



GETTLER - RYAN INC.

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TO: Mr. Dave De Witt
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 2000 Crow Canyon Place, Suite 400
 San Ramon, California 94583

DATE: March 4, 1999
 PROJ. #: 140107.02-3
 SUBJECT: Report
 Tosco 76 Branded Facility
 No. 7376
 4191 First Street
 Pleasanton, California

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cc: Scott Seery, Alameda County Health Care Services Agency
 Chuck Headlee, Regional Water Quality Control Board, San Francisco Bay Region



GETTLER-RYAN Inc.

WELL INSTALLATION AND SOIL BORING REPORT

at

Tosco 76 Branded Facility No. 7376
4191 First Street
Pleasanton, California

Report No. 140107.02-3

Prepared for:

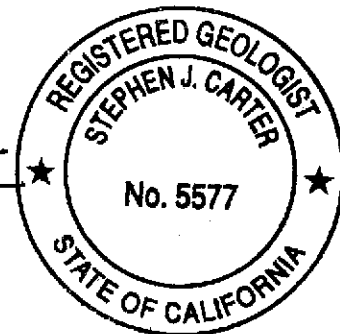
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March 4, 1999

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Report No. 140107.02-3

INTRODUCTION

This report summarizes field activities performed by Gettler-Ryan Inc. (GR) from June 8 through September 22, 1998, at the subject site. The purpose of this subsurface investigation was to collect data to better understand the local geology/hydrogeology and to delineate the lateral and vertical extent of hydrocarbon-impacted soil and groundwater beneath and adjacent to the subject site. The work performed included: drilling seven soil borings and constructing groundwater monitoring wells in two of the off-site borings; collecting soil samples for description and chemical analysis; developing and sampling the newly installed groundwater monitoring wells; surveying all of the wells and borings; analyzing the soil and groundwater samples; and preparing this report. In addition to the delineation of the gasoline compounds, this document also reports GR's findings associated with the heavy hydrocarbons previously identified as "crude oil" known to exist beneath the site. This work was performed at the request of Tosco Marketing Company and in response to a letter from the Alameda County Health Care Services Agency (ACHCSA) dated February 9, 1998. This work was originally proposed in the Kaprealian Engineering Inc. (KEI) Report No. KEI-P94-0903.P3, *Work Plan/Proposal*, dated May 6, 1997 and amended by the GR Report No. 140107.02-1, *Work Plan Addendum*, dated May 11, 1998. The Work Plan was approved in a letter from the ACHCSA dated June 8, 1998. Subsequent direction from ACHCSA was received in a letter dated June 10, 1998, requesting the continuous sampling of additional borings proposed in GR's Work Plan Addendum.

SITE DESCRIPTION

The subject site is an operating service station located on the north corner of the intersection of First Street and Ray Street in Pleasanton, California (Figure 1). The site is bounded to the northwest by a former Southern Pacific Railroad right-of-way currently owned by Alameda County, to the north and northeast by a commercial building, to the southeast by First Street,

and to the southwest by Ray Street. Properties in the immediate site vicinity are used for a mix of residential and commercial purposes that include restaurants and shopping facilities. The site is located at an approximate elevation of 366 feet above sea level. Current site facilities consist of a kiosk with four product dispenser islands and two 12,000-gallon double-wall fiberglass gasoline underground storage tanks (USTs). Locations of the pertinent site features are shown on the Site Plan (Figure 2).

SITE HISTORY/PREVIOUS ENVIRONMENTAL WORK

The site was developed in 1899 as a warehouse to store grains and hay (Amador-Livermore Valley Historical Society, 1994). According to a Sanborn map, an "in-ground" storage tank for oil was installed on-site in 1907. The first service station was built on the site in 1976 (Enviros, 1995). Between November 8, 1982 and February 8, 1985, the Pleasanton Fire Department (PFD) responded to five separate fuel releases at the site (PFD, 1988).

On June 30, 1987, exploratory soil borings B-1, B-2, and B-3 were drilled at the site and sampled by Applied GeoSystems (AGS). Borings B-1 and B-2 were drilled to a final depth of 46.5 feet below ground surface (bgs) and B-3 was drilled to 55 feet bgs. Three soil samples from each boring were analyzed for Total Petroleum Hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and xylenes (BTEX), except for a sample collected at 35 feet bgs from B-1 (sample S-35-B1) which was also analyzed for Total Petroleum Hydrocarbons as diesel (TPHd). A sample collected at 10 feet bgs from B-3 was reported as not detected for all analytes. The remaining samples contained petroleum hydrocarbons at concentrations ranging from 7.72 to 188.8 parts per million (ppm) of TPHg and 0.07 to 17.1 ppm of benzene. Sample S-35-B1 also contained 1,325 ppm of TPHd. Groundwater was not encountered in the borings (AGS, 1987).

On August 21, 1987, soil boring B-4 was advanced by AGS to a total depth of 66.5 feet bgs. One soil sample collected at 35 feet bgs contained 100.5 ppm of TPHg, 1.4 ppm of benzene, and 1,835 ppm of TPHd. A second soil sample collected at 65 feet bgs was reported as not detected for TPHg, TPHd, and BTEX. Groundwater was not encountered in the boring (AGS, 1987a).

On December 2 through 7, 1987, AGS advanced three soil borings (B-5, B-6, B-7) to a total depth of 96.5 feet bgs and completed the borings as groundwater monitoring wells MW-1, MW-2, and MW-3. The wells were completed at depths of 96.5, 85, and 96.5 feet bgs, respectively. Saturated soil was initially encountered at approximately 80 feet bgs. Two soil samples collected at 35 and 70 feet bgs in boring B-5 were reported as not detected for TPHg,

TPHd, and BTEX. One soil sample collected at 35 feet bgs in boring B-6 contained 15.0 ppm of TPHg, 6,300 ppm of TPHd and was not detected for benzene. One soil sample collected at 70 feet bgs in Boring B-6 were reported as not detected for TPHg, TPHd, and BTEX. A sample collected at 55 feet bgs in boring B-7 contained 390 ppm of TPHg, 1.3 ppm of benzene, and 220 ppm of TPHd. A sample collected at 75 feet bgs in boring B-7 contained 5.0 ppm of TPHg, 30.0 ppm of TPHd, and was not detected for BTEX. Groundwater samples collected from well MW-1, MW-2, and MW-3 contained petroleum hydrocarbon concentrations ranging from 0.0500 to 24.000 ppm of TPHg, 0.058 to 2.600 ppm of benzene, and 0.620 to 2.300 ppm of TPHd (AGS, 1987b).

~~A 1/2-mile radius well survey was performed by AGS in late 1987 or early 1988. A review of the Alameda County Flood Control and Water Conservation District - Zone 7 (Zone 7) files identified five water wells and two other types of wells within the 1/2-mile radius of the site. Four of the five water wells are domestic wells and the fifth appears to be a monitoring well (AGS, 1987b and KEI, 1996).~~

Reportedly, in December 1987, the four 12,000-gallon USTs were replaced with two 12,000-gallon double-wall USTs. An unknown volume of contaminated soil was reportedly removed and transported to a Class I facility. The property and facilities were sold to the Unocal Corporation in February 1988 (KEI, 1996 and Enviro, 1995).

In September 1994, KEI performed soil sampling services during a dispenser and product piping upgrade at the site. A total of twelve trench soil samples were collected at approximately 3 feet bgs. Petroleum hydrocarbons were detected in the samples at concentrations ranging from not detected to 8,900 ppm of TPHg, and not detected to 65 ppm of benzene. Upon receipt of the analytical data, overexcavation was performed in the area of two soil samples with elevated hydrocarbon concentrations. Three soil samples were collected at approximately 9 feet bgs. The two overexcavation samples were reported to contain 13 and 17 ppm of TPHg and 0.020 to 0.029 ppm of benzene. The third soil sample, collected laterally between the two overexcavation samples contained 4,400 ppm of TPHg and 29 ppm of benzene (KEI, 1994).

On February 6 and 7, 1995, KEI destroyed monitoring well MW-2 and advanced two soil borings (MW-2B and EB-1). Boring MW-2B was completed as a monitoring well. Well MW-2 was destroyed due to asphalt tar being introduced into the well casing during repaving activities at the site. Soil boring EB-1 was drilled to a total depth of 66 feet bgs and well MW-2B was drilled and constructed to a total depth of 91 feet bgs. A total of twenty-nine soil samples were collected during boring EB-1 and MW-2B drilling activities. Samples collected from 5 to 50 feet bgs from EB-1 contained petroleum hydrocarbon concentrations

ranging from 27 to 15,000 ppm of TPHg, 0.29 to 340 ppm of benzene, and 55 to 3,600 ppm of TPHd. Samples collected from 55 to 65 feet bgs from EB-1 contained petroleum hydrocarbon concentrations ranging from not detected to 6.4 ppm of TPHg, not detected to 0.89 ppm of benzene, and not detected for TPHd. Soil samples collected from 5 to 65 feet bgs in well boring MW-2B contained petroleum hydrocarbons concentrations ranging from 1.0 to 720 ppm of TPHg, not detected to 9.5 ppm of benzene, and not detected to 2,400 ppm of TPHd. Soil samples collected from 70 to 80 feet bgs in well boring MW-2B were reported as not detected for TPHg, BTEX, and TPHd (KEI, 1995).

Enviros was contracted to perform a Phase I Environmental Site Assessment for the site in early 1995 (Enviros, 1995).

On July 23 and 24, 1996, KEI advanced three soil borings and completed them as groundwater monitoring wells MW-4, MW-5 and MW-6 to total depths of 73.5 to 93 feet bgs. Well MW-4 was installed on-site and wells MW-5 and MW-6 were installed off-site on the former Southern Pacific Railroad right-of-way. A total of forty-seven soil samples were collected from the well borings and analyzed for TPHg, BTEX, and fuel fingerprinting. Soil samples from well boring MW-4 contained low concentrations of petroleum hydrocarbons ranging from not detected to 47 ppm of TPHg, not detected to 0.27 ppm of benzene, not detected to 15 ppm of TPHd. Soil samples collected in the upper 50 feet of well boring and MW-5 were reported as not detected for TPHg and TPHd, and contained benzene in concentrations ranging from not detected to 0.038 ppm. Samples collected between 55 and 65 feet bgs in MW-5 contained petroleum hydrocarbon concentrations ranging from 32 to 560 ppm of TPHg, 0.28 to 3.9 ppm of benzene, and not detected to 450 ppm of TPHd. Samples collected from MW-6 contain petroleum hydrocarbon concentrations ranging from not detected to 5.0 ppm of TPHg, not detected to 1.2 ppm of benzene, and not detected for TPHd except for 200 ppm detected at 55 feet bgs. Petroleum hydrocarbon concentrations in the range of kerosene, motor oil, and unidentified extractable hydrocarbons were also identified in the samples collected from the well borings (KEI, 1996).

