NO ODOR, LOW MOISTURE
C-4-B	RED CLAY, NO ODOR, LOW MOISTURE
C-5-T	RED CLAY, NO ODOR, LOW MOISTURE
C-5-M	RED CLAY, NO ODOR, LOW ~~MO~~ MOISTURE
C-5-B	RED CLAY, NO ODOR, LOW MOISTURE
D-5-T	RED CLAY, NO ODOR, LOW MOISTURE : TAKEN 8'3" TOWARDS
D-5-M	RED CLAY, NO ODOR, LOW MOISTURE POINT "D-4".
D-5-B	RED CLAY, NO ODOR, LOW MOISTURE
C-6-T	RED CLAY, NO ODOR, LOW MOISTURE
C-6-M	RED CLAY, NO ODOR, LOW MOISTURE
C-6-B	RED CLAY, NO ODOR, LOW MOISTURE
D-10-T	RED CLAY, NO ODOR, HIGH MOISTURE
D-10-M	RED CLAY, NO ODOR, HIGH MOISTURE
D-10-B	RED CLAY, NO ODOR, HIGH MOISTURE

HARMON ENGINEERING ASSOCIATES, INC.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACEFLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

SOIL SAMPLING LOG

HE SAMPLE I.D.	COMMENTS
D-3-T	RED CLAY, NO ODOR, LOW MOISTURE
D-3-M	RED CLAY, NO ODOR, LOW MOISTURE
D-3-B	RED CLAY, NO ODOR, LOW MOISTER
D-2-T	RED CLAY, NO ODOR, MED. MOISTURE
D-2-M	RED CLAY, NO ODOR, MED. MOISTURE
D-2-B	RED CLAY, NO ODOR, LOW MOISTURE
E-2-T	RED CLAY, NO ODOR, MED. MOISTURE
E-2-M	RED CLAY, NO ODOR, MED. MOISTURE
E-2-B	RED CLAY, NO ODOR, MED. MOISTURE
F-1-T	RED CLAY, NO ODOR, MED. MOISTURE
F-1-M	RED CLAY, NO ODOR, LOW MOISTURE
E-1-B	RED CLAY, NO ODOR, MED. MOISTURE
E-3-T	RED CLAY, MILD ODOR, HIGH MOISTURE
E-3-M	RED CLAY, MILD ODOR, HIGH MOISTURE
E-3-B	RED CLAY, MILD ODOR, HIGH MOISTURE
E-4-T	RED CLAY, NO ODOR, HIGH MOISTURE
E-4-M	RED CLAY, NO ODOR, HIGH MOISTURE
E-4-B	RED CLAY/W SOME BLACK, NO ODOR, HIGH MOISTURE
D-4-T	RED CLAY, STRONG ODOR, HIGH MOISTURE
D-4-M	RED CLAY, NO ODOR, HIGH MOISTURE
D-4-B	RED CLAY, NO ODOR, HIGH MOISTURE

HARMON ENGINEERING ASSOCIATES, INC.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACEFLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

SOIL SAMPLING LOG

HE SAMPLE I.D.	COMMENTS		
D-6-T	RED CLAY	NO ODOR	HIGH MOISTURE
D-6-M	"	"	"
D-6-B	"	"	"
F-10-T	"	"	MED. MOISTURE
F-10-M	"	"	"
F-10-B	"	"	HIGH MOISTURE
F-11-T	"	"	" : TAKEN 1'-9" IN THE
F-11-M	"	"	" DIRECTION OF "F-12".
F-11-B	"	"	"
E-9-T	"	"	" : TAKEN @ 8'-3"
E-9-M	"	"	" TOWARDS POINT "E-10".
E-9-B	"	"	"
E-10-T	"	"	"
E-10-M	"	"	"
E-10-B	"	"	"
B-5-T	"	"	"
B-5-M	"	"	"
B-5-B	"	"	VERY HIGH MOISTURE
B-4-T	"	"	HIGH MOISTURE
B-4-M	"	"	"
B-4-B	"	"	"

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACEFLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

SOIL SAMPLING LOG

HE SAMPLE I.D.	COMMENTS
B-3-T	RED CLAY, NO ODOR, HIGH MOISTURE
B-3-M	" " "
B-3-B	" " "
B-2-T	" " "
B-2-M	" " "
B-2-B	" " "
B-10-T	" " MED. MOISTURE
B-10-M	" " HIGH MOISTURE
B-10-B	" " "
B-11-T	" " "
B-11-M	" " "
B-11-B	" " "
A-11-T	" " "
A-11-M	" " "
A-11-B	" " "
A-1-T	" " MED. MOISTURE
A-1-M	" " MED. MOISTURE
A-1-B	" " HIGH MOISTURE
F-9-T	" " MED. MOISTURE
F-9-M	" " "
F-9-B	" " "

HARMON ENGINEERING ASSOCIATES, INC.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACEFLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

SOIL SAMPLING LOG

HE SAMPLE I.D.	COMMENTS		
E-7-T	RED CLAY	NO ODOR	MED. MOISTURE
E-7-M	"	"	LOW MOISTURE
E-7-B	"	"	"
C-1-T	"	"	"
C-1-M	"	"	HIGH MOISTURE
C-1-B	"	"	MED. MOISTURE
B-1-T	"	"	"
B-1-M	"	"	"
B-1-B	"	"	"
DUPLICATE B-10-T	"	"	"
DUPLICATE B-10-M	"	"	LOW MOISTURE
B-10-B	"	"	MED. MOISTURE
D-5-T	"	"	"
DUPLICATE D-5-M	"	"	"
D-5-B	Lt. Red Clay	"	"
A-4-T	RED CLAY	"	"
DUPLICATE A-4-M	"	"	"
A-4-B	"	"	"
A-4-T	"	"	LOW MOISTURE
A-4-M	"	"	MED. "
A-4-B	"	"	"

HARMON ENGINEERING ASSOCIATES, INC.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACEFLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

SOIL SAMPLING LOG

HE SAMPLE I.D.	COMMENTS		
B-6-T	RED CLAY	NO ODOR	MED. MOISTURE
B-6-M	"	"	"
B-6-B	"	"	"
B-7-T	"	"	HIGH MOISTURE
B-7-M	"	"	MED. "
B-7-B	"	"	"
B-8-T	"	"	HIGH MOISTURE
B-8-M	"	"	"
B-8-B	"	"	MED. "
B-9-T	"	"	"
B-9-M	"	"	"
B-9-B	"	"	"
E-3-T	"	"	"
E-3-M	"	"	HIGH MOISTURE
E-3-B	"	"	LOW "
C-2-T	"	"	MED. "
C-2-M	"	"	HIGH MOISTURE
C-2-B	"	"	"

DUPLICATE

DUPLICATE

HARMON ENGINEERING ASSOCIATES, INC.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACEFLIGHT CENTER

RCRA CLEAN CLOSURE CERTIFICATION DATA
SHIELDS ROAD YARD

SOIL SAMPLING LOG

HE SAMPLE I.D.	COMMENTS
F(-3) B	LT. BROWN DIRT, NO ODOR, NO MOISTURE (very little)
F(-4) B	DK. Brown DIRT, " , VERY LOW MOISTURE
E(-3) B	MED. Brown dirt, " , "
E(-4) B	" , " , LOW MOISTURE
D(-5) B	RED CLAY, " , MED. MOISTURE
D(-6) B	" , " , "

SECTION 6

CLOSURE PLAN

MSFC
CLOSURE PLAN FOR THE SHIELDS ROAD YARD
HAZARDOUS WASTES CONTAINER STORAGE FACILITY

MSFC has two facilities involved with storage of hazardous wastes which when closed must comply with the closure requirements of Section 4.255.14 of the "Alabama Hazardous Waste Management Regulations." This section requires that MSFC notify the Alabama Department of Environment Management (ADEM) at least 180 days prior to the date of expected closure of either of the above mentioned facilities. All hazardous wastes must be removed from a facility designated for closure within 90 days of receipt of the final volume of hazardous wastes. Specific closure procedures for Shields Road Yard are as follows:

The Hazardous Wastes Container Storage Facility at Shields Road Yard is a secure storage yard designated for the storage of containers of hazardous wastes for more than 90 days prior to off-site disposal action. This facility has an estimated maximum capacity of 800 drums containing hazardous wastes.

The first step of closure of this facility, the removal of the containers of hazardous wastes to the new hazardous wastes container management facility at Building 4640, has been completed. The storage yard area will be thoroughly sampled and analyzed for evidence of spilled residues from the containers. If such residues are discovered, the affected materials will be removed for off-site disposal.

The determination of whether clean closure of the Shields Road Yard Hazardous Wastes Container Storage Facility has been accomplished will be done by use of a testing procedure. This procedure will consist of laying out a grid within the area where hazardous wastes containers were stored (see figure 1) and sampling the underlying gravel and soil for subsequent chemical analysis. Representative soil samples will be taken with a hand auger at a number of locations within the storage area. Random samples will be collected at intervals of not less than one sample per 1000 square feet of storage area. In addition, areas with a visual appearance of contamination will be sampled and tested. Samples will be placed in clean, one-liter plastic sample bottles (Reference 1). These samples will penetrate three feet into the ground with analyses run at one foot intervals. Analyses will be run that will detect contamination from any of the constituents which have been stored over the lifetime of the facility. ~~Four~~ Six background samples will be taken from the immediate area outside of the storage area. Background samples will be collected using a 12-inch core sampler. Only the lower six inches of the core will be used for analysis. The background concentration will be defined as the average of the concentrations of the four samples. The following analyses will be performed on each sample:

PARAMETERS

EP Toxicity Metals
Cyanide (Total)
Aniline
Chloroform
Trichloroethylene
PCB's
pH
Diphenylamine
Nickel
Methylene Chloride
Perchloroethylene
1,1,1-Trichloroethane
Toluene
Xylene
Sulfates
Nitrobenzene
Phenylenediamine

Chemical analyses will be performed in accordance with appropriate methods of Reference 2 using atomic absorption spetrophotometry, total cyanide, gas chromatograph or by use of methods described in Reference 3.

Clean closure will be defined as concentrations for each parameter within the storage area at levels equal to or below concentrations for the background samples. If contamination is detected, the sampling area will be extended if necessary to ensure that the entire contaminated surface area is covered by the sampling grid. This will require that all samples taken outside the perimeter of the contaminated area be free of contamination.

Any contaminated soil and gravel found will be excavated and removed for appropriate off-site disposal as a hazardous waste. The soil underlying the excavated material will then be sampled as described above to verify that all contaminated material has been removed. If contamination should be detected above background in the soil down to the level of the saturated zone, groundwater monitoring wells will be installed, and a groundwater monitoring program will be implemented to assess the extent of any groundwater contamination. If no groundwater contamination is found, uncontaminated backfill will be added to restore the original grade.

The site will then be inspected and certified to be decontaminated and closed in accordanced with the aproved Closure Plan by both MSFC and an independent registered professional engineer. These certifications will be submitted to ADEM/EPA after closure. This independent engineer will review the Closure Plan and observe closure activity. Closure of this facility is planned for early 1985. Removal of the hazardous wastes containers and cleanup of the premises shall be completed within 90 days of implementing the Closure Plan.

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1. Samplers and Sampling Procedures for Hazardous Waste Streams. U.S.E.P.A. 600/2-80-018, 1980.

2. Test Methods for Evaluating Solid Waste, Physical and Chemical Methods (2nd Edition), U.S.E.P.A., SW-846, 1984.

3. Methods for Chemical Analysis of Water and Waste. U.S.E.P.A., 1979.

MSFC

HAZARDOUS WASTES CONTAINER STORAGE FACILITY SHIELDS ROAD YARD

CLOSURE MILESTONE SCHEDULE

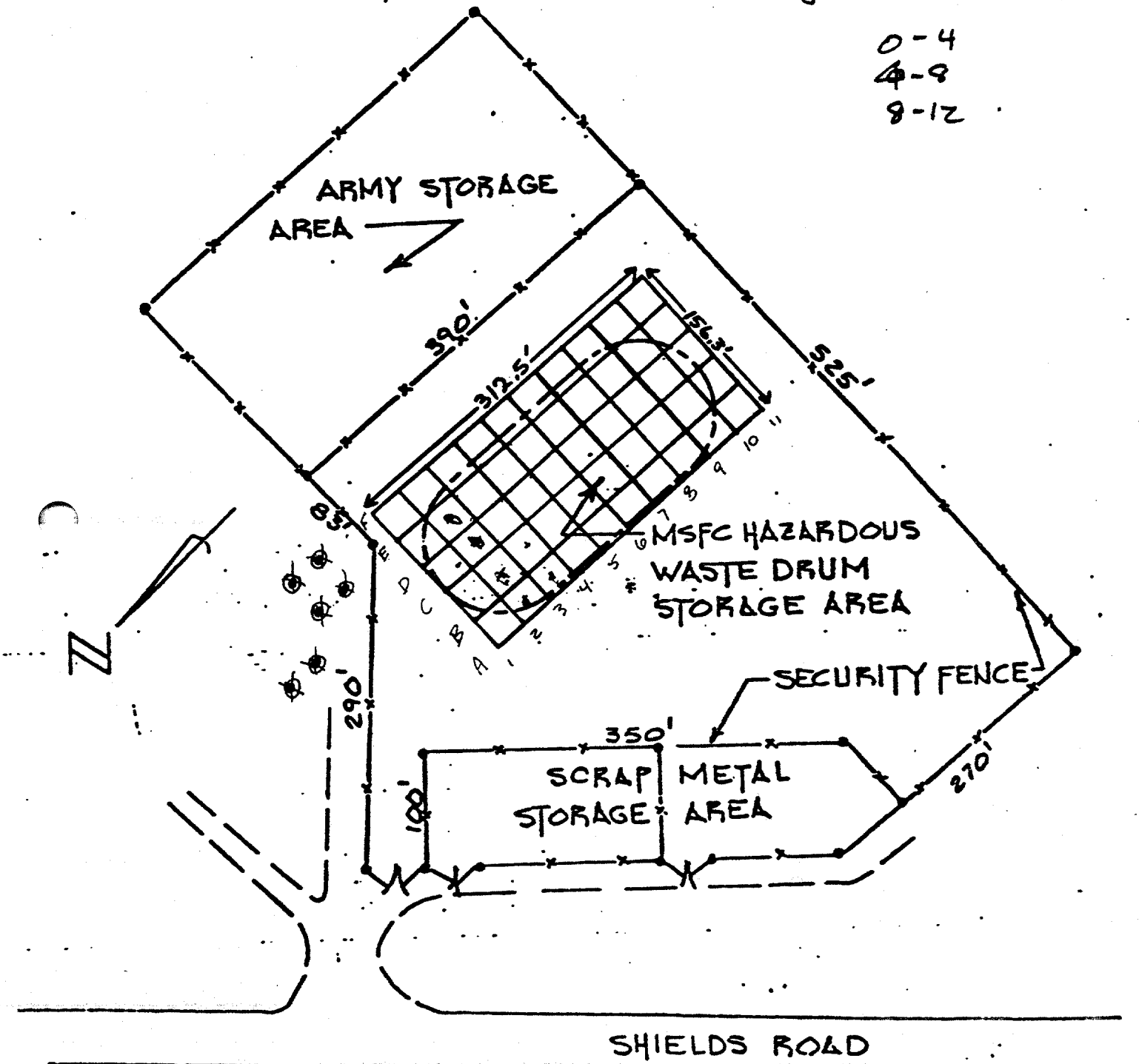
	Action	Cumulative Days
1.	Submission of Closure Plan to ADEM/EPA	
2.	Approval of Closure Plan by ADEM/EPA	
3.	In-House Assessment of Requirements	
4.	Implementation of Closure Plan	0
5.	Sampling of Underlying Material at Shields Road Yard	5
6.	Completion of Chemical Analyses of Material	25
7.	Removal for Off-Site Disposal of Any Contaminated Material, if required	80
8.	Verification Sampling	85
9.	Inspection and Certification of Proper Closure by MSFC and Independent Professional Engineers, Submittal of Certifications to ADEM/EPA	90

FIGURE 1

SHIELDS ROAD YARD
CLEAN CLOSURE SAMPLING GRID

NOTE: 1. Testing accomplished after all containers are removed.
2. Samples collected at intersections of transects plus at 13 random locations on grid border.
3. Total samples = 312.5' x 156.3' = 48,844 sq. ft./1 sample point/1000 sq. ft. = 49 points x 3 depths/point = 147 points. + 6 background samples = 153

0-4
4-8
8-12



Marshall Corlew 453-1130
Gridded?
Water Supply