



AQUATERRA

Environmental Consultants

November 26, 1991

Mr. Douglas E. Howey
Environmental Geologist
North Carolina Department of Transportation
Geotechnical Unit
Post Office Box 25201
Raleigh, North Carolina 27611-5201

Reference: Underground Storage Tank Closure Assessment
Ms. Moyde Cox Property, Parcel 6
State Project 6.804743 (Z-2360B)
Linwood, North Carolina
Aquaterra Job No. G710

Dear Mr. Howey:

Aquaterra, Inc. (Aquaterra) has conducted an underground storage tank (UST) closure assessment at the Ms. Moyde Cox Property, Parcel 6 site located in Linwood, North Carolina. The assessment was conducted in an effort to satisfy the underground storage tank closure assessment requirements set forth in 40 CFR Part 280 Subpart G.

This report summarizes the field activities and laboratory analyses and provides our recommendations for the site. If you have any questions or comments, please contact us at (919) 273-5003.

Sincerely,

AQUATERRA, INC.

S. Leah Wieselquist
Environmental Technician

Susan Kite, P.G.
Project Geologist/Project Manager

Senior Peer Review By
David L. Duncklee
Senior Project Manager

SLW/SK/slw
GR11091

Charlotte Office:
P O Box 50328
Raleigh, NC 27650
(919) 859-9987
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P O Box 668107
Charlotte, NC 28266-8107
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P O Box 16241
Greensboro, NC 27416-0241
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DEC 4 1991

Winston-Salem
Regional Office

**Underground Storage Tank Closure Assessment
Ms. Moyde Cox Property, Parcel 6
State Project 6.804743 (Z-2360B)
Linwood, North Carolina**

November 26, 1991

Prepared For

**North Carolina Department of Transportation
Geotechnical Unit**

Prepared By

**Aquaterra, Inc.
Greensboro, North Carolina**

Aquaterra, Inc.



**Underground Storage Tank Closure Assessment
Ms. Moyde Cox Property, Parcel 6
State Project 6.804743 (Z-2360B)
Linwood, North Carolina
Aquaterra Job No. G710**

1 Introduction

Aquaterra, Inc. (Aquaterra) has conducted an underground storage tank (UST) closure assessment at the Ms. Moyde Cox Property, Parcel 6 site located in Linwood, North Carolina (see Figure 1). It was Aquaterra's understanding that two USTs of unknown size and age, one containing gasoline and one containing heating oil, were located at the site. Aquaterra was to conduct the closure assessment in conjunction with the removal of these USTs. The USTs were to be excavated, removed, and properly disposed of by Four Seasons Industrial Services, Inc. (Four Seasons).

The closure assessment included screening the in situ and excavated soils with an organic vapor analyzer (OVA) for total volatilized organic compounds (VOCs) which may indicate petroleum hydrocarbon contamination. This involves filling a clean container approximately half full with soil and sealing the container. The gases in the soils are allowed approximately 10 minutes to equilibrate with the gases in the container. The probe of the OVA is then inserted into the headspace of the container and a reading of total VOCs is recorded. Soil samples collected from the former UST excavation were analyzed for total petroleum hydrocarbons (TPH) by laboratory gas chromatograph (GC) according to SW-846 Extraction Methods 3550 and 5030. These analyses support the field OVA readings and document the closure assessment.

2 Field Investigation

On October 14, 1991, Aquaterra mobilized an environmental scientist to the Ms. Moyde Cox Property, Parcel 6 site to conduct a UST closure assessment. The assessment was conducted in conjunction with the removal of a heating oil UST and a gasoline UST. Upon arrival at the site, the environmental scientist located one gasoline UST and piping and a pump that appeared to have formerly been connected to an aboveground storage tank (AST) (see Figure 2). There did not appear to be a heating oil UST at the site. The gasoline UST did not contain pumpable liquids.

The soils on top of and around the gasoline UST were excavated and the tank was removed. The UST was excavated, removed, and disposed of according to 40 CFR 280.71 (see Attachment A). The UST, measuring 3.5 feet (D) x 8 feet (L), was noted to have 2 holes on the bottom of the west end and the fill pipe was slightly separated from the UST. Gasoline odors were noted in the west end of the excavation.