Free product was found in well MW-5 during quarterly monitoring activities on June 27, 1997. In December 1997, (Entrix) performed a forensic geochemical analysis of free product extracted from well MW-5. The Entrix study determined that the free product was most likely composed of a mixture of over 50% refined gasoline and heavier hydrocarbons. The gasoline constituents appeared to be relatively fresh according to Entrix. The heavier hydrocarbon mixture had a carbon distribution ranging from about nC13 to nC33. This distribution is similar in nature to a very weathered crude oil or Bunker C fuel, not refined petroleum products such as diesel #2, motor oil, lube oil, etc. (Entrix, 1997).

Groundwater has been monitored on a quarterly basis from December 1994 to the present. Groundwater analytical data collected during monitoring indicates that free product or a product sheen has been present in well MW-5 since December 1996. Excluding MW-5, petroleum hydrocarbon concentrations in the groundwater on-and off-site has ranged from not detected to 19,000 ppb of TPHg, not detected to 950 ppb of benzene, not detected to 4,400 ppb of MTBE, and not detected to 4,000 ppb of TPHd. Depth to groundwater during this period fluctuated from approximately 49.63 to 86.02 feet bgs (GR, 1998).

REGIONAL GEOLOGY

The subject site is located at the base of the northwest end of the Valle De San Jose. The site is underlain by Holocene age coarse grain non-marine alluvium interpreted to be alluvial fan deposits. These deposits are composed of unconsolidated and well bedded, moderately sorted, permeable sand and silt, with coarse sand and gravel becoming abundant toward fan heads and in narrow canyons (Helley, 1979). The site is also located approximately 1,000 feet west of Pliocene and/or Pleistocene non-marine sedimentary Livermore Gravel (Diblee, 1980).

Previous subsurface studies performed by AGS and KEI indicate the site is underlain by alluvium to a maximum explored depth of 96.5 feet bgs. The alluvium consists of interbedded layers of silts, sands, clays and gravels in both the vadose and saturated zones (KEI, 1996).

Groundwater has been historically reported at approximately 67.15 to 87.26 feet below top of casing (TOC) in wells MW-1, MW-2B, MW-3, MW-4, and MW-6. Groundwater in well MW-5 has been historically reported at 49.63 to 69.47 feet below TOC. The water-bearing zone appears to be unconfined beneath the site. Groundwater in well MW-5 has historically displayed "perched" water table tendencies with a maximum 15 foot depth to water elevation variation, compared to nearby well water table elevations (Wells MW-6, MW-7 and MW-8). A review of Alameda County Flood Control and Water Conservation District-Zone 7 (1993) groundwater data determined that the regional groundwater flow direction in the vicinity of the site was toward the northwest. The nearest surface water is Arroyo Valle, located approximately 700 feet northwest of the site.

FIELD ACTIVITIES

Field work was performed in accordance with the GR Site Safety Plan No. 140038.02, dated May 19, 1998, GR Field Methods and Procedures and Site Safety Plan are presented in Appendix A. Underground Service Alert (USA) was notified prior to beginning the drilling activities and a utility locator service was employed to clear each drilling location. Drilling and well installation was performed under Zone 7 Drilling Permit No. 98020 and Alameda County Public Works Agency Roadway Encroachment Permit No. R00-LD0401. A copy of the permits is included in Appendix B.

Fieldwork was delayed during the implementation of this project because of weather, property and physical access, coordination with the adjacent property owner and concurrent construction activities. A transect of five on-site borings located along the northwest property boundary were drilled between June 8 and June 11, 1998 (B-8 through B-12) to total depths ranging from 71 to 86 feet below ground surface (bgs). These borings were installed to collect additional information regarding the subsurface conditions, geologic information and investigation into the source of the "crude oil" or "heavy" hydrocarbon identified in off-site well MW-5. Two off-site soil borings were drilled on June 12 and August 14, 1998 and completed as groundwater monitoring wells MW-8 and MW-7, respectively. The wells were installed to total depths of approximately 86 and 75 feet bgs, respectively. The purpose of installing these wells was to delineate impacted groundwater down-gradient. Locations of the borings and wells are shown on Figure 2.

All borings were drilled using a truck-mounted drill rig equipped with eight-inch diameter hollow stem augers. Drilling was performed by Woodward Drilling Company of Rio Vista, California (#C57 710079). A GR geologist observed the drilling and well installation activities, described the encountered soil, and prepared a log of each boring. Logs of the soil borings are included in Appendix B. A representative of ACHSCA was not present to witness placement of the well seals, but did intermittently witness drilling activities.

Soil cuttings generated during drilling were placed on and covered with plastic sheeting and stored at the site pending disposal. Sample US-1 (comp) was collected from the stockpiled soil cuttings and submitted to the laboratory to be composited and analyzed as one sample. Stockpile sampling procedures are presented in Appendix A. Water generated during the cleaning of the drilling equipment was placed in properly labeled drums and stored at the site pending disposal.

Well Installation

Each well was constructed using 2-inch diameter Schedule 40 polyvinyl chloride (PVC) casing and 0.02-inch machine-slotted well screen. The annular space around the well screen in each well boring was packed with Lonestar #3 sand to approximately one foot above the top of the well screen. The sandpack in each well was followed by a bentonite transition seal and then completed with neat cement. The top of each well is protected by a vault box, locking well cap, and lock. Well construction details are included on the boring logs in Appendix B.

Well Monitoring, Development, and Sampling

Monitoring, development, and sampling of the two newly installed and six existing wells was performed by GR personnel. Copies of the well development and field monitoring data sheets are included in Appendix C.

Well MW-8 was developed on June 22, 1998 and sampled during the 2nd Quarter 1998 monitoring and sampling event on June 26, 1998. Well MW-7 (drilled on August 14, 1998), was developed and sampled on August 18, 1998. Depth to groundwater in the wells was measured and each well checked for the presence of floating product prior to development. The wells did not dewater during development, and each yielded a minimum of 10 well casing volumes of purge water. After the wells were properly developed, groundwater samples were collected in appropriate containers supplied by the laboratory. A hydrocarbon sheen was observed in well MW-5 on June 26 and August 18, 1998. Purge water generated during development and sampling procedures was discharged to a truck-mounted tank, then transported to the Tosco Refinery in Rodeo, California for disposal. Monitoring data are summarized in Table 1.

Wellhead Survey

Following installation of the wells, the well casing elevations were surveyed by Virgil Chavez Land Surveying of Vallejo, California (California Land Surveyor No. 6323). Top of casing and vault box elevations were measured relative to MSL, and the horizontal locations of the wells surveyed. Horizontal locations of the soil borings and other pertinent equipment were also surveyed. Well casing elevations are summarized in Table 1. A copy of the surveyor's report is included in Appendix D.

SUBSURFACE CONDITIONS

The unsaturated (vadose) zone is comprised predominantly of fill material overlying a fine-grained unit containing discontinuous strata, overlying a predominantly coarse-grained unit with silt and clay strata. The saturated zone is comprised of interbedded silts, sands, clay and gravels. Groundwater was initially encountered at depths of approximately 61.5 to 77 feet bgs. Two geologic cross sections (A-A' on Figure 3 and B-B' on Figure 4) were constructed from data generated during drilling activities. Cross section locations are shown on Figure 2.

Prior to groundwater sample collection on June 26, 1998, and well development and groundwater sample collection on August 18, 1998, GR personnel measured the depth to groundwater in wells MW-1 through MW-8 at 63.00 to 79.65 and 70.40 to 83.99 feet below top of well casing, respectively. A product sheen was observed in well MW-5 during both monitoring episodes. These data were used to construct two Potentiometric Maps (Figures 5 and 6). Based on these data, the Potentiometric Maps of the shallow groundwater beneath the subject site depicts a groundwater high in the area of wells MW-5 and MW-8, showing converging groundwater flows of northwest and southwest at a calculated hydraulic gradient of 0.07 to 0.17 feet /feet respectively. The third quarter monitoring event was performed on September 22, 1998, and reported to have a general groundwater flow of north-northwest at a calculated hydraulic gradient of 0.10 feet/feet (Figure 7). **This map shows a possible perched water table in wells MW-5, MW-7 and MW-8 that may be imbricated in relation to the wells MW-1 through MW-4 (on-site). The difference in the groundwater elevations may also be a result of lithological or structural constraints, or possibly some offset or displacement in the soils beneath the site in the area between MW-2B and MW-5 (Figures 3 and 4).** The encountered water-bearing zone(s) appears to be unconfined. *

CHEMICAL ANALYTICAL RESULTS

A total of forty soil samples from the soil borings, one composite sample from the stockpiled drill cuttings, four grab groundwater samples and eight groundwater monitoring well samples were collected and submitted for chemical analysis. Soil samples were selected using OVM data and geologic interpretation. Columbia Analytical Services Inc. of Santa Clara, California (ELAP # 1426) performed analyses of soil and grab groundwater samples. Analyses of monitoring well groundwater samples were performed by Sequoia Analytical of Redwood City, California (ELAP #1210). Copies of the laboratory reports and chain-of-custody forms are included in Appendix E.

Chemical Analytical Procedures

Selected soil samples from the borings were analyzed for total petroleum hydrocarbons as gasoline (TPHg), diesel (TPHd), and oil (TPHo), benzene, toluene, ethylbenzene and xylenes (BTEX), and methyl tert-butyl ether (MtBE) according to Environmental Protection Agency (EPA) Method 5030/8015/8020. Groundwater samples were analyzed for TPHg, TPHd, BTEX, and MtBE. The soil stockpile sample was analyzed for TPHg, TPHd, TPHo, BTEX, MtBE, and CAM 17 metals. Groundwater chemical analytical data are summarized in Table 1. Soil chemical analytical data are summarized in Table 2 and shown on Figures 3 and 4.

Soil Chemical Analytical Results

Soil Boring B-8

No petroleum hydrocarbons were detected in soil samples collected at 61.5 and 71.5 feet bgs. In addition, field screening procedures conducted with a PID at five-foot depth intervals also confirmed the absence of any hydrocarbons in the soils at this location.

