United States Army
Fort Monmouth, New Jersey

Underground Storage Tank Closure and Site Investigation Report

Building 9307
Camp Evans Area

NJDEP UST Registration No. 90029-32

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EXECUTIVE SUMMARY

UST Closure

On September 10, 1997, a steel underground storage tank (UST) was closed by removal at the Camp Evans area of the U.S. Army Fort Monmouth, Fort Monmouth, New Jersey. The UST, New Jersey Department of Environmental Protection (NJDEP) Registration No. 90029-32 (Fort Monmouth Identification No. 9307), was located northwest of Building 9307 in the Camp Evans area of Fort Monmouth. The UST was a 1,000-gallon No. 2 fuel oil tank. The UST fill port was located directly above the southern end of the tank.

Site Assessment

The site assessment was performed by Tetra Tech EM Inc. (Tetra Tech) and SMC Environmental Services Group (SMC). One hole approximately 0.25-inch in diameter was noted on the north side of the UST; however, no evidence of potentially contaminated soil was observed around the tank. Samples collected at the time the UST was removed contained total petroleum hydrocarbons (TPHC) at up to 1,104.66 milligrams per kilogram (mg/kg). After additional soil was removed, TPHC concentrations in the remaining soil range from nondetect to 476.74 mg/kg. The total amount of soil removed from the excavation was 25 cubic yards.

Site Restoration

After receipt of all post-excavation soil sampling results, the excavation was backfilled to grade with clean native soil from the Building 9307 area, as well as clean soil imported from the New Jersey Sand and Gravel Company. The excavation site was then restored to its original condition.

Conclusions and Recommendations

Based on post-excavation soil sampling results, TPHC concentrations in remaining soil do not exceed the NJDEP soil cleanup criterion for total organic contaminant of 10,000 mg/kg, or the more stringent soil cleanup criteria of 1,000 mg/kg TPHC used by Fort Monmouth, at the former location of the UST or associated piping. No further action is proposed with regard to the closure and site assessment of UST No. 90029-32 at Building 9307.

1.0 UNDERGROUND STORAGE TANK DECOMMISSIONING ACTIVITIES

One underground storage tank (UST), New Jersey Department of Environmental Protection (NJDEP) Registration No. 90029-32, was closed at Building 9307 at the Camp Evans area of U.S. Army Fort Monmouth, Fort Monmouth, New Jersey on September 10, 1997. The UST was a steel 1,000-gallon tank containing No. 2 fuel oil.

The UST removal was performed in accordance with the Fort Monmouth UST Management Plan (S.O.P. Number 19), which had previously been approved by the NJDEP. The signed site assessment summary form for UST No. 90029-32 is included in Appendix A.

Based on an inspection of the UST, field screening of subsurface soil, and soil sample analytical results, Tetra Tech has concluded that no significant historical discharges are associated with UST No. 90029-32 or associated piping.

This report was prepared based on information collected at the time of UST closure. Section 1 of this UST closure and site investigation report provides a site description and summarizes UST removal activities. Section 2 describes site investigation activities, including field screening and soil sampling. Section 3 presents the post-excavation soil sampling results. Conclusions and recommendations are presented in Section 4 of this report.

1.1 SITE DESCRIPTION

Building 9307 is located in the Camp Evans area of the Fort Monmouth Army Base as shown in Figure 1. UST No. 90029-32 was located northwest of Building 9307 and associated piping ran approximately 6 feet southeast from the UST to Building 9307. The UST fill port area was located directly above the southern end of the tank. A site map is provided in Figure 1 showing the location of the UST removal relative to Building 9307.

1.2 UNDERGROUND STORAGE TANK EXCAVATION AND CLEANING

Prior to UST decommissioning activities, surficial soil was excavated to expose the UST and associated piping. All free product present in the piping was drained into the UST. The UST was not purged prior to the removal of the piping because of the low volatility of No. 2 fuel oil. After the removal of associated piping, soil excavation continued to uncover the UST. Because of a malfunction with the drum vacuum equipment, the removal contractor, SMC Environmental Services Group (SMC), removed the tank from the ground prior to opening and cleaning the tank.

After the UST was removed from the excavation, it was staged on polyethylene sheeting and examined for holes. One hole approximately 0.25-inch in diameter was observed by the Tetra Tech site manager and the SMC subsurface evaluator. Appendix B provides photographs of the tank. Soil around the UST was screened visually and with a photoionization detector (PID) and flame ionization detector (FID) for contamination. No evidence of contamination was observed or detected by the PID/FID. Visual and PID/FID soil screening was also performed along piping associated with the UST. No contamination was noted anywhere along the piping length.

After removal of the UST, polyethylene sheeting was placed in the excavation and the excavation was backfilled because of the potential for heavy precipitation overnight and subsequent undermining of the building foundation.

The following day, the UST was cut open with a nonsparking pneumatic cutter and the remaining contents of the tank (approximately 55 gallons) were removed with a drum vacuum device. SMC completed cleaning the UST by wiping the interior of the tank with oil absorbent pads.

The 55 gallons removed from the UST were transported by Lorco Petroleum Company to its NJDEP-approved petroleum recycling and disposal facility in Old Bridge, New Jersey. Appendix E provides a copy of the waste manifest for the off-site transport of the 55 gallons of sludge.

1.3 UNDERGROUND STORAGE TANK TRANSPORTATION AND DISPOSAL

The cleaned tank was transported to Mazza and Sons, Inc. in Tinton Falls, New Jersey for disposal in compliance with all applicable regulations and laws. Appendix D provides a copy of the UST Disposal Certificate. Prior to transport, the UST was labeled with the following information:

- Site of origin
- Contact person
- NJDEP UST facility identification number
- Name of transporter and contact person
- Destination site and contact person

1.4 MANAGEMENT OF EXCAVATED SOILS

Post-excavation soil sampling locations are shown in Figures 2 and 3 and discussed in Section 2.2. Based on PID/FID air monitoring results and total petroleum hydrocarbon (TPHC) results from post-excavation soil samples, soil at the UST9307B3 sampling location was contaminated. After additional excavation was performed and post-excavation sampling results confirmed that the contaminated soil had been removed, the clean excavated soil and imported clean fill were used to backfill the UST excavation. Contaminated soil was removed to the staging area for disposal off site at a later date.

2.0 SITE INVESTIGATION ACTIVITIES

In accordance with NJDEP's "Technical Requirements for Site Remediation" and "Field Sampling Procedures Manual," Tetra Tech and SMC personnel conducted the site assessment. The site investigation was managed by Tetra Tech and performed by SMC. All analyses were performed and results reported by the U.S. Army Fort Monmouth Environmental Laboratory, a NJDEP-certified testing laboratory operated by TECOM-Vinnell Services, Inc. (TVS). All sampling was performed under the direct supervision of a NJDEP certified subsurface evaluator in accordance with methods described in NJDEP's "Field Sampling Procedures Manual" dated 1992. Sampling frequency and parameters analyzed complied with applicable regulations at the date of UST closure specified in NJDEP-BUST's document "Interim Closure Requirements for Underground Storage Tank Systems" dated October 1990; revisions dated November 1, 1991. All records of site investigation activities are maintained by Tetra Tech and the Fort Monmouth Department of Public Works (DPW) Environmental Office.

The following parties participated in UST closure and site investigation activities:

- Subsurface Evaluator: David H. Daniels
  Employer: SMC Environmental Services Group
  Telephone No.: (215) 788-7844
  NJDEP Certification No.: 0010279

- Analytical Laboratory: U.S. Army Fort Monmouth Environmental Laboratory
  Contact Person: Daniel K. Wright
  Telephone No.: (732) 532-4359
  NJDEP Company Certification No.: 13461

- Hazardous Waste Hauler: Lorco Petroleum Company
  Contact Person: Dan MacKay
  Telephone No.: (732) 721-0900
  NJDEP Hazardous Waste Hauler No.: S6247

2.1 FIELD SCREENING/MONITORING

Visual screening and field screening using a PID/FID were performed by a NJDEP certified subsurface evaluator to identify potentially contaminated material. Soil excavated from around the UST and associated piping, as well as the UST excavation sidewalls and bottom, did not exhibit evidence of contamination at the time of the UST removal.

2.2 SOIL SAMPLING

On September 10, 1997, after UST removal, post-excavation soil samples UST9307B1, UST9307B2 (Duplicate of UST9307B1), UST9307B3, UST9307W, UST9307E, UST9307N, UST9307S, and UST9307RF were collected from seven locations in the UST excavation. Figure 2 presents the sampling locations. Excavation sidewall samples were collected at the edge of the former UST location, and bottom samples were collected from 0 to 6-inches beneath the former UST location, or 7 to 7.5-feet below ground surface (bgs). The sidewall samples were collected from 6.5 to 7-feet bgs. Sample UST9307RF was collected from next to Building 9307 along the former return/feed line piping length of the excavation, which was approximately 6 feet long. Sample UST9307RF was collected from 3 to 3.5-feet bgs. All samples were analyzed for TPHC and total solids.

Analytical results for the original post-excavation samples revealed 1,104.66 milligrams per kilogram (mg/kg) TPHC at the UST9307B3 sample location. This concentration exceeds 1,000 mg/kg TPHC, which is NJDEP's criterion for additional soil removal/remediation or for required VOC sampling. As

a result, on October 14, 1997, Tetra Tech and SMC excavated additional soil from the western half of the original UST excavation and collected post-excavation soil samples 9307B4, 9307B5 (duplicate of 9307B4), 9307B6, 9307N21, 9307W21, and 9307S21 from a total of five sampling locations. Bottom samples were collected from 10 to 10.5 feet bgs. Sidewall samples were collected from 9.5 to 10 feet bgs. In addition, samples 9307OBS1, 9307OBS2, and 9307OBS3 were collected from three locations on the overburden soil pile to verify that the pile was not contaminated and could be used as clean backfill for the excavation. Figure 3 presents the additional post-excavation sampling locations.

Post-excavation soil samples were collected in accordance with standard sampling procedures specified in NJDEP's Field Sampling Procedures Manual" dated 1992.. Samples were chilled and delivered to the U.S. Army Fort Monmouth Environmental Laboratory in Fort Monmouth, New Jersey, for analysis. A summary of post-excavation sampling activities, including parameters analyzed for, is provided in Table 1.

3.0 SOIL SAMPLING RESULTS

To evaluate soil conditions after removal of the UST and associated piping, post-excavation soil samples were collected from seven locations on September 10, 1997. All samples were analyzed for TPHC and total solids. Post-excavation sampling results were compared to the NJDEP residential direct contact soil cleanup criterion of 10,000 mg/kg for total organic contaminants (N.J.A.C. 7:26D and revisions dated February 3, 1994) and the more stringent soil cleanup criterion of 1,000 mg/kg used by Fort Monmouth. A summary of the analytical results and comparison to the NJDEP soil cleanup criterion is provided in Table 2. Soil sampling locations are shown in Figures 2 and 3. The analytical data package is provided in Appendix C.

One of the post-excavation soil samples collected on September 10, 1997, from the UST excavation and from below piping associated with the UST contained 1,104.66 mg/kg of TPHC, which exceeded the NJDEP soil cleanup criterion of 1,000 mg/kg TPHC, requiring additional soil removal remediation or required VOC sampling. The remainder of the samples contained TPHC concentrations ranging from nondetect to 476.74 mg/kg.

On October 14, 1997 (see Section 2.2), following the removal of the potentially contaminated soil from the excavation, an additional five soil samples were collected. All samples from the five sampling locations contained nondetectable concentrations of TPHC.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The analytical results for all post-excavation soil samples collected from the UST closure excavation at Building 9307 were below the NJDEP soil cleanup criterion for total organic contaminants.

Based on post-excavation sampling results, soil containing TPHC concentrations exceeding the NJDEP soil cleanup criterion for total organic contaminants of 10,000 mg/kg, or the more stringent Fort Monmouth soil cleanup criterion of 1,000 mg/kg TPHC, no longer exist in the former location of the UST or associated piping; therefore, no further action is proposed with regard to the closure and site assessment of UST No. 90029-32 at Building 9307.

Legend of Sample Identifications
Camp Evans Area
Wall Township, New Jersey

B	Sample from the bottom of the excavation
W	Samples from the west sidewall of the excavation
E	Samples from the east sidewall of the excavation
N	Samples from the north sidewall of the excavation
S	Samples from the south sidewall of the excavation
RF	Sample from beneath the former location of the return/feed lines of the UST
VL	Sample from beneath the former location of the vent line to the UST
OBS	Sample from the overburden soil pile of a UST excavation to determine if the soil can be used as backfill or must be transported to the contaminated soil stockpile
N21	Sample collected from the north sidewall on the second day of sampling (from a particular UST excavation) first sample (from that particular sidewall or area of the excavation) (NOTE: The "21" designation can be used with any of the letter combinations listed above).
FPS	Soil located directly adjacent to the fill port of the tank ("Fill Port Soil").
BFP	Soil located beneath the fill port of the tank ("Beneath Fill Port")
9116CSP	Contaminated soil pile from the UST-9116 excavation
DS	Deep Sample
9196BE1A	Geoprobe boring performed on the east side of the UST-9196 excavation to investigate contamination from the leaking UST. Last number denotes the boring number and last letter indicates which sample in the sequence.
RFL/B6	Sample from remedial excavation of a leaking remote fill line/what area of the excavation the sample was collected.
RF(CT)	Samples was collected from return feed lines consisting of copper tubing.
RFL(2)	Samples collected from a second remote fill line for a particular UST excavation
RB1	Remedial excavation for a particular building. The second letter and number designate the particular area of the excavation where the sample was collected
CNFRM	Confirmatory sample to confirm that contamination has been removed
CNFM	Another designation for a confirmatory sample
R/F/VL	Return/feed/vent lines. Used at buildings where the return/feed lines and the vent lines were located close together and one sample could be collected for both lines
SCNT1	Sample collected at a location of suspected contamination
(W)E1	Sample collected from the eastern sidewall of the western half of the excavation (remedial excavation).
TP	Test pit/trench
HWAB	Hazardous waste area building (former location)
AST	Above ground storage tank
9105ASTB1	Sample collected at the former location of an AST at the specified building
DEL	Delineation sample to document the extent of contamination
SD	Sample collected from a storm drain
SW	Sample collected from a sidewall of a remedial excavation
CTR	Copper tubing run
CSP-1	Clean soil pile

Table 1
Summary of Post-Excavation Sampling Activities
Building 9307, Camp Evans Area
Wall Township, New Jersey

Sample ID	Date Collected	Date Analysis Started	Matrix	Sample Type	Analytical Parameters*	Analysis Method
UST9307B1	9/10/97	9/11/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
UST9307B2	9/10/97	9/11/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
UST9307B3	9/10/97	9/11/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
UST9307W	9/10/97	9/11/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
UST9307E	9/10/97	9/11/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
UST9307N	9/10/97	9/11/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
UST9307S	9/10/97	9/11/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
UST9307RF	9/10/97	9/11/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
9307OBS1	10/14/97	10/16/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
9307OBS2	10/14/97	10/16/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
9307OBS3	10/14/97	10/16/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
9307B4	10/14/97	10/16/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
9307B5	10/14/97	10/16/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
9307B6	10/14/97	10/16/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
9307N21	10/14/97	10/16/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
9307W21	10/14/97	10/16/97	Soil	Post-Excavation	TPHC	OQA-QAM-025
9307S21	10/14/97	10/16/97	Soil	Post-Excavation	TPHC	OQA-QAM-025

Note:

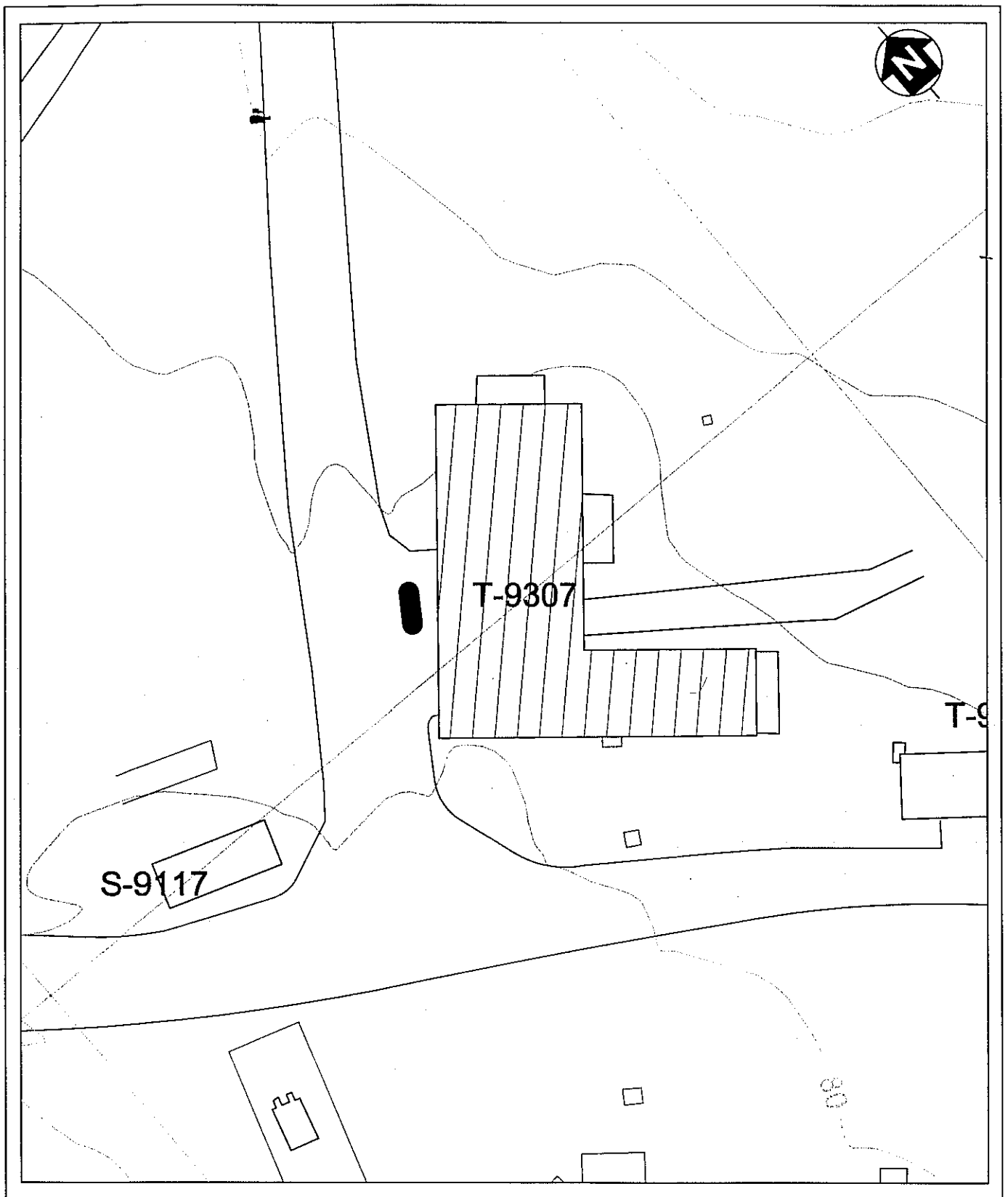
* TPHC Total petroleum hydrocarbons

Table 2
Post-Excavation Soil Sampling Results
Building 9307, Camp Evans Area
Wall Township, New Jersey

Sample ID	Sample Laboratory ID	Sample Date	Analysis Date(s)	Analytical Method Used	Method Detection Limit (mg/kg)	Result (mg/kg)	NJDEP Soil Cleanup Criteria* (mg/kg)	Exceeds Cleanup Criteria
UST9307B1	2981.01	9/10/97	9/11 - 13/97	TPHC	161	278.59	10,000	No
UST9307B2	2981.02	9/10/97	9/11 - 13/97	TPHC	161	ND	10,000	No
UST9307B3	2981.03	9/10/97	9/11 - 13/97	TPHC	155	1,104.66	10,000	No
UST9307W	2981.04	9/10/97	9/11 - 13/97	TPHC	165	ND	10,000	No
UST9307E	2981.05	9/10/97	9/11 - 13/97	TPHC	165	ND	10,000	No
UST9307N	2981.06	9/10/97	9/11 - 13/97	TPHC	158	201.16	10,000	No
UST9307S	2981.07	9/10/97	9/11 - 13/97	TPHC	160	ND	10,000	No
UST9307RF	2981.08	9/10/97	9/11 - 13/97	TPHC	161	476.74	10,000	No
9307OBS21	3065.01	10/14/99	10/16 - 17/97	TPHC	170	ND	10,000	No
9307OBS22	3065.02	10/14/99	10/16 - 17/97	TPHC	163	ND	10,000	No
9307OBS23	3065.03	10/14/99	10/16 - 17/97	TPHC	163	ND	10,000	No
9307B4	3065.04	10/14/99	10/16 - 17/97	TPHC	159	ND	10,000	No
9307B5	3065.05	10/14/99	10/16 - 17/97	TPHC	154	ND	10,000	No
9307B6	3065.06	10/14/99	10/16 - 17/97	TPHC	153	ND	10,000	No
9307N21	3065.07	10/14/99	10/16 - 17/97	TPHC	157	ND	10,000	No
9307W21	3065.08	10/14/99	10/16 - 17/97	TPHC	155	ND	10,000	No
9307S21	3065.09	10/14/99	10/16 - 17/97	TPHC	158	ND	10,000	No

Note:

* Tetra Tech EM Inc. used the NJDEP limit of 1,000 ppm of TPHC before sampling for volatiles is required as a soil cleanup criteria.
ND Not detected
TPHC Total petroleum hydrocarbons
Sample area was further remediated and resampled.



