



February 24, 1993

Mr. Peter Sullivan  
RIDEM Oil Pollution/UST Program  
291 Promenade Street  
Providence, Rhode Island 02908-5767

RE: Project #9317  
Tomal Realty Group  
Soil Remediation  
Georgetown Manor Ethan Allen Furniture Site  
1128 North Main Street  
Providence, Rhode Island

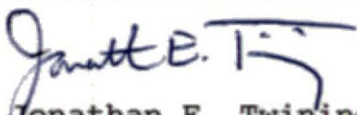
Dear Mr. Sullivan:

Enclosed, please find one copy of the final remediation report for the above referenced site. Over 300 tons of petroleum-contaminated soil was excavated on 3-4 February, 1993, and subsequently removed from the site between February 17-18 for disposal at D'Ambra Construction's aggregate facility. The post cleanup results (included) show that the soil remaining in the tank pit contained less than 300 ppm of total petroleum hydrocarbons.

If you have any further questions regarding this report, please do not hesitate to contact us.

Sincerely,

TRIANGLE ENVIRONMENTAL

  
Jonathan E. Twining  
Project Manager

**FINAL REMEDIATION REPORT**

**Ethan Allen Furniture Site  
Mr. Steven Ferdinandi  
Tomal Realty Group  
1441 Park Avenue  
Cranston, Rhode Island 02920**

**FINAL REMEDIATION REPORT**

**for the**

**Georgetown Manor Ethan Allen Furniture Site  
1128 North Main Street, Providence, R.I.  
Project #9317**


**prepared for**

**Tomal Realty Group  
c/o McDonald, Ferdinandi, and Mastrati  
1441 Park Avenue, Cranston, R.I. 02920**

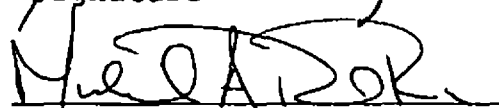
**issued:**

**February 19, 1993**

Jonathan E. Twining  
Project Manager

  
Signature

Michael A. DelRossi, P.E.  
Project Technical Review

  
Signature

**Prepared By:**

R.I. Analytical Laboratories, Inc.  
Triangle Environmental Division  
175 Metro Center Blvd., Suite 7  
Warwick, Rhode Island 02888  
(401)-737-0570 FAX (401)-732-5607



**TRIANGLE  
ENVIRONMENTAL**

ENGINEERING  
CONSULTING  
PERMITTING

February 19, 1993

Mr. Steven Ferdinandi  
Tomal Realty Group  
c/o McDonald, Ferdinandi, and Mastrati  
1441 Park Avenue  
Cranston, Rhode Island 02920-6698

RE: Project #9317  
UST Closure: Soil Remediation Phase  
Georgetown Manor Ethan Allen Furniture Site  
1128 North Main Street  
Providence, Rhode Island

Dear Mr. Ferdinandi:

On 3-4 February, 1993, Triangle Environmental monitored the removal of petroleum-contaminated soil at the above referenced site. The events leading to the removal of the contaminated soil are as follows:

- (1) In October of 1992, Goldberg-Zoino & Associates (GZA) prepared an environmental site assessment for Miriam Hospital, who intended to purchase the property. During the course of their investigation, GZA identified one 1,000 gallon #2 fuel oil tank on the South side of the building. Two monitoring wells were installed within 15-20 feet of the tank, representing an upgradient and a downgradient location.
- (2) Using a photoionization detector (PID), GZA found low levels of total organic vapors in soil samples collected at a depth of 35-37 feet during the monitoring well installation process (2.1 ppm in the upgradient well; 14.0 ppm in the downgradient well). No total organic vapors were detected in soil samples collected from depths of 0.5-32 feet in either well.

- (3) Using a field gas chromatograph (GC), GZA found no volatile organic compounds in the static headspace above the soil samples, nor were any VOCs detected in two groundwater samples collected from the monitoring wells. GZA did, however, comment that unknown petroleum distillates were detected in both groundwater samples, and in the soil sample from the 35-37' depth of the downgradient monitoring well.
- (4) GZA concluded that there was fuel oil in the soil and/or groundwater at the site. GZA stated that the source may be from past or present USTs existing at the site, or from an off-site location.
- (5) Subsequent to the GZA report, Miriam Hospital purchased the property from Tomal Realty Group.
- (6) Resource Control Associates (RCA) conducted a precision test on the 1,000 gallon fuel oil tank on November 23, 1992. The tank was found to be leaking.
- (7) RCA monitored the removal of the tank from the site on December 17, 1992. The tank pit was inspected by RCA engineers, and the soil beneath the tank was found to be contaminated with petroleum. In addition, an inspection of the tank bottom revealed several corrosion holes. Contaminated soil that had been removed during the tank closure was placed in the bottom of the tank pit. The pit was lined with polyethylene, and clean fill was used to backfill the hole.