Soil Boring B-9

No petroleum hydrocarbons were detected in a soil sample collected at 61.5 feet bgs. A sample collected at 80.5 feet bgs contained 5 ppm of TPHg, 0.32 ppm of benzene, 280 ppm of a petroleum hydrocarbon that contained components that eluted in the diesel range, but the chromatogram did not match the typical diesel fingerprint, and was reported not detected for TPHo and MtBE. A sample collected at 81 feet bgs contained 4 ppm of TPHg, 0.29 ppm of benzene, and was reported as not detected for TPHd, TPHo, and MtBE.

Soil Boring B-10

Four soil samples collected from boring B-10 between 12 and 38 feet bgs contained petroleum hydrocarbons in concentrations ranging from 1 to 760 ppm of TPHg, 0.013 to 7.3 ppm of benzene, 1.8 to 1900 ppm of TPHd, not detected to 0.23 ppm of MtBE and not detected at elevated detection limits for TPHo. The highest petroleum hydrocarbon concentrations were identified at 24.5 and 31 feet bgs. Three soil samples collected between 49 and 75.5 feet bgs did not contain any petroleum hydrocarbons except for 0.012 ppm of benzene for the sample collected at 57 feet bgs.

Soil Boring B-11

Nine soil samples collected from boring B-11 between 5.5 and 61 feet bgs contained petroleum hydrocarbons in concentrations ranging from not detected to 580 ppm of TPHg, 0.008 to 12 ppm of benzene, 23 to 7,300 ppm of TPHd, and not detected to 2.5 ppm of MTBE. TPHo concentrations were detected in soil samples collected at 5.5 and 10.5 feet bgs at 590 and 5,200 ppm, respectively. Two soil samples collected at 66.5 and 73.5 feet bgs were reported as not detected for petroleum hydrocarbons except for 0.12 ppm of MTBE and 140 ppm of a petroleum hydrocarbon that contained components that eluted in the diesel range, but the chromatogram did not match the typical diesel fingerprint.

Visual evidence of "heavy" hydrocarbons were noted in boring B-11 from 15 to 62 feet bgs in varying quantities. Two samples, collected at 10.5 and 61 feet bgs were submitted to Global GeoChemistry Corporation for identification "fingerprint". The results are discussed in the following section; "Global GeoChemistry Corporation Report Results".

Soil Boring B-12

Five soil samples collected from boring B-12 between 10 and 47 feet bgs contained petroleum hydrocarbons in concentrations ranging from not detected to 1,700 ppm of TPHg, not detected to 21 ppm of benzene, not detected to 14,000 ppm of TPHd, and not detected to 2.6 ppm of MTBE. TPHo was not detected in any of the samples. The highest petroleum concentration was identified at 28.5 to 47 feet bgs. Two soil samples collected at 55 and 72 feet bgs were reported as not detected for all petroleum hydrocarbons.

Well Boring MW-7

No petroleum hydrocarbons were detected in five soil samples collected between 11 and 60.5 feet bgs. In addition, field screening procedures conducted on retrieved soil samples also indicated an absence of petroleum hydrocarbons in well boring MW-7.

Well Boring MW-8

Five soil samples collected from well boring MW-8 between 11 and 67 feet bgs were reported as not detected for TPHg, benzene, TPHd, TPHo, and MTBE, except for 60 ppm of TPHg and 79 ppm of TPHd detected in the sample collected at 45.5 feet bgs.

Groundwater Chemical Analytical Results

Grab Groundwater Samples

Grab groundwater sample B-8 was reported as not detected for TPHg, benzene, and MTBE. A representative groundwater sample was not collected from boring B-9, due to a ruptured water line in the area of the borehole that flooded the borehole. A groundwater sample collected from boring B-10 contained 980 ppb of TPHg, 39 ppb of benzene, 930 ppb of TPHd, 250 ppb of MtBE, and not detected for TPHo. A groundwater sample collected from boring B-11 contained 110 ppb of benzene, 600 ppb of TPHd, 6,200 ppb of MtBE and was reported as not detected for TPHg and TPHo. Groundwater samples collected from boring B-12 contained 5 ppb of benzene, 64 ppb of TPHd, 220 ppb of MtBE, and were reported as not detected for TPHg and TPHo. These data were used to construct the attached groundwater concentration map (Figure 8).

Monitoring Well Groundwater Samples

Groundwater samples MW-1 through MW-6 and MW-8 were collected on June 26, 1998 and sample MW-7 was collected on August 18, 1998, following installation. A groundwater sample was collected from well MW-5 after petroleum hydrocarbon sheen was detected. Petroleum hydrocarbons were detected in all groundwater samples at concentrations ranging from not detected to 4,000 ppb (MW-7) of TPHg, not detected to 1,900 ppb (MW-7) of benzene, not detected to 230,000 ppb (MW-5) of TPHd, and not detected to 4,000 ppb (MW-2B) of MTBE. TPHg and TPHd concentrations detected also contained discrete peaks and unidentified hydrocarbons outside of normal TPHg and TPHd parameters. See Table 1 for specific notes and explanations.

Stockpile Chemical Analytical Results

Soil stockpile sample US-1(comp) was reported as not detected for TPHo and MTBE and contained 100 ppm of TPHg, 0.27 ppm of benzene, 1,100 ppm of TPHd, and allowable concentrations of metals.

Free Product Geochemical Report Results

Tosco had previously initiated an investigation into the chemical make-up of the free product that has historically been observed in MW-5. Free product samples were collected and submitted to Entrix, Inc. of Walnut Creek California for forensic geochemical analysis to finger print and identify the free product found in MW-5. Entrix Inc. submitted a report dated

December 12, 1997, and found the free product in MW-5 to be a mixture of refined gasoline and a heavier hydrocarbon. The gasoline fraction, comprising at least 50% of the hydrocarbons, was reported to be somewhat fresh in composition. The remaining 50% was reported to be a heavy hydrocarbon that did not appear to contain any refined petroleum products such as diesel #2, motor oil, lube oil, etc. Rather, the heavy hydrocarbon fraction appeared to be a very weathered crude oil and comparable to Bunker C fuel. These results were derived from both chromatographic (high resolution gas chromatography or HRGC) and simulated distillation data types. A copy of the Entrix Inc. report dated December 12, 1997 is presented in Appendix F. These results initiated an inquiry into the type of products transported in the adjacent pipeline operated by Santa Fe Pacific. GR's findings indicated that according to the current pipeline operator, they lease out this pipeline for transportation of refined petroleum products only. Historically, the pipeline may have transported unrefined petroleum products and Bunker C fuel, however, the current operator has no data to document the transportation of unrefined petroleum products. In general, the Santa Fe Pacific Pipeline and rail systems have in the past transported unrefined petroleum products as well as refined petroleum products. but not here

During this investigation, soil samples collected from soil borings in the vicinity of the former UST excavation exhibited evidence of a thick black hydrocarbon-type substance in the soil cracks and pore spaces. Two soil samples collected from boring B-11 at 10.5 and 61 feet bgs (B-11-10.5 and B-11-61) were submitted under a Chain-of-Custody to Global Geochemistry Corporation (Global) of Canoga Park, California for hydrocarbon fingerprinting chemical analysis. These samples were analyzed by the same methods as the free product sample from MW-5. The results of these analyses indicate that the hydrocarbon in the soil samples are a mixture of about 90% semi-volatile and high boiling components identified as crude oil and 10% gasoline. The gasoline fraction is not highly weathered and the crude oil fraction varies from highly weathered in sample B-11-61 to very severely weathered in sample B-11-10.5. The Global report dated August 7, 1998 is also included in Appendix F.

Both independent laboratories arrived at the same conclusion on the chemical components of the free product (heavy hydrocarbon) found at the site. The gasoline fractions are rather fresh and the heavy hydrocarbons are unrefined highly weathered crude type petroleum products. The source of the gasoline or refined fraction is likely from a retail fuel dispensing operation. The source of the heavy or crude type hydrocarbon product is still unknown and may never be identified. The soil analytical data from the site borings suggest a possible source of the heavy or crude oil found in boring B-11 at 11 feet bgs. The heavy hydrocarbon material may have been imported in the fill material found at the site, or possibly from activities prior to the service station operations, however, no conclusive documentation has been found. It is unlikely though, that bulk crude type oil was ever stored, sold or used at this location.

WASTE DISPOSAL

Approximately 305 gallons of waste water generated by cleaning the drilling equipment and well development procedures were removed from the site by GR, and transported to the Tosco Refinery in Rodeo, California, for treatment. Approximately 29.91 tons of soil (drill cuttings) were removed from the site by Denbeste Transportation, Inc. of Windsor, California and transported to the Forward Incorporated facility in Manteca, California for disposal. A copy of the Forward disposal confirmation form included in Appendix G.

DISCUSSION

The purpose of this investigation was to collect additional site data to better understand the geology and potential migratory pathways that exist at the site through the installation of soil borings. In addition, monitoring wells MW-7 and MW-8 were installed down-gradient of the site to delineate the dissolved hydrocarbons and possibly the free product identified in MW-5.

The five on-site soil borings completed a fence of boreholes that transect the northwestern property boundary. Data from these borings, along with data generated by previous environmental studies performed at the site, identifies specific zones containing residual hydrocarbons. **Geologic and hydraulic data generated during this investigation suggest the hydrogeologic conditions responsible for the elevated or perched water table identified in well MW-5 as possibly a result of the discontinuous nature of the alluvial fan deposit or some small off-set or displacement of the soils that underlies the site (see cross-sections on Figures 3 and 4). Physical evidence of a possible fault or displacement feature has not been identified and is suggested based on the cross-section interpretation.**

Soil samples from B-11 that contained visible hydrocarbons were analyzed by Global for a hydrocarbon fingerprint. The results were similar to the fingerprint analysis performed on a free product sample from MW-5 by Entrix Inc in December 1997. Both laboratories identified a fresh gasoline fraction as well as a highly weathered unrefined hydrocarbon such as crude oil or Bunker C fuel. This suggests that there was a separate source for the heavy unrefined hydrocarbon fraction. Unrefined hydrocarbons are not a result of the operations of a fuel dispensing operation. Historical records (Sandborn Maps, Enviro 1995) show a UST in the area of boring B-10 that was used from 1907 until approximately 1969 and contained oil for an oil-fired boiler. This former oil UST is believed to be the source of the heavy hydrocarbon identified in MW-5 and in borings B-10 and B-11. The source of the gasoline product is from the UST and piping facilities at the site. The fingerprint analysis for both the shallow and deep soils as well as the free product in MW-5 indicates that it is a mixture of

refined fresh gasoline and unrefined highly weathered heavy crude oil. It is likely that gasoline moved vertically in the same path of the unrefined hydrocarbon through the soil until it was trapped in the vicinity of MW-5. The two additional down-gradient wells installed delineated the heavy hydrocarbon but did not delineate the dissolved hydrocarbons as anticipated. TPHg and MtBE have been identified in newly installed wells MW-7 and MW-8. Further off-site (down-gradient) may not be feasible because of the new construction currently in progress. A well survey was previously prepared and did not identify any potential domestic, industrial, commercial or municipal wells within a 1/2-mile radius of the site. The closest municipal well located in the down gradient direction has already been impacted by MtBE (conversations with ACHCS, 1998). *not so!*

DISTRIBUTION

GR recommends that a copy of this report be forwarded to Mr. Chuck Headlee of the California Regional Water Quality Control Board, San Francisco Bay Region at 1515 Clay Street Suite 1400, Oakland, California 94612 and Mr. Scott Seery of the Alameda County Health Care Services Agency at 1131 Harbor Bay Parkway, 2nd Floor, Alameda, California 94502.