UNDERGROUND STORAGE TANK

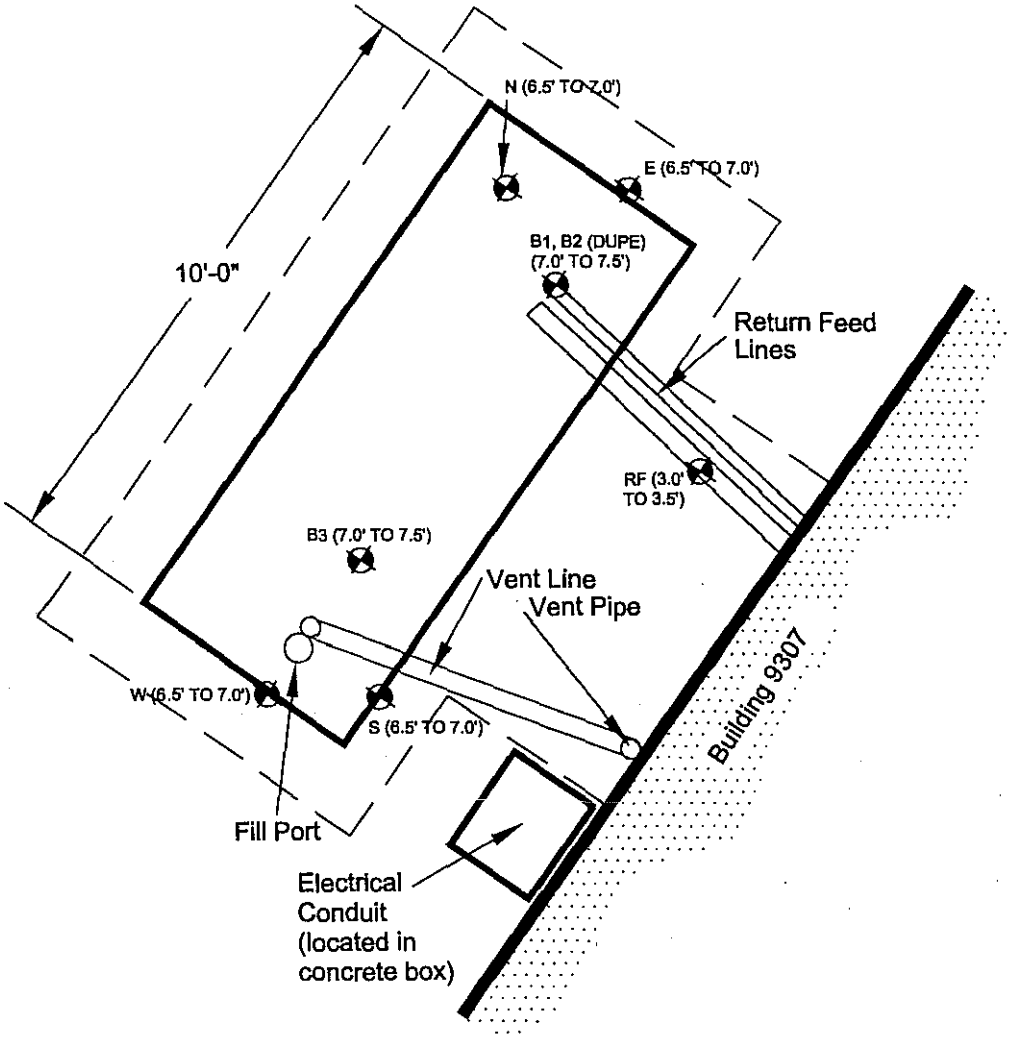
25 0 25 50
SCALE

EVANS AREA
FORT MONMOUTH, NEW JERSEY

FIGURE 1
BUILDING 9307 - UST REMOVAL LOCATION MAP

TETRA TECH EM INC.

9307.DWG ASC 01/19/99



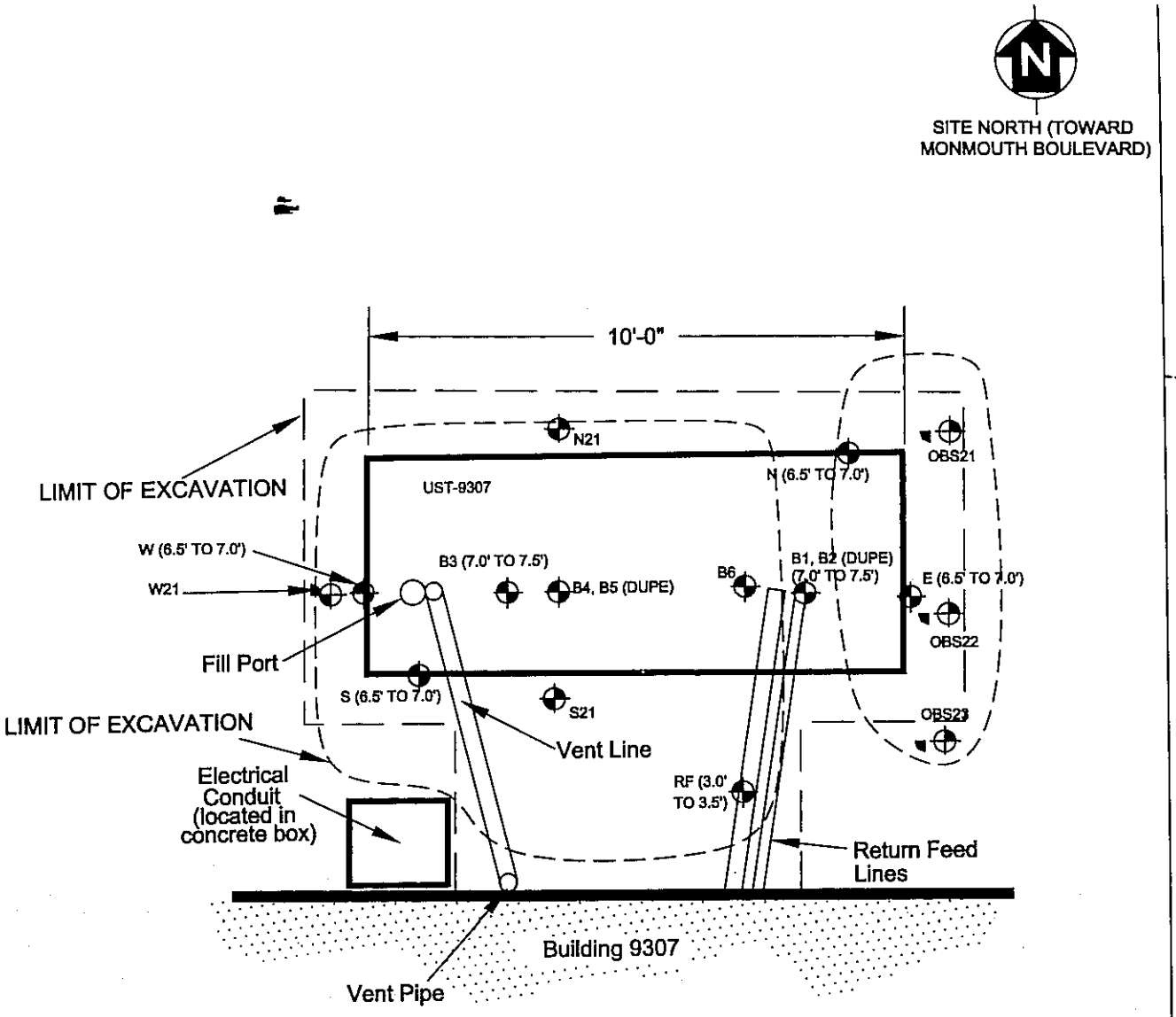
NOTE: All sample designations are preceded by "UST-9307".

1.5 0 1.5 3
APPROXIMATE SCALE

EVANS AREA
FORT MONMOUTH, NEW JERSEY

FIGURE 2
BUILDING 9307 - UST REMOVAL
AND SOIL SAMPLE LOCATIONS

TETRA TECH EM INC.



NOTES:

1) ALL SAMPLE DESIGNATIONS ARE PRECEDED BY "UST-9307" (FOR ORIGINAL EXCAVATION)
2) ALL SAMPLE DESIGNATIONS ARE PRECEDED BY "9307-" (FOR REMEDIATION EXCAVATION)
3) A) ⊕ SAMPLES FROM ORIGINAL EXCAVATION
   B) ⊕ SAMPLES FROM REMEDIATION EXCAVATION
4) SAMPLE DEPTHS (FROM REMEDIATION EXCAVATION)
   A) B4,B5,B6: 10.0' TO 10.5'
   B) N21,S21,W21: 9.5' TO 10.0'
   C) OBS21,OBS22,OBS23: PILE
5) UST-9307 WAS 10' LONG AND 4' IN DIAMETER

— — ORIGINAL EXCAVATION
— — — REMEDIATION EXCAVATION AND SOIL PILE

1.5 0 1.5 3
APPROXIMATE SCALE

EVANS AREA
FORT MONMOUTH, NEW JERSEY

FIGURE 3
BUILDING 9307
UST REMEDIAL SOIL SAMPLE LOCATIONS

TETRA TECH EM INC.

APPENDIX A

SIGNED SITE ASSESSMENT SUMMARY FORM

UST NO. 90029-32

(12/97) **New Jersey Department of Environmental Protection**

Site Remediation Program

UST Site/Remedial Investigation Report Certification Form

A. Facility Name: U.S. Army, Fort Monmouth

Facility Street Address: Building 167

Municipality: Fort Monmouth, N.J. County: Monmouth

Block: _____ Lot(s): _____ Telephone Number: (732) 532-6224

B. Owner (RP)'s Name: U.S. Army, Fort Monmouth, Directorate of Public Works

Street Address: Building 167 City: Fort Monmouth

State: N.J. Zip: 07703 Telephone Number: (732) 532-6224

C. (Check as appropriate)

- Site Investigation Report (SIR) $500 Fee
- Remedial Investigation Report (RIR) $1000 Fee

D. (Complete all that apply)

- Assigned Case Manager: Mr. Ian Curtis
- UST Registration Number: (7 digits) 900029-32
- Incident Report Number (10 or 12 digits)
- Tank Closure Number C(N)9 (7 characters)

E. Certification by the Subsurface Evaluator:

The attached report conforms to the specific reporting requirements of N.J.A.C. 7:26E .....

Name: Kevin J. Phelan Signature: Kevin J. Phelan UST Cert. No.: 0018435

Firm: Tetra Tech EM, Inc. Firm's UST Cert. Number: US00457

Firm Address: 1 Bank Street, Suite 103 City: Rockaway

State: New Jersey Zip: 07866 Telephone Number: (973) 983-0507

(NOTE: Certification numbers required only if work was conducted on USTs regulated per N.J.S.A. 58:10A-21 et seq.)

F. Certification by the Responsible Party(ies) of the Facility:

The following certification shall be signed [according to the requirements of N.J.A.C. 7:14B-1.7(b)]as follows:

1. For a Corporation by a person authorized by a resolution of the board of directors to sign the document. A copy o resolution, certified as a true copy by the secretary of the corporation, shall be submitted along with the certificati
2. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or
3. For a municipality, State, federal or other public agency by either a principal executive officer or ranking elected

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals responsible for obtaining the informati that the submitted information is true, accurate, and complete. I am aware that there are significant civil penalties for submitting false, inaccurate, or incomplete information and that I am committing a crime of the fourth degree if I ma false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of I am personally liable for the penalties."

Name (Print or Type): Charles Appleby
BRAC Environmental Coordinator
Subsurface # NJDEP 2056

Signature:

Company Name: U.S. Army

APPENDIX B

PHOTOGRAPHS OF UST CLOSURE

UST NO. 90029-32

PHOTO 1: View of UST-9307 being removed from the ground (looking south/southwest).

PHOTO 2: View of a 1/4-inch hole on the underside of UST-9307 (located near the northern end the tank).

PHOTO 3: View of the sampling locations in the UST-9307 excavation (looking east/northeast).

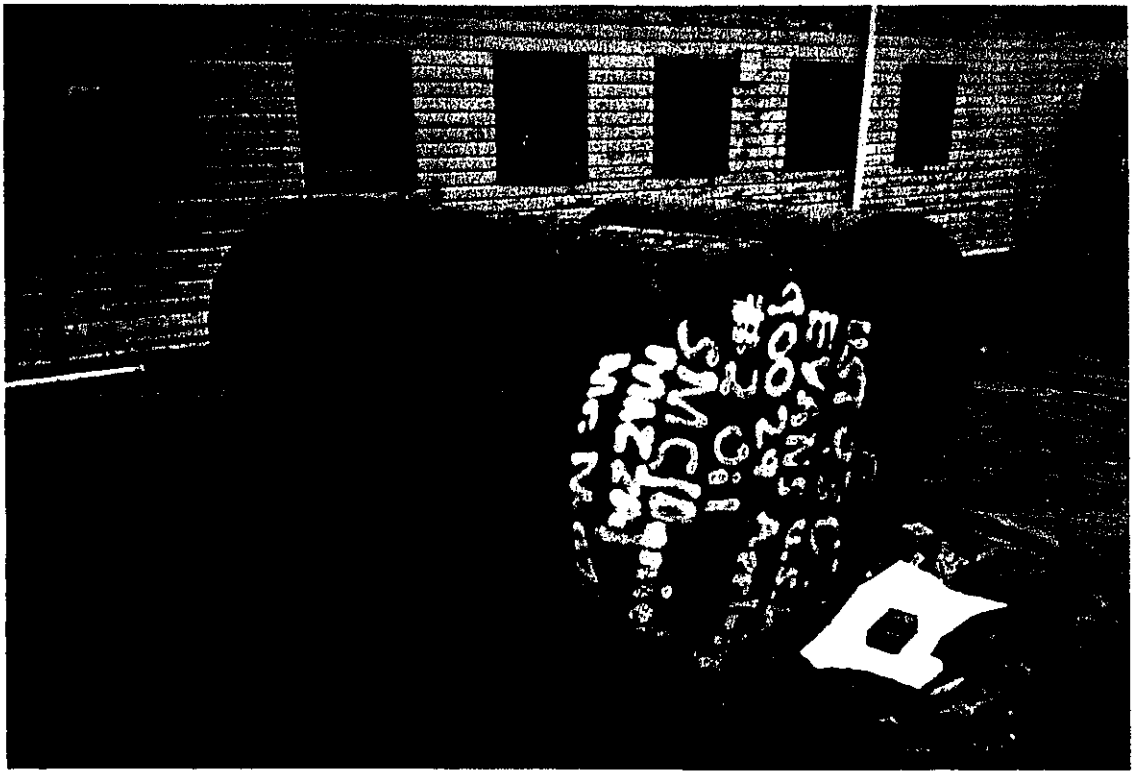


PHOTO 4: View of UST-9307 staged on the west side of Building 9061 awaiting disposal and labeled with all required information.

APPENDIX C

SOIL SAMPLE ANALYTICAL DATA PACKAGE

UST NO. 90029-32

US ARMY FT. MONMOUTH ENVIRONMENTAL LABORATORY
NJDEPE # 13461

REPORT OF ANALYSIS

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 173
Ft. Monmouth, NJ 07703

Project: Total Petroleum Hydrocarbons
97-1251
Bldg. 9307
Tetra Tech - BRAC

Project # 2981
Date Rec. 09/10/97
Date Compl. 09/13/97
Released by:

Daniel K. Wright
Laboratory Director

Method Summary

NJDEP Method OQA-QAM-025-10/97

Gas Chromatographic Determination of Total Petroleum Hydrocarbons in Soil

Fifteen grams (15g)(wet weight) of a soil sample is added to a 125 mL acid cleaned, solvent rinsed, capped Erlenmeyer flask. 15g anhydrous sodium sulfate is added to dry sample. Surrogate standard spiking solution is then added to the flask.

Twenty five milliliters(25mL) Methylene Chloride is added to the flask and it is secured on a gyrotory shaker table. The agitation rate is set to 400rpm and the sample is shaken for 30 minutes. The flask is the removed from the table and the particulate matter is allowed to settle. The extract is transferred to a Teflon capped vial. A second 25mL of Methylene Chloride is added to the flask and shaken for an additional 30 minutes. The flask is again removed and allowed to settle. The extracts are combined in the vial then transferred to a 1mL autosampler vial.

The extract is then injected directly into a GC-FID for analysis. The sample is analyzed for petroleum hydrocarbons covering a range of C8-C42 including pristane and phytane. Total Petroleum Hydrocarbon concentration is determined by integrating between 5 minutes and 22 minutes. The baseline is established by starting the integration after the end of the solvent peak and stopping after the last peak.

The final concentration of Total Petroleum Hydrocarbons is calculated using percent solid, sample weight and concentration.

PHC Conformance/Non-conformance Summary Report

	No	Yes
1. Method Detection Limits provided.	__	✓
2. Method Blank Contamination - If yes, list the sample and the corresponding concentrations in each blank.	✓	__
3. Matrix Spike Results Summary Meet Criteria. (If not met, list the sample and corresponding recovery which falls outside the acceptable range).	__	✓
4. Duplicate Results Summary Meet Criteria. (If not met, list the sample and corresponding recovery which falls outside the acceptable range).	__	✓
5. IR Spectra submitted for standards, blanks, & samples	__	NA __
6. Chromatograms submitted for standards, blanks, and samples if GC fingerprinting was conducted.	__	✓
7. Analysis holding time met.	__	✓

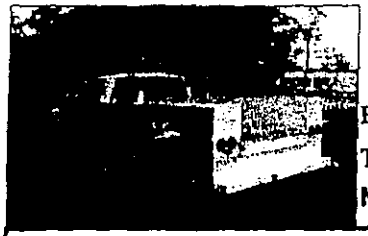
(If not met, list number of days exceeded for each sample)

Additional Comments:

Laboratory Authentication Statement

I certify under penalty of law, where applicable, that this laboratory meets the Laboratory Performance Standards and Quality Control requirements specified in N.J.A.C. 7:18 and 40 CFR Part 136 for Water and Wastewater Analyses and SW 846 for Solid Waste Analysis. I have personally examined the information contained in this report, and to the best of my knowledge, I believe that the submitted information is true, accurate, complete, and meets the above referenced standards where applicable. I am aware that there are significant penalties for purposefully submitting falsified information, including the possibility of a fine and imprisonment.

Daniel K. Wright
Laboratory Manager



Fort Monmouth Environmental Testing Laboratory

Bldg. 173, SELFM-PW-EV, Fort Monmouth, NJ 07703
Tel (908)532-4359 Fax (908)532-3484 EMail:appleby@doim6.monmouth.army.mil
NJDEP Certification #13461

Chain of Custody Record

Customer: Chuck Appleby/Tetra Tech | Project No: 97 - 1251
Phone #: (908)532 - 6224 | Location: Bldg. 9307
( )DERA ( )OMA (X)Other: BRAC
Samplers Name / Company: Kevin J. Phelan/Tetra Tech

Lab Sample I.D.	Sample Location	Date	Time	Sample Type	# bottles	Analysis Parameters: TPHC	Comments: Remarks / Preservation Method
2981 01	UST - 9307 B1 (7.0'-7.5')	9/10/97	14:01	Soil	1	X	ICE
02	UST - 9307 B2 (7.0'-7.5')		14:03			X	
03	UST - 9307 B3 (7.0'-7.5')		14:09			X	
04	UST - 9307 W (6.5'-7.0')		14:14			X	
05	UST - 9307 E (6.5'-7.0')		14:21			X	
06	UST - 9307 N (6.5'-7.0')		14:25			X	
07	UST - 9307 S (6.5'-7.0')		14:31			X	
08	UST - 9307 RF (3.0'-3.5')		14:36			X	

Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):
Kevin J. Phelan	9/10/97 1605				
Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):

Report Type: (_)Full, (X)Reduced, (_)Standard, (_)Screen / non-certified
Turnaround time: (_)Standard 4 wks, (X)Rush 3-5 Days, (X)ASAP Verbal 18 Hrs. (From Time Samples Are Relinquished To Lab)

Remarks:

Site Telephone Number: (908) 427 - 4371.

print legibly

Custody.xls7/11/97

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Client :	U.S. Army	**Lab. ID # :**	2981
	DPW. SELFM-PW-EV	**Date Rec'd:**	10-Sep-97
	Bldg. 173	**Analysis Start:**	11-Sep-97
	Ft. Monmouth, NJ 07703	**Analysis Complete:**	13-Sep-97

Analysis:	OQA-QAM-025	**UST Reg. #:**	
Matrix:	Soil	**Closure #:**	
Analyst:	D.DEINHARDT	**DICAR #:**	
Ext. Meth:	Shake	**Location #:**	BLDG.9307

Sample	Field ID	Dilution Factor	Weight (g)	% Solid	MDL (mg/kg)	TPHC Result (mg/kg)
2981.01	UST-9307B1	1.00	15.38	94.89	161	278.59
2981.02	UST-9307B2	1.00	15.41	94.73	161	ND
2981.03	UST-9307B3	1.00	15.76	96.51	155	1104.66
2981.04	UST-9307W	1.00	16.37	87.07	165	ND
2981.05	UST-9307E	1.00	15.01	95.05	165	ND
2981.06	UST-9307N	1.00	16.15	92.05	158	201.16
2981.07	UST-9307S	1.00	15.18	96.82	160	ND
2981.08	UST-9307RF	1.00	15.79	92.21	161	476.74
METHOD BLANK	11-Sep-97	1.00	15.00	100.00	157	ND