Two soil samples (T1-E and T1-W) were collected for laboratory analysis at a depth of approximately 6.5 feet below the ground surface (see Figure 2). The soil samples were screened with an OVA according to the methods previously described. OVA readings of soil samples T1-N and T1-W were less than 1.0 parts per million (ppm) and 240 ppm respectively (see Table 1). The excavation was backfilled with the excavated soils.



3 Laboratory Analytical Procedures and Results

The soil samples were immediately placed in laboratory provided glass containers and labeled with a tag indicating date, time, sample number, sampler's name, and analysis to be conducted. The samples were then placed in a cooler and chilled with ice to approximately 4°C. The samples were transported to the laboratory according to EPA approved chain-of-custody procedures to be analyzed for TPH by GC.

Laboratory analytical results of soil samples T1-E and T1-W did not exhibit TPH levels above the laboratory method detection limit of 2.0 mg/kg (see Table 1 and Attachment B).

4 Additional Sampling

Based on the presence of gasoline vapors during excavation and the holes observed in the west end of the UST, Aquaterra remobilized an environmental technician to the Ms. Moyde Cox property to collect an additional soil sample in the vicinity of the former UST. A hand auger boring was advanced to a depth of 7 feet. A soil sample (S-3) was collected for laboratory analysis at a depth of 6.5 feet. Apparent ground water was encountered at a depth of 7 feet. The soil sample was handled as previously described and analyzed for TPH by GC, Extraction Method 5030.

5 Additional Sampling Laboratory Analytical Results

Laboratory analytical results of soil sample S-3 did not indicate TPH levels above the laboratory method detection limit of 2 mg/kg (see Table 1 and Attachment B).

6 Conclusions and Recommendations

Laboratory analytical results of the soil samples collected from the UST excavation are below the North Carolina Department of Environment, Health, and Natural Resources (NCDEHNR), Division of Environmental Management (DEM) soil clean up level of 10 mg/kg for TPH.