REFERENCES

Alameda County Flood Control and Water Conservation District, 1993, Fall 1993 Groundwater Contour Map Report, dated December 17, 1993.

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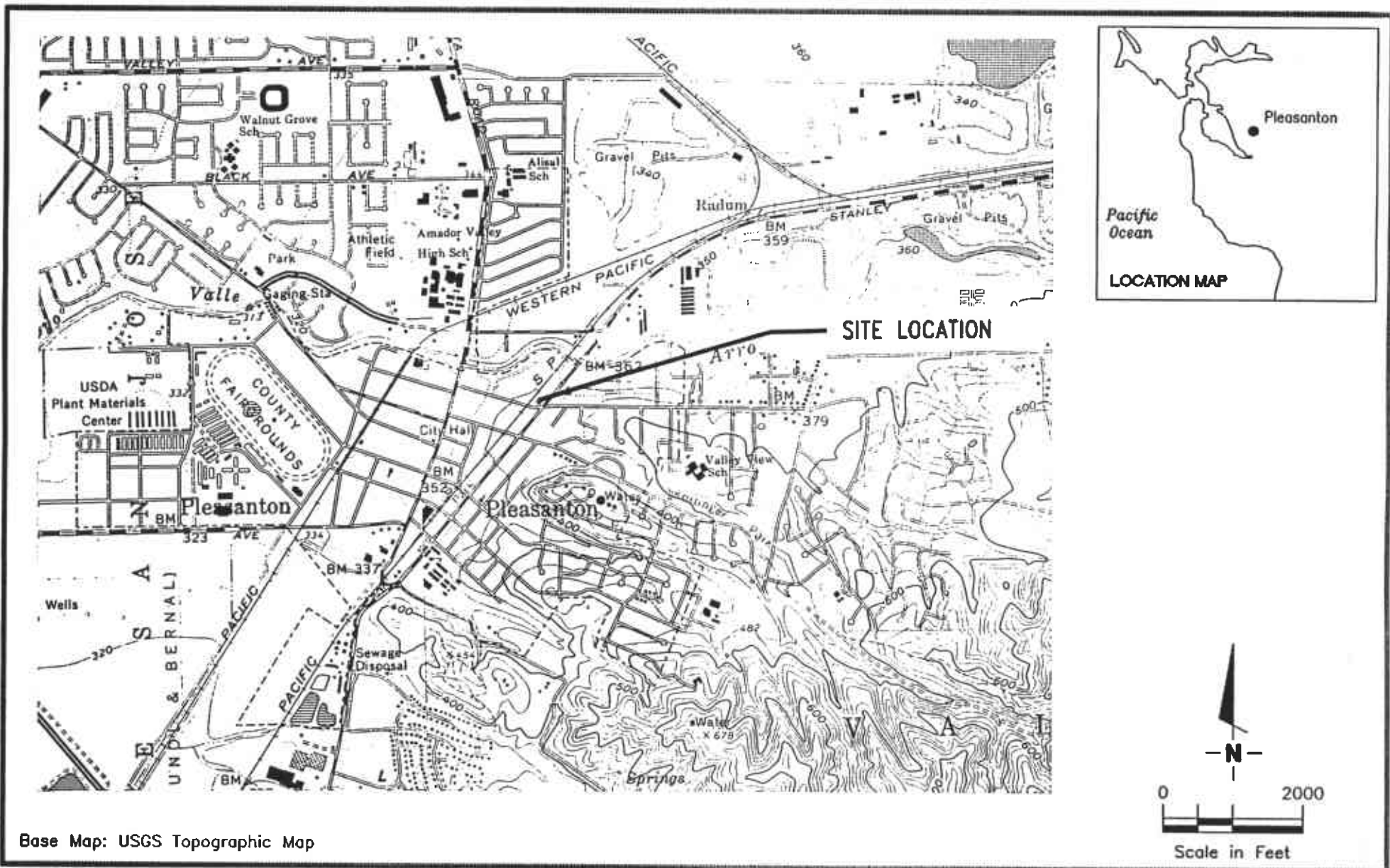
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Base Map: USGS Topographic Map