ND = Not Detected

MDL = Method Detection Limit

Daniel K. Wright
Laboratory Director

Response Factor Report FID/TCD

Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997

Calibration Files
1 =T02114.D 2 =T02113.D 3 =T02112.D
4 =T02115.D 5 =T02116.D

		Compound	1	2	3	4	5	Avg		%RSD
1)	t	C8	1.133	0.928	1.228	1.214	1.288	1.158	E4	12.09
2)	t	C10	1.413	1.154	1.267	1.255	1.336	1.285	E4	7.51
3)	t	C12	1.488	1.214	1.339	1.323	1.411	1.355	E4	7.55
4)	t	C14	1.511	1.231	1.361	1.344	1.434	1.376	E4	7.60
5)	t	C16	1.525	1.252	1.374	1.361	1.455	1.393	E4	7.38
6)	t	C18	1.744	1.383	1.559	1.529	1.636	1.570	E4	8.51
7)	t	C20	1.563	1.284	1.396	1.416	1.480	1.428	E4	7.26
8)	t	C22	1.551	1.278	1.423	1.439	1.545	1.447	E4	7.70
9)	t	C24	1.471	1.242	1.408	1.397	1.510	1.406	E4	7.28
10)	t	C26	1.346	1.115	1.280	1.285	1.398	1.285	E4	8.28
11)	t	C28	1.205	1.002	1.145	1.164	1.250	1.153	E4	8.12
12)	t	C30	1.128	0.935	1.087	1.116	1.156	1.084	E4	8.01
13)	t	C32	1.003	0.799	0.993	1.023	1.026	0.969	E4	9.90
14)	t	C34	8.616	6.327	8.921	9.130	9.000	8.399	E3	13.97
15)	t	C36	6.298	4.163	6.576	6.744	6.512	6.058	E3	17.69
16)	t	C38	3.576	2.229	4.033	4.051	3.881	3.554	E3	21.52
17)	t	C40	1.659	0.924	2.036	2.053	1.942	1.723	E3	27.48
18)	t	c42	6.708	4.052	9.651	9.619	9.092	7.825	E2	31.07
19)	T	Pristane	1.641	1.335	1.444	1.458	1.533	1.482	E4	7.66
20)	T	Phytane	1.608	1.314	1.440	1.423	1.505	1.458	E4	7.43
21)	s	o-terphenyl	2.037	1.518	1.472	1.453	1.549	1.606	E4	15.19
22)	t	TPHC - total	2.045	1.518	1.561	1.314	1.350	1.558	E4	18.77

(#) = Out of Range

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\970910\T02248.D
Acq On : 12 Sep 97 11:34 pm
Sample : 50 PPM STANDARD
Misc :
IntFile : TPHCINT.E

Vial: 2
Operator: DEINHARDT
Inst : FID/TCD
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
2	t	C10	12.849	10.310 E3	19.8	80	0.00
3	t	C12	13.551	11.095 E3	18.1	81	0.00
4	t	C14	13.764	11.337 E3	17.6	82	0.00
5	t	C16	13.934	11.502 E3	17.5	82	0.00
6	t	C18	15.700	12.961 E3	17.4	80	0.00
7	t	C20	14.278	12.207 E3	14.5	83	0.00
8	t	C22	14.472	12.174 E3	15.9	81	0.00
9	t	C24	14.056	11.883 E3	15.5	82	0.00
10	t	C26	12.848	11.304 E3	12.0	85	0.00
11	t	C28	11.528	10.238 E3	11.2	87	0.00
12	t	C30	10.844	9.528 E3	12.1	85	0.00
13	t	C32	9.689	8.502 E3	12.3	84	0.00
14	t	C34	8.399	7.270 E3	13.4	82	0.00
15	t	C36	6.058	5.027 E3	17.0	77	0.00
16	t	C38	3.554	2.805 E3	21.1	72	0.00
17	t	C40	1.723	1.275 E3	26.0#	67	-0.01
18	t	c42	782.453	545.992	30.2#	63	-0.02
19	T	Pristane	14.823	12.174 E3	17.9	83	0.00
20	T	Phytane	14.581	12.285 E3	15.7	83	0.00
21	s	o-terphenyl	16.060	12.195 E3	24.1	81	0.00
22	t	TPHC - total	15.576	12.045 E3	22.7	88	-0.04

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Surrogate Recovery Report

Lab. ID # : 2981

Location #: BLDG.9307

Sample		Surrogate Added (ppm)	Amount Recovered (ppm)	Percent Recovery
2981.01		10.00	11.65	116.48
2981.02		10.00	11.46	114.62
2981.03		10.00	11.34	113.40
2981.04		10.00	11.47	114.66
2981.05		10.00	11.12	111.19
2981.06		10.00	11.21	112.06
2981.07		10.00	11.03	110.28
2981.08		10.00	10.92	109.20
METHOD BLANK	11-Sep-97	10.00	11.72	117.20

Surrogate Added : o-Terphenyl

9/15/97

U.S. Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Matrix Spike Recovery Report

Lab. ID # : 2981
Location #: BLDG.9307

Sample	Spike Amount Added (ppm)	Sample Amount (ppm)	Matrix Spike Amount (ppm)	Percent Recovery	QC Limits %
2980.12MS	1000	0.00	1047.47	104.75	75-125
2980.12MSD	1000	0.00	1095.07	109.51	75-125

RPD	4.44	20.00

9/15/97

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Blank Spike Recovery Report

Lab. ID # : 2981

Location #: BLDG.9307

Sample	Date Extracted	Spike Amount Added (ppm)	Matrix Spike Amount (ppm)	Percent Recovery	QC Limits %
Blank Spike	11-Sep-97	1000	1011.63	101.16	75-125

9/15/97

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\970910\T02249.D Vial: 69
Acq On : 13 Sep 97 12:26 am Operator: DEINHARDT
Sample : 2981.01 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Sep 15 8:06 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
21) s o-terphenyl	13.65	187056	11.648	mg/L
Spiked Amount 10.000	Recovery = 116.48%			
Target Compounds				
1) t C8	0.00	0	N.D.	mg/L
2) t C10	0.00	0	N.D.	mg/L
3) t C12	0.00	0	N.D.	mg/L
4) t C14	0.00	0	N.D.	mg/L
5) t C16	0.00	0	N.D.	mg/L
6) t C18	0.00	0	N.D.	mg/L
7) t C20	0.00	0	N.D.	mg/L
8) t C22	0.00	0	N.D.	mg/L
9) t C24	14.72	5370	0.382	mg/L
10) t C26	15.40	2887	0.225	mg/L
11) t C28	16.04	2554	0.222	mg/L
12) t C30	16.63	2109	0.194	mg/L
13) t C32	0.00	0	N.D.	mg/L
14) t C34	0.00	0	N.D.	mg/L
15) t C36	0.00	0	N.D.	mg/L
16) t C38	0.00	0	N.D.	mg/L
17) t C40	0.00	0	N.D.	mg/L
18) t c42	0.00	0	N.D.	mg/L
19) T Pristane	0.00	0	N.D.	mg/L
20) T Phytane	0.00	0	N.D.	mg/L
22) t TPHC - total	13.65	1266594	81.315	mg/L m

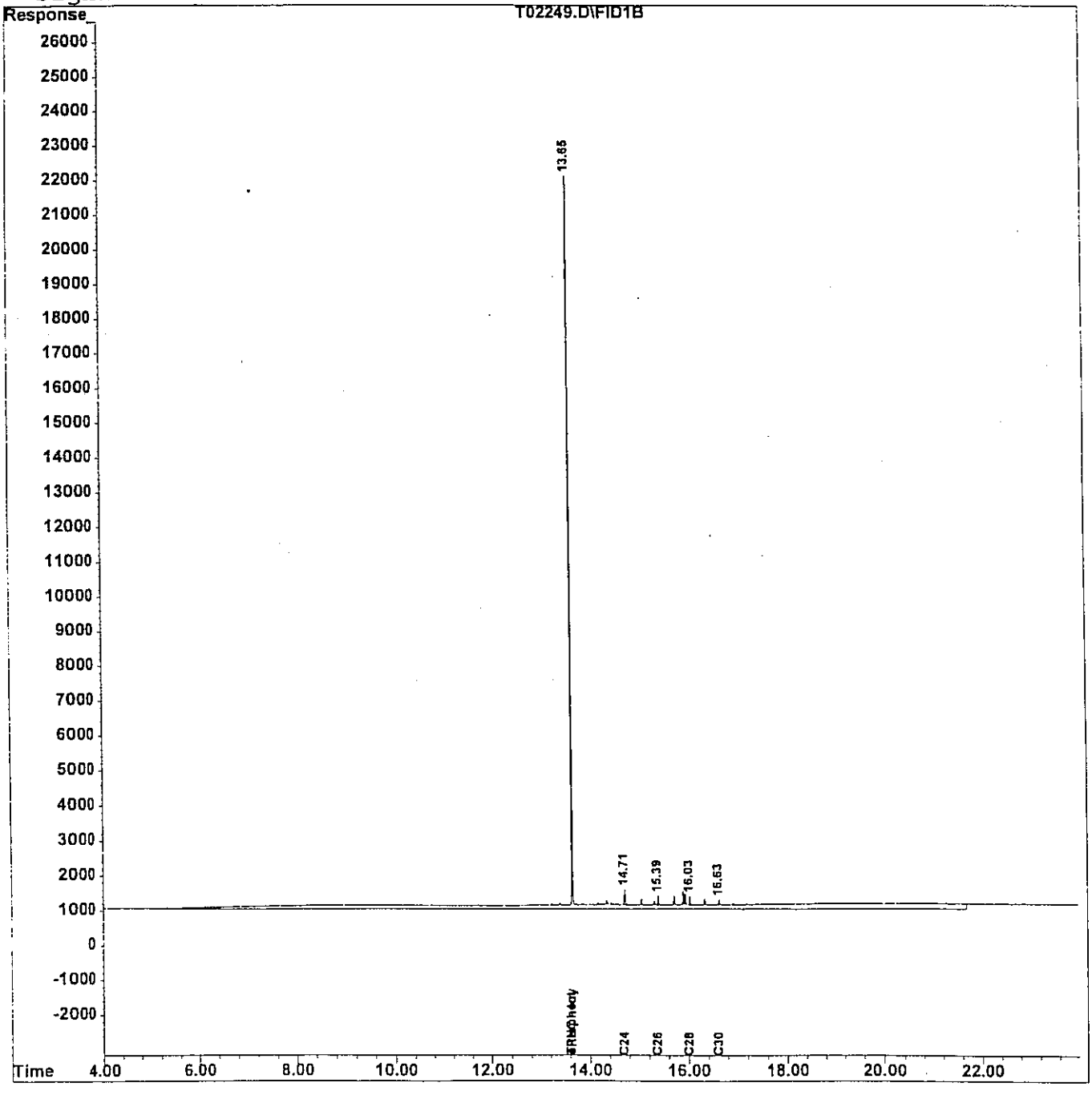
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File : C:\HPCHEM\1\DATA\970910\T02249.D Vial: 69
Acq On : 13 Sep 97 12:26 am Operator: DEINHARDT
Sample : 2981.01 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Sep 15 8:06 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Report (Not Reviewed)

Data File : C:\HPCHEM\1\DATA\970910\T02250.D
Acq On : 13 Sep 97 1:17 am
Sample : 2981.02
Misc :
IntFile : TPHCINT.E
Quant Time: Sep 13 1:45 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

	Compound	R.T.	Response	Conc [mg/L]
	System Monitoring Compounds			
21) s	o-terphenyl	13.65	184075	11.462
Spiked Amount	10.000	Recovery	=	114.62%
	Target Compounds			
1) t	C8	0.00	0	N.D.
2) t	C10	0.00	0	N.D.
3) t	C12	0.00	0	N.D.
4) t	C14	0.00	0	N.D.
5) t	C16	0.00	0	N.D.
6) t	C18	0.00	0	N.D.
7) t	C20	0.00	0	N.D.
8) t	C22	0.00	0	N.D.
9) t	C24	14.71	4187	0.258
10) t	C26	15.31	1219	0.095
11) t	C28	0.00	0	N.D.
12) t	C30	0.00	0	N.D.
13) t	C32	0.00	0	N.D.
14) t	C34	0.00	0	N.D.
15) t	C36	0.00	0	N.D.
16) t	C38	0.00	0	N.D.
17) t	C40	0.00	0	N.D.
18) t	c42	0.00	0	N.D.
19) T	Pristane	0.00	0	N.D.
20) T	Phytane	0.00	0	N.D.
22) t	TPHC - total	0.00	0	N.D.

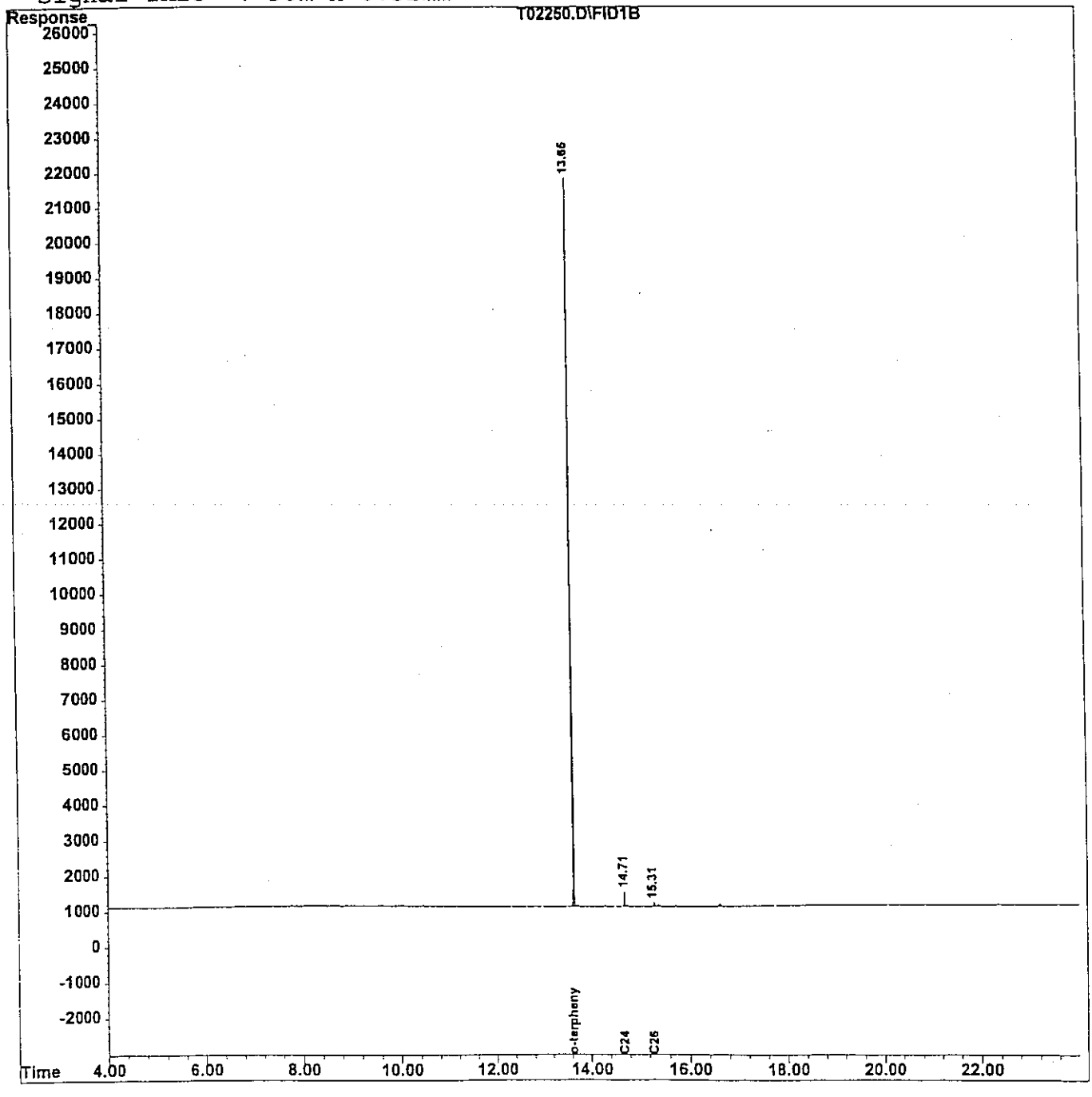
(f)=RT Delta > 1/2 Window (m)=manual int

Quantitation Report

Data File : C:\HPCHEM\1\DATA\970910\T02250.D Vial: 70
Acq On : 13 Sep 97 1:17 am Operator: DEINHARDT
Sample : 2981.02 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Sep 13 1:45 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\970910\T02251.D Vial: 71
Acq On : 13 Sep 97 2:07 am Operator: DEINHARDT
Sample : 2981.03 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Sep 15 8:09 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

	Compound	R.T.	Response	Conc	Units	
	System Monitoring Compounds					
21) s	o-terphenyl	13.65	182117	11.340	mg/L	
Spiked Amount	10.000	Recovery	=	113.40%		
	Target Compounds					
1) t	C8	0.00	0	N.D.	mg/L	
2) t	C10	0.00	0	N.D.	mg/L	
3) t	C12	0.00	0	N.D.	mg/L	
4) t	C14	11.19	1541	0.112	mg/L	
5) t	C16	12.23	5023	0.360	mg/L	
6) t	C18	12.69	4142	0.264	mg/L	
7) t	C20	13.13	2849	0.200	mg/L	
8) t	C22	13.95	8772	0.606	mg/L	
9) t	C24	14.70	11751	0.836	mg/L	
10) t	C26	15.40	2488	0.194	mg/L	
11) t	C28	0.00	0	N.D.	mg/L	
12) t	C30	16.62	1509	0.139	mg/L	
13) t	C32	0.00	0	N.D.	mg/L	
14) t	C34	0.00	0	N.D.	mg/L	
15) t	C36	0.00	0	N.D.	mg/L	
16) t	C38	0.00	0	N.D.	mg/L	
17) t	C40	0.00	0	N.D.	mg/L	
18) t	c42	0.00	0	N.D.	mg/L	
19) T	Pristane	12.72	40893	2.759	mg/L	
20) T	Phytane	13.18	23479	1.610	mg/L	
22) t	TPHC - total	13.65	5234257	336.036	mg/L	m

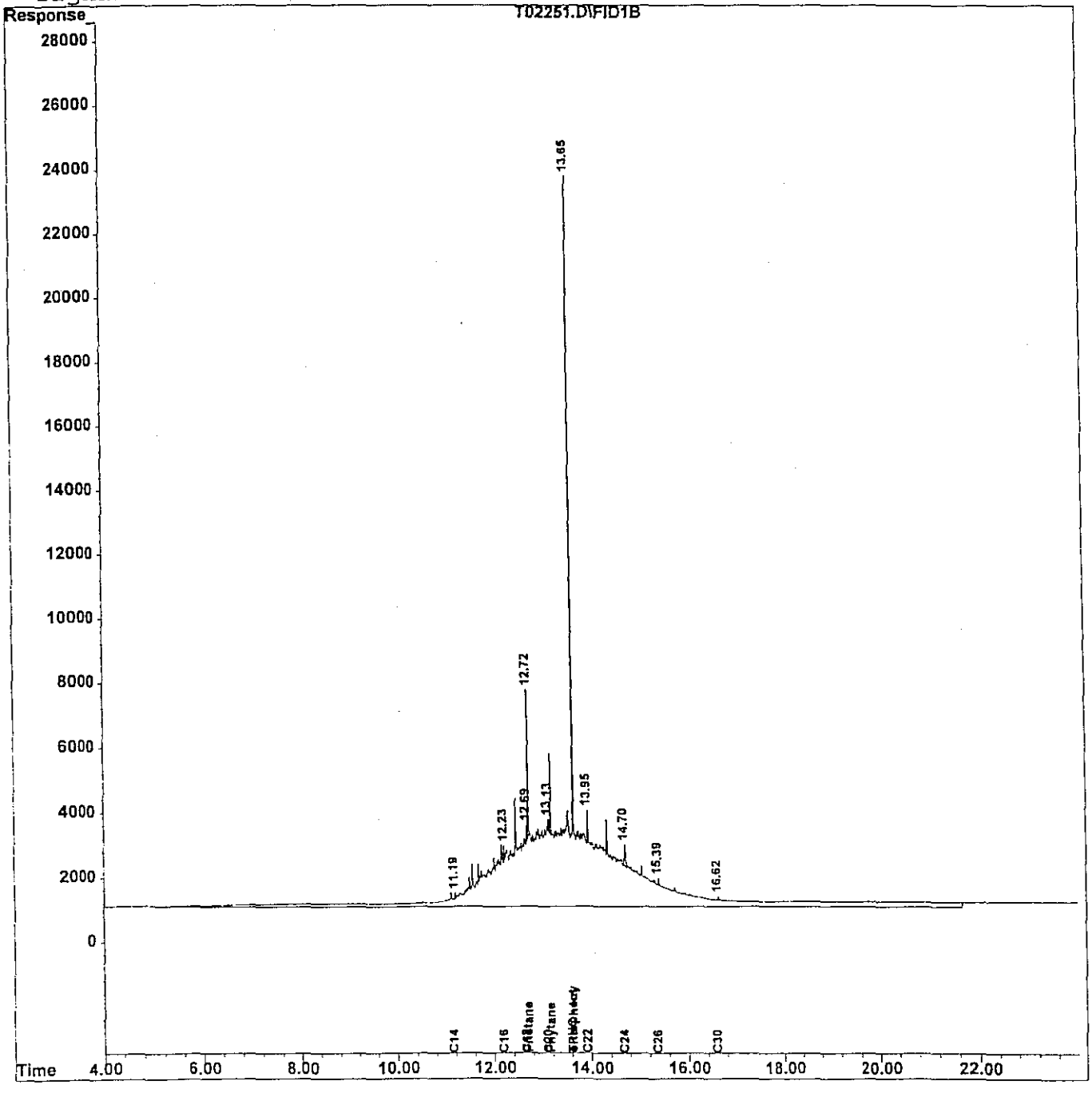
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File : C:\HPCHEM\1\DATA\970910\T02251.D Vial: 71
Acq On : 13 Sep 97 2:07 am Operator: DEINHARDT
Sample : 2981.03 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Sep 15 8:09 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Report (Not Reviewed)

Data File : C:\HPCHEM\1\DATA\970910\T02252.D Vial: 72
Acq On : 13 Sep 97 2:58 am Operator: DEINHARDT
Sample : 2981.04 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Sep 13 3:25 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
21) s o-terphenyl	13.65	184145	11.466	mg/L
Spiked Amount 10.000		Recovery =	114.66%	
Target Compounds				
1) t C8	0.00	0	N.D.	mg/L
2) t C10	0.00	0	N.D.	mg/L
3) t C12	0.00	0	N.D.	mg/L
4) t C14	0.00	0	N.D.	mg/L
5) t C16	0.00	0	N.D.	mg/L
6) t C18	0.00	0	N.D.	mg/L
7) t C20	0.00	0	N.D.	mg/L
8) t C22	0.00	0	N.D.	mg/L
9) t C24	14.71	3999	0.285	mg/L
10) t C26	15.31	1238	0.096	mg/L
11) t C28	0.00	0	N.D.	mg/L
12) t C30	16.62	1219	0.112	mg/L
13) t C32	0.00	0	N.D.	mg/L
14) t C34	0.00	0	N.D.	mg/L
15) t C36	0.00	0	N.D.	mg/L
16) t C38	0.00	0	N.D.	mg/L
17) t C40	0.00	0	N.D.	mg/L
18) t c42	0.00	0	N.D.	mg/L
19) T Pristane	0.00	0	N.D.	mg/L
20) T Phytane	0.00	0	N.D.	mg/L
22) t TPHC - total	0.00	0	N.D.	mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

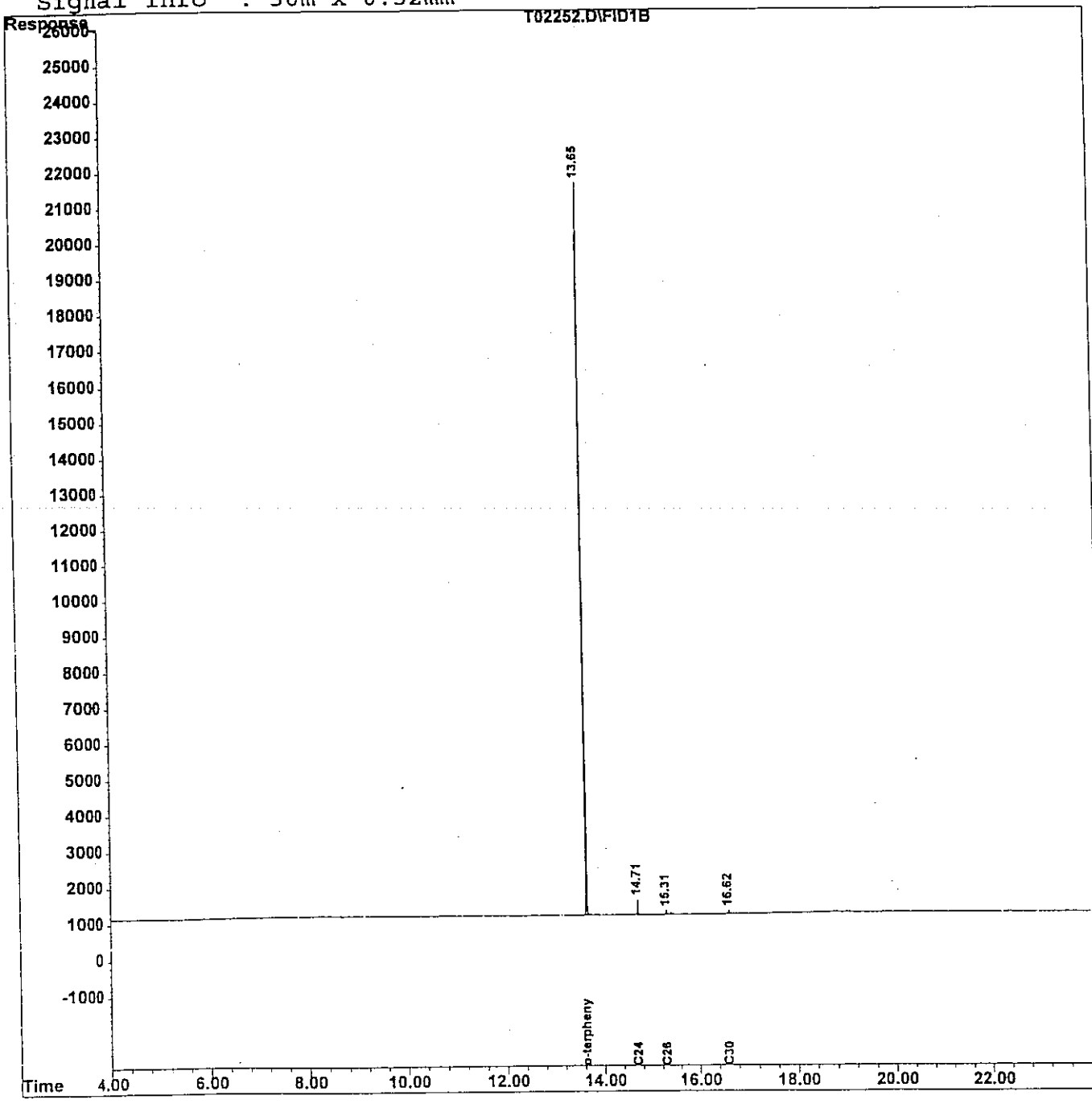
Quantitation Report

Data File : C:\HPCHEM\1\DATA\970910\T02252.D
Acq On : 13 Sep 97 2:58 am
Sample : 2981.04
Misc :
IntFile : TPHCINT.E
Quant Time: Sep 13 3:25 1997 Quant Results File: TPH13.RES

Vial: 72
Operator: DEINHARDT
Inst : FID/TCD
Multiplr: 1.00

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Report (Not Reviewed)

Data File : C:\HPCHEM\1\DATA\970910\T02253.D Vial: 73
Acq On : 13 Sep 97 3:47 am Operator: DEINHARDT
Sample : 2981.05 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : THCINT.E
Quant Time: Sep 13 4:15 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
21) s o-terphenyl	13.65	178563	11.119 mg/L
Spiked Amount 10.000		Recovery =	111.19%
Target Compounds			
1) t C8	0.00	0	N.D. mg/L
2) t C10	0.00	0	N.D. mg/L
3) t C12	0.00	0	N.D. mg/L
4) t C14	0.00	0	N.D. mg/L
5) t C16	0.00	0	N.D. mg/L
6) t C18	0.00	0	N.D. mg/L
7) t C20	0.00	0	N.D. mg/L
8) t C22	0.00	0	N.D. mg/L
9) t C24	14.71	4006	0.285 mg/L
10) t C26	15.31	1492	0.116 mg/L
11) t C28	0.00	0	N.D. mg/L
12) t C30	16.62	1273	0.117 mg/L
13) t C32	0.00	0	N.D. mg/L
14) t C34	0.00	0	N.D. mg/L
15) t C36	0.00	0	N.D. mg/L
16) t C38	0.00	0	N.D. mg/L
17) t C40	0.00	0	N.D. mg/L
18) t c42	0.00	0	N.D. mg/L
19) T Pristane	0.00	0	N.D. mg/L
20) T Phytane	0.00	0	N.D. mg/L
22) t TPHC - total	0.00	0	N.D. mg/L

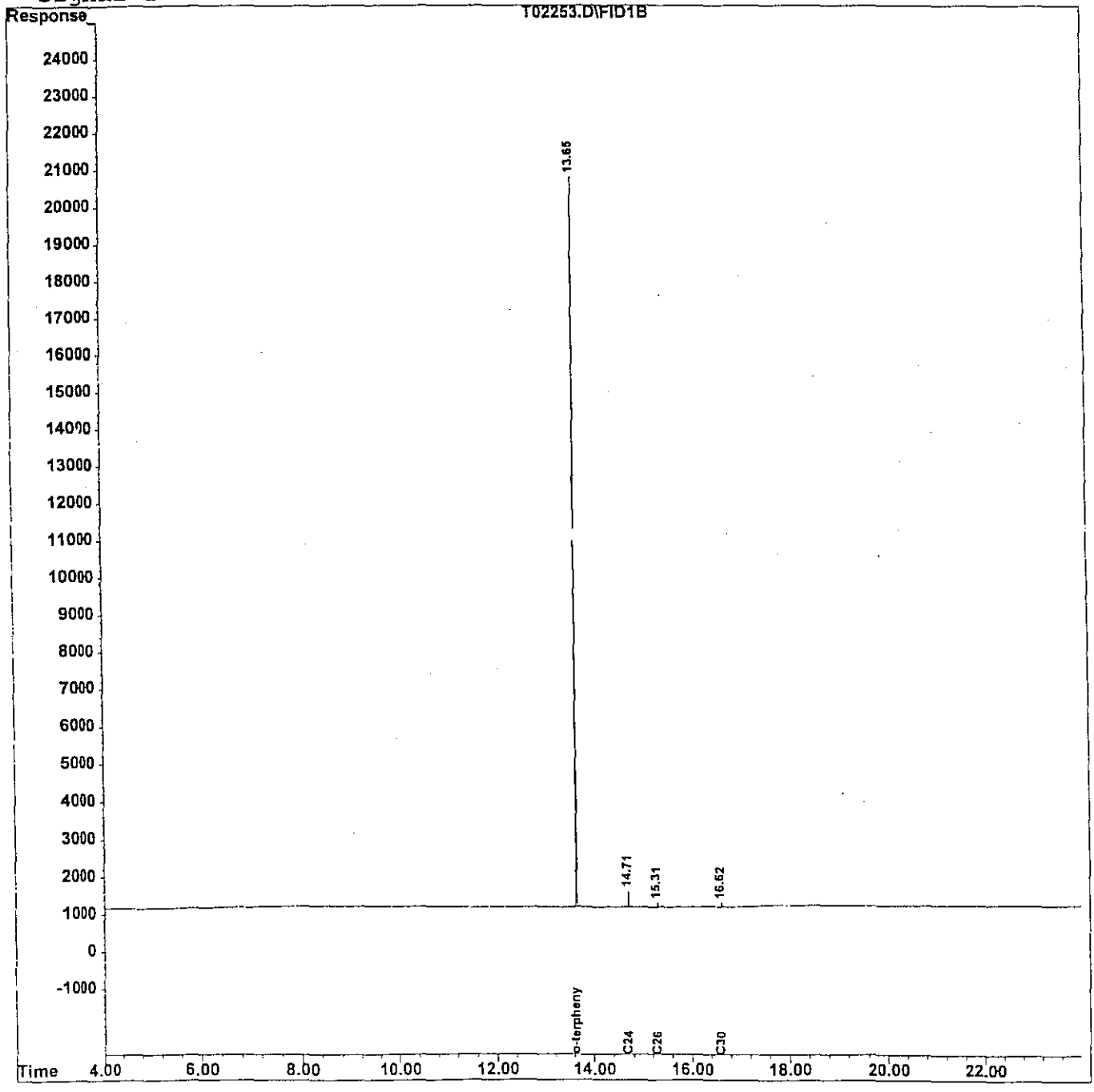
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File : C:\HPCHEM\1\DATA\970910\T02253.D Vial: 73
Acq On : 13 Sep 97 3:47 am Operator: DEINHARDT
Sample : 2981.05 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Sep 13 4:15 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\970910\T02254.D Vial: 74
Acq On : 13 Sep 97 4:37 am Operator: DEINHARDT
Sample : 2981.06 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Sep 15 8:10 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
21) s o-terphenyl	13.65	179964	11.206	mg/L
Spiked Amount 10.000	Recovery = 112.06%			
Target Compounds				
1) t C8	0.00	0	N.D.	mg/L
2) t C10	0.00	0	N.D.	mg/L
3) t C12	0.00	0	N.D.	mg/L
4) t C14	0.00	0	N.D.	mg/L
5) t C16	0.00	0	N.D.	mg/L
6) t C18	0.00	0	N.D.	mg/L
7) t C20	0.00	0	N.D.	mg/L
8) t C22	0.00	0	N.D.	mg/L
9) t C24	14.71	5272	0.375	mg/L
10) t C26	15.40	2730	0.212	mg/L
11) t C28	16.04	1794	0.156	mg/L
12) t C30	16.63	1603	0.148	mg/L
13) t C32	0.00	0	N.D.	mg/L
14) t C34	0.00	0	N.D.	mg/L
15) t C36	0.00	0	N.D.	mg/L
16) t C38	0.00	0	N.D.	mg/L
17) t C40	0.00	0	N.D.	mg/L
18) t c42	0.00	0	N.D.	mg/L
19) T Pristane	0.00	0	N.D.	mg/L
20) T Phytane	0.00	0	N.D.	mg/L
22) t TPHC - total	13.65	931613	59.809	mg/L m

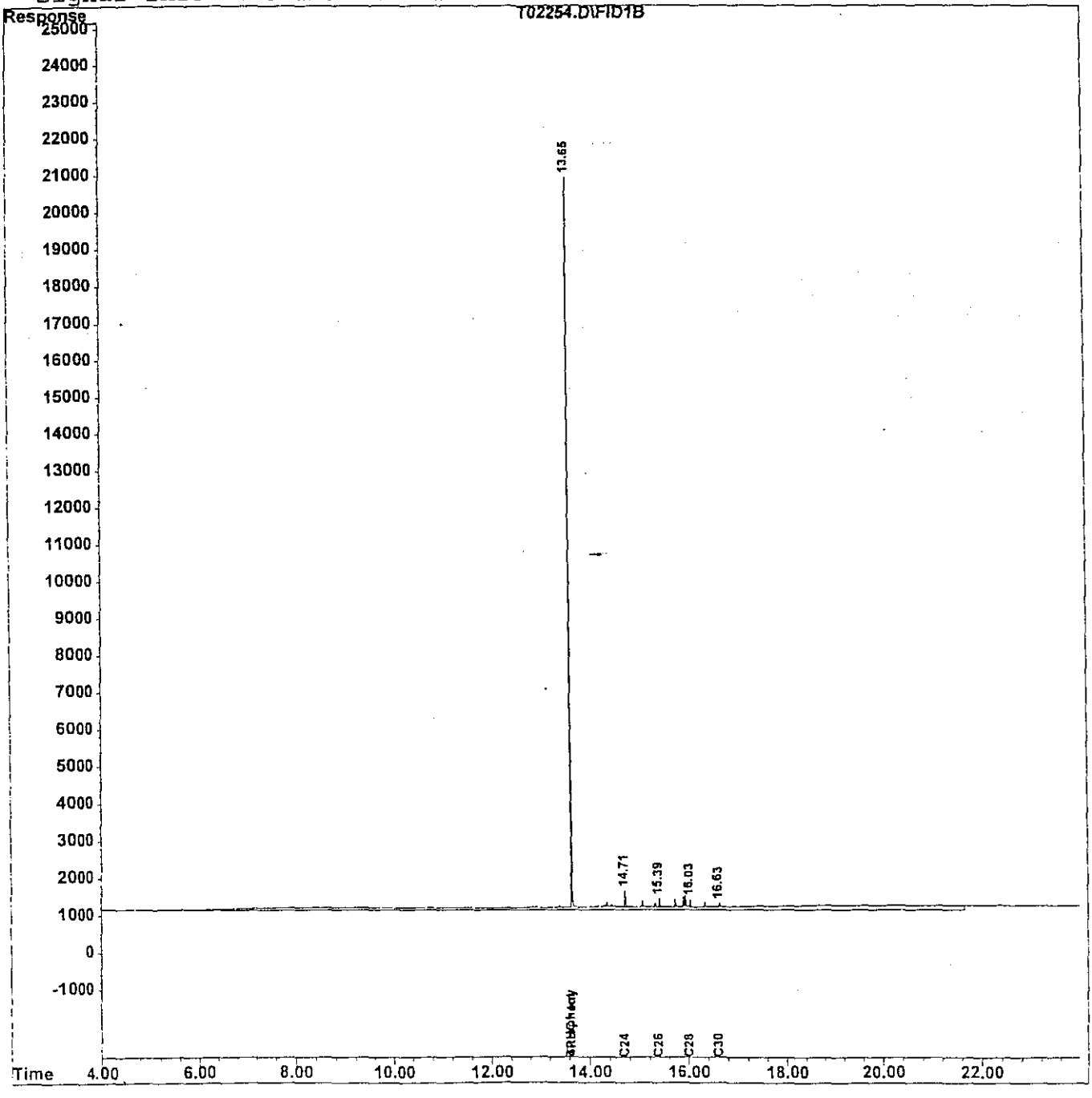
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File : C:\HPCHEM\1\DATA\970910\T02254.D Vial: 74
Acq On : 13 Sep 97 4:37 am Operator: DEINHARDT
Sample : 2981.06 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Sep 15 8:10 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Report (Not Reviewed)

Data File : C:\HPCHEM\1\DATA\970910\T02255.D Vial: 75
Acq On : 13 Sep 97 5:26 am Operator: DEINHARDT
Sample : 2981.07 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Sep 13 5:54 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

	Compound	R.T.	Response	Conc	Units
	System Monitoring Compounds				
21)	s o-terphenyl	13.65	177103	11.028	mg/L
Spiked Amount	10.000	Recovery	=	110.28%	
	Target Compounds				
1)	t C8	0.00	0	N.D.	mg/L
2)	t C10	0.00	0	N.D.	mg/L
3)	t C12	0.00	0	N.D.	mg/L
4)	t C14	0.00	0	N.D.	mg/L
5)	t C16	0.00	0	N.D.	mg/L
6)	t C18	0.00	0	N.D.	mg/L
7)	t C20	0.00	0	N.D.	mg/L
8)	t C22	0.00	0	N.D.	mg/L
9)	t C24	14.71	3809	0.271	mg/L
10)	t C26	15.31	1318	0.103	mg/L
11)	t C28	0.00	0	N.D.	mg/L
12)	t C30	16.62	1222	0.113	mg/L
13)	t C32	0.00	0	N.D.	mg/L
14)	t C34	0.00	0	N.D.	mg/L
15)	t C36	0.00	0	N.D.	mg/L
16)	t C38	0.00	0	N.D.	mg/L
17)	t C40	0.00	0	N.D.	mg/L
18)	t c42	0.00	0	N.D.	mg/L
19)	T Pristane	0.00	0	N.D.	mg/L
20)	T Phytane	0.00	0	N.D.	mg/L
22)	t TPHC - total	0.00	0	N.D.	mg/L

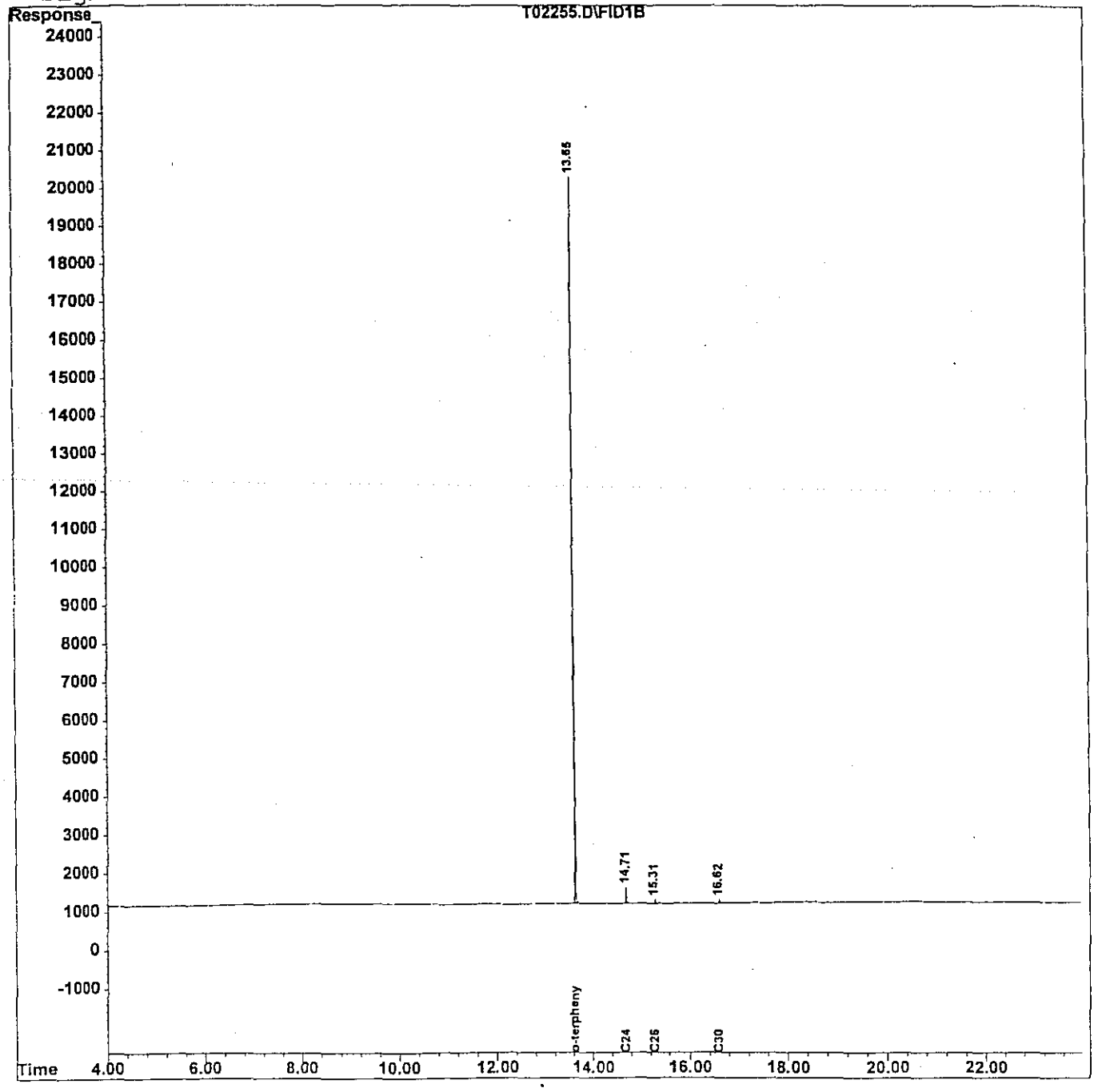
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File : C:\HPCHEM\1\DATA\970910\T02255.D Vial: 75
Acq On : 13 Sep 97 5:26 am Operator: DEINHARDT
Sample : 2981.07 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Sep 13 5:54 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\970910\T02256.D Vial: 76
Acq On : 13 Sep 97 6:15 am Operator: DEINHARDT
Sample : 2981.08 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Sep 15 8:11 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
21) s o-terphenyl	13.65	175366	10.920	mg/L
Spiked Amount 10.000		Recovery =	109.20%	
Target Compounds				
1) t C8	0.00	0	N.D.	mg/L
2) t C10	0.00	0	N.D.	mg/L
3) t C12	0.00	0	N.D.	mg/L
4) t C14	11.23	1363	0.099	mg/L
5) t C16	12.23	1299	0.093	mg/L
6) t C18	12.69	1104	0.070	mg/L
7) t C20	13.18	2203	0.154	mg/L
8) t C22	13.86	1160	0.080	mg/L
9) t C24	14.71	5976	0.425	mg/L
10) t C26	15.39	4576	0.356	mg/L
11) t C28	16.04	4155	0.360	mg/L
12) t C30	16.63	2746	0.253	mg/L
13) t C32	0.00	0	N.D.	mg/L
14) t C34	0.00	0	N.D.	mg/L
15) t C36	0.00	0	N.D.	mg/L
16) t C38	0.00	0	N.D.	mg/L
17) t C40	0.00	0	N.D.	mg/L
18) t c42	0.00	0	N.D.	mg/L
19) T Pristane	12.72	2666	0.180	mg/L
20) T Phytane	13.18	2203	0.151	mg/L
22) t TPHC - total	13.65	2162400	138.825	mg/L m