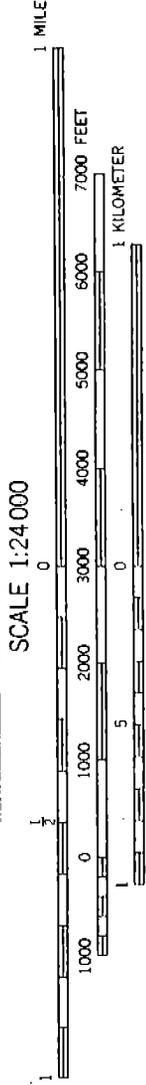
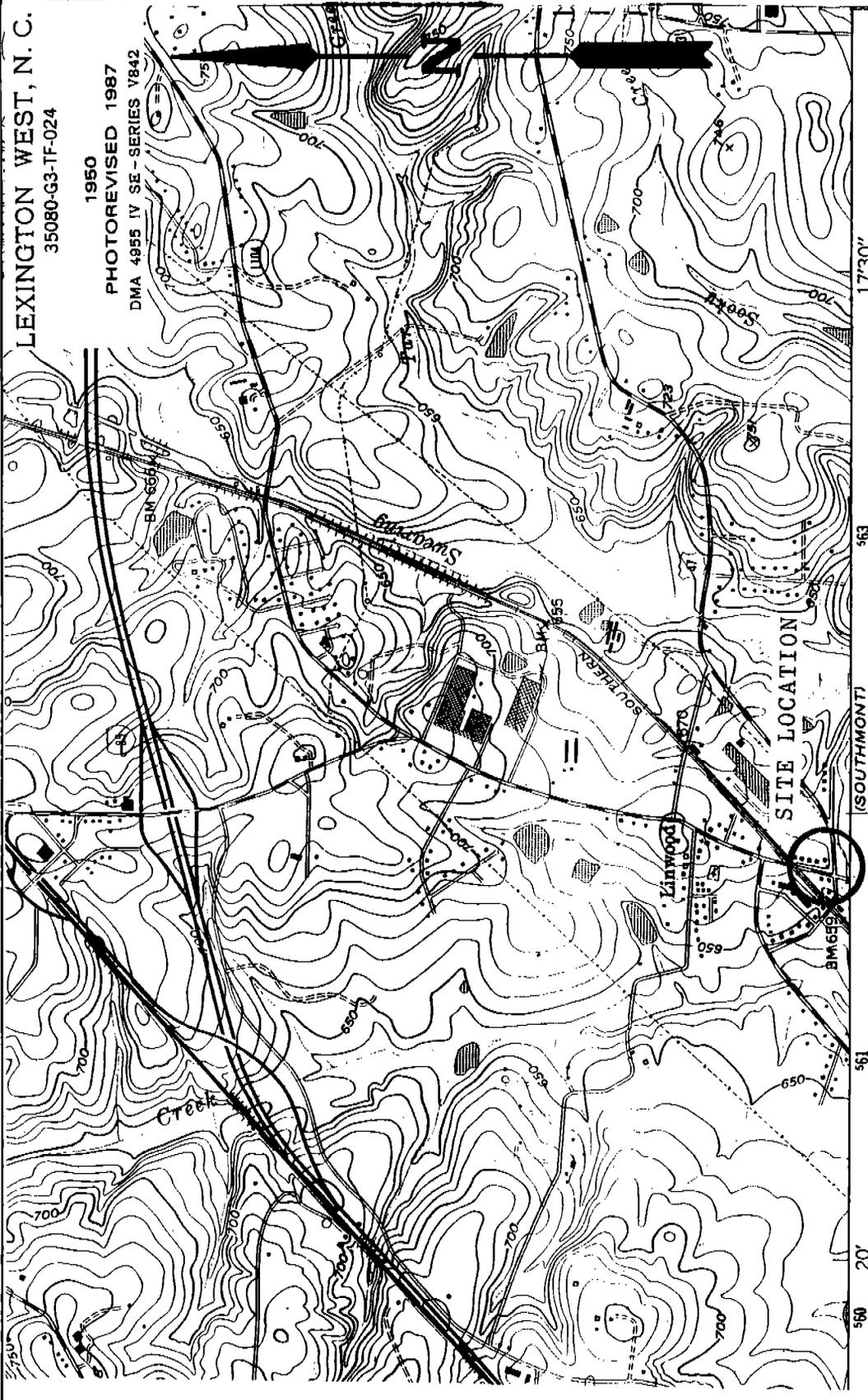
Aquaterra recommends that a copy of this report be sent to the DEM at the following address:

NCDEHNR, DEM
Winston-Salem Regional Office
8025 North Point Boulevard
Winston-Salem, North Carolina 27106