Triangle Environmental was contacted by Richard Bennett, Esq., of Licht and Semonoff, the legal counsel for Miriam Hospital, which had contracted to purchase the subject property, to provide direction to the Hospital and Tomal Realty Group concerning the assessment and remediation of the petroleum-contaminated soil remaining on the site.

#### 1.0 SUBMISSION OF THE REMEDIAL ACTION PLAN

On 25 January, 1993, Triangle Environmental submitted a remedial action plan for the removal of petroleum contaminated soil from the referenced site in Providence, Rhode Island. The outline of the remedial action plan was as follows:

- (1) Submit the remedial action plan to the RIDEM Oil Pollution/UST Program for approval.
- (2) Upon approval of the remedial action plan, excavate the clean fill in the former tank location to the depth of the polyethylene covering. Caution must be exercised to prevent mixing of clean and contaminated soil.
- (3) Excavate the petroleum-contaminated soil in the tank pit, using a photoionization detector and visual observations to determine the extent of the contaminated soil.
- (4) Excavate the soil from the bottom and the sides of the pit until the level of total organic vapors in the soil is less than 10 ppm.
- (5) When it appears that the extent of the petroleum contamination has been reached, collect soil samples from the sides and bottom of the excavation for total petroleum hydrocarbons analysis. The samples will be analyzed by R.I. Analytical Laboratories, Inc. within 24 hours of collection. The level of total petroleum hydrocarbons in the two samples must not exceed the cleanup standard established by the RIDEM for the site at the time of the approval of this plan. A typical cleanup standard for sites of this nature is in the range of 300-500 ppm for total petroleum hydrocarbons.

If the soil TPH levels exceed the cleanup standard, then excavation will continue, and further samples will be collected and analyzed, until the soil TPH levels have dropped below the cleanup standard.

- (6) Based on the urban nature of the site, the depth to groundwater, and the groundwater classification of the area, it is the opinion of Triangle Environmental that it will neither be cost effective nor practical to remediate the petroleum contamination which may have migrated along the water table in a direction downgradient of the tank pit. It is hereby proposed that the excavation of petroleum-contaminated soil be limited to that soil which has been impacted to the greatest degree; i.e., that which is immediately beneath the former tank location. In addition, any free product which has migrated to the water table and is exposed during the soil removal process will be cleaned until visibly free of petroleum product. This will be accomplished by the use of absorbent materials, skimmers, or other recovery devices.

- (7) When the soil samples from the tank pit have TPH levels which are less than the cleanup standard, the hole can be backfilled with clean soil and compacted.
- (8) The excavated petroleum-contaminated soil must be stockpiled on and covered with polyethylene sheeting. The stockpile(s) will be sampled at a frequency of one sample per 100 cubic yards. The samples will be analyzed for the following parameters, as required for acceptance at a Rhode Island-licensed aggregate facility:

pH	Flashpoint
Physical State	Total Cyanide
TPH	TCLP Metals
PCBs	Volatile Organics (EPA Method 8010/8020)
- (9) Upon completion of the disposal analyses (5-7 days) and approval by the aggregate facility, the soil will be transported to the facility for disposal.

The basis for the submittal of the proposed plan was as follows:

- (1) The groundwater in the vicinity of the project site has been classified as Class GB by the RIDEM Division of Groundwater and ISDS. Class GB groundwater is typical of urban and industrial areas where the groundwater has been impacted, and is no longer suitable for use as drinking water without treatment.
- (2) There is a lack of sensitive receptors, such as private or public drinking water wells, wetlands, and sensitive ecosystems, in the area. The area is supplied with public drinking water and sewers.
- (3) The apparent direction of groundwater flow, based on area topography, is to the West toward the Moshassuck River. It is possible that the migration of petroleum could be diverted by underground utilities, foundations, and other subsurface conditions.

- (4) Two months prior to discovering the release, GZA installed two monitoring wells, one of which is downgradient of the tank location. No floating product was found in these wells, and only low levels of total organic vapors were recorded at the depth of the water table (35-37').
- (5) The overburden is composed of fine-to-coarse sand and gravel in the upper 15 feet of soil, and fine-to-coarse sand from 15-40 feet.