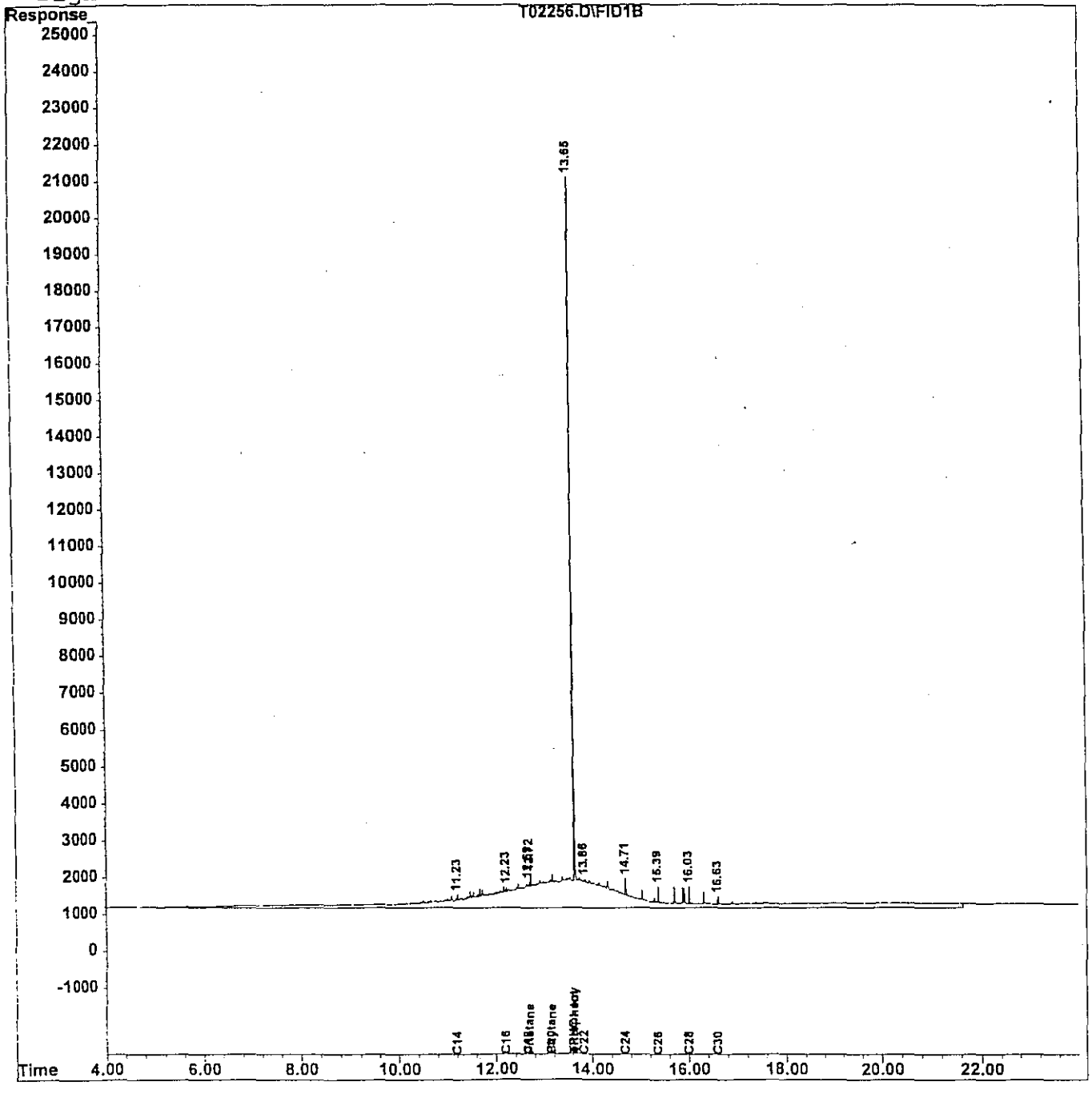
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File : C:\HPCHEM\1\DATA\970910\T02256.D Vial: 76
Acq On : 13 Sep 97 6:15 am Operator: DEINHARDT
Sample : 2981.08 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Sep 15 8:11 1997 Quant Results File: TPH13.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH13.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH13.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



LABORATORY DELIVERABLES CHECKLIST AND NON-CONFORMANCE SUMMARY

THIS FORM MUST BE COMPLETED BY THE LABORATORY OR ENVIRONMENTAL CONSULTANT AND ACCOMPANY ALL DATA SUBMISSIONS

The following Laboratory Deliverables checklist and Non-Conformance Summary shall be included in the data submission. All deviations from the accepted methodology and procedures, of performance values outside acceptable ranges shall be summarized in the Non-Conformance Summary. The Technical Requirements for Site Remediation, effective June 7, 1993, provides further details. The document shall be bound and paginated, contain a table of contents, and all pages shall be legible. Incomplete packages will be returned or held without review until the data package is completed.

It is recommended that the analytical results summary sheets listing all targeted and non-targeted compounds with the method detection limits, practical quantitation limits, and the laboratory and/or sample numbers be included in one section of the data package and in the main body of the report.

1. Cover page, Title Page listing Lab Certification #, facility name and address, & date of report submitted ✓
2. Table of Contents submitted ✓
3. Summary Sheets listing analytical results for all targeted and non-targeted compounds submitted ✓
4. Document paginated and legible ✓
5. Chain of Custody submitted ✓
6. Samples submitted to lab within 48 hours of sample collection ✓
7. Methodology Summary submitted ✓
8. Laboratory Chronicle and Holding Time Check submitted ✓
9. Results submitted on a dry weight basis ✓
10. Method Detection Limits submitted
11. Lab certified by NJDEP for parameters of appropriate category of parameters or a member of the USEPA CLP ✓

Laboratory Manager or Environmental Consultant's Signature _____

Date 11/10/97

Laboratory Certification #13461

*Refer to NJAC 7:26E - Appendix A, Section IV - Reduced Data Deliverables - Non-USEPA/CLP Methods for further guidance

US ARMY FT. MONMOUTH ENVIRONMENTAL LABORATORY
NJDEPE # 13461

REPORT OF ANALYSIS

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 173
Ft. Monmouth, NJ 07703

Project: Total Petroleum Hydrocarbons
97-1251
Bldg. 9307
Tetra Tech - BRAC

Project # 3065
Date Rec. 10/14/97
Date Compl. 10/17/97
Released by:

Daniel K. Wright
Laboratory Director

Table of Contents

Method Summary

NJDEP Method OQA-QAM-025-10/97

Gas Chromatographic Determination of Total Petroleum Hydrocarbons in Soil

Fifteen grams (15g)(wet weight) of a soil sample is added to a 125 mL acid cleaned, solvent rinsed, capped Erlenmeyer flask. 15g anhydrous sodium sulfate is added to dry sample. Surrogate standard spiking solution is then added to the flask.

Twenty five milliliters(25mL) Methylene Chloride is added to the flask and it is secured on a gyrotory shaker table. The agitation rate is set to 400rpm and the sample is shaken for 30 minutes. The flask is the removed from the table and the particulate matter is allowed to settle. The extract is transferred to a Teflon capped vial. A second 25mL of Methylene Chloride is added to the flask and shaken for an additional 30 minutes. The flask is again removed and allowed to settle. The extracts are combined in the vial then transferred to a 1mL autosampler vial.

The extract is then injected directly into a GC-FID for analysis. The sample is analyzed for petroleum hydrocarbons covering a range of C8-C42 including pristane and phytane. Total Petroleum Hydrocarbon concentration is determined by integrating between 5 minutes and 22 minutes. The baseline is established by starting the integration after the end of the solvent peak and stopping after the last peak.

The final concentration of Total Petroleum Hydrocarbons is calculated using percent solid, sample weight and concentration.

PHC Conformance/Non-conformance Summary Report

	No	Yes
1. Method Detection Limits provided.	__	✓
2. Method Blank Contamination - If yes, list the sample and the corresponding concentrations in each blank.	✓	__
3. Matrix Spike Results Summary Meet Criteria. (If not met, list the sample and corresponding recovery which falls outside the acceptable range).	__	✓
4. Duplicate Results Summary Meet Criteria. (If not met, list the sample and corresponding recovery which falls outside the acceptable range).	__	✓
5. IR Spectra submitted for standards, blanks, & samples	__ NA __	
6. Chromatograms submitted for standards, blanks, and samples if GC fingerprinting was conducted.	__	✓
7. Analysis holding time met.	__	✓

(If not met, list number of days exceeded for each sample)

Additional Comments:

Laboratory Authentication Statement

I certify under penalty of law, where applicable, that this laboratory meets the Laboratory Performance Standards and Quality Control requirements specified in N.J.A.C. 7:18 and 40 CFR Part 136 for Water and Wastewater Analyses and SW 846 for Solid Waste Analysis. I have personally examined the information contained in this report, and to the best of my knowledge, I believe that the submitted information is true, accurate, complete, and meets the above referenced standards where applicable. I am aware that there are significant penalties for purposefully submitting falsified information, including the possibility of a fine and imprisonment.

Daniel K. Wright
Laboratory Manager

Fort Monmouth Environmental Testing Laboratory

Bldg. 173, SELFM-PW-EV, Fort Monmouth, NJ 07703
Tel (908)532-4359 Fax (908)532-3484 EMail:appleby@doim6.monmouth.army.mil
NJDEP Certification #13461

Chain of Custody Record

Customer: Chuck Appleby/Tetra Tech | Project No: 97-1251
Phone #: (908) 532-6224 | Location(s): Bldgs. 9307
( )DERA ( )OMA (X)Other: BRAC
Samplers Name / Company: Kevin J. Phelan/Tetra Tech

Lab Sample I.D.	Sample Location	Date	Time	Sample Type	# bottles	TPH							HNU Calibration	Comments: Remarks / Preservation Method
3065 1	9307-OBS21(Pile)	10/14/97	09:55	Soil	1	X							(Span - 0.0 ppm; Span - 100.0 ppm (at 7.86 reading))	ICE
2	9307-OBS22(Pile)		09:58			X								
3	9307-OBS23(Pile)		10:02			X								
4	9307-B4(10-10.5')		10:20			X								
5	9307-B5(10-10.5')		10:21			X								
6	9307-B6(10-10.5')		10:29			X								
7	9307-N21(9.5-10')		10:33			X								
8	9307-W21(9.5-10')		10:38			X								
9	9307-[redacted]S21(9.5-10')		10:42			X								

Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):
Kevin J. Phelan	10/15/97 1610				
Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):

Report Type: ( )Full, (X)Reduced, ( )Standard, (X)Screen / non-certified
Turnaround time: ( )Standard 4 wks, (X)Rush 3-5 Days, (X)ASAP Verbal 24 Hrs.

Remarks:

Custody.xls7/9/97

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Client :	U.S. Army	**Lab. ID # :**	3065
	DPW. SELFM-PW-EV	**Date Rec'd:**	15-Oct-97
	Bldg. 173	**Analysis Start:**	16-Oct-97
	Ft. Monmouth, NJ 07703	**Analysis Complete:**	17-Oct-97
Analysis:	OQA-QAM-025	**UST Reg. #:**	
Matrix:	Soil	**Closure #:**	
Analyst:	D.DEINHARDT	**DICAR #:**	
Ext. Meth:	Shake	**Location #:**	BLDG. 9307

Sample	Field ID	Dilution Factor	Weight (g)	% Solid	MDL (mg/kg)	TPHC Result (mg/kg)
3065.01	9307-OBS21	1.00	15.13	91.51	170	ND
3065.02	9307-OBS22	1.00	15.70	91.65	163	ND
3065.03	9307-OBS23	1.00	15.74	91.82	163	ND
3065.04	9307-B4	1.00	15.25	96.72	159	ND
3065.05	9307-B5	1.00	15.90	96.00	154	ND
3065.06	9307-B6	1.00	15.86	97.11	153	ND
3065.07	9307-N21	1.00	15.33	97.53	157	ND
3065.08	9307-W21	1.00	15.77	96.30	155	ND
3065.09	9307-S21	1.00	15.35	97.13	158	ND
METHOD BLANK	16-Oct-97	1.00	15.00	100.00	157	ND

ND = Not Detected

MDL = Method Detection Limit

Daniel K. Wright
Laboratory Director

Response Factor Report FID/TCD

Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997

Calibration Files
1 =T02563.D 2 =T02562.D 3 =T02561.D
4 =T02560.D 5 =T02559.D

		Compound	1	2	3	4	5	Avg		%RSD
1)	t	C8	1.239	1.233	1.136	1.165	1.149	1.184	E4	4.06
2)	t	C10	1.261	1.273	1.178	1.200	1.187	1.220	E4	3.62
3)	t	C12	1.329	1.346	1.248	1.268	1.259	1.290	E4	3.43
4)	t	C14	1.358	1.369	1.269	1.289	1.283	1.314	E4	3.53
5)	t	C16	1.374	1.394	1.290	1.310	1.304	1.334	E4	3.48
6)	t	C18	1.608	1.612	1.492	1.475	1.545	1.546	E4	4.10
7)	t	C20	1.484	1.499	1.382	1.409	1.393	1.433	E4	3.77
8)	t	C22	1.462	1.489	1.385	1.416	1.410	1.432	E4	2.93
9)	t	C24	1.479	1.469	1.363	1.400	1.393	1.421	E4	3.56
10)	t	C26	1.352	1.295	1.330	1.367	1.378	1.344	E4	2.47
11)	t	C28	1.232	1.272	1.214	1.253	1.350	1.264	E4	4.17
12)	t	C30	1.176	1.209	1.155	1.214	1.356	1.222	E4	6.43
13)	t	C32	1.077	1.131	1.072	1.187	1.230	1.139	E4	6.03
14)	t	C34	1.033	1.069	0.948	1.179	1.089	1.064	E4	7.91
15)	t	C36	8.305	8.680	6.669	9.566	8.289	8.302	E3	12.64
16)	t	C38	5.760	5.941	3.889	6.293	5.501	5.477	E3	17.04
17)	t	C40	3.163	3.285	1.884	3.423	2.984	2.948	E3	20.90
18)	t	c42	1.608	1.557	0.832	1.656	1.400	1.411	E3	23.92
19)	T	Pristane	1.484	1.490	1.364	1.403	1.349	1.418	E4	4.65
20)	T	Phytane	1.502	1.513	1.389	1.413	1.393	1.442	E4	4.19
21)	s	o-terphenyl	1.615	1.629	1.504	1.542	1.531	1.564	E4	3.52
22)	t	TPHC - total	1.804	1.668	1.279	1.394	1.322	1.494	E4	15.43

(#) = Out of Range

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\971016\T02741.D
Acq On : 17 Oct 97 10:39 pm
Sample : 50 PPM STANDARD
Misc :
IntFile : TPHCINT.E

Vial: 2
Operator: DEINHARDT
Inst : FID/TCD
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	t	C8	11.844	12.301 E3	-3.9	103	-0.01
2	t	C10	12.199	13.183 E3	-8.1	107	0.00
3	t	C12	12.899	14.098 E3	-9.3	107	0.00
4	t	C14	13.135	14.329 E3	-9.1	107	0.00
5	t	C16	13.343	14.493 E3	-8.6	107	-0.01
6	t	C18	15.464	16.734 E3	-8.2	106	-0.01
7	t	C20	14.334	15.574 E3	-8.7	108	-0.01
8	t	C22	14.324	15.456 E3	-7.9	106	-0.01
9	t	C24	14.208	15.369 E3	-8.2	107	-0.01
10	t	C26	13.442	15.071 E3	-12.1	112	-0.01
11	t	C28	12.641	14.416 E3	-14.0	120	-0.01
12	t	C30	12.219	14.108 E3	-15.5	126	-0.01
13	t	C32	11.393	12.605 E3	-10.6	126	-0.02
14	t	C34	10.635	10.622 E3	0.1	121	-0.02
15	t	C36	8.302	7.413 E3	10.7	118	-0.02
16	t	C38	5.477	4.378 E3	20.1	115	-0.03
17	t	C40	2.948	2.085 E3	29.3#	110	-0.04
18	t	c42	1.411	0.901 E3	36.1#	104	-0.05
19	T	Pristane	14.180	15.557 E3	-9.7	109	-0.01
20	T	Phytane	14.419	15.649 E3	-8.5	108	-0.01
21	s	o-terphenyl	15.642	16.857 E3	-7.8	111	-0.01
22	t	TPHC - total	14.936	14.422 E3	3.4	107	0.91#

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\971016\T02730.D Vial: 2
Acq On : 17 Oct 97 2:45 pm Operator: DEINHARDT
Sample : 50 PPM STANDARD Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E

Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	t	C8	11.844	11.909 E3	-0.5	100	0.00
2	t	C10	12.199	12.676 E3	-3.9	102	0.00
3	t	C12	12.899	13.500 E3	-4.7	103	0.00
4	t	C14	13.135	13.704 E3	-4.3	102	0.00
5	t	C16	13.343	13.874 E3	-4.0	102	0.00
6	t	C18	15.464	15.782 E3	-2.1	100	0.00
7	t	C20	14.334	14.923 E3	-4.1	103	0.00
8	t	C22	14.324	14.924 E3	-4.2	103	-0.01
9	t	C24	14.208	14.742 E3	-3.8	103	-0.01
10	t	C26	13.442	14.213 E3	-5.7	105	-0.01
11	t	C28	12.641	13.845 E3	-9.5	115	-0.01
12	t	C30	12.219	13.476 E3	-10.3	121	-0.01
13	t	C32	11.393	12.110 E3	-6.3	121	-0.01
14	t	C34	10.635	10.263 E3	3.5	117	-0.01
15	t	C36	8.302	7.196 E3	13.3	114	-0.02
16	t	C38	5.477	4.283 E3	21.8	113	-0.02
17	t	C40	2.948	2.064 E3	30.0#	109	-0.03
18	t	c42	1.411	0.893 E3	36.7#	103	-0.04
19	T	Pristane	14.180	14.639 E3	-3.2	102	0.00
20	T	Phytane	14.419	14.975 E3	-3.9	103	0.00
21	s	o-terphenyl	15.642	16.183 E3	-3.5	106	0.00
22	t	TPHC - total	14.936	14.296 E3	4.3	106	0.92#

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\971016\T02719.D Vial: 2
Acq On : 17 Oct 97 7:01 am Operator: DEINHARDT
Sample : 50 PPM STANDARD Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E

Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	t	C8	11.844	12.243 E3	-3.4	103	-0.02
2	t	C10	12.199	13.082 E3	-7.2	106	-0.01
3	t	C12	12.899	13.884 E3	-7.6	106	-0.01
4	t	C14	13.135	14.039 E3	-6.9	105	-0.01
5	t	C16	13.343	14.200 E3	-6.4	104	-0.01
6	t	C18	15.464	16.388 E3	-6.0	104	-0.01
7	t	C20	14.334	15.265 E3	-6.5	106	-0.01
8	t	C22	14.324	15.255 E3	-6.5	105	-0.01
9	t	C24	14.208	15.121 E3	-6.4	106	-0.01
10	t	C26	13.442	14.843 E3	-10.4	110	-0.01
11	t	C28	12.641	14.207 E3	-12.4	118	-0.01
12	t	C30	12.219	13.935 E3	-14.0	125	-0.02
13	t	C32	11.393	12.492 E3	-9.6	125	-0.02
14	t	C34	10.635	10.564 E3	0.7	121	-0.02
15	t	C36	8.302	7.413 E3	10.7	118	-0.02
16	t	C38	5.477	4.397 E3	19.7	116	-0.03
17	t	C40	2.948	2.147 E3	27.2#	113	-0.04
18	t	c42	1.411	0.933 E3	33.9#	108	-0.05
19	T	Pristane	14.180	14.866 E3	-4.8	104	-0.01
20	T	Phytane	14.419	15.319 E3	-6.2	106	-0.01
21	s	o-terphenyl	15.642	16.591 E3	-6.1	109	-0.01
22	t	TPHC - total	14.936	14.275 E3	4.4	105	0.91#

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Surrogate Recovery Report

Lab. ID # : 3065

Location #: BLDG. 9307

Sample		Surrogate Added (ppm)	Amount Recovered (ppm)	Percent Recovery
3065.01		10.00	13.29	132.89
3065.02		10.00	12.14	121.37
3065.03		10.00	13.05	130.52
3065.04		10.00	12.61	126.07
3065.05		10.00	12.68	126.82
3065.06		10.00	13.11	131.05
3065.07		10.00	13.06	130.63
3065.08		10.00	12.84	128.38
3065.09		10.00	13.09	130.87
METHOD BLANK	16-Oct-97	10.00	12.24	122.35

Surrogate Added : o-Terphenyl

10/21/97

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Matrix Spike Recovery Report

Lab. ID # : 3065
Location #: BLDG. 9307

Sample	Spike Amount Added (ppm)	Sample Amount (ppm)	Matrix Spike Amount (ppm)	Percent Recovery	QC Limits %
3065.08MS	1000	0.00	1012.63	101.26	75-125
3065.08MSD	1000	0.00	1041.13	104.11	75-125

RPD	2.78	20.00

10/21/97

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Blank Spike Recovery Report

Lab. ID # : 3065

Location #: BLDG. 9307

Sample	Date Extracted	Spike Amount Added (ppm)	Matrix Spike Amount (ppm)	Percent Recovery	QC Limits %
Blank Spike	16-Oct-97	1000	1027.44	102.74	75-125

10/21/97

...cation Report (Not Reviewed)

Data File : C:\HPCHEM\1\...\1016\T02731.D
Acq On : 17 Oct 97
Sample : 3065-01
Misc :
IntFile : TPHCINT.E
Quant Time: Oct 17 15:58

Vial: 36
Operator: DEINHARDT
Inst : FID/TCD
Multiplr: 1.00

Quant Results File: TPH15.RES

Quant Method : C:\HPCHEM\...METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 ...9:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
21) s o-terphenyl	13.65	207859	13.289	mg/L
Spiked Amount 10.000	Recovery	=	132.89%	
Target Compounds				
1) t C8	0.00	0	N.D.	mg/L
2) t C10	0.00	0	N.D.	mg/L
3) t C12	0.00	0	N.D.	mg/L
4) t C14	0.00	0	N.D.	mg/L
5) t C16	0.00	0	N.D.	mg/L
6) t C18	0.00	0	N.D.	mg/L
7) t C20	0.00	0	N.D.	mg/L
8) t C22	0.00	0	N.D.	mg/L
9) t C24	14.71	2655	0.187	mg/L
10) t C26	0.00	0	N.D.	mg/L
11) t C28	0.00	0	N.D.	mg/L
12) t C30	16.61	1055	0.086	mg/L
13) t C32	0.00	0	N.D.	mg/L
14) t C34	0.00	0	N.D.	mg/L
15) t C36	0.00	0	N.D.	mg/L
16) t C38	0.00	0	N.D.	mg/L
17) t C40	0.00	0	N.D.	mg/L
18) t C42	0.00	0	N.D.	mg/L
19) T Pristane	0.00	0	N.D.	mg/L
20) T Phytane	0.00	0	N.D.	mg/L
22) t TPHC - total				

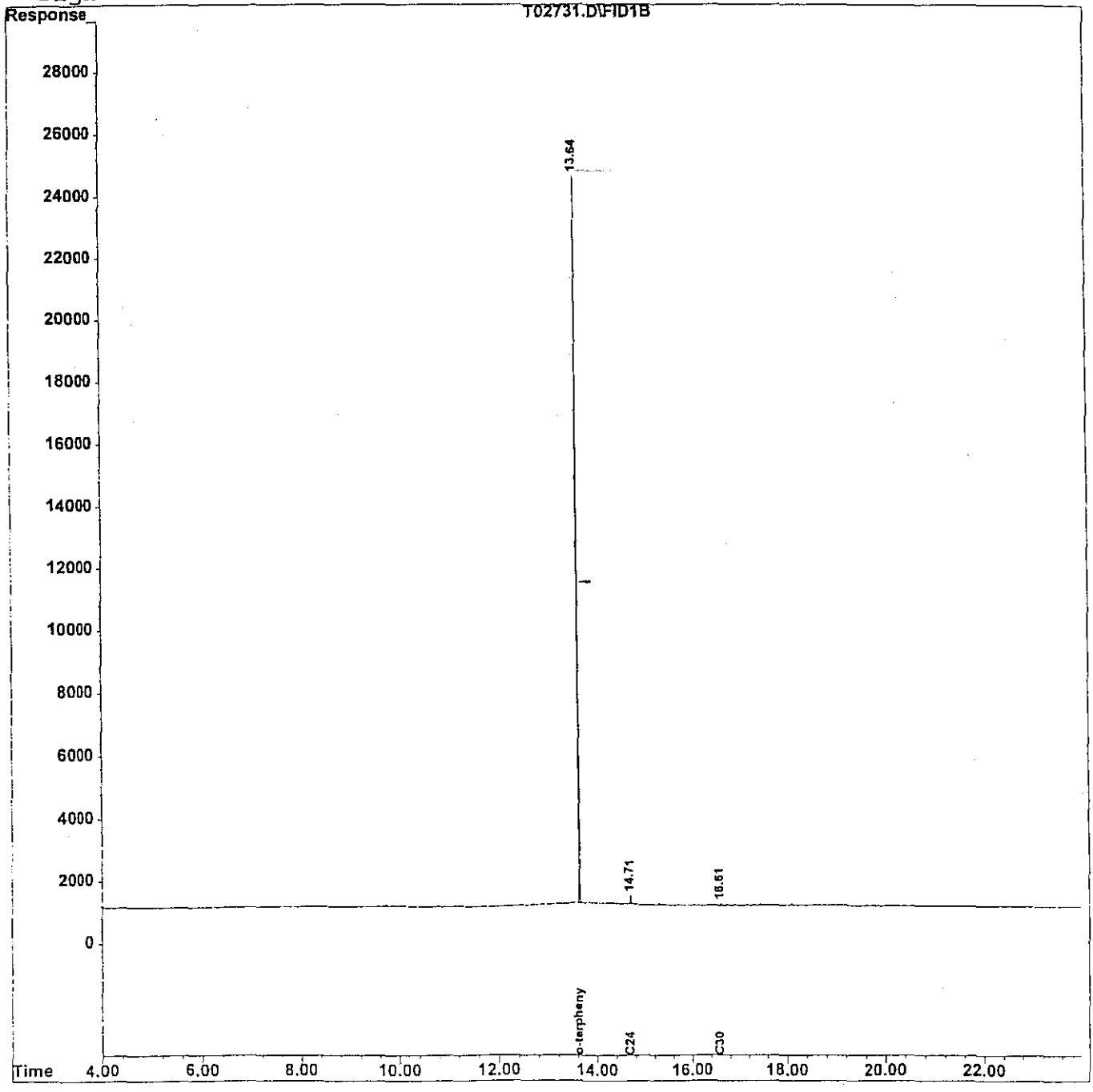
(m)=manual int.

Quantitation Report

Data File : C:\HPCHEM\1\DATA\971016\T02731.D Vial: 36
Acq On : 17 Oct 97 3:30 pm Operator: DEINHARDT
Sample : 3065.01 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Oct 17 15:58 1997 Quant Results File: TPH15.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Report (Not Reviewed)

Data File : C:\HPCHEM\1\DATA\971016\T02732.D Vial: 37
Acq On : 17 Oct 97 4:15 pm Operator: DEINHARDT
Sample : 3065.02 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Oct 17 16:43 1997 Quant Results File: TPH15.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

	Compound	R.T.	Response	Conc	Units
	System Monitoring Compounds				
21) s	o-terphenyl	13.64	189841	12.137	mg/L
Spiked Amount	10.000	Recovery	=	121.37%	
	Target Compounds				
1) t	C8	0.00	0	N.D.	mg/L
2) t	C10	0.00	0	N.D.	mg/L
3) t	C12	0.00	0	N.D.	mg/L
4) t	C14	0.00	0	N.D.	mg/L
5) t	C16	0.00	0	N.D.	mg/L
6) t	C18	0.00	0	N.D.	mg/L
7) t	C20	0.00	0	N.D.	mg/L
8) t	C22	0.00	0	N.D.	mg/L
9) t	C24	14.71	2591	0.182	mg/L
10) t	C26	0.00	0	N.D.	mg/L
11) t	C28	0.00	0	N.D.	mg/L
12) t	C30	0.00	0	N.D.	mg/L
13) t	C32	0.00	0	N.D.	mg/L
14) t	C34	0.00	0	N.D.	mg/L
15) t	C36	0.00	0	N.D.	mg/L
16) t	C38	0.00	0	N.D.	mg/L
17) t	C40	0.00	0	N.D.	mg/L
18) t	c42	0.00	0	N.D.	mg/L
19) T	Pristane	0.00	0	N.D.	mg/L
20) T	Phytane	0.00	0	N.D.	mg/L
22) t	TPHC - total	0.00	0	N.D.	mg/L

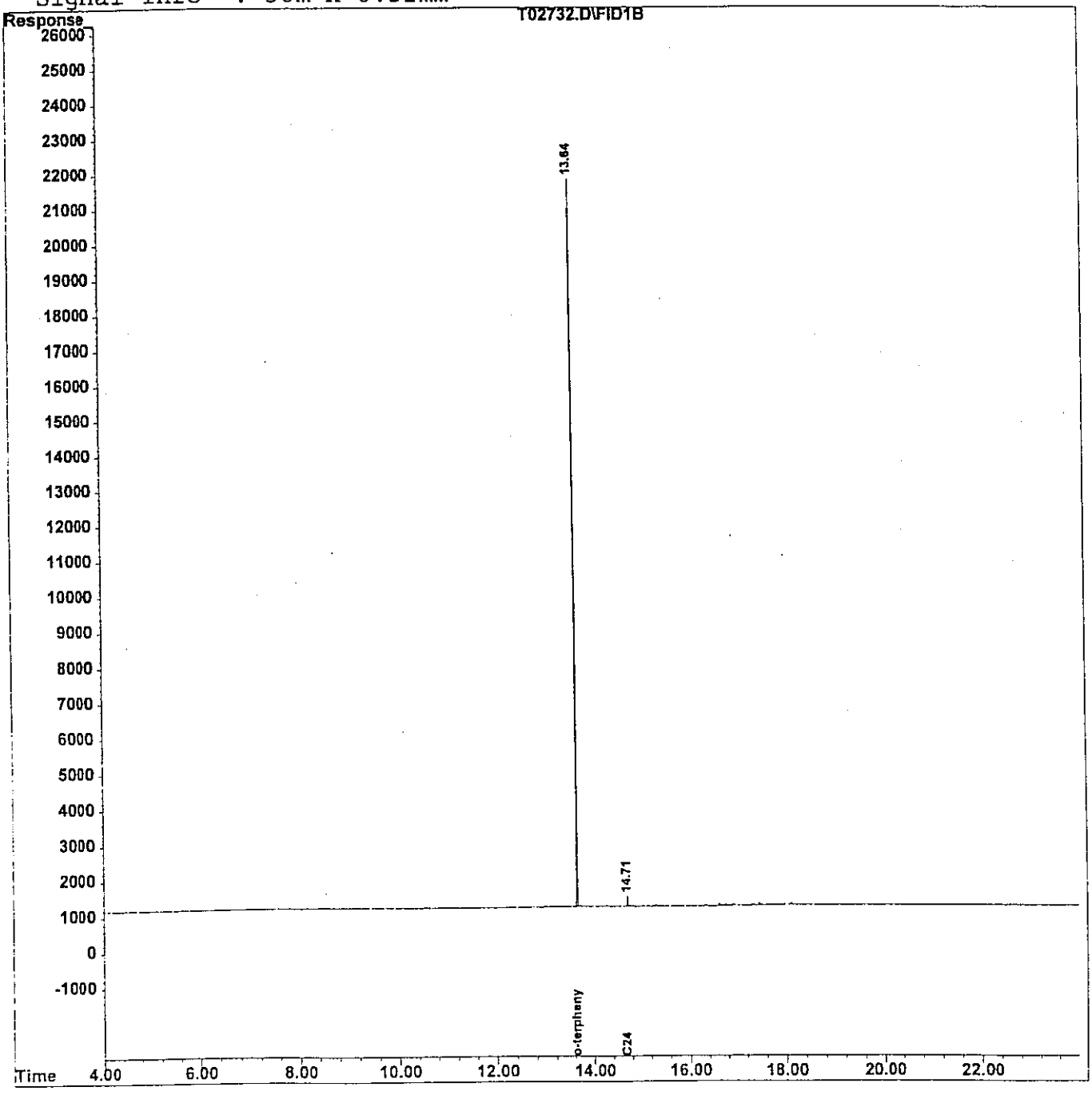
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File : C:\HPCHEM\1\DATA\971016\T02732.D Vial: 37
Acq On : 17 Oct 97 4:15 pm Operator: DEINHARDT
Sample : 3065.02 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Oct 17 16:43 1997 Quant Results File: TPH15.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Report (Not Reviewed)

Data File : C:\HPCHEM\1\DATA\971016\T02733.D Vial: 38
Acq On : 17 Oct 97 4:59 pm Operator: DEINHARDT
Sample : 3065.03 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Oct 17 17:27 1997 Quant Results File: TPH15.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

	Compound	R.T.	Response	Conc	Units
	System Monitoring Compounds				
21) s	o-terphenyl	13.64	204156	13.052	mg/L
Spiked Amount	10.000	Recovery	=	130.52%	
	Target Compounds				
1) t	C8	0.00	0	N.D.	mg/L
2) t	C10	0.00	0	N.D.	mg/L
3) t	C12	0.00	0	N.D.	mg/L
4) t	C14	0.00	0	N.D.	mg/L
5) t	C16	0.00	0	N.D.	mg/L
6) t	C18	0.00	0	N.D.	mg/L
7) t	C20	0.00	0	N.D.	mg/L
8) t	C22	0.00	0	N.D.	mg/L
9) t	C24	14.71	2496	0.176	mg/L
10) t	C26	0.00	0	N.D.	mg/L
11) t	C28	0.00	0	N.D.	mg/L
12) t	C30	16.61	1108	0.091	mg/L
13) t	C32	0.00	0	N.D.	mg/L
14) t	C34	0.00	0	N.D.	mg/L
15) t	C36	0.00	0	N.D.	mg/L
16) t	C38	0.00	0	N.D.	mg/L
17) t	C40	0.00	0	N.D.	mg/L
18) t	c42	0.00	0	N.D.	mg/L
19) T	Pristane	0.00	0	N.D.	mg/L
20) T	Phytane	0.00	0	N.D.	mg/L
22) t	TPHC - total	0.00	0	N.D.	mg/L

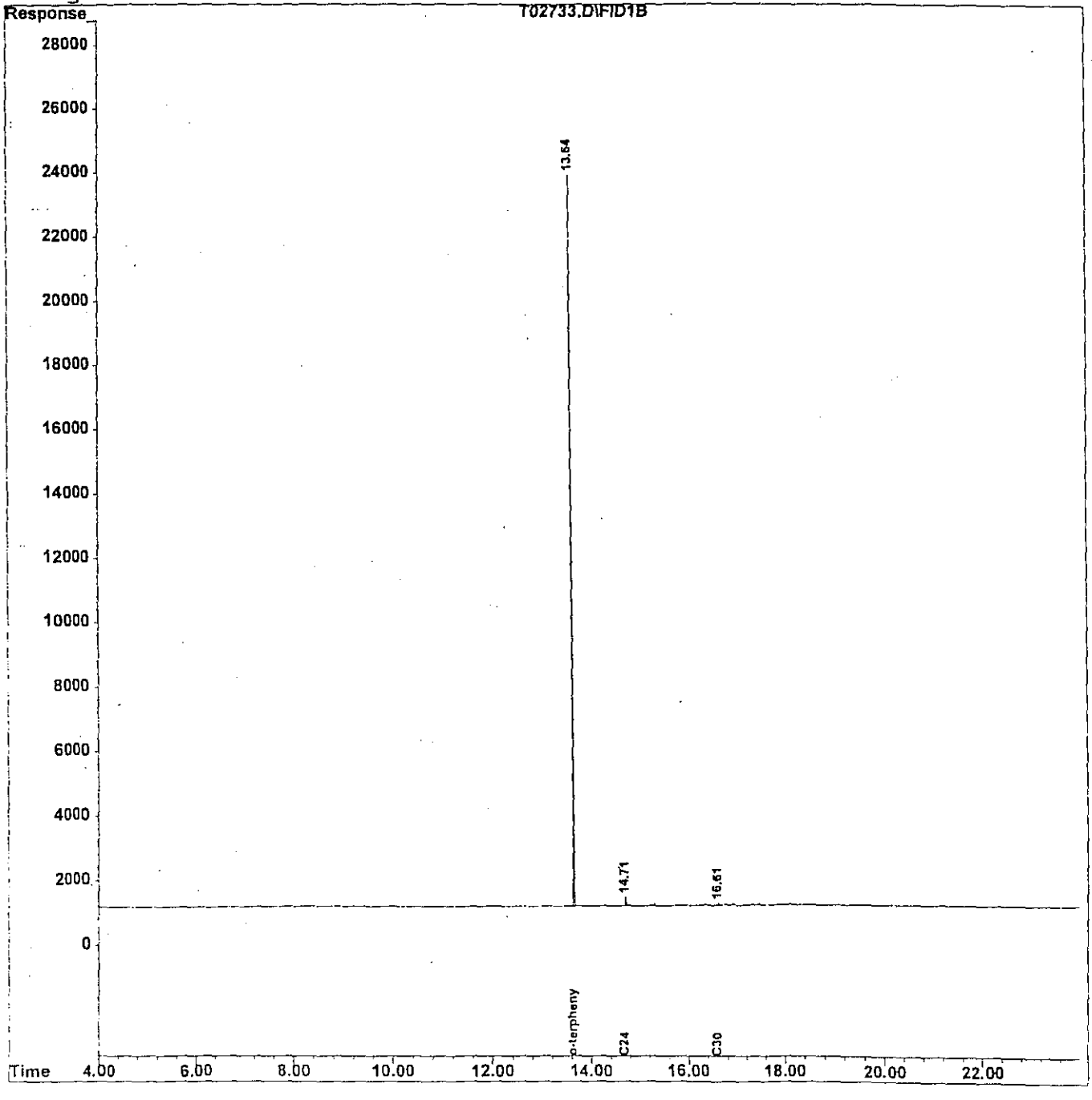
(#) RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File : C:\HPCHEM\1\DATA\971016\T02733.D Vial: 38
Acq On : 17 Oct 97 4:59 pm Operator: DEINHARDT
Sample : 3065.03 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Oct 17 17:27 1997 Quant Results File: TPH15.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Repo

Data File : C:\HPCHEM\1\DATA\971016\T02734
Acq On : 17 Oct 97 5:43 pm
Sample : 3065.04
Misc :
IntFile : TPHCINT.E
Quant Time: Oct 17 18:11 1997 Quant Resu

Quant Method : C:\HPCHEM\1\METHODS\TPH15.
Title : TPHC Calibration 06/05/97
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

Compound	R.T.
System Monitoring Compounds	
21) s o-terphenyl	13.64
Spiked Amount 10.000	Recove
Target Compounds	
1) t C8	0.00
2) t C10	0.00
3) t C12	0.00
4) t C14	0.00
5) t C16	0.00
6) t C18	0.00
7) t C20	0.00
8) t C22	0.00
9) t C24	14.71
10) t C26	0.00
11) t C28	0.00
12) t C30	0.00
13) t C32	0.00
14) t C34	0.00
15) t C36	0.00
16) t C38	0.00
17) t C40	0.00
18) t c42	0.00
19) T Pristane	0.00
20) T Phytane	0.00
22) t TPHC - total	0.00

1/2 Window

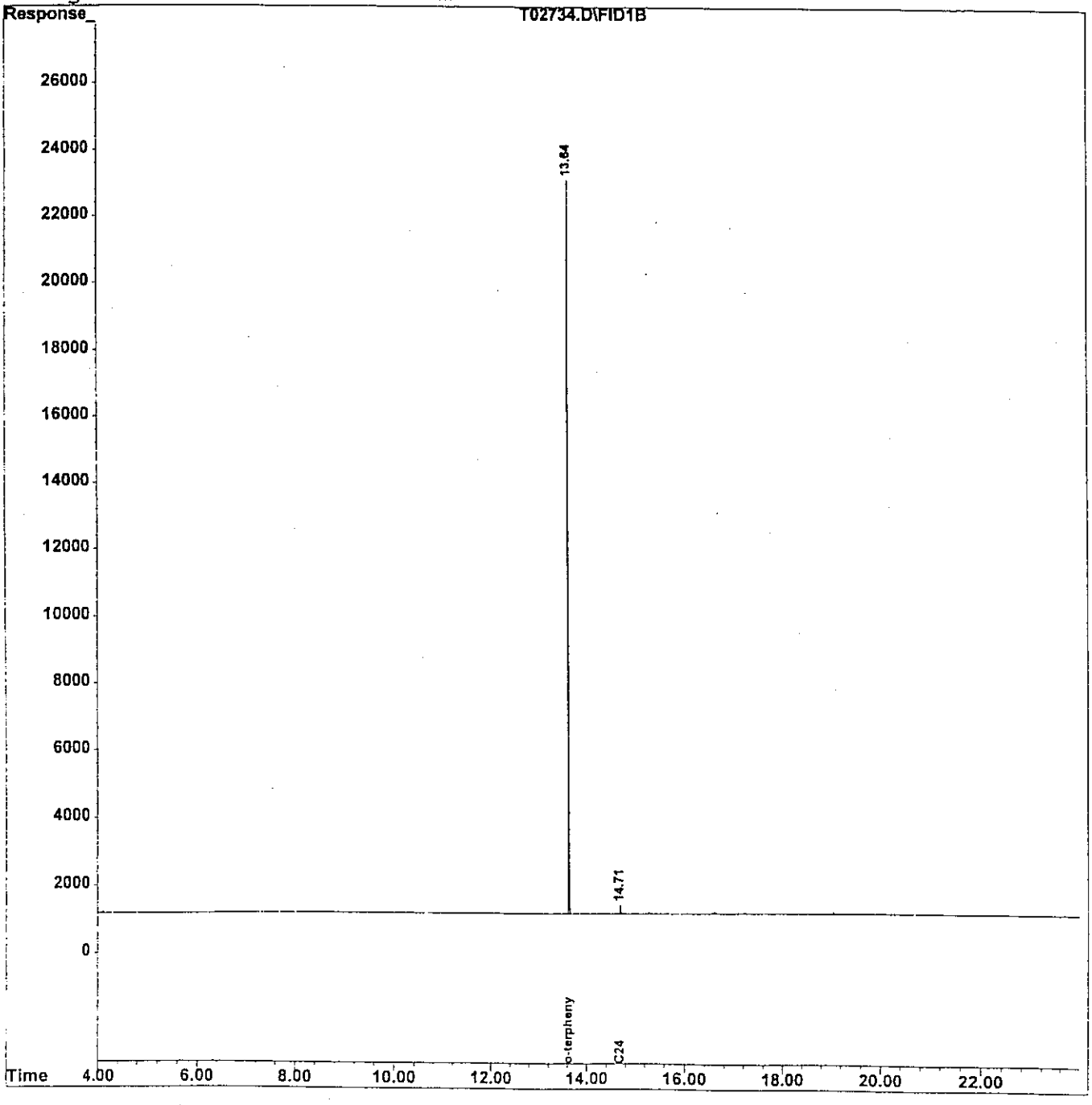
Quantitation Report

Data File : C:\HPCHEM\1\DATA\971016\T02734.D
Acq On : 17 Oct 97 5:43 pm
Sample : 3065.04
Misc :
IntFile : TPHCINT.E
Quant Time: Oct 17 18:11 1997 Quant Results File: TPH15.RES

Vial: 39
Operator: DEINHARDT
Inst : FID/TCD
Multiplr: 1.00

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Report (Not Reviewed)

Data File : C:\HPCHEM\1\DATA\971016\T02735.D
Acq On : 17 Oct 97 6:27 pm
Sample : 3065.05
Misc :
IntFile : TPHCINT.E
Quant Time: Oct 17 18:54 1997 Quant Results File: TPH15.RES

Vial:
Operator:
Inst :
Multiplr:

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integr
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
21) s o-terphenyl	13.64	198372	12.682	mg/L
Spiked Amount 10.000	Recovery	=	126.82%	
Target Compounds				
1) t C8	0.00	0	N.D.	mg/L
2) t C10	0.00	0	N.D.	mg/L
3) t C12	0.00	0	N.D.	mg/L
4) t C14	0.00	0	N.D.	mg/L
5) t C16	0.00	0	N.D.	mg/L
6) t C18	0.00	0	N.D.	mg/L
7) t C20	0.00	0	N.D.	mg/L
8) t C22	14.71	2338	0.165	mg/L
9) t C24	0.00	0	N.D.	mg/L
10) t C26	0.00	0	N.D.	mg/L
11) t C28	0.00	0	N.D.	mg/L
12) t C30	0.00	0	N.D.	mg/L
13) t C32	0.00	0	N.D.	mg/L
14) t C34	0.00	0	N.D.	mg/L
15) t C36	0.00	0	N.D.	mg/L
16) t C38	0.00	0	N.D.	mg/L
17) t C40	0.00	0	N.D.	mg/L
18) t c42	0.00	0	N.D.	mg/L
19) T Pristane	0.00	0	N.D.	mg/L
20) T Phytane	0.00	0	N.D.	mg/L
22) t TPHC - total				

(f)=RT Delta > 1/2 Window (m)=manual

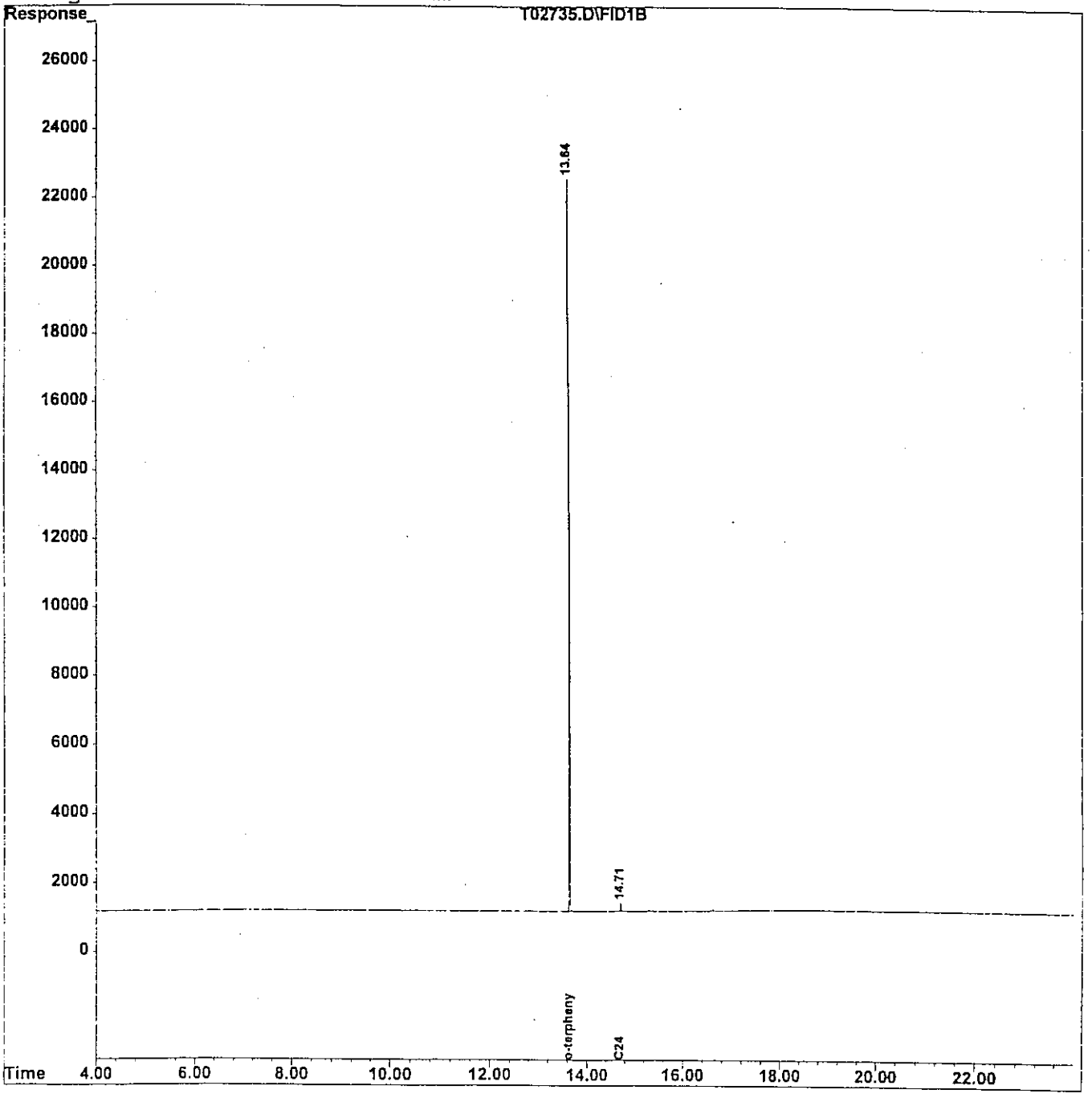
Quantitation Report

Data File : C:\HPCHEM\1\DATA\971016\T02735.D
Acq On : 17 Oct 97 6:27 pm
Sample : 3065.05
Misc :
IntFile : TPHCINT.E
Quant Time: Oct 17 18:54 1997 Quant Results File: TPH15.RES

Vial: 40
Operator: DEINHARDT
Inst : FID/TCD
Multiplr: 1.00

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Report (Not Reviewed)

Data File : C:\HPCHEM\1\DATA\971016\T02736.D
Acq On : 17 Oct 97 7:09 pm
Sample : 3065.06
Misc :
IntFile : TPHCINT.E
Quant Time: Oct 17 19:37 1997 Quant Results File: TPH15.RES

Vial: 41
Operator: DEINHARDT
Inst : FID/TCD
Multiplr: 1.00

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

	Compound	R.T.	Response	Conc	Units
	System Monitoring Compounds				
21)	s o-terphenyl	13.64	204988	13.105	mg/L
Spiked Amount	10.000	Recovery	=	131.05%	
	Target Compounds				
1)	t C8	0.00	0	N.D.	mg/L
2)	t C10	0.00	0	N.D.	mg/L
3)	t C12	0.00	0	N.D.	mg/L
4)	t C14	0.00	0	N.D.	mg/L
5)	t C16	0.00	0	N.D.	mg/L
6)	t C18	0.00	0	N.D.	mg/L
7)	t C20	0.00	0	N.D.	mg/L
8)	t C22	0.00	0	N.D.	mg/L
9)	t C24	14.71	2232	0.157	mg/L
10)	t C26	0.00	0	N.D.	mg/L
11)	t C28	0.00	0	N.D.	mg/L
12)	t C30	0.00	0	N.D.	mg/L
13)	t C32	0.00	0	N.D.	mg/L
14)	t C34	0.00	0	N.D.	mg/L
15)	t C36	0.00	0	N.D.	mg/L
16)	t C38	0.00	0	N.D.	mg/L
17)	t C40	0.00	0	N.D.	mg/L
18)	t c42	0.00	0	N.D.	mg/L
19)	T Pristane	0.00	0	N.D.	mg/L
20)	T Phytane	0.00	0	N.D.	mg/L
22)	t TPHC - total	0.00	0	N.D.	mg/L

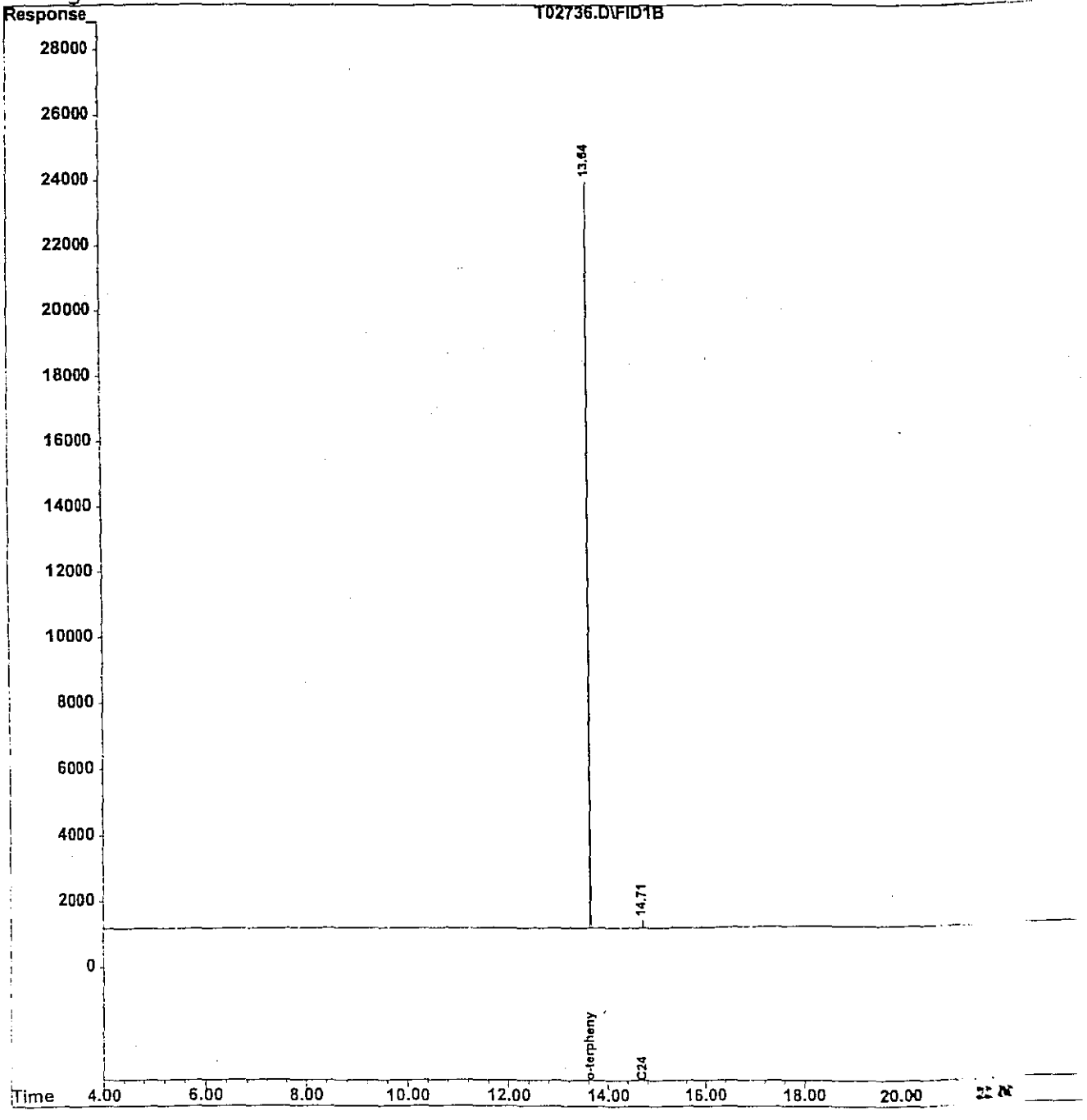
(f)=RT Delta > 1/2 Window
(m)=manual int.

Quantitation Report

Data File : C:\HPCHEM\1\DATA\971016\T02736.D
Acq On : 17 Oct 97 7:09 pm
Sample : 3065.06
Misc :
IntFile : TPHCINT.E
Quant Time: Oct 17 19:37 1997 Quant Results File: TPH15.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integ
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Report (Not Reviewed)

Data File : C:\HPCHEM\1\DATA\971016\T02737.D Vial: 42
Acq On : 17 Oct 97 7:52 pm Operator: DEINHARDT
Sample : 3065.07 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Oct 17 20:19 1997 Quant Results File: TPH15.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

	Compound	R.T.	Response	Conc	Units
	System Monitoring Compounds				
21) s	o-terphenyl	13.64	204332	13.063	mg/L
Spiked Amount	10.000	Recovery	=	130.63%	
	Target Compounds				
1) t	C8	0.00	0	N.D.	mg/L
2) t	C10	0.00	0	N.D.	mg/L
3) t	C12	0.00	0	N.D.	mg/L
4) t	C14	0.00	0	N.D.	mg/L
5) t	C16	0.00	0	N.D.	mg/L
6) t	C18	0.00	0	N.D.	mg/L
7) t	C20	0.00	0	N.D.	mg/L
8) t	C22	0.00	0	N.D.	mg/L
9) t	C24	14.71	2182	0.154	mg/L
10) t	C26	0.00	0	N.D.	mg/L
11) t	C28	0.00	0	N.D.	mg/L
12) t	C30	0.00	0	N.D.	mg/L
13) t	C32	0.00	0	N.D.	mg/L
14) t	C34	0.00	0	N.D.	mg/L
15) t	C36	0.00	0	N.D.	mg/L
16) t	C38	0.00	0	N.D.	mg/L
17) t	C40	0.00	0	N.D.	mg/L
18) t	c42	0.00	0	N.D.	mg/L
19) T	Pristane	0.00	0	N.D.	mg/L
20) T	Phytane	0.00	0	N.D.	mg/L
22) t	TPHC - total	0.00	0	N.D.	mg/L

(f)=RT Delta > 1/2 Window (m)=manual int.

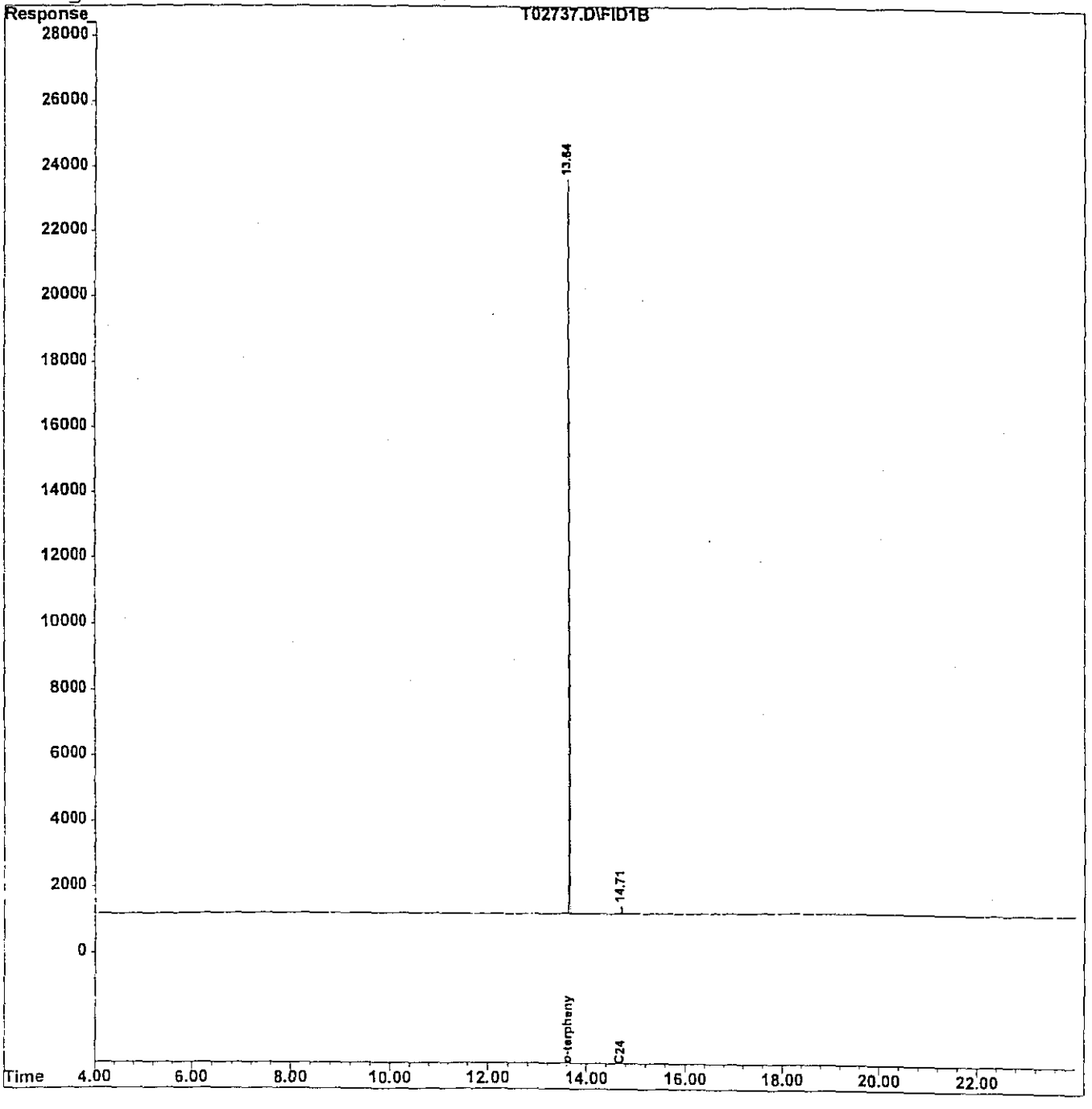
Quantitation Report

Data File : C:\HPCHEM\1\DATA\971016\T02737.D
Acq On : 17 Oct 97 7:52 pm
Sample : 3065.07
Misc :
IntFile : TPHCINT.E
Quant Time: Oct 17 20:19 1997 Quant Results File: TPH15.RES

Vial: 42
Operator: DEINHARDT
Inst : FID/TCD
Multiplr: 1.00

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Report (Not Reviewed)

Data File : C:\HPCHEM\1\DATA\971016\T02738.D
Acq On : 17 Oct 97 8:34 pm
Sample : 3065.08
Misc :
IntFile : TPHCINT.E
Quant Time: Oct 17 21:02 1997 Quant Results File: TPH15.RES

Vial: 43
Operator: DEINHARDT
Inst : FID/TCD
Multiplr: 1.00

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

	Compound	R.T.	Response	Conc	Units
	System Monitoring Compounds				
21) s	o-terphenyl	13.64	200811	12.838	mg/L
Spiked Amount	10.000	Recovery	=	128.38%	
	Target Compounds				
1) t	C8	0.00	0	N.D.	mg/L
2) t	C10	0.00	0	N.D.	mg/L
3) t	C12	0.00	0	N.D.	mg/L
4) t	C14	0.00	0	N.D.	mg/L
5) t	C16	0.00	0	N.D.	mg/L
6) t	C18	0.00	0	N.D.	mg/L
7) t	C20	0.00	0	N.D.	mg/L
8) t	C22	0.00	0	N.D.	mg/L
9) t	C24	14.71	1969	0.139	mg/L
10) t	C26	0.00	0	N.D.	mg/L
11) t	C28	0.00	0	N.D.	mg/L
12) t	C30	0.00	0	N.D.	mg/L
13) t	C32	0.00	0	N.D.	mg/L
14) t	C34	0.00	0	N.D.	mg/L
15) t	C36	0.00	0	N.D.	mg/L
16) t	C38	0.00	0	N.D.	mg/L
17) t	C40	0.00	0	N.D.	mg/L
18) t	c42	0.00	0	N.D.	mg/L
19) T	Pristane	0.00	0	N.D.	mg/L
20) T	Phytane	0.00	0	N.D.	mg/L
22) t	TPHC - total	0.00	0	N.D.	mg/L

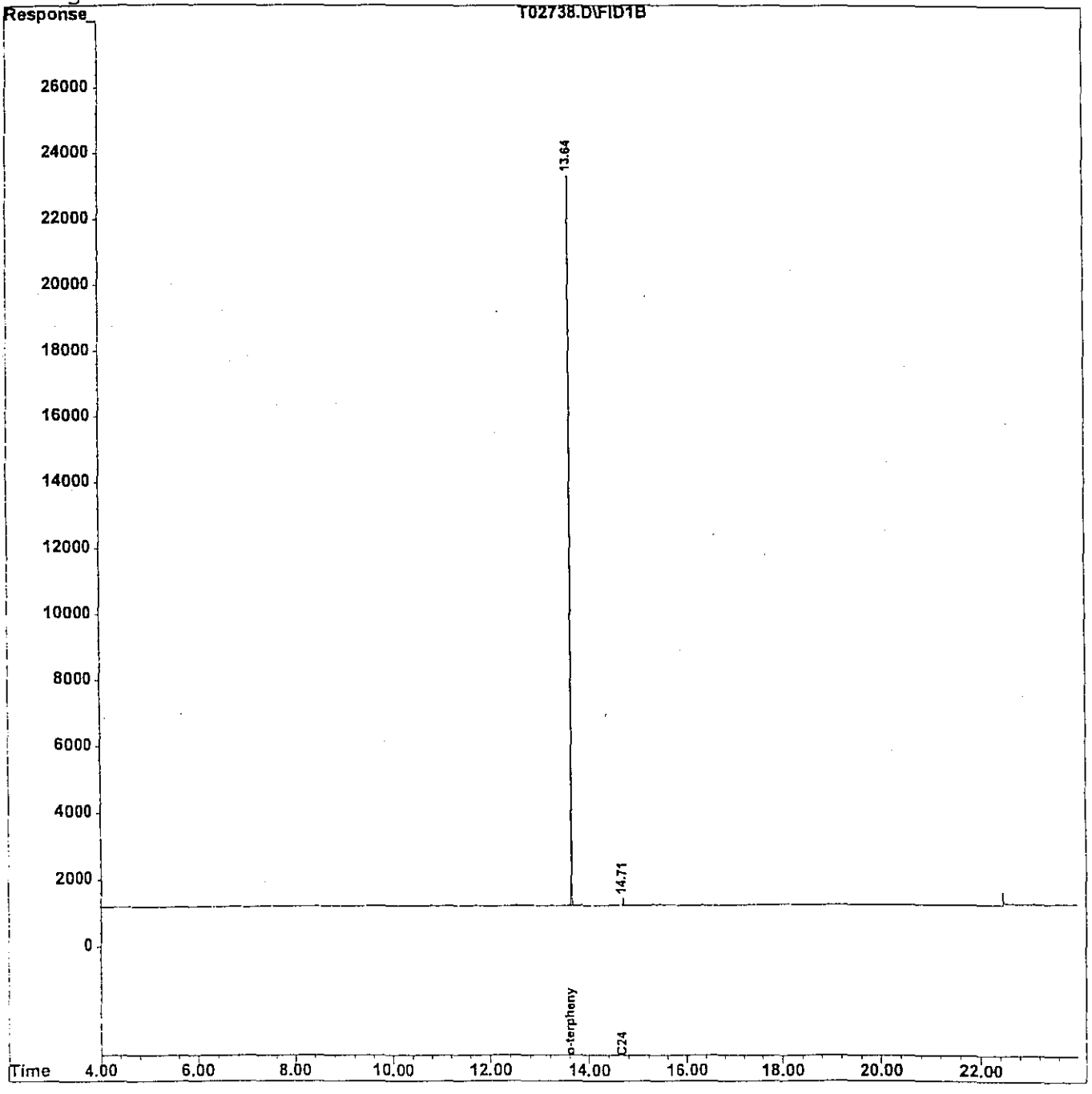
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File : C:\HPCHEM\1\DATA\971016\T02738.D Vial: 43
Acq On : 17 Oct 97 8:34 pm Operator: DEINHARDT
Sample : 3065.08 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Oct 17 21:02 1997 Quant Results File: TPH15.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



Quantitation Report (Not Reviewed)

Data File : C:\HPCHEM\1\DATA\971016\T02742.D Vial: 47
Acq On : 17 Oct 97 11:20 pm Operator: DEINHARDT
Sample : 3065.09 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Oct 17 23:48 1997 Quant Results File: TPH15.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Initial Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm

	Compound	R.T.	Response	Conc	Units
	System Monitoring Compounds				
21) s	o-terphenyl	13.64	204694	13.087	mg/L
Spiked Amount	10.000	Recovery	=	130.87%	
	Target Compounds				
1) t	C8	0.00	0	N.D.	mg/L
2) t	C10	0.00	0	N.D.	mg/L
3) t	C12	0.00	0	N.D.	mg/L
4) t	C14	0.00	0	N.D.	mg/L
5) t	C16	0.00	0	N.D.	mg/L
6) t	C18	0.00	0	N.D.	mg/L
7) t	C20	0.00	0	N.D.	mg/L
8) t	C22	0.00	0	N.D.	mg/L
9) t	C24	14.71	1996	0.141	mg/L
10) t	C26	0.00	0	N.D.	mg/L
11) t	C28	0.00	0	N.D.	mg/L
12) t	C30	0.00	0	N.D.	mg/L
13) t	C32	0.00	0	N.D.	mg/L
14) t	C34	0.00	0	N.D.	mg/L
15) t	C36	0.00	0	N.D.	mg/L
16) t	C38	0.00	0	N.D.	mg/L
17) t	C40	0.00	0	N.D.	mg/L
18) t	c42	0.00	0	N.D.	mg/L
19) T	Pristane	0.00	0	N.D.	mg/L
20) T	Phytane	0.00	0	N.D.	mg/L
22) t	TPHC - total	0.00	0	N.D.	mg/L

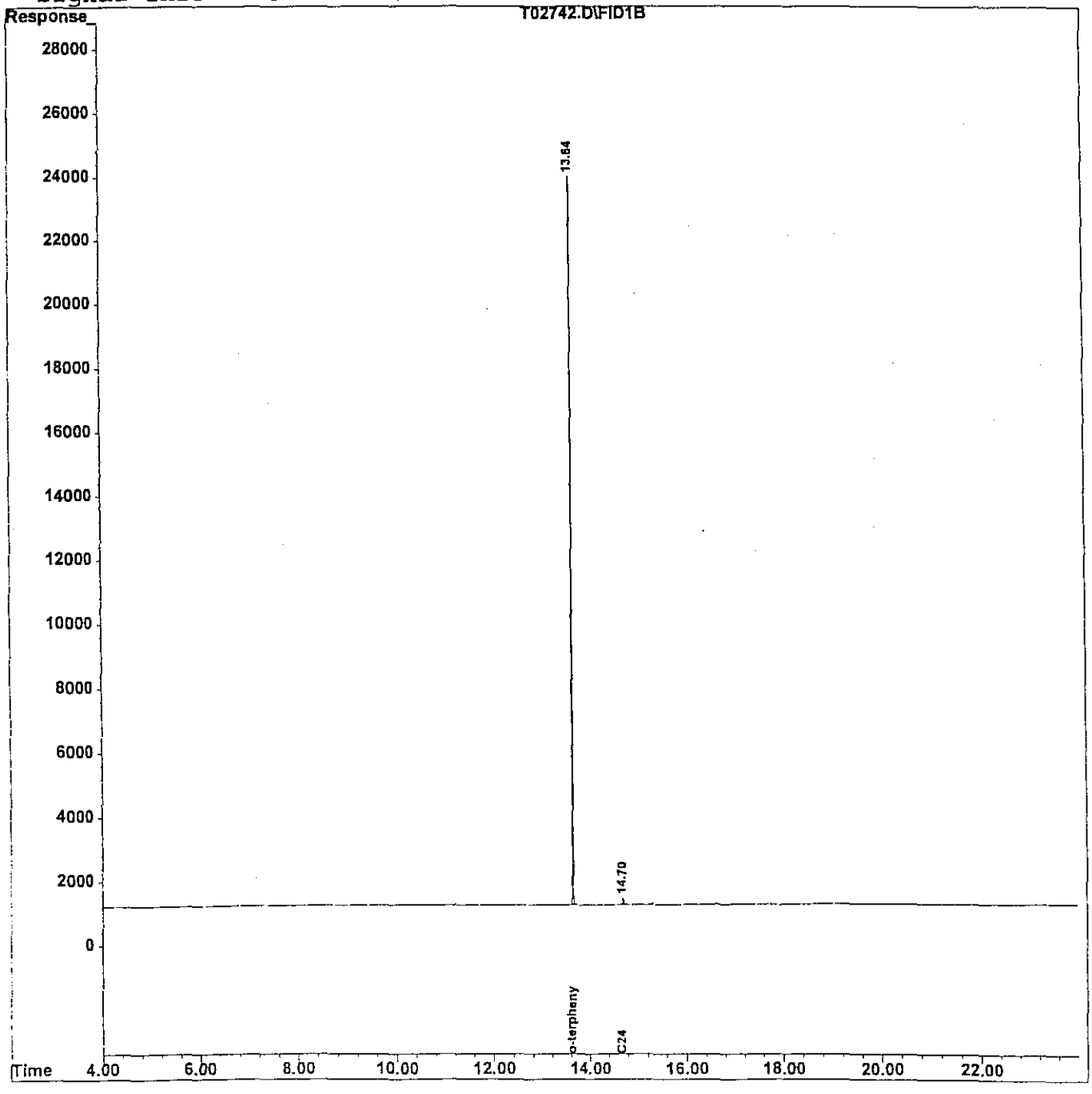
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File : C:\HPCHEM\1\DATA\971016\T02742.D Vial: 47
Acq On : 17 Oct 97 11:20 pm Operator: DEINHARDT
Sample : 3065.09 Inst : FID/TCD
Misc : Multiplr: 1.00
IntFile : TPHCINT.E
Quant Time: Oct 17 23:48 1997 Quant Results File: TPH15.RES

Quant Method : C:\HPCHEM\1\METHODS\TPH15.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 22 07:39:41 1997
Response via : Multiple Level Calibration
DataAcq Meth : TPH15.M

Volume Inj. : 1 ul
Signal Phase : HP-5
Signal Info : 30m x 0.32mm



LABORATORY DELIVERABLES CHECKLIST AND NON-CONFORMANCE SUMMARY

THIS FORM MUST BE COMPLETED BY THE LABORATORY OR ENVIRONMENTAL CONSULTANT AND ACCOMPANY ALL DATA SUBMISSIONS

The following Laboratory Deliverables checklist and Non-Conformance Summary shall be included in the data submission. All deviations from the accepted methodology and procedures, of performance values outside acceptable ranges shall be summarized in the Non-Conformance Summary. The Technical Requirements for Site Remediation, effective June 7, 1993, provides further details. The document shall be bound and paginated, contain a table of contents, and all pages shall be legible. Incomplete packages will be returned or held without review until the data package is completed.

It is recommended that the analytical results summary sheets listing all targeted and non-targeted compounds with the method detection limits, practical quantitation limits, and the laboratory and/or sample numbers be included in one section of the data package and in the main body of the report.

1. Cover page, Title Page listing Lab Certification #, facility name and address, & date of report submitted ✓
2. Table of Contents submitted ✓
3. Summary Sheets listing analytical results for all targeted and non-targeted compounds submitted ✓
4. Document paginated and legible ✓
5. Chain of Custody submitted ✓
6. Samples submitted to lab within 48 hours of sample collection ✓
7. Methodology Summary submitted ✓
8. Laboratory Chronicle and Holding Time Check submitted ✓
9. Results submitted on a dry weight basis ✓
10. Method Detection Limits submitted
11. Lab certified by NJDEP for parameters of appropriate category of parameters or a member of the USEPA CLP ✓

Laboratory Manager or Environmental Consultant's Signature X

Date 8/6/97

Laboratory Certification #13461

*Refer to NJAC 7:26E - Appendix A, Section IV - Reduced Data Deliverables - Non-USEPA/CLP Methods for further guidance

APPENDIX D

UST DISPOSAL CERTIFICATE

UST NO. 90029-32

REORDER ITEM # BLN74

STRAIGHT BILL OF LADING
ORIGINAL - NOT NEGOTIABLE

Shipper No. 001

Carrier No.

Date

SMC ENVIRONMENTAL SERVICES GROUP
(Name of Carrier)

Mazza + Sons, INC.	Camp Evans (U.S. Army)
3230 Shafto Road	Building 9307
Tinton Falls, N.J. 07753	Wall, NJ 07719

No. Shipping Units	Kind of Packaging, Description of Articles, Special Marks and Exceptions	Weight (Subject to Correction)	RATE	CHARGES
(1)	For SCRAP ONLY			
	1-1,000 Gallon U.S.T Shell			
	Clean			
	TANK # 90029-32			
	Building # 9307			

REMIT C.O.D. TO: ADDRESS

COD Amt: $

C.O.D. FEE: PREPAID ☐ $ COLLECT ☐

TOTAL CHARGES: $

If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight."

Note - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.

The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding _____ per _____

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

_____ Signature

Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

_____ (Signature of Consignor)

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is agreed as to each carrier of all or any of said property over all or any portion of said route to destination and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER Camp Evans (U.S. Army)	CARRIER SMC ENVIRONMENTAL SERVICES GROUP
PER David H. Davis (Agent)	PER Mark [illegible]
	DATE 10/13/97

"Mark with "X" in duplicate Hazardous Materials as defined in Title 49 of the Code of Federal Regulations.

SMC Environmental Services Group
A Subsidiary of Science Management Corporation
P.O. Box 859
Valley Forge Pennsylvania 19482
Telephone (610) 265-2700

CERTIFICATE OF NON-HAZARDOUS VESSEL

FACILITY: Camp Evans (US Army)
Wall NJ
Building 9307

VESSEL: 1,000 gallon steel tank
(Formally #2 Fuel Oil)

This letter is to confirm that the vessel/vessels at the above referenced location has been physically entered (if necessary), degreased, washed/cleaned, and the material contained within has been completely removed and properly disposed. As of 3:00 A.M. on 9/11/97, the above said vessel is certified gas free and has been cleaned following recommended procedures in API PUBLICATION 2015. Under conditions that **SMC Environmental Services Group** has no control over, this certification is valid only until the vessel is received by the designated steel recycling facility. **SMC Environmental Services Group** will not be held liable for any damages which may occur after certification.

SMC ENVIRONMENTAL SERVICES GROUP
SIGNATURE OF CERTIFICATION

David H. Daniels /smc
Signature

David H. Daniels /Site Manager
Print or Type Name Here

LORCO PETROLEUM SERVICES
RD1 Box 5A
Old Bridge, N.J. 08857
(908) 721-0900
Fax (908) 721-0231

STANDARD COLLECTION ORDER FORM

175941

GENERATOR/LOCATION — SALES ORDER #

NAME
INFORMATION/ATTENTION LINE — ACCOUNT APPROVAL CODE
DELIVERY ADDRESS
CITY — STATE — ZIP
PHONE NUMBER — PURCHASE ORDER NUMBER
USA EPA ID NO. (IF APPLICABLE) — STATE ID NO.

BILL TO (IF DIFFERENT FROM LOCATION)

NAME
INFORMATION/ATTENTION LINE — ACCOUNT APPROVAL CODE
DELIVERY ADDRESS
CITY — STATE — ZIP
PHONE NUMBER — PURCHASE ORDER NUMBER

MANIFEST NUMBER

SHIPPING INFORMATION

This is to certify that the below named materials are properly classified, described, packaged, marked and labeled; and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

NO.	TYPE	QTY.	UNIT	US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	SALES REPRESENTATIVE
	T	1200	Gal	VIRGIN USED OIL	

SERVICE SECTION

SALES CODE	DESCRIPTION	WASTE CODE	QUANTITY	UNIT PRICE	PRICE	TAX	LINE TOTAL
40500	USED OIL REMOVAL						
40300	ANTI-FREEZE REMOVAL						
40600	USED OIL FILTER REMOVAL						
40501	OILY WATER DISPOSAL						
40502	SLUDGE DISPOSAL						
41001	GASOLINE/WATER						
[illegible]501	DRUM DISPOSAL						
[illegible]504	TANK ENTRY						
40800	PARTS WASHER SERVICE						
41500	TRUCK & OPERATOR						
41511	NEW 55 GAL DRUM /17H						
41503	QAQC ANALYTICAL TESTING						
42001	DEXSIL TEST KIT TAX						
41509	TRANSPORTATION						

CHARGE MY ACCOUNT FOR THIS TRANSACTION UNLESS OTHERWISE INDICATED IN THE PAYMENT SECTION. $

INVOICES REFLECTING CHARGES TO CUSTOMER ARE SUBJECT TO AN INTEREST RATE OF THE LESSER OF 1½% PER MONTH (18% PER ANNUM) OR THE MAXIMUM RATE ALLOWED BY LAW ON ANY INVOICES THAT ARE NOT PAID WITHIN 30 DAYS. IN THE EVENT OF DEFAULT, LORCO SHALL BE ENTITLED TO RECOVER COSTS OF COLLECTION, INCLUDING REASONABLE ATTORNEY'S FEES.

GENERATOR WARRANTS AND REPRESENTS THAT THE MATERIALS PROVIDED LORCO HEREUNDER HAVE NOT BEEN MIXED, COMBINED, OR OTHERWISE BLENDED IN ANY QUANTITY WITH MATERIALS CONTAINING POLYCHLORINATED BIPHENYLS (PCB) OR ANY OTHER MATERIAL DEFINED AS HAZARDOUS WASTE UNDER APPLICABLE LAWS, INCLUDING BUT NOT LIMITED TO 40 CFR PART 261; GENERATOR AGREES TO INDEMNIFY AND HOLD LORCO HARMLESS FOR ANY DAMAGES, COSTS, ATTORNEY'S FEES, ETC. ARISING OUT OF OR IN ANY WAY RELATED TO A BREACH OF THE ABOVE WARRANTY BY THE GENERATOR.

Generator certifies that the waste is:
In accordance the N.J.A.C. 7:26-12.1 et seq, LORCO has the required permits to accept the above described waste.

Print Name: [illegible] Title: [illegible]
Signature: [signature] Date: 9-9-97
GENERATOR/CUSTOMER

SMALL QUANTITY GENERATOR CERTIFICATION

I certify that this generator generates less than 100 kilograms of hazardous waste per month, as defined at 40 C.F.R. 261, and does not accumulate more than 1,000 kilograms of such waste during the month.

GENERATOR'S SIGNATURE

LARGE QUANTITY GENERATOR CERTIFICATION

DEXSIL CDT TEST RESULTS

PPM

TOTAL

9307 → 700 gallons

PAYMENT RECEIVED SECTION

CASH ☐ — TOTAL RECEIVED
CHECK NUMBER ☐

CUSTOMER SERVICED EVERY 30 DAYS

In accordance with 40 CFR 266 § 43(5) LORCO has notified the US EPA of its location and used oil management activities.

Print Name: [illegible]
Signature: [signature] Date: 9-9-97

LORCO PETROLEUM SERVICES
RD1 Box 6A
Old Bridge, N.J. 08857
(908) 721-0900
Fax (908) 721-0231

STANDARD COLLECTION ORDER FORM

176848

SALES ORDER #

GENERATOR/LOCATION

NAME

INFORMATION/ATTN LINE

ACCOUNT APPROVAL CODE

DELIVERY ADDRESS

CITY

STATE

ZIP

PHONE NUMBER

PURCHASE ORDER NUMBER

STATE ID NO.

USA EPA ID NO. (IF APPLICABLE)

BILL TO (IF DIFFERENT FROM LOCATION)

NAME

INFORMATION/ATTENTION LINE

ACCOUNT APPROVAL CODE

DELIVERY ADDRESS

CITY

STATE

ZIP

PHONE NUMBER

PURCHASE ORDER NUMBER

MANIFEST NUMBER

SHIPPING INFORMATION

This is to certify that the below-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

NO.	TYPE	QTY.	UNIT	US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)
				Combustible Liq. 1 UN 1270 PG III

SALES REPRESENTATIVE

SERVICE SECTION

SALES CODE	DESCRIPTION	WASTE CODE	QUANTITY	UNIT PRICE	PRICE	TANK	Volume
40500	USED OIL REMOVAL						
40300	ANTI-FREEZE REMOVAL					9307	55
40600	USED OIL FILTER REMOVAL						
40501	OILY WATER DISPOSAL		344	Gal		9162	55
40502	SLUDGE DISPOSAL						
41001	GASOLINE/WATER					9196	55
41501	DRUM DISPOSAL						
41504	TANK CLEANING					9116	55
40800	PARTS WASHER SERVICE						
41500	TRUCK OPERATOR		3 men @ 3:00 = 35 hours			9003	30
41511	PREPARE DRUM FOR DISPOSAL						
41503	LABORATORY TESTING					9006	200
42001	DEXSIL TEST KIT						
41509	TRANSPORTATION					9059	30
						9031	30

TOTAL

Tank to the North of 9t had 344 gallons of water

CHARGE MY ACCOUNT FOR THIS TRANSACTION UNLESS OTHERWISE INDICATED IN THE PAYMENT SECTION.

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INVOICES REFLECTING CHARGES TO CUSTOMER ARE SUBJECT TO AN INTEREST RATE OF THE LESSER OF 1½% PER MONTH (18% PER ANNUM) OR THE MAXIMUM RATE ALLOWED BY LAW ON ANY INVOICES THAT ARE NOT PAID WITHIN 30 DAYS. IN THE EVENT OF DEFAULT, LORCO SHALL BE ENTITLED TO RECOVER COSTS OF COLLECTION, INCLUDING REASONABLE ATTORNEY'S FEES.

GENERATOR WARRANTS AND REPRESENTS THAT THE MATERIALS PROVIDED HEREUNDER HAVE NOT BEEN MIXED, COMBINED, OR OTHERWISE BLENDED IN ANY QUANTITY WITH MATERIALS CONTAINING POLYCHLORINATED BIPHENYLS (PCB) OR ANY OTHER MATERIAL DEFINED AS HAZARDOUS WASTE UNDER APPLICABLE LAWS, INCLUDING BUT NOT LIMITED TO 40 CFR PART 261. GENERATOR AGREES TO INDEMNIFY AND HOLD LORCO HARMLESS FOR ANY DAMAGES, COSTS, ATTORNEY'S FEES, ETC. ARISING OUT OF OR IN ANY WAY RELATED TO A BREACH OF THE ABOVE WARRANTY BY THE GENERATOR.

Generator certifies that the waste is Non Haz. In accordance with the N.J.A.C. 7:26-12.1 et seq, LORCO has the required permits to accept the above described waste.

Print Name [signature] Title Fac Ped Sp.

[signature] 10-7-97 Date

SMALL QUANTITY GENERATOR CERTIFICATION

I certify that this generator generates less than 100 kilograms of hazardous waste per month, as defined at 40 C.F.R. 261, and does not accumulate more than 1,000 kilograms of such waste during the month.

GENERATOR'S SIGNATURE

LARGE QUANTITY GENERATOR CERTIFICATION

DEXSIL CDT TEST RESULTS

PAYMENT RECEIVED SECTION

CASH ☐	TOTAL RECEIVED
CHECK NUMBER	

CUSTOMER SERVICED EVERY 30 DAYS

In accordance with 40 CFR 266 § 43(5) LORCO h the US EPA of its location and used oil managemer

[signature] LUECK

Print Name