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Dublin, CA 94568

VICINITY MAP

Tosco 76 Branded Facility No. 7376
4191 First Street
Pleasanton, California

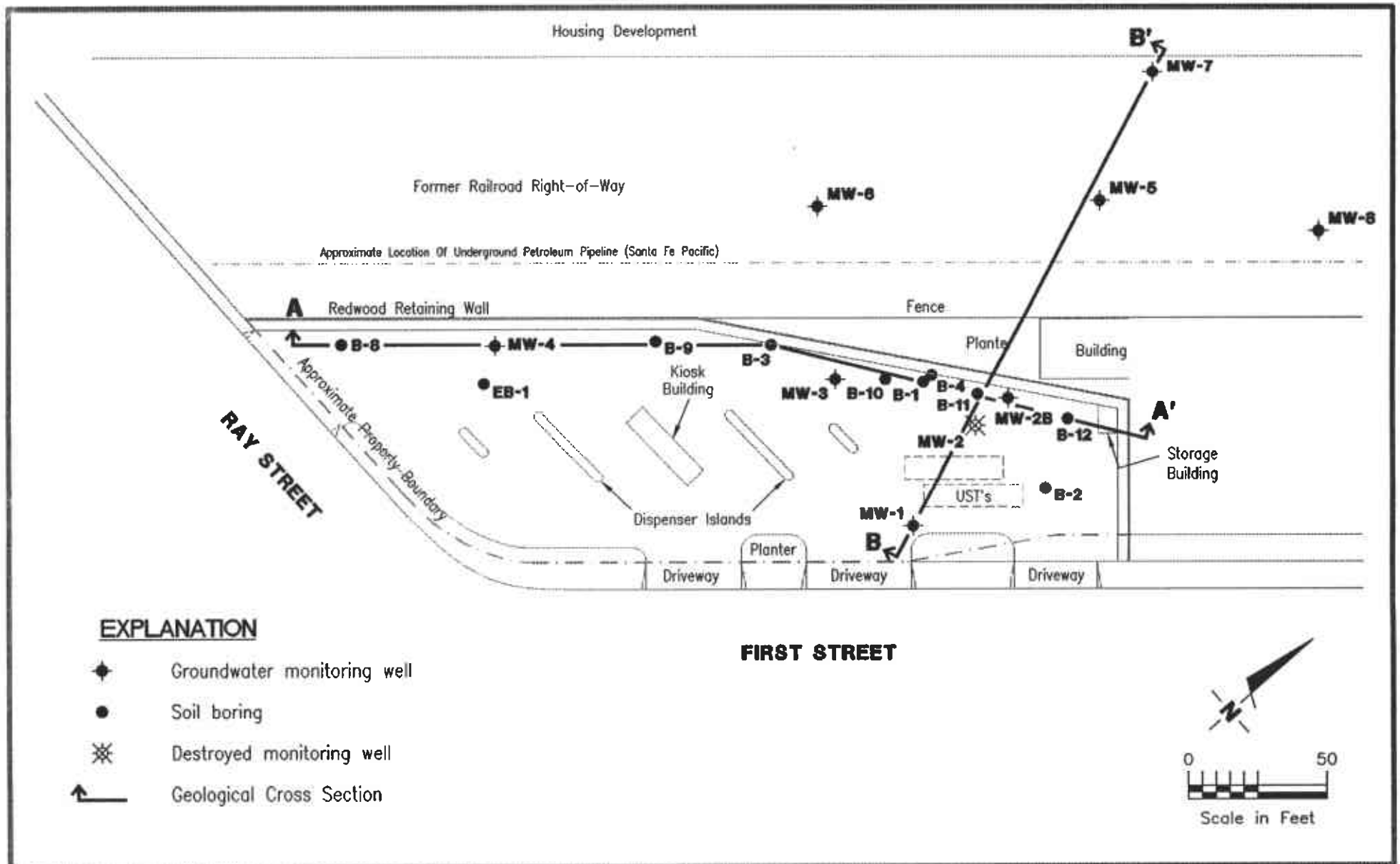
JOB NUMBER
140107

REVIEWED BY

DATE
February, 1999

REVISED DATE

FIGURE
1



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SITE PLAN

Tosco 76 Branded Facility No. 7376
4191 First Street
Pleasanton, California

FIGURE

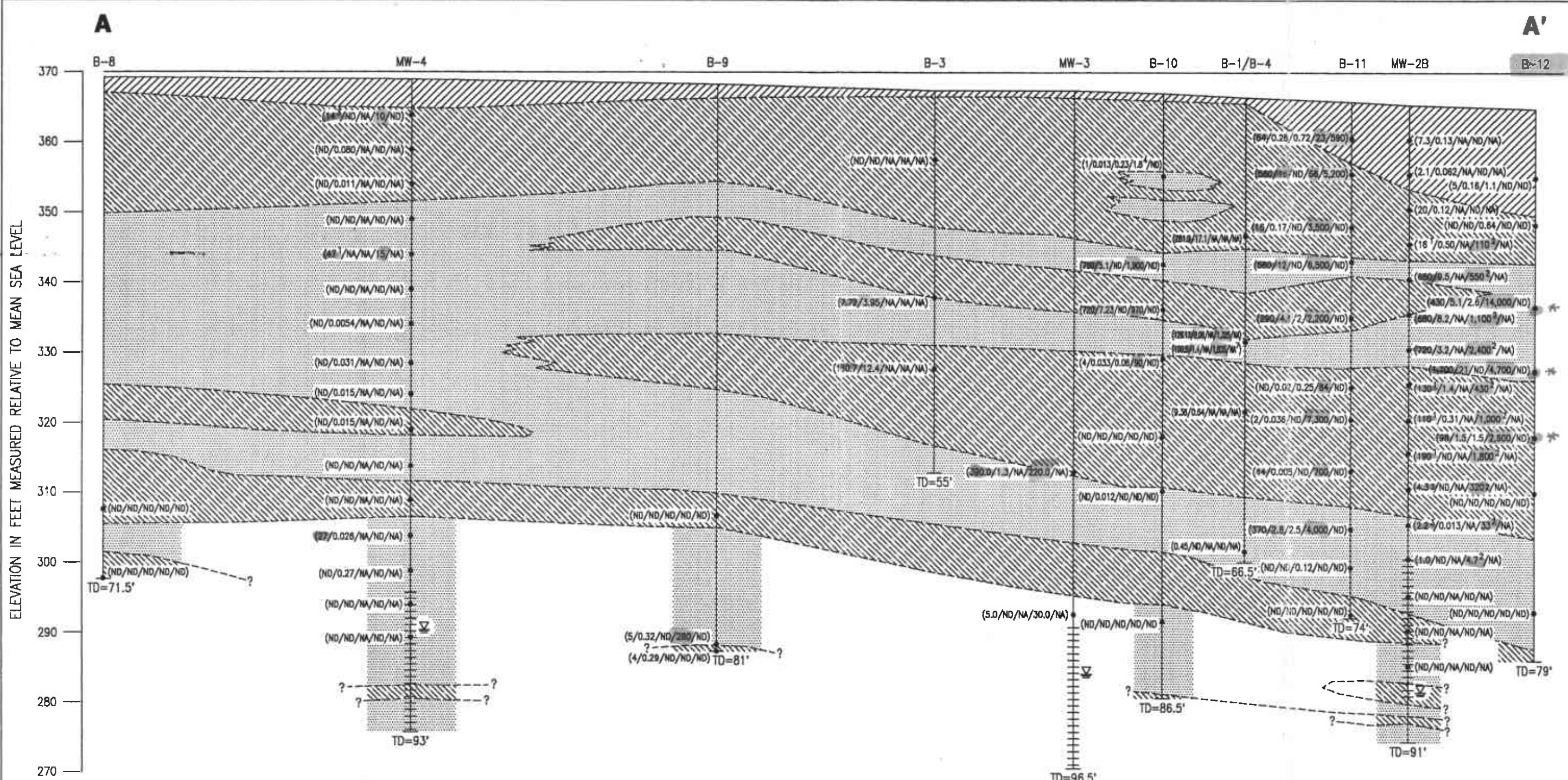
2

JOB NUMBER
140107.02

REVIEWED BY

DATE
September, 1998

REVISED DATE
02/99



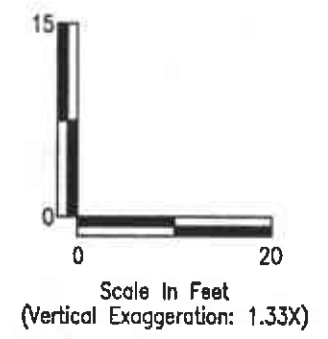
ELEVATION IN FEET MEASURED RELATIVE TO MEAN SEA LEVEL

EXPLANATION:

- Approximate Lithographic Contact
 - Soil Sample From Boring
 - +++ Screened Interval Of Well
 - ▼ Groundwater Level Measured 08/18/98
- Concentrations Of
 TPHg/Benzene/MTBE/TPHd/TPHo
 In Soil Measured In
 Parts Per Million (ppm)
- (1,700/21/ND/4,700/ND)
- ND Not Detected
 NA Not Analyzed

- Fill, Baserock, Pavement
- Clays And Silts
- Sands And Gravels

- Notes:
- 1 = Hydrocarbons detected appear to be a gasoline and non-gasoline mixture
 - 2 = Hydrocarbons detected appear to be a diesel and non-diesel mixture
 - 3 = Hydrocarbons detected did not appear to be gasoline
 - 4 = Sample contains components that eluted in the diesel range, but the chromatogram does not match the typical diesel fingerprint



GENERALIZED GEOLOGIC CROSS-SECTION A-A'
 Unocal Service Station No. 7376
 4191 1st Street
 Pleasanton, California

Gottler - Ryan Inc.
 6747 Sierra Ct., Suite J
 Dublin, CA 94568
 (510) 551-7555

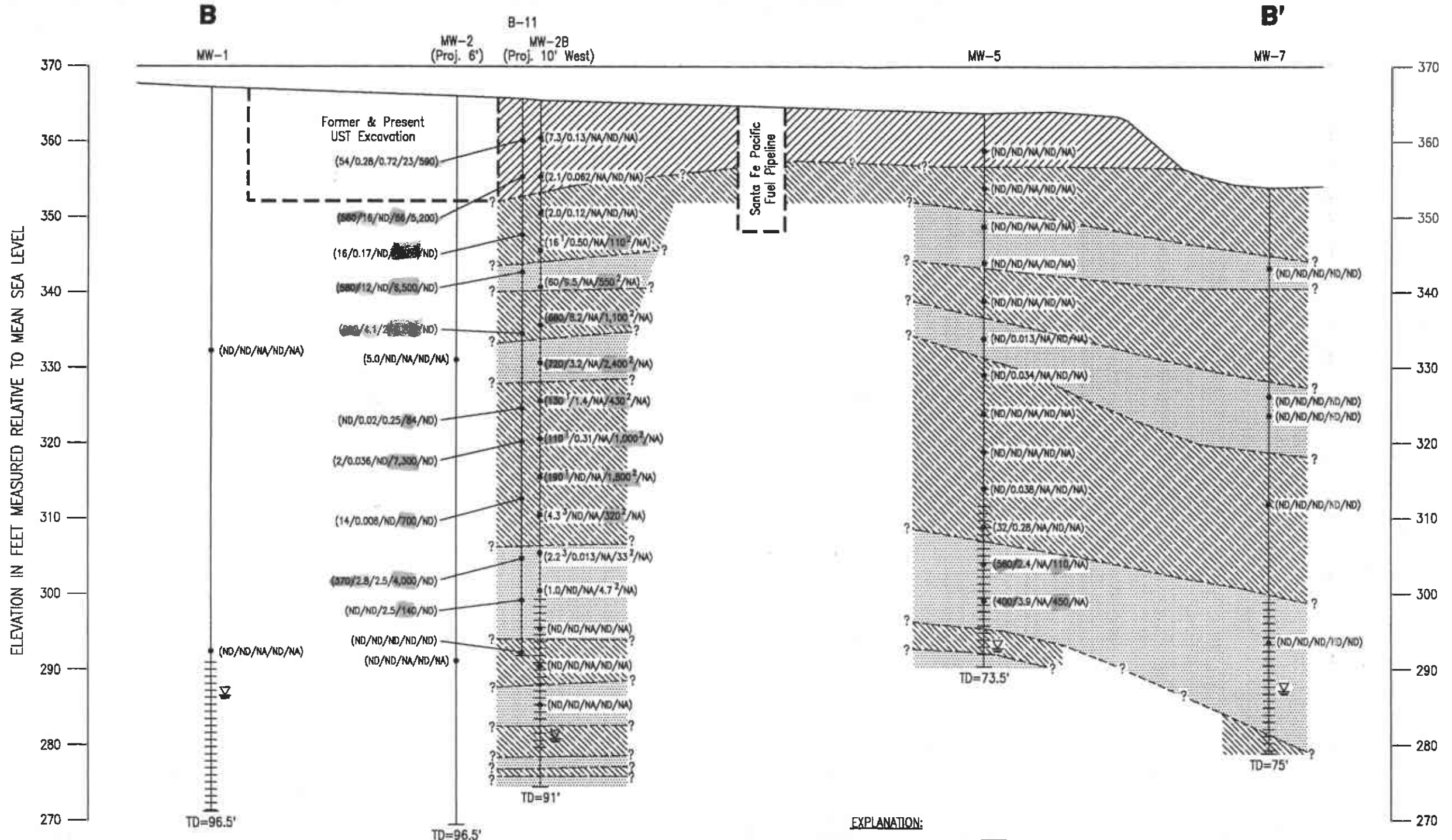


REVISION DATE
 03/99

DATE
 10/98

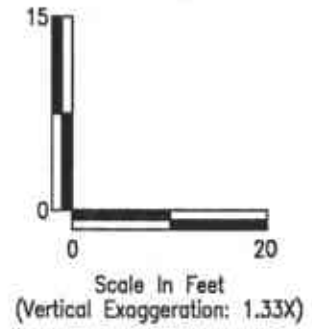
REVIEWED BY

JOB NUMBER
 140107



EXPLANATION:

- Approximate Lithographic Contact
 - Soil Sample From Boring
 - ++++ Screened Interval Of Well
 - ▽ Groundwater Level Measured 08/18/98
- Concentrations Of
TPHg/Benzene/MTBE/TPHh/TPHo
In Soil Measured In
Parts Per Million (ppm)
- ND Not Detected
NA Not Analyzed
- Fill, Baserock, Pavement
 - Clays And Silts
 - Sands And Gravels
- Notes:
1 = Hydrocarbons detected appear to be a gasoline and non-gasoline mixture
2 = Hydrocarbons detected appear to be a diesel and non-diesel mixture
3 = Hydrocarbons detected did not appear to be gasoline



GENERALIZED GEOLOGIC CROSS-SECTION B-B'
Unocal Service Station No. 7376
4191 1st Street
Pleasanton, California