Based on the results of the GZA investigation and the facts stated above, it was the opinion of Triangle Environmental that the majority of the petroleum contamination was confined to the soil immediately beneath the tank. There may be some migration of petroleum in the downgradient direction, as indicated by the presence of unknown petroleum distillates identified in the soil and groundwater samples collected by GZA at the depth of the water table. However, the lack of floating product and elevated total organic vapor levels in the samples collected from the downgradient well suggested that the migration of petroleum was relatively insignificant at the time of the GZA report.

Triangle Environmental received approval for the remedial action plan from the RIDEM Oil Pollution/UST Program on 29 January, 1993. The plan was implemented by Triangle Environmental and Cyn Environmental Services on Wednesday, 3 February, 1993.

## 2.0 REMEDIATION OF PETROLEUM CONTAMINATED SOIL

The excavation began at approximately 8:30 A.M. on 3 February, 1993. Present at the site for Triangle Environmental were Jonathan E. Twining, Project Manager, and Nathaniel Finsness, Environmental Scientist. Triangle personnel monitored the soil excavation using an HNU PI-101 photoionization detector calibrated to a benzene standard. Triangle Environmental personnel also observed the soil for visual and olfactory evidence of petroleum contamination.

Cyn Environmental stripped approximately 2-3 feet of soil from a 40' X 60' area at surface elevation above the tank pit. Triangle personnel began to encounter petroleum odors in soil samples collected at a depth of 2-3 feet below surface elevation. The samples were analyzed by the jar headspace method for the presence of total organic vapors. The vapor levels ranged from <1 - 10 ppm. Since the level of total organic vapors was less than



the RIDEM approved trigger of 10 ppm, the soil was stockpiled separately and analyzed for TPH to determine if the soil could be reutilized on site. The TPH analysis revealed that the soil contained over 1,300 ppm of petroleum hydrocarbons; therefore, the soil was stockpiled as contaminated material for off-site disposal.

Contaminated soil was removed to a depth of approximately 22 feet from surface elevation. Soil excavation was limited to the North by the building foundation. An estimated 200-225 cubic yards of soil was excavated and stockpiled on six mil polyethylene sheeting. The stockpile was also covered with six mil poly sheeting. The excavation was backfilled with gravel on 4 February, 1993.

Triangle Environmental personnel collected three post-cleanup soil samples from the bottom and sides of the excavated area. The samples were analyzed for total petroleum hydrocarbons. The analytical results, which are enclosed, reveal that the level of TPH remaining in the soil is less than 100 ppm. These levels meet the RIDEM cleanup criteria of 300 ppm established for the site.

Triangle Environmental personnel also collected composite soil samples from the stockpile using the criteria established by the RIDEM Division of Air and Hazardous Materials, Solid Waste Section, in the Regulations For Solid Waste Management Facilities. The samples were initially analyzed for the following parameters for acceptance at D'Ambra Construction Company:

pH	Flashpoint
Physical State	Total Cyanide
TPH	TCLP Metals
PCBs	Volatile Organics
	(EPA Method 8010/8020)

Cyn Environmental Services could not get the material into the D'Ambra facility. Subsequently, the material was accepted at Bardon Trimount's facility in Massachusetts. R.I. Analytical performed the following additional analyses for the soil to be accepted at Bardon Trimount: paint filter test, sulfide reactivity, and total petroleum hydrocarbons. The results of these analyses have been included with this report.