LEXINGTON WEST, N. C.
35080-G3-TF-024

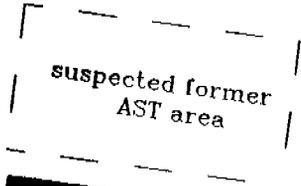
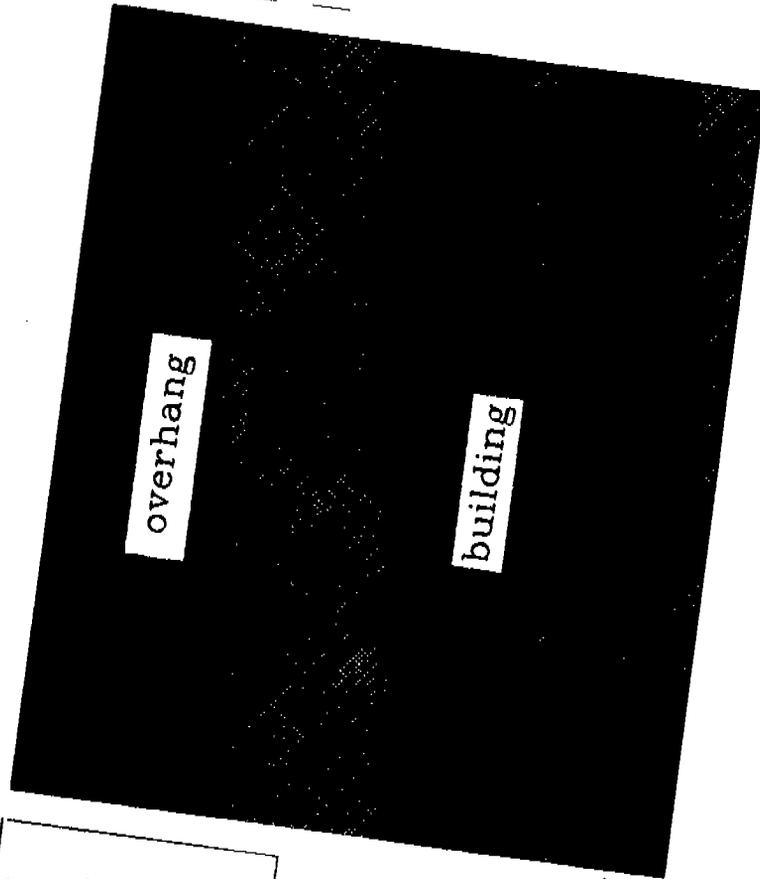
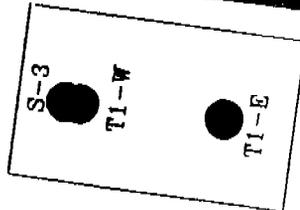
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 <p>AQUATERA, INC. RALEIGH, GREENSBORO, CHARLOTTE NORTH CAROLINA</p>		<p>Author: SHP Job No.: G710</p>	<p>Drawing: [blank] Revision: [blank]</p>	<p>Layers: [blank] Figure: I</p>	<p>Date: 10/21/91 Scale: NTS</p>	<p>Title: Project Location Map Project: Ms. Mayde Cox Property Linwood, North Carolina</p>
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Junior Order Home Road
S.R. 1130

Southmont Linwood Road
S.R. 1396



Legend:
● soil sample



AQUATERRA, INC.
RALEIGH, GREENSBORO, CHARLOTTE
NORTH CAROLINA

Author SHP	Drawing G710-1	Layers	Date 10/21/91	Title Soil Sample Location Map
Job No. G710	Revision	Figure 2	Scale NTS	Project Ms. Moyde Cox Property Linwood, North Carolina

Table 1. Laboratory Analytical Results for Ms. Moyde Cox Property, Parcel 6, Linwood, North Carolina.

Sample No.	Date	Depth (feet)	OVA (ppm)	TPH by GC	
				Method 5030 (mg/kg)	Method 3550 (mg/kg)
T1-E	10/14/91	6.5	<1.0	<2.0	<2.0
T1-W	10/14/91	6.5	240	<2.0	<2.0
S-3	11/11/91	6.5	NA ^a	<2.0	NA ^a

^aNot Analyzed

Analytical Laboratory: *Industrial & Environmental Analysts, Inc.*
Cary, North Carolina

Aquaterra Job No. G710
GR110-91

**N.C. DEPT. OF TRANSPORTATION
LINWOOD, NORTH CAROLINA**

**Summary of Underground Storage Tank Removal Performed
October 1991**

Prepared by
Four Seasons Industrial Services, Incorporated

FOUR SEASONS



Four Seasons Industrial Services, Inc.
3107 South Elm-Eugene Street • P.O. Box 16590
Greensboro, North Carolina 27416-0590
(919) 273-2718 • Fax Number (919) 274-5798

October 31, 1991

Aquaterra, Inc.
309 Concord Street, Suite 204-D
Greensboro, North Carolina 27416

Attention: Susan Kite

Reference: **Closure Report for NCDOT
Abandoned Service Station
Linwood, North Carolina**

Dear Ms. Kite:

Four Seasons is pleased to provide you with this closure summary of the UST closure at the above referenced facility.

<u>Tank Identification</u>	<u>Capacity (Gal.)</u>	<u>Previous Contents</u>
#1	1,000	Gasoline

In summary, the tank closure methodology consisted of the following phases and includes references to the U.S. EPA's Underground Storage Tank Rules:

Phase I

Removal and proper disposal of all petroleum/sludge/water remaining in the tank (40 CFR 280.71).

Phase II

Excavation, removal, and proper disposal of the underground tank (40 CFR 280.71).

Phase III

If soil sampling verifies the presence of contamination, select and implement a remedial action alternative to complete closure (EPA 40 CFR Part 280.72).