Gottler - Ryan Inc.
6747 Sierra Ct., Suite J (510) 551-7555
Dublin, CA 94568

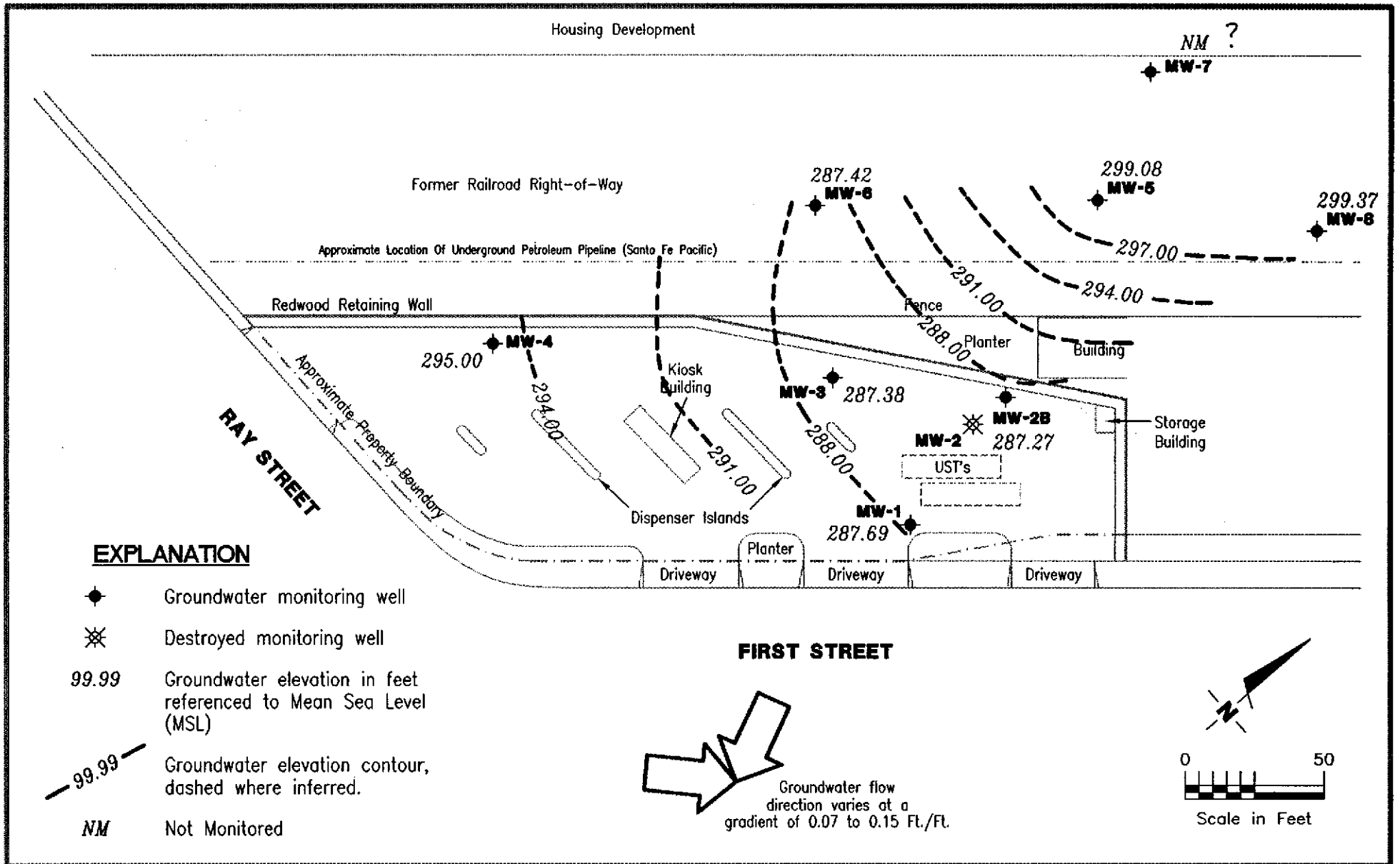


REVISED DATE
03/99

DATE
10/98

REVIEWED BY

JOB NUMBER
140107



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POTENTIOMETRIC MAP

Tosco 76 Branded Facility No. 7376
4191 First Street
Pleasanton, California

FIGURE

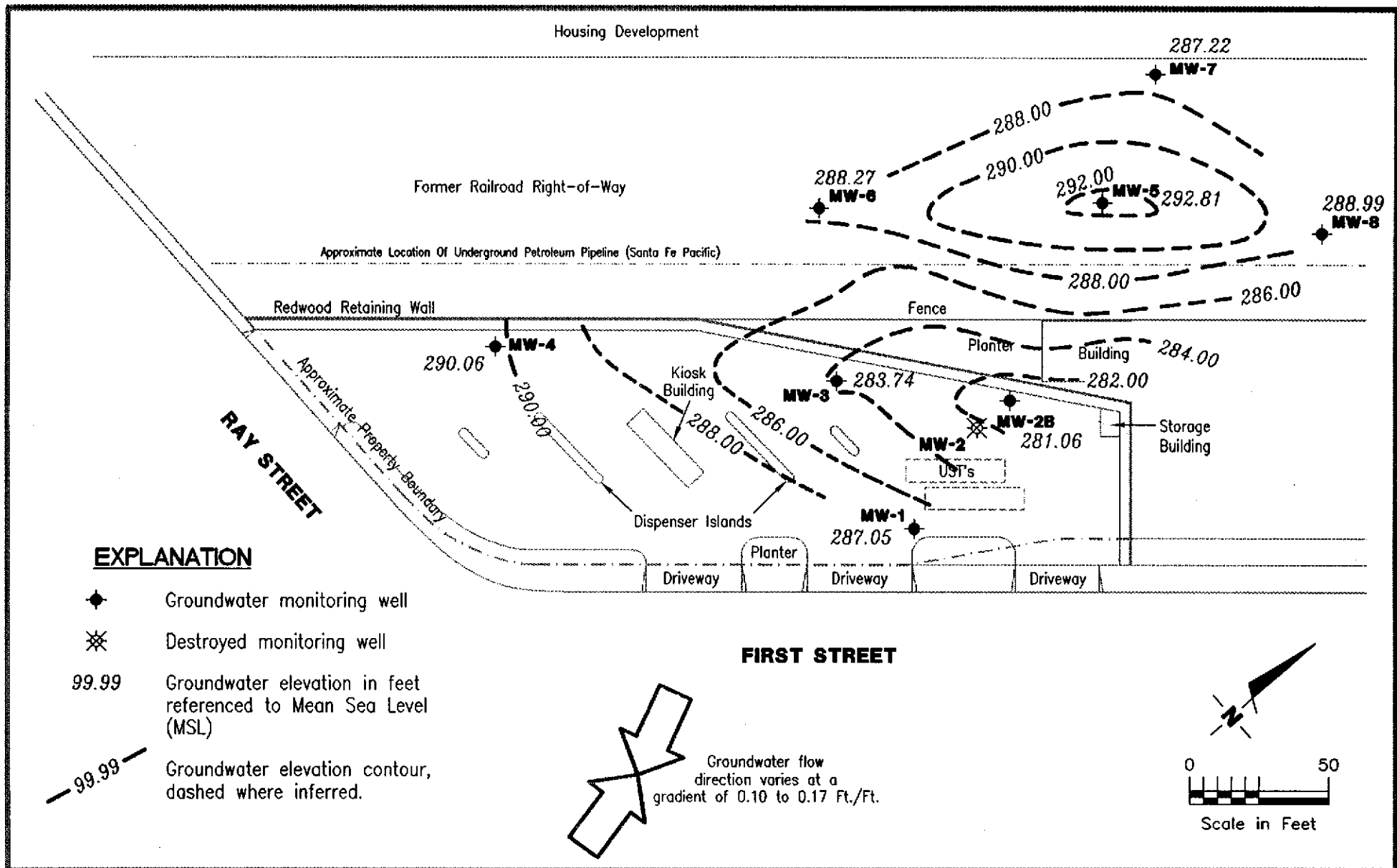
5

JOB NUMBER
140107.02

REVIEWED BY

DATE
June 26, 1998

REVISED DATE



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POTENTIOMETRIC MAP

Tosco 76 Branded Facility No. 7376
4191 First Street
Pleasanton, California

FIGURE

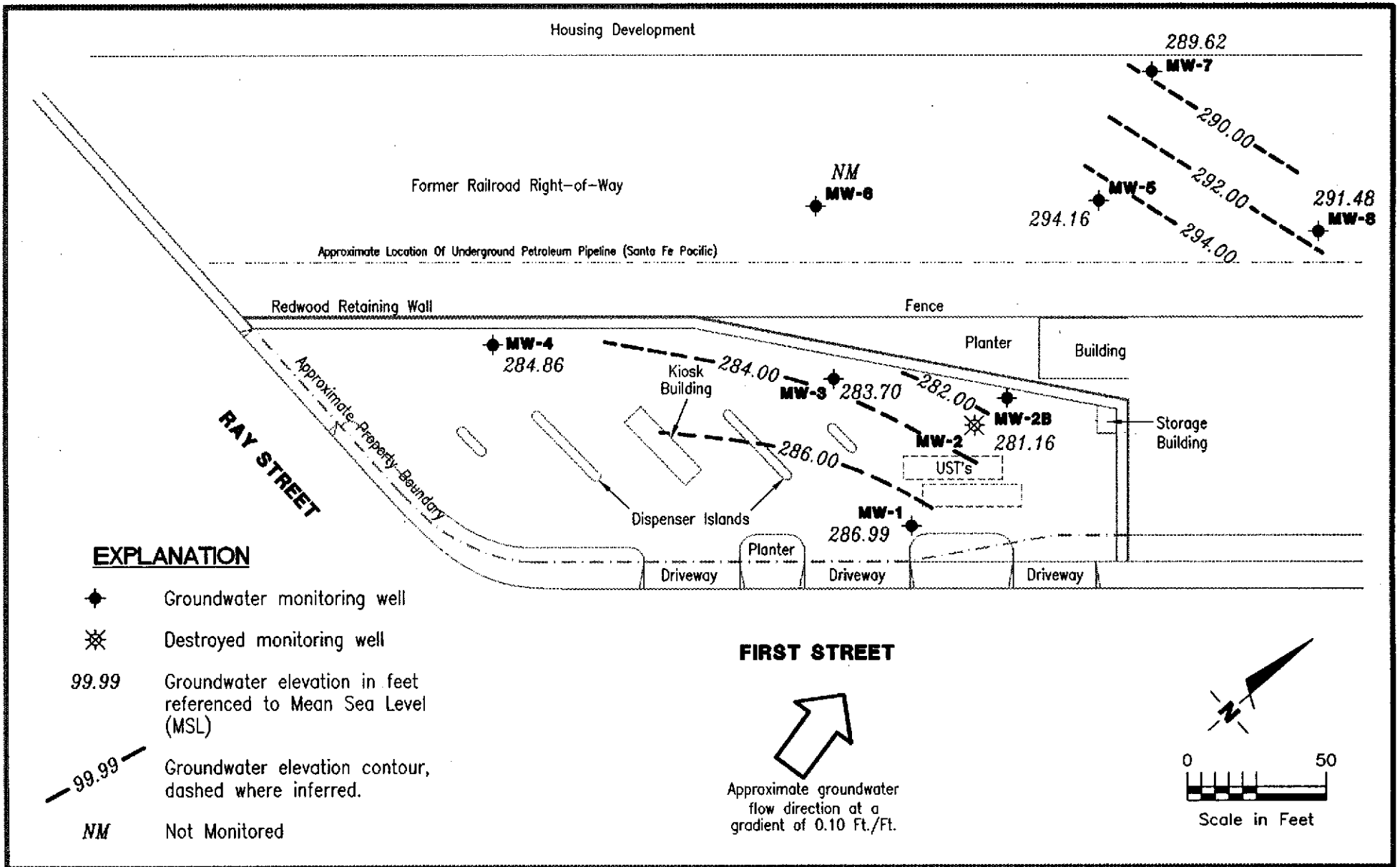
6

JOB NUMBER
140107.02

REVIEWED BY

DATE
August 18, 1998

REVISED DATE

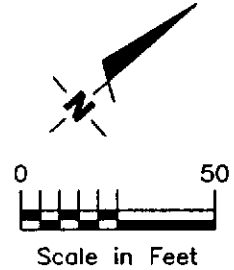


EXPLANATION

- ◆ Groundwater monitoring well
- ⊗ Destroyed monitoring well
- 99.99 Groundwater elevation in feet referenced to Mean Sea Level (MSL)
- 99.99 - Groundwater elevation contour, dashed where inferred.
- NM Not Monitored