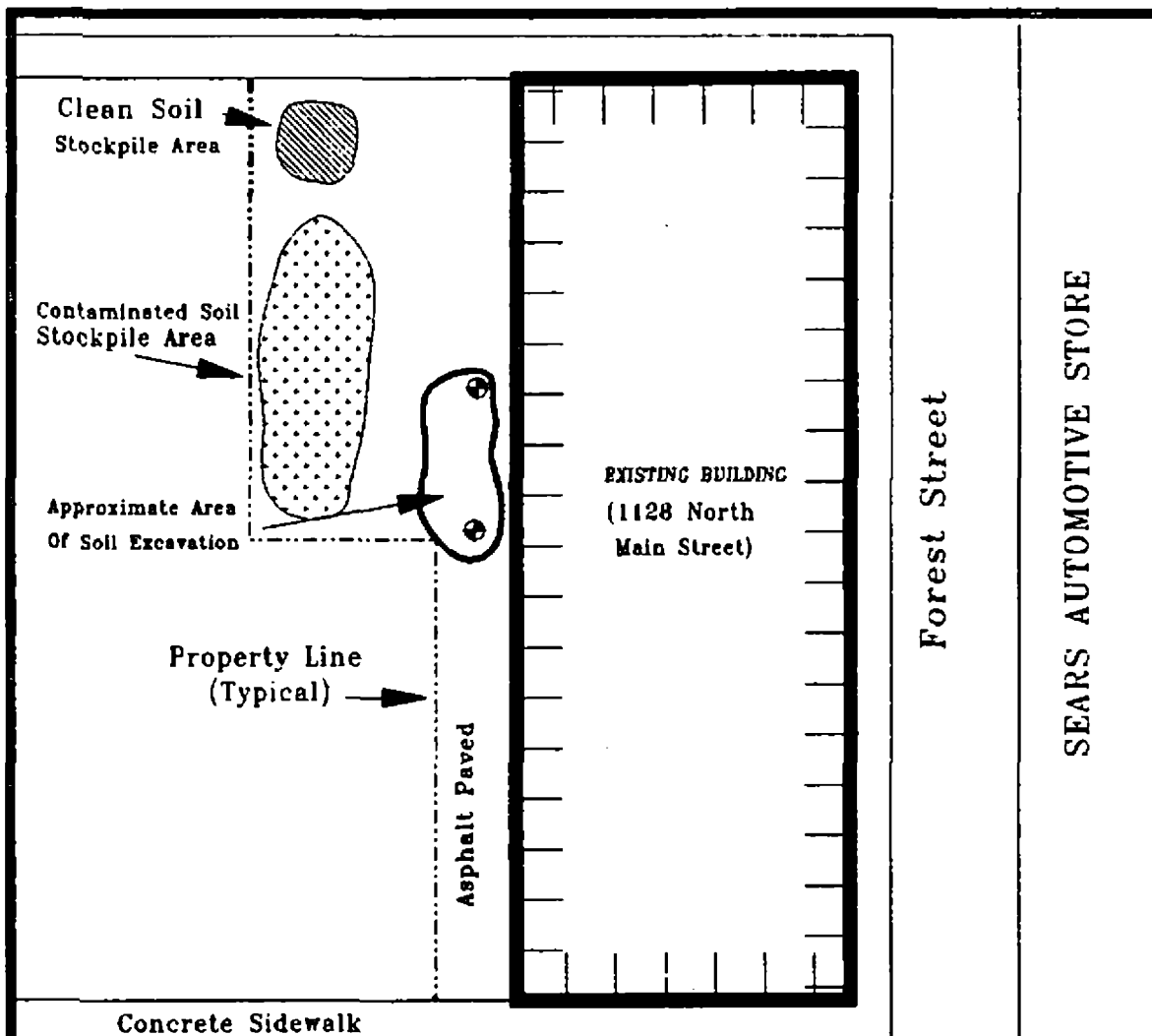
Cyn Environmental Services removed a total of 305.38 tons of stockpiled soil from the subject property on Wednesday and Thursday, 17-18 February, 1993. Since the backfill in the excavated area had settled, one truckload of gravel was brought in to level the hole which was formed by the settling fill (at no additional cost to the client).

### 3.0 CONCLUSIONS

Triangle Environmental monitored the removal of petroleum contaminated soil from the Ethan Allen Furniture site, North Main Street, Providence, Rhode Island, between February 3-18, 1993. The petroleum contaminated soil was the result of a leaking underground storage tank removed from the site in December of 1992 by Resource Control Associates and Cyn Environmental Services.

It is the opinion of Triangle Environmental that the petroleum contaminated soil has been removed from the site in accordance with the RIDEM cleanup criteria of 300 ppm established for the site. Based on the groundwater classification of the area (Class GB) and the lack of sensitive receptors in the area of the project site, it is also the opinion of Triangle Environmental that any petroleum constituents which may have reached the water table and migrated in the downgradient direction from the site will not significantly degrade the environment beyond that which is typical of an urbanized area.

If there are any questions concerning the contents of this report, please do not hesitate to contact Jonathan E. Twining of Triangle Environmental for further information.



— TRIANGLE — Z

TRIANGLE ENVIRONMENTAL

175 Metro Center Blvd.

Warwick, R.I. 02886

SCALE: 1"=45 FT

APPROVED BY:

DRAWN BY: JET

DATE: 2/24/93

REVISED:

Site Plan Depicting Areas of Excavation and Stockpiling

Ethan Allen Site, 1128 N. Main Street, Providence, RI

DRAWING NO. 9317



# R.I. Analytical

Specialists in Environmental Services

## CERTIFICATE OF ANALYSIS

Tomal Realty  
Attn: Mr. Steve Ferdinandi  
c/o McDonald Ferdinandi & Mastrati  
1441 Park Avenue  
Cranston, RI 02920

DATE RECEIVED: 02/03/93  
DATE REPORTED: 02/04/93  
P.O. #:  
INVOICE #: F1523

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**SAMPLE DESCRIPTION:** One (1) solid sample labelled Ethan Allen  
Furniture Site, Providence, RI, Project 9317

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Subject sample, collected by RIAL personnel, has been analyzed by  
our laboratory with the following results:

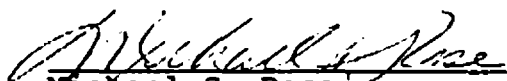
PARAMETER	RESULTS
Total Petroleum Hydrocarbons	1,330 mg/kg*

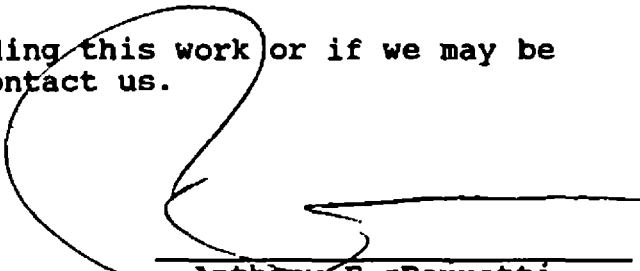
\* Calculated on a dry weight basis.

Reference: Test Methods for Evaluating Solid Waste, Physical/  
Chemical Methods, U.S. EPA, SW-846, July 1982,  
second edition. Revised December 1987

If you have any questions regarding this work or if we may be  
of further assistance, please contact us.

Approved by:

  
Michael S. Rose  
Laboratory Manager

  
Anthony E. Perrotti  
President

tom:cmc



# R.I. Analytical

Specialists in Environmental Services

## CERTIFICATE OF ANALYSIS

Tomal Realty  
Attn: Mr. Steve Ferdinandi  
c/o McDonald Ferdinandi & Mastrati  
1441 Park Avenue  
Cranston, RI 02920

DATE RECEIVED: 02/03/93  
DATE REPORTED: 02/08/93  
P.O. #:  
INVOICE #: F1538

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**SAMPLE DESCRIPTION:** Three (3) solid samples labelled Ethan Allen Furniture Site, Providence, RI, Project 9317 (Post Cleanup Samples)

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Subject sample, collected by RIAL personnel, has been analyzed by our laboratory with the following results:

SAMPLE ID	TOTAL PETROLEUM HYDROCARBONS
Bottom of Tank Pit	47.0 mg/kg*
West Wall of Tank Pit	<24.1 "
South Wall of Tank Pit	<23.4 "

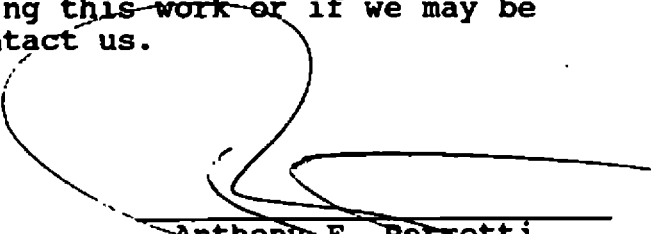
\* Calculated on a dry weight basis.

Reference: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, U.S. EPA, SW-846, July 1982, second edition. Revised December 1987

If you have any questions regarding this work or if we may be of further assistance, please contact us.

Approved by:

  
Michael S. Rose  
Laboratory Manager

  
Anthony E. Perrotti  
President



**R.I. Analytical**

Specialists in Environmental Services

**CERTIFICATE OF ANALYSIS**

Tomal Realty  
c/o McDonald, Ferdinand, & Mastrati  
Attn: Mr. Steve Ferdinand  
1441 Park Avenue  
Cranston, RI 02920

**DATE RECEIVED:** 02/03/93  
**DATE REPORTED:** 02/11/93  
**P.O. #:**  
**INVOICE #:** F1537

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**SAMPLE DESCRIPTION:** Two (2) solid samples from Ethan Allen Furniture Site, Providence, RI, disposal (Project #9317)

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Subject samples, collected by RIAL personnel, have been analyzed by our laboratory with the attached results.


**Reference:** Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, U.S. EPA, SW-846, July 1982, second edition. Revised December 1987

TCLP Procedure, Federal Register, Vol. 55, No. 126, Friday, June 29, 1990.

If you have any questions regarding this work, or if we may be of further assistance, please contact us.

Approved By:

  
Michael S. Rose  
Laboratory Manager

  
Anthony E. Perrotti  
President

tom:sf

**CERTIFICATE OF ANALYSIS**

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Tomal Realty  
Date Received: 02/03/93  
Date Reported: 02/11/93  
Invoice #: F1537

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**Volatile Organic Compounds  
Method #8010/8020**

chloromethane  
bromomethane  
vinyl chloride  
dichlorodifluoromethane  
chloroethane  
methylene chloride  
trichlorofluoromethane  
1,1-dichloroethylene  
1,1-dichloroethane  
trans-1,2-dichloroethylene  
chloroform  
1,2-dichloroethane  
1,1,1-trichloroethane  
carbon tetrachloride  
bromodichloromethane  
1,2-dichloropropane  
cis-1,3-dichloropropylene  
trichloroethylene  
trans-1,3-dichloropropylene  
1,1,2-trichloroethane  
dibromochloromethane  
bromoform  
tetrachloroethylene  
1,1,2,2-tetrachloroethane  
chlorobenzene  
2-chloroethyl vinyl ether  
dichlorobenzenes  
benzene  
toluene  
ethylbenzene  
xylenes

**Detection Limit: 1 mg/kg**

**RI ANALYTICAL LABORATORIES, INC.**

**CERTIFICATE OF ANALYSIS**

Tomal Realty

**DATE REPORTED:** 02/11/93**DATE RECEIVED:** 02/03/93**INVOICE #:** F1537

PARAMETER	SAMPLE #1	SAMPLE #2
Characteristic of Corrosivity: pH	6.7 SU	6.9 SU
Characteristic of Ignitibility Flash Point (c/c)	>200°F	>200°F
Physical State	Solids, No Free Liquid	Solids, No Free Liquid
Cyanide (total)*	<0.20 mg/kg	<0.20 mg/kg
Total Petroleum Hydrocarbons*	561 "	601 "
Polychlorinated Biphenyls (Method #8080):*		
Aroclor 1016	<0.1 mg/kg	<0.1 mg/kg
Aroclor 1221	<0.1 "	<0.1 "
Aroclor 1232	<0.1 "	<0.1 "
Aroclor 1242	<0.1 "	<0.1 "
Aroclor 1248	<0.1 "	<0.1 "
Aroclor 1254	<0.1 "	<0.1 "
Aroclor 1260	<0.1 "	<0.1 "
Volatile Organic Compounds: (Method #8010/8020)	ND	ND
<b>Toxicity Characteristic Leaching Procedure:</b>		
Metals:		
Arsenic	<0.005 mg/l	<0.005 mg/l
Barium	0.26 "	0.22 "
Cadmium	0.02 "	<0.01 "
Chromium	0.03 "	<0.03 "
Lead	0.16 "	0.18 "
Mercury	<0.0005 "	<0.0005 "
Selenium	<0.005 "	<0.005 "
Silver	<0.02 "	<0.02 "

\*Calculated on dry weight basis.

Note: A list of other volatile organic compounds tested for and their detection limits is attached.

**RI ANALYTICAL LABORATORIES, INC.**





**R.I. Analytical**

Specialists in Environmental Services

**CERTIFICATE OF ANALYSIS**

CYN Environmental Services  
Attn: Mr. Don Heath  
520 Allens Avenue  
Providence, RI 02905

DATE RECEIVED: 02/16/93  
DATE REPORTED: 02/17/93  
P.O. #  
INVOICE #: F1759

**SAMPLE DESCRIPTION:** One (1) soil sample from Ethan Allen Furniture Site,  
Providence, RI (Disposal)

Subject sample has been analyzed by our laboratory with the following results:

PARAMETER	RESULTS
Total Petroleum Hydrocarbons	126 mg/kg*
Paint Filter	solids; no free liquids
Characteristic of Reactivity: Sulfide Generation	<0.25 mg/kg*

\* Calculated on a dry weight basis.

Reference: Test Methods for Evaluating Solid Waste. Physical/  
Chemical Methods, U.S. EPA, SW-846, July 1982,  
second edition. Revised December 1987

If you have any questions regarding this work, or if we may be of further assistance, please contact us.

Approved By:

\_\_\_\_\_  
Michael S. Rose  
Laboratory Manager

\_\_\_\_\_  
Anthony E. Perrotti  
President

cyn:cmc