Phase IV

Submit a project completion summary report documenting closure activities demonstrating compliance with closure requirements (EPA 40 CFR 280.74).

On October 14, 1991, Four Seasons mobilized the appropriate equipment and personnel to the referenced site to initiate the tank removal program. Prior to excavation, the tank was checked for the presence of residual liquids, there were none.

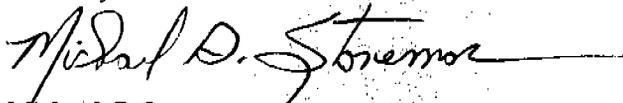
Closure Summary Report
NCDOT - Abandoned Station
Linwood, NC
Page 2

Following removal of the underground storage tank, the vessel was secured onto a trailer and transported to Four Seasons' Patton Avenue Facility in Greensboro, N.C. At this point, the tank was subjected to an appropriate decontamination procedure.

Following completion of the cleaning and decontamination process, the carbon steel tank was cut into scrap pieces and subsequently transported to a metal recycling facility. The Tank Disposal Manifest," included in Attachment A, documents the final disposition of the vessel.

Ms. Kite, thank you once again for the opportunity to provide these environmental services for Aquaterra, Inc. and the NCDOT. If you should have any further questions or require additional information, please contact our office.

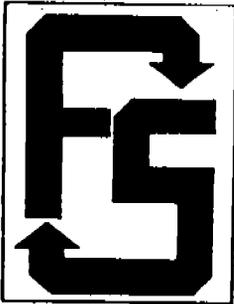
Sincerely,



Michael G. Stoneman
Corporate UST Program Manager

ncdot-2

ATTACHMENT A



FOUR SEASONS INDUSTRIAL SERVICES, INC.

Post Office Box 16590
Greensboro, North Carolina 27416-0590
(919)273-2718

91-50191

TANK DISPOSAL MANIFEST

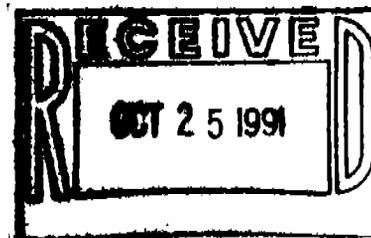
1)	Tank Owner/Authorized Representative: Name and Mailing Address _____ <u>DOT</u> <u>Abandoned Station Linwood N.C.</u>		
2)	Tank Owner/Authorized Representative: Phone No. () _____		
3)	Description of Tanks:		
	<u>Tank No.</u>	<u>Capacity</u>	<u>Previous Contents</u> <u>Comments</u>
	<u>AQ-1</u>	<u>1000 ga.</u>	<u>Gasoline</u> <u># 270</u>
4)	Tank Owner/Authorized Representative Certification: The undersigned certifies that the above listed storage tanks have been removed from the premises of the tank Owner.		
	<u>Sallie H. Page</u> Printed/Typed Name	<u>Sallie H. Page</u> Signature	<u>10/14/91</u> Month Day Year
5)	Transporter: The undersigned certifies that the above listed storage tanks have been transported to the Four Seasons Industrial Services facility at 519 Patton Ave. Greensboro, N.C.		
	<u>Michael A. Parks</u> Printed/Typed Name	<u>Michael A. Parks</u> Signature	<u>10-14-91</u> Month Day Year
6)	Decontamination Manager: The undersigned certifies that the above listed storage tanks have been cleaned and scrapped.		
	<u>Waymon H. Artoy Jr</u> Printed/Typed Name	<u>Waymon H. Artoy Jr</u> Signature	<u>10-17-91</u> Month Day Year
7)	Disposal Certification: The undersigned certifies that the above-named storage tank(s) have been cut into scrap pieces and accepted by the metal recycling facility.		
	Recycling Facility: _____		
	<u>Robert Fields</u> Printed/Typed Name	<u>Robert Fields</u> Signature	<u>10-15-91</u> Month Day Year



an environmental testing company

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

October 24, 1991



Sallie H. Page
Aquaterra, Inc.
309 Concord Street, Suite 204D
Greensboro, NC 27406

Reference IEA Report No.: 835535
Project I.D.: G710

Dear Ms. Page,

Transmitted herewith are the results of analyses on two samples submitted to our laboratory.