FIRST STREET

Approximate groundwater flow direction at a gradient of 0.10 Ft./Ft.



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POTENTIOMETRIC MAP
 Tosco 76 Branded Facility No. 7376
 4191 First Street
 Pleasanton, California

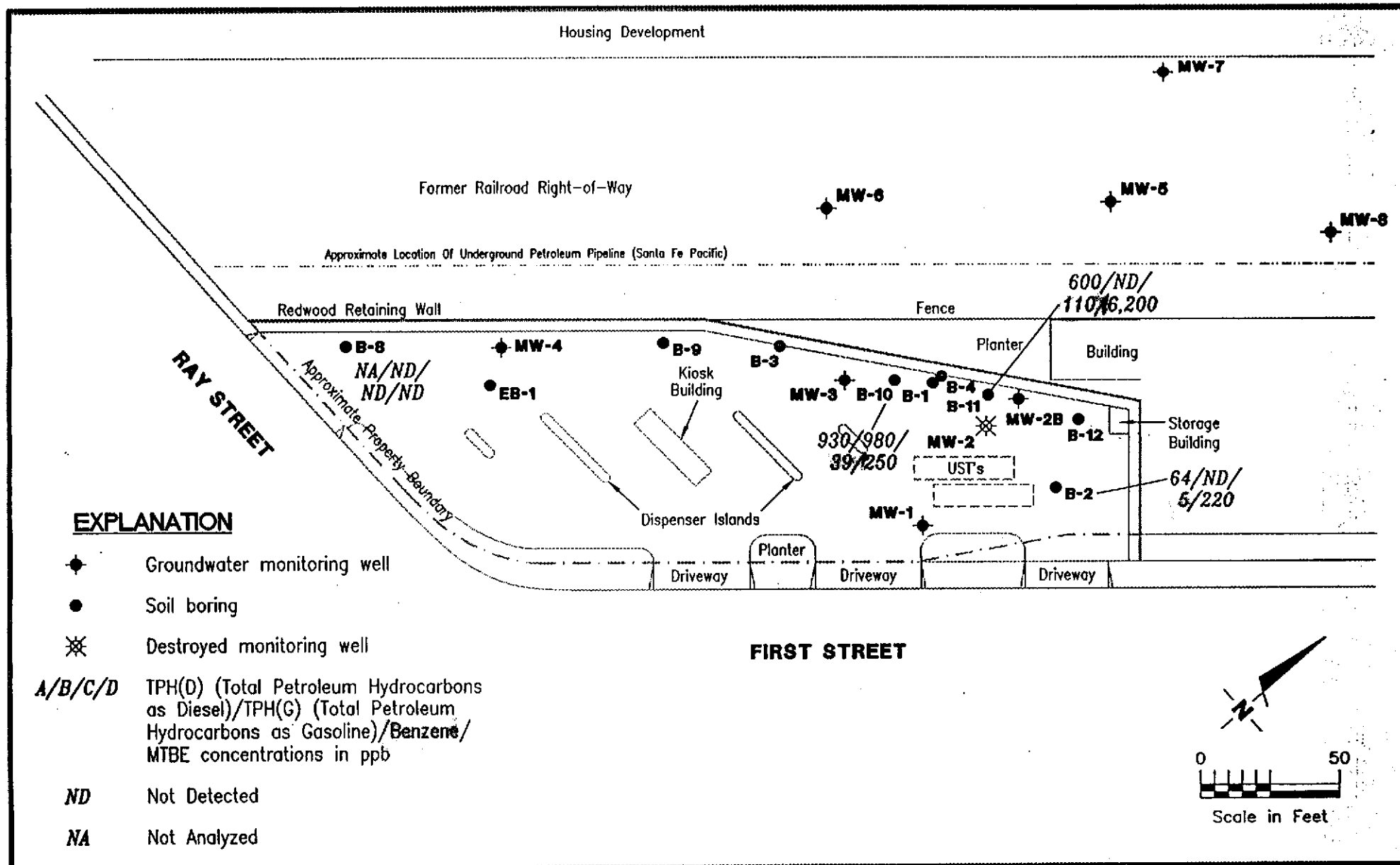
FIGURE
7

JOB NUMBER
 140107.02

REVIEWED BY

DATE
 September 22, 1998

REVISED DATE
 02/99



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Dublin, CA 94568

GROUNDWATER GRAB SAMPLE CONCENTRATION MAP
Tosco 76 Branded Facility No. 7376
4191 First Street
Pleasanton, California

FIGURE

8

JOB NUMBER
140107.02

REVIEWED BY

DATE
June 9, 10, and 11, 1998

REVISED DATE

TABLE 1 - GROUNDWATER MONITORING AND CHEMICAL ANALYTICAL DATA

Tosco (Unocal) Service Station No. 7376

4191 First Street

Pleasanton, California

Sample No.	Sample Date	Total Well	Well	Depth to	Floating	Groundwater	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-	Xylenes (ppb)	MIBE (ppb)	TPHd (ppb)
		Depth (ft.)	Elevation ¹ (ft. MSL)	Water ² (ft.)	Product (ft.)	Elevation (ft. MSL)				benzene (ppb)			
Soil Borings													
B-8	6/10/98	---	---	---	0.0	---	ND	ND	1.6	ND	ND	ND	---
B-10	6/11/98	---	---	---	0.0	---	980	39	13	23	100	250	930 ¹²
B-11	6/9/98	---	---	---	0.0	---	ND ⁵	110	220	ND ⁵	240	6,200	600 ¹²
B-12	6/10/98	---	---	---	0.0	---	ND ⁵	5	ND ⁵	ND ⁵	5	220	64 ¹²
Groundwater Monitoring Wells													
MW-1	6/26/98	86.43	366.98	79.93	0.0	287.05	59 ³	0.90	ND	ND	ND	570	ND
MW-2B	6/26/98	85.26	365.05	83.99	0.0	281.06	ND	ND	ND	ND	ND	4,000	790 ⁷
MW-3	6/26/98	94.11	367.03	83.29	0.0	283.74	400 ⁴	15	ND ⁵	ND ⁵	1.9	490	63 ³
MW-4	6/26/98	93.07	368.81	78.75	0.0	290.06	100 ³	62	ND	ND	ND	ND	630 ⁸
MW-5	6/26/98	72.51	363.21	70.40	sheen	292.81	490 ⁶	6.3	2.8	4.2	5.1	10	230,000 ⁹
MW-6	6/26/98	88.00	363.13	74.86	0.0	288.27	530	300	8.3	2.8	8.7	81	180 ⁷
MW-7	8/18/98	77 ²	355.97	68.75	0.0	287.22	4,000	1,900	48	160	ND ⁵	1,700	1,400 ¹¹
MW-8	6/26/98	86.40	362.37	73.38	0.0	288.99	ND	6.0	ND	ND	ND	150	80 ¹⁰
Trip Blank	---	---	---	---	---	---	ND	ND	ND	ND	ND	ND	ND

EXPLANATION:

ND = not detected

ft. = feet

ft. MSL = feet relative to Mean Sea Level.

ppb = parts per billion

— = not applicable

ANALYTICAL LABORATORY:

Sequoia Analytical (ELAP #1210)

Columbia Analytical Services (ELAP #1426)

ANALYTICAL DATA:

TPHg = Total Petroleum Hydrocarbons as gasoline according to EPA Method 8015 Modified

TPHd = Total Petroleum Hydrocarbons as diesel according to EPA Method 8015 Modified

MtBE = Methyl tertiary butyl ether according to EPA Method 8020.

¹ = Well elevations reported as top of casing (TOC) surveyed by Virgil Chavez Land Surveying, Licensed California Land Surveyor No. 6323.

² = Measurement taken on August 18, 1998.

³ = Laboratory report indicated discrete peaks

⁴ = Laboratory report indicated discrete peaks and unidentified hydrocarbons < C7.

⁵ = Elevated detection limit. See analytical report for detection limits.

⁶ = Laboratory report indicated gasoline and unidentified hydrocarbons > C8.

⁷ = Laboratory report indicated diesel and unidentified hydrocarbons > C20

⁸ = Laboratory report indicated diesel and unidentified hydrocarbons < C15.

⁹ = Laboratory report indicated diesel and unidentified hydrocarbons < C15 and > C20.

¹⁰ = Laboratory report indicated unidentified hydrocarbons > C16.

¹¹ = Laboratory report indicated unidentified hydrocarbon C9 - C24.

¹² = Sample was also reported as not detected for total petroleum hydrocarbons as oil according to EPA Method 8015 Modified.

TABLE 2 - SOIL CHEMICAL ANALYTICAL DATA
 Unocal Service Station No. 7376
 4191 1st Street
 Pleasanton, California

Sample Location and ID	Sample Depth (feet)	Date Collected	TPHg (ppm)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	TPHd (ppm)	TPHo (ppm)	MtBE (ppm)
Boring B-8										
B-8-61.5	61.5	6/8/98	ND	ND	ND	ND	ND	ND	ND	ND
B-8-71.5	71.5	6/8/98	ND	ND	ND	ND	ND	ND	ND	ND
Boring B-9										
B-9-61.5	61.5	6/8/98	ND	ND	ND	ND	ND	ND	ND	ND
B-9-80.5	80.5	6/8/98	5	0.32	0.025	0.032	0.43	280 ¹	ND	ND ³
B-9-81	81	6/8/98	4	0.29	0.59	0.039	0.31	ND	ND	ND
Boring B-10										
B-10-12	12	6/11/98	1	0.013	0.013	0.021	0.13	1.8 ¹	ND ³	0.23
B-10-24.5	24.5	6/11/98	760	5.1	0.9	22	25	1900	ND ³	ND
B-10-31	31	6/11/98	720	7.3	31	11	68	970	ND ³	ND ³
B-10-38	38	6/11/98	4	0.033	0.006	0.010	0.032	90	ND ³	0.08
B-10-49	49	6/11/98	ND	ND	ND	ND	ND	ND	ND	ND
B-10-57	57	6/11/98	ND	0.012	0.012	0.006	0.048	ND	ND	ND
B-10-75.5	75.5	6/11/98	ND	ND	ND	ND	ND	ND	ND	ND
Boring B-11										
B-11-5.5	5.5	6/9/98	54	0.28	0.2	0.3	3.6	23	590 ²	0.72
B-11-10.5	10.5	6/9/98	560	16	8.0	5.2	25	66	5200 ²	ND ³
B-11-18	18	6/9/98	16	0.17	0.031	0.21	0.52	3500	ND ³	ND
B-11-23	23	6/9/98	580	12	1.3	6.0	17	6500	ND ³	ND ³
B-11-31	31	6/9/98	290	4.1	0.89	4.7	11	2200	ND ³	2
B-11-41	41	6/9/98	ND	0.02	ND	ND	ND	84	ND	0.25
B-11-45.5	45.5	6/9/98	2	0.036	0.15	0.022	0.15	7300	ND ³	ND
B-11-53	53	6/9/98	14	0.008	0.008	0.02	0.025	700	ND	ND
B-11-61	61	6/9/98	370	2.8	16	5.2	24	4000	ND ³	2.5
B-11-66.5	66.5	6/9/98	ND	ND	ND	ND	ND	140 ¹	ND	0.12
B-11-73.5	73.5	6/9/98	ND	ND	ND	ND	ND	ND	ND	ND

Sample Location and ID	Sample Depth (feet)	Date Collected	TPHg (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylenes (ppm)	TPHd (ppm)	TPHo (ppm)	MtBE by 8020 (ppm)
Boring B-12										
B-12-10	10	6/10/98	5	0.16	0.073	0.02	0.22	ND	ND	1.1
B-12-16.5	16.5	6/10/98	ND	ND	ND	ND	ND	ND	ND	0.64
B-12-28.5	28.5	6/10/98	430	5.1	3.2	6.6	15	14000	ND ³	2.6
B-12-37.5	37.5	6/10/98	1700	21	3.8	8.7	7.6	4700	ND ³	ND ³
B-12-47	47	6/10/98	98	1.5	1.2	2.0	4.4	2600	ND ³	1.5
B-12-55	55	6/10/98	ND	ND	ND	ND	0.01	ND	ND	ND
B-12-72	72	6/10/98	ND	ND	ND	ND	ND	ND	ND	ND
Well Boring MW-7										
MW-7-11	11	8/14/98	ND	ND	ND	ND	ND	ND	ND	ND
MW-7-28	28	8/14/98	ND	ND	ND	ND	ND	ND	ND	ND
MW-7-30.5	30.5	8/14/98	ND	ND	ND	ND	ND	ND	ND	ND
MW-7-42	42	8/14/98	ND	ND	ND	ND	ND	ND	ND	ND
MW-7-60.5	60.5	8/14/98	ND	ND	ND	ND	ND	ND	ND	ND
Well Boring MW-8										
MW-8-11	11	6/12/98	ND	ND	0.007	ND	0.010	ND	ND	ND
MW-8-37	37	6/12/98	ND	ND	0.006	ND	ND	ND	ND	ND
MW-8-45.5	45.5	6/12/98	60	ND ³	0.058	0.27	0.58	79	ND	ND ³
MW-8-51.5	51.5	6/12/98	ND	ND	ND	ND	ND	ND	ND	ND
MW-8-67	67	6/12/98	ND	ND	ND	ND	ND	ND	ND	ND
Stockpile										
US-1(comp) ²	----	6/15/98	100	0.27	0.16	0.82	1.9	1100	ND ³	ND ³

ANALYTICAL METHODS:

ANALYTICAL LABORATORY:

TPHg = Total Petroleum Hydrocarbons as gasoline according to EPA Method 8015 Modified.
 BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes according to EPA Method 8020.
 MtBE = Methyl t-Butyl Ether according to EPA Method 8020.

Columbia Analytical Services(ELAP #1426)

EXPLANATION:

feet = feet below ground surface

ppm = parts per million

ND = Not Detected

¹ = Sample contains components that eluted in the diesel range, but the chromatogram does not match the typical diesel fingerprint.

² = This sample was analyzed for CAM 17 metals. Concentrations were below allowable levels for disposal.

³ = Elevated detection limit. See analytical report for detection limits.

APPENDIX A

GR Field Methods and Procedures and Site Safety Plan

**GETTLER-RYAN INC.
FIELD METHODS AND PROCEDURES**

Site Safety Plan

Field work performed by Gettler-Ryan Inc. (GR) is conducted in accordance with GR's Health and Safety Plan and the Site Safety Plan. GR personnel and subcontractors who perform work at the site are briefed on the contents of these plans prior to initiating site work. The GR geologist or engineer at the site when the work is performed acts as the Site Safety Officer. GR utilizes a photoionization detector (PID) to monitor ambient conditions as part of the Health and Safety Plan.

Collection of Soil Samples

Exploratory soil borings are drilled by a California-licensed well driller. A GR geologist is present to observe the drilling, collect soil samples for description, physical testing, and chemical analysis, and prepare a log of the exploratory soil boring. Soil samples are collected from the exploratory soil boring with a split-barrel sampler or other appropriate sampling device fitted with clean brass or stainless steel liners. The sampling device is driven approximately 18 inches with a 140-pound hammer falling 30 inches. The number of blows required to advance the sampler each successive 6 inches is recorded on the boring log. The encountered soil is described using the Unified Soil Classification System (ASTM 2488-84) and the Munsell Soil Color Chart.

After removal from the sampling device, soil samples for chemical analysis are covered on both ends with teflon sheeting or aluminum foil, capped, labeled, and placed in a cooler with blue ice for preservation. A chain-of-custody form is initiated in the field and accompanies the selected soil samples to the analytical laboratory. Samples are selected for chemical analysis based on:

- a. depth relative to underground storage tanks and existing ground surface
- b. depth relative to known or suspected groundwater
- c. presence or absence of contaminant migration pathways
- d. presence or absence of discoloration or staining
- e. presence or absence of obvious gasoline hydrocarbon odors
- f. presence or absence of organic vapors detected by headspace analysis

Field Screening of Soil Samples

A PID is used to perform head-space analysis in the field for the presence of organic vapors from the soil sample. This test procedure involves removing some soil from one of the sample tubes not retained for chemical analysis and immediately covering the end of the tube with a plastic cap. The PID probe is inserted into the headspace inside the tube through a hole in the plastic cap. Head-space screening results are recorded on the boring log. Head-space screening procedures are performed and results recorded as reconnaissance data. GR does not consider field screening techniques to be verification of the presence or absence of hydrocarbons.

Stockpile Sampling

Stockpile samples consist of four individual sample liners collected from each 100 cubic yards (yd³) of stockpiled soil material. Four arbitrary points on the stockpiled material are chosen, and discrete soil sample is collected at each of these points. Each discrete stockpile sample is collected by removing the upper 3 to 6 inches of soil, and then driving the stainless steel or brass tube into the stockpiled material with a wooden mallet or hand driven soil sampling device. The sample tubes are then covered on both ends with teflon sheeting or aluminum foil, capped,

labeled, placed in the cooler with blue ice for preservation. A chain-of-custody form is initiated in the field and accompanies the selected soil samples to the analytical laboratory. Stockpiled soils are covered with plastic sheeting after completion of sampling.

Construction of Monitoring Wells

Monitoring wells are constructed in the exploratory borings with Schedule 40 polyvinyl Chloride (PVC) casing. All joints are thread-joined; no glues, cements, or solvents are used in well construction. The screened interval is constructed of machine-slotted PVC well screen which generally extends from the total well depth to a point above the groundwater. An appropriately-sized sorted sand is placed in the annular space adjacent to the entire screened interval. A bentonite transition seal is placed in the annular space above the sand, and the remaining annular space is sealed with neat cement or cement grout.

Wellheads are protected with water-resistant traffic rated vault boxes placed flush with the ground surface. The top of the well casing is sealed with a locking cap. A lock is placed on the well cap to prevent vandalism and unintentional introduction of materials into the well.

Storing and Sampling of Drill Cuttings

Drill cuttings are stockpiled on plastic sheeting or stored in drums depending on site conditions and regulatory requirements. Stockpile samples are collected and analyzed on the basis of one composite sample per 50 cubic yards of soil. Stockpile samples are composed of four discrete soil samples, each collected from an arbitrary location on the stockpile. The four discrete samples are then composited in the laboratory prior to analysis.

Each discrete stockpile sample is collected by removing the upper 3 to 6 inches of soil, and then driving the stainless or brass sample tube into the stockpiled material with a hand, mallet, or drive sampler. The sample tubes are then covered on both ends with teflon sheeting or aluminum foil, capped, labeled, and placed in a cooler with blue ice for preservation. A chain-of-custody form is initiated in the field and accompanies the selected soil samples to the analytical laboratory. Stockpiled soils are covered with plastic sheeting after completion of sampling.

Wellhead Survey

The top of the newly-installed well casing is surveyed by a California-licensed Land Surveyor to mean sea level (MSL).

Well Development

The purpose of well development is to improve hydraulic communication between the well and surrounding aquifer. Prior to development, each well is monitored for the presence of separate-phase hydrocarbons and the depth-to-water is recorded. Wells are then developed by alternately surging the well with the bailer, then purging the well with a pump to remove accumulated sediments and draw groundwater into the well. Development continues until the groundwater parameters (temperature, pH, and conductivity) have stabilized.

Groundwater Monitoring and Sampling

Decontamination Procedures

All physical parameter measