808IHSSF1230

DocumentID	NONCD0002865
Site Name	PIEDMONT TRIAD AIRPORT-AIR CARGO
DocumentType	Site Assessment Rpt (SAR)
RptSegment	1
DocDate	8/29/1991
DocRcvd	2/20/2007
Box	SF1230
AccessLevel	PUBLIC
Division	WASTE MANAGEMENT
Section	SUPERFUND
Program	IHS (IHS)
DocCat	FACILITY

808

TRIGON
ENGINEERING CONSULTANTS, INC.

Geotechnical, Environmental,
Construction Materials, & Roofing Engineers

P.O. Box 18846•Zip 27419-8846•313 Gallimore Dairy Rd. Greensboro, N.C. 27409•(919) 668-0093

August 29, 1991

RECEIVED
N.C. Dept. NRCD
AUG 30 1991
Winston-Salem
Regional Office

North Carolina Department Environment
Health and Natural Resources
Winston-Salem, Regional Office
8025 North Point Boulevard
Suite 100
Winston-Salem, North Carolina 27106-3203

Attention: Mr. Larry D. Coble, Regional Supervisor

Reference: Air Cargo Expansion Site
Piedmont Triad International Airport
Greensboro, North Carolina

Dear Mr. Coble:

The following information is provided pursuant to your request for response within 15 days addressing efforts to achieve compliance at the above referenced site. As indicated in our initial report of May 7, 1991, petroleum odors were noted at the site during geotechnical soil test boring activities. Pursuant to those observations, our environmental investigation was initiated to identify the source and extent of the problem. Included with this letter is a report dated August 1, 1991 addressing continued investigation efforts at the site.

Since the period of the initial report, additional investigations were initiated. These investigations included groundwater sampling, the burn pit areas, and surface water and soils sampling in the wetland area. Pursuant to these efforts, approximately 1835 cubic yards of impacted soils were removed and stockpiled at the airport property per guidelines issued by the North Carolina Department of Environment, Health, and Natural Resources (NCDENHR) Division of Environmental Management, Groundwater Section on impermeable material with plastic cover to prevent rainwater infiltration. The Airport Authority is currently preparing bid solicitation documents for the remediation of the impacted soils. The remediation quotations are anticipated to be brought before the Piedmont Triad Airport Authority Board for approval and implementation at their next meeting in the latter part of September, 1991. All contracting must be preapproved by the public appointed Board prior to implementation. Upon signing of contracts, the soils will be remediated to the satisfaction of NCDEHNR. Because of analytical

turnaround, contractor solicitations and required Board approval, adherence with the 45 day soil remediation period indicated in your letter may prove difficult.

Because of on-going construction, excavation and fill activities, we have been temporarily delayed initiating the construction of a downgradient monitoring well from MW-3 to determine if petroleum hydrocarbons have extended beyond this immediate area. Slug tests have been performed for MW-1 and MW-5 monitoring wells in an effort to determine hydraulic gradient in order to assess potential groundwater migration rates and the associated planning parameters for groundwater remediation.

Please also find attached the latest analysis of stockpiled soils pursuant to the selection of remediation alternatives. As identified in the laboratory analysis, the soils do not exhibit apparent hazardous characteristics, and therefore, are suitable for landfarming, brick kiln incorporation, thermal stripping or bioremediation. All of these methods are currently being evaluated to assess remediation options. Please be assured that Piedmont Triad Airport Authority is moving expeditiously to resolve and evaluate the remediation alternatives for the soils and the evaluation of groundwater impact.

Upon review of the latest report, please contact either Mr. Scott Pearce or Mr. Kirk Rife, with Trigon Engineering Consultants, Inc. (919) 668-0093 should you have additional technical questions. We appreciate your assistance and guidance in our efforts.

Very truly yours,

TRIGON ENGINEERING CONSULTANTS, INC.

Kirk L. Rife
Director, Environmental Affairs

J. Scott Pearce
Staff Geologist

Eric N. Johnson, P.E.
Senior Project Manager

KLR:JSP:ENJ:ejm

cc: Ted Johnson
Steve Kay
Dain Riley

TRIGON

Total Petroleum Hydrocarbon Analysis

IEA Sample No:	471-171-9	Date Sampled:	06-06-91
Client Sample No:	SP-1	Date Received:	06-07-91
Client Project No:	015-91-036	Date Extracted:	06-12-91

Extraction (SW 846 - 3550) / GC-FID analysis (for #2 fuel oil,kerosene,varsol)
Date Analyzed: 06-13-91 Analyzed by: McCutcheon

The sample contains a petroleum hydrocarbon blend with a distillation range similar to #2 fuel oil. The concentration is 5.1 mg/kg. The quantitation limit is 2.0 mg/kg.

Comment:

==========

Purge and Trap (SW 846 - 5030) / GC-FID analysis (for gasoline only)
Date Analyzed: 06-14-91 Analyzed by: McCutcheon

The sample does not contain a petroleum hydrocarbon blend with a distillation range similar to gasoline. The quantitation limit is 2.0 mg/kg.

Comment:

Total Petroleum Hydrocarbon Analysis

IEA Sample No:	471-171-10	Date Sampled:	06-06-91
Client Sample No:	SP-2	Date Received:	06-07-91
Client Project No:	015-91-036	Date Extracted:	06-12-91

Extraction (SW 846 - 3550) / GC-FID analysis (for #2 fuel oil,kerosene,varsol)
Date Analyzed: 06-13-91 Analyzed by: McCutcheon

The sample contains a petroleum hydrocarbon blend with a distillation range similar to #2 fuel oil. The concentration is 240 mg/kg. The quantitation limit is 2.0 mg/kg.

Comment:

==========

Purge and Trap (SW 846 - 5030) / GC-FID analysis (for gasoline only)
Date Analyzed: 06-14-91 Analyzed by: McCutcheon

The sample does not contain a petroleum hydrocarbon blend with a distillation range similar to gasoline. The quantitation limit is 2.0 mg/kg.

Comment:

Total Petroleum Hydrocarbon Analysis

IEA Sample No:	471-171-11	Date Sampled:	06-06-91
Client Sample No:	SP-3	Date Received:	06-07-91
Client Project No:	015-91-036	Date Extracted:	06-12-91

Extraction (SW 846 - 3550) / GC-FID analysis (for #2 fuel oil,kerosene,varsol)
Date Analyzed: 06-13-91 Analyzed by: McCutcheon

The sample contains a petroleum hydrocarbon blend with a distillation range similar to #2 fuel oil. The concentration is 2800 mg/kg. The quantitation limit is 2.0 mg/kg.

Comment:

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Purge and Trap (SW 846 - 5030) / GC-FID analysis (for gasoline only)
Date Analyzed: 06-14-91 Analyzed by: McCutcheon

The sample does not contain a petroleum hydrocarbon blend with a distillation range similar to gasoline. The quantitation limit is 2.0 mg/kg.

Comment:

an environmental testing company
P.O. Box 12846
Research Triangle Park, North Carolina 27709
(919) 677-0090
FAX (919) 677-0427

August 23, 1991

Scott Pearce
Trigon Engineering, Inc.
313 Gallimore Dairy Rd.
Greensboro, NC 27419

Reference IEA Report No.: 471195
Project ID: 015-91-036

Dear Mr. Pearce,

Transmitted herewith are the results of analyses on one sample submitted to our laboratory.

Please see the enclosed reports for your results.

Very truly yours,

IEA, Inc.

Linda F. Mitchell
Director, Technical Support Services

State Certification:

Alabama - #40210	New Jersey - #67719	South Carolina - #99021
Georgia - #816	Tennessee - #00296	North Carolina - #37720
Kansas - #E-158	Virginia - #00179	#84

IEA LABORATORY RESULTS
TCLP SCREEN

IEA Project #: 471-195
Client Name: Trigon Engineering, Inc.

Sample #	Client ID	Parameter	Regulatory Level		Results		Date Analyzed
		TCLP METALS:					
1	Stockpile	Arsenic	5.0	mg/L	<0.025	mg/L	08/18/91
	QC Blank	Arsenic	5.0	mg/L	<0.025	mg/L	08/18/91
1	Stockpile	Barium	100	mg/L	0.84	mg/L	08/13/91
	QC Blank	Barium	100	mg/L	0.71	mg/L	08/13/91
1	Stockpile	Cadmium	1.0	mg/L	<0.05	mg/L	08/13/91
	QC Blank	Cadmium	1.0	mg/L	<0.05	mg/L	08/13/91
1	Stockpile	Chromium	5.0	mg/L	<0.15	mg/L	08/13/91
	QC Blank	Chromium	5.0	mg/L	<0.15	mg/L	08/13/91
1	Stockpile	Mercury	0.2	mg/L	<0.0025	mg/L	08/12/91
	QC Blank	Mercury	0.2	mg/L	<0.0025	mg/L	08/12/91
1	Stockpile	Lead	5.0	mg/L	<0.025	mg/L	08/16/91
	QC Blank	Lead	5.0	mg/L	<0.025	mg/L	08/16/91
1	Stockpile	Selenium	1.0	mg/L	<0.025	mg/L	08/14/91
	QC Blank	Selenium	1.0	mg/L	<0.025	mg/L	08/14/91
1	Stockpile	Silver	5.0	mg/L	<0.25	mg/L	08/13/91
	QC Blank	Silver	5.0	mg/L	<0.25	mg/L	08/13/91

Comments:

*Please note that this report does not include matrix spike and corrected results as required in the TCLP Method (40 CFR, Part 261, Subpart C, Appendix I).

FORM TCLP-METLSCN Rev. 051591

PESTICIDES / PCBs
SW-846 METHOD 8080

IEA Sample Number: 471-195-1
Sample Identification: Stockpile
Date Extracted: 08/13/91
Date Analyzed: 08/14/91 By: Travis

Number	Compound	Quantitation Limit (ug/kg)	Results Concentration (ug/kg)
1	alpha-BHC	8.0	BQL
2	beta-BHC	8.0	BQL
3	delta-BHC	8.0	BQL
4	gamma-BHC (Lindane)	8.0	BQL
5	Heptachlor	8.0	BQL
6	Aldrin	8.0	BQL
7	Heptachlor epoxide	8.0	BQL
8	Endosulfan I	8.0	BQL
9	Dieldrin	16	BQL
10	4,4'-DDE	16	BQL
11	Endrin	16	BQL
12	Endosulfan II	16	BQL
13	4,4'-DDD	16	BQL
14	Endosulfan sulfate	16	BQL
15	4,4'-DDT	16	BQL
16	Methoxychlor	80	BQL
17	Toxaphene	160	BQL
18	Aroclor 1016	80	BQL
19	Aroclor 1221	80	BQL
20	Aroclor 1232	80	BQL
21	Aroclor 1242	80	BQL
22	Aroclor 1248	80	BQL
23	Aroclor 1254	160	BQL
24	Aroclor 1260	160	BQL
25	Chlordane (technical)	80	BQL
26	Endrin aldehyde	16	BQL

Additional Compounds:

27	Endrin ketone	16	BQL
28	alpha-Chlordane	80	BQL
29	gamma-Chlordane	80	BQL

Comments:

BQL = Below Quantitation Limit

PESTICIDES / PCBs
SW-846 METHOD 8080

IEA Sample Number: 471-195-1
Sample Identification: PBLK-308
Date Extracted: 08/13/91
Date Analyzed: 08/17/91 By: Travis

Number	Compound	Quantitation Limit (ug/kg)	Results Concentration (ug/kg)
1	alpha-BHC	8.0	BQL
2	beta-BHC	8.0	BQL
3	delta-BHC	8.0	BQL
4	gamma-BHC (Lindane)	8.0	BQL
5	Heptachlor	8.0	BQL
6	Aldrin	8.0	BQL
7	Heptachlor epoxide	8.0	BQL
8	Endosulfan I	8.0	BQL
9	Dieldrin	16	BQL
10	4,4'-DDE	16	BQL
11	Endrin	16	BQL
12	Endosulfan II	16	BQL
13	4,4'-DDD	16	BQL
14	Endosulfan sulfate	16	BQL
15	4,4'-DDT	16	BQL
16	Methoxychlor	80	BQL
17	Toxaphene	160	BQL
18	Aroclor 1016	80	BQL
19	Aroclor 1221	80	BQL
20	Aroclor 1232	80	BQL
21	Aroclor 1242	80	BQL
22	Aroclor 1248	80	BQL
23	Aroclor 1254	160	BQL
24	Aroclor 1260	160	BQL
25	Chlordane (technical)	80	BQL
26	Endrin aldehyde	16	BQL

Additional Compounds:

27	Endrin ketone	16	BQL
28	alpha-Chlordane	80	BQL
29	gamma-Chlordane	80	BQL

Comments:

BQL = Below Quantitation Limit

GC/MS PURGEABLES
SW-846 METHOD 8240

IEA Sample Number: 471-195
Sample Identification: Stockpile
Date Analyzed: 08/13/91 By: Stephenson

Number	Compound	Quantitation Limit (ug/kg)	Results Concentration (ug/kg)
1	Acetone	100	BQL
2	Benzene	5	BQL
3	Bromodichloromethane	5	BQL
4	Bromoform	5	BQL
5	Bromomethane	10	BQL
6	2-Butanone	100	BQL
7	Carbon disulfide	5	BQL
8	Carbon tetrachloride	5	BQL
9	Chlorobenzene	5	BQL
10	Dibromochloromethane	5	BQL
11	Chloroethane	10	BQL
12	2-Chloroethylvinyl ether	10	BQL
13	Chloroform	5	BQL
14	Chloromethane	10	BQL
15	1,1-Dichloroethane	5	BQL
16	1,2-Dichloroethane	5	BQL
17	1,1-Dichloroethene	5	BQL
18	1,2-Dichloroethene (total)	5	BQL
19	1,2-Dichloropropane	5	BQL
20	cis-1,3-Dichloropropene	5	BQL
21	trans-1,3-Dichloropropene	5	BQL
22	Ethylbenzene	5	BQL
23	2-Hexanone	50	BQL
24	Methylene chloride	5	BQL
25	4-Methyl-2-pentanone	50	BQL
26	Styrene	5	BQL
27	1,1,2,2-Tetrachloroethane	5	BQL
28	Tetrachloroethene	5	BQL
29	Toluene	5	BQL
30	1,1,1-Trichloroethane	5	BQL
31	1,1,2-Trichloroethane	5	BQL
32	Trichloroethene	5	BQL
33	Vinyl acetate	50	BQL
34	Vinyl chloride	10	BQL
35	Xylenes (total)	5	BQL

Comments:
BQL = Below Quantitation Limit
Filename = 0813e03

FORM 8240 Rev. 071390

GC/MS PURGEABLES
SW-846 METHOD 8240

IEA Sample Number: 471-195
Sample Identification: VBLK 50
Date Analyzed: 08/13/91 By: Stephenson

Number	Compound	Quantitation Limit (ug/kg)	Results Concentration (ug/kg)
1	Acetone	100	BQL
2	Benzene	5	BQL
3	Bromodichloromethane	5	BQL
4	Bromoform	5	BQL
5	Bromomethane	10	BQL
6	2-Butanone	100	BQL
7	Carbon disulfide	5	BQL
8	Carbon tetrachloride	5	BQL
9	Chlorobenzene	5	BQL
10	Dibromochloromethane	5	BQL
11	Chloroethane	10	BQL
12	2-Chloroethylvinyl ether	10	BQL
13	Chloroform	5	BQL
14	Chloromethane	10	BQL
15	1,1-Dichloroethane	5	BQL
16	1,2-Dichloroethane	5	BQL
17	1,1-Dichloroethene	5	BQL
18	1,2-Dichloroethene (total)	5	BQL
19	1,2-Dichloropropane	5	BQL
20	cis-1,3-Dichloropropene	5	BQL
21	trans-1,3-Dichloropropene	5	BQL
22	Ethylbenzene	5	BQL
23	2-Hexanone	50	BQL
24	Methylene chloride	5	BQL
25	4-Methyl-2-pentanone	50	BQL
26	Styrene	5	BQL
27	1,1,2,2-Tetrachloroethane	5	BQL
28	Tetrachloroethene	5	BQL
29	Toluene	5	BQL
30	1,1,1-Trichloroethane	5	BQL
31	1,1,2-Trichloroethane	5	BQL
32	Trichloroethene	5	BQL
33	Vinyl acetate	50	BQL
34	Vinyl chloride	10	BQL
35	Xylenes (total)	5	BQL

Comments:
BQL = Below Quantitation Limit
Filename = 0813e03

FORM 8240 Rev. 071390

BLANK SUMMARY FORM

Blank Filename:	0813e03	Matrix: Low Soil	
Instrument ID:	MSD5	Date Analyzed:	08/13/91
Analytical Method:	SW-846 Method 8240		

Samples Associated With This Blank:

IEA SAMPLE ID	CLIENT SAMPLE ID
471-195-1	Stockpile

BASE/NEUTRAL EXTRACTABLES
SW-846 METHOD 8270

IEA Sample Number: 471-195-1
Sample Identification: Stockpile
Date Extracted: 08/07/91
Date Analyzed: 08/20/91 By: Kraemer

Number	Compound	Quantitation Limit (ug/kg)	Results Concentration (ug/kg)
1	Acenaphthene	200	BQL
2	Acenaphthylene	200	BQL
3	Anthracene	200	BQL
4	Benzo(a)anthracene	200	BQL
5	Benzo(b)fluoranthene	200	BQL
6	Benzo(k)fluoranthene	200	BQL
7	Benzo(g,h,i)perylene	200	BQL
8	Benzo(a)pyrene	200	BQL
9	Benzyl alcohol	400	BQL
10	bis(2-Chloroethoxy)methane	200	BQL
11	bis(2-Chloroethyl)ether	200	BQL
12	bis(2-Chloroisopropyl)ether	200	BQL
13	bis(2-Ethylhexyl)phthalate	200	BQL
14	4-Bromophenyl phenyl ether	200	BQL
15	Benzyl butyl phthalate	200	BQL
16	4-Chloroaniline	400	BQL
17	2-Chloronaphthalene	200	BQL
18	4-Chlorophenyl phenyl ether	200	BQL
19	Chrysene	200	BQL
20	Dibenzo(a,h)anthracene	200	BQL
21	Dibenzofuran	200	BQL
22	Di-n-butylphthalate	200	BQL
23	1,3-Dichlorobenzene	200	BQL
24	1,4-Dichlorobenzene	200	BQL
25	1,2-Dichlorobenzene	200	BQL
26	3,3'-Dichlorobenzidine	400	BQL
27	Diethyl phthalate	200	BQL
28	Dimethyl phthalate	200	BQL
29	2,4-Dinitrotoluene	200	BQL
30	2,6-Dinitrotoluene	200	BQL
31	Di-n-octylphthalate	200	BQL
32	Fluoranthene	200	BQL
33	Fluorene	200	BQL
34	Hexachlorobenzene	200	BQL
35	Hexachlorobutadiene	200	BQL
36	Hexachlorocyclopentadiene	200	BQL
37	Hexachloroethane	200	BQL
38	Indeno(1,2,3-cd)pyrene	200	BQL
39	Isophorone	200	BQL

BASE/NEUTRAL EXTRACTABLES
SW-846 METHOD 8270

IEA Sample Number: 471-195-1
Sample Identification: Stockpile
Date Extracted: 08/07/91
Date Analyzed: 08/20/91 By: Kraemer

Number	Compound	Quantitation Limit (ug/kg)	Results Concentration (ug/kg)
40	2-Methylnaphthalene	200	BQL
41	Naphthalene	200	BQL
42	2-Nitroaniline	1000	BQL
43	3-Nitroaniline	1000	BQL
44	4-Nitroaniline	1000	BQL
45	Nitrobenzene	200	BQL
46	N-Nitroso-di-n-propylamine	200	BQL
47	N-Nitrosodiphenylamine	200	BQL
48	Phenanthrene	200	BQL
49	Pyrene	200	BQL
50	1,2,4-Trichlorobenzene	200	BQL

Comments:

BQL = Below Quantitation Limit

FORM 8270B (2) Rev. 060689

BASE/NEUTRAL EXTRACTABLES
SW-846 METHOD 8270

IEA Sample Number: 471-195
Sample Identification: SVB-360
Date Extracted: 08/07/91
Date Analyzed: 08/16/91 By: Kraemer

Number	Compound	Quantitation Limit (ug/kg)	Results Concentration (ug/kg)
1	Acenaphthene	200	BQL
2	Acenaphthylene	200	BQL
3	Anthracene	200	BQL
4	Benzo(a)anthracene	200	BQL
5	Benzo(b)fluoranthene	200	BQL
6	Benzo(k)fluoranthene	200	BQL
7	Benzo(g,h,i)perylene	200	BQL
8	Benzo(a)pyrene	200	BQL
9	Benzyl alcohol	400	BQL
10	bis(2-Chloroethoxy)methane	200	BQL
11	bis(2-Chloroethyl)ether	200	BQL
12	bis(2-Chloroisopropyl)ether	200	BQL
13	bis(2-Ethylhexyl)phthalate	200	BQL
14	4-Bromophenyl phenyl ether	200	BQL
15	Benzyl butyl phthalate	200	BQL
16	4-Chloroaniline	400	BQL
17	2-Chloronaphthalene	200	BQL
18	4-Chlorophenyl phenyl ether	200	BQL
19	Chrysene	200	BQL
20	Dibenzo(a,h)anthracene	200	BQL
21	Dibenzofuran	200	BQL
22	Di-n-butylphthalate	200	BQL
23	1,3-Dichlorobenzene	200	BQL
24	1,4-Dichlorobenzene	200	BQL
25	1,2-Dichlorobenzene	200	BQL
26	3,3'-Dichlorobenzidine	400	BQL
27	Diethyl phthalate	200	BQL
28	Dimethyl phthalate	200	BQL
29	2,4-Dinitrotoluene	200	BQL
30	2,6-Dinitrotoluene	200	BQL
31	Di-n-octylphthalate	200	BQL
32	Fluoranthene	200	BQL
33	Fluorene	200	BQL
34	Hexachlorobenzene	200	BQL
35	Hexachlorobutadiene	200	BQL
36	Hexachlorocyclopentadiene	200	BQL
37	Hexachloroethane	200	BQL
38	Indeno(1,2,3-cd)pyrene	200	BQL
39	Isophorone	200	BQL

BASE/NEUTRAL EXTRACTABLES
SW-846 METHOD 8270

IEA Sample Number: 471-195
Sample Identification: SVB-360
Date Extracted: 08/07/91
Date Analyzed: 08/16/91 By: Kraemer

Number	Compound	Quantitation Limit (ug/kg)	Results Concentration (ug/kg)
40	2-Methylnaphthalene	200	BQL
41	Naphthalene	200	BQL
42	2-Nitroaniline	1000	BQL
43	3-Nitroaniline	1000	BQL
44	4-Nitroaniline	1000	BQL
45	Nitrobenzene	200	BQL
46	N-Nitroso-di-n-propylamine	200	BQL
47	N-Nitrosodiphenylamine	200	BQL
48	Phenanthrene	200	BQL
49	Pyrene	200	BQL
50	1,2,4-Trichlorobenzene	200	BQL

Comments:

BQL = Below Quantitation Limit

an environmental testing company
3000 WESTON PKWY.
CARY, N.C. 27513

CHAIN OF CUSTODY RECORD

NO: 19492

REGULATORY CLASSIFICATION - PLEASE SPECIFY

☐ NPDES ☐ DRINKING WATER ☐ RCRA ☐ OTHER _____

PROJECT #	PROJECT NAME
[illegible]	

SAMPLERS: *(SIGNATURE)* [illegible]

SAMPLE I.D.	DATE	TIME	COMP	GRAB	STATION LOCATION	# OF CONTAINERS	MATRIX SOIL	MATRIX WATER	8240	8270	8080	TCL TRPH [illegible]									
	[illegible]	[illegible]	X		Stock Pile	6	X		+	X	X	X									

RELINQUISHED BY *(SIGNATURE)*	DATE	TIME	RECEIVED BY	DATE	TIME
[illegible]	[illegible]	[illegible]	Bobs [illegible]		
RELINQUISHED BY *(SIGNATURE)*	**DATE**	**TIME**	**RECEIVED FOR LAB BY**	**DATE**	**TIME**
			[illegible]	8/1/91	12 N

IEA QUOTE NO.	IEA RUSH NO.
PROJECT MANAGER (PLEASE PRINT)	**P.O. NO.**
[illegible]	

IEA REMARKS

4/1-1/5

FIELD REMARKS

1. [illegible]
2. Normal Turnaround