Please see the enclosed reports for your results.

Very truly yours,

IEA, Inc.

for Linda F. Mitchell
Director, Technical Support Services

State Certification:

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

Monroe,
Connecticut
203-261-4458

Miramar,
Florida
305-989-0928

Schaumburg,
Illinois
708-705-0740

N. Billerica,
Massachusetts
617-272-5212

Whippany,
New Jersey
201-428-8181

Essex Junction,
Vermont
802-878-5138



Total Petroleum Hydrocarbon Analysis

IEA Sample No:	835-535	Date Sampled:	N/A
Client Sample No:	QC Blank	Date Received:	N/A
Client Project No:	G710	Date Extracted:	10-17-91

Extraction (SW 846 - 3550) / GC-FID analysis (for #2 fuel oil, kerosene, varsol)
Date Analyzed: 10-17-91 Analyzed by: Correa

The sample does not contain a petroleum hydrocarbon blend in the distillation range referenced above. The quantitation limit is 2.0 mg/kg.

Comment:
N/A = Not applicable

=====
Purge and Trap (SW 846 - 5030) / GC-FID analysis (for gasoline only)
Date Analyzed: 10-19-91 Analyzed by: Joaquin

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:
N/A = Not applicable



Total Petroleum Hydrocarbon Analysis

IEA Sample No: 835-535-1 Date Sampled: 10-14-91
Client Sample No: T1-E Date Received: 10-15-91
Client Project No: G710 Date Extracted: 10-17-91

Extraction (SW 846 - 3550) / GC-FID analysis (for #2 fuel oil, kerosene, varsol)
Date Analyzed: 10-17-91 Analyzed by: Correa

The sample does not contain a petroleum hydrocarbon blend in the distillation range referenced above. The quantitation limit is 2.0 mg/kg.

Comment:

=====
Purge and Trap (SW 846 - 5030) / GC-FID analysis (for gasoline only)
Date Analyzed: 10-19-91 Analyzed by: Joaquin

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: 835-535-2 Date Sampled: 10-14-91
Client Sample No: T1-W Date Received: 10-15-91
Client Project No: G710 Date Extracted: 10-17-91

Extraction (SW 846 - 3550) / GC-FID analysis (for #2 fuel oil, kerosene, varsol)
Date Analyzed: 10-17-91 Analyzed by: Correa

The sample does not contain a petroleum hydrocarbon blend in the distillation range referenced above. The quantitation limit is 2.0 mg/kg.

Comment:

=====
Purge and Trap (SW 846 - 5030) / GC-FID analysis (for gasoline only)
Date Analyzed: 10-19-91 Analyzed by: Joaquin

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

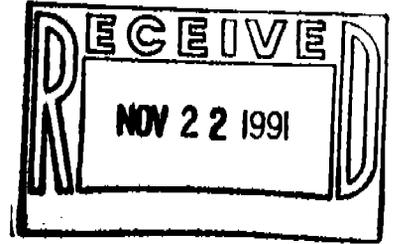
Comment:



an environmental testing company

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

November 21, 1991



Sue Kite
Aquaterra, Inc.
309 Concord Street, Suite 204D
Greensboro, NC 27406

IEA Project No.: 835551
IEA Reference No.: A9111213
Client Project I.D.: G710

Dear Ms. Kite,

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^{for}
Director, Technical Support Services

State Certification:

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



Total Petroleum Hydrocarbon Analysis

IEA Sample No: 835-551 Date Sampled: N/A
Client Sample No: QC Blank Date Received: N/A
Client Project No: G710

Purge and Trap (SW 846 - 5030) / GC-FID analysis (for gasoline only)
Date Analyzed: 11-17-91 Analyzed by: Joaquin

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:

N/A=Not applicable



Total Petroleum Hydrocarbon Analysis

IEA Sample No: 835-551-1 Date Sampled: 11-11-91
Client Sample No: S3 Date Received: 11-12-91
Client Project No: G710

Purge and Trap (SW 846 - 5030) / GC-FID analysis (for gasoline only)
Date Analyzed: 11-17-91 Analyzed by: Joaquin

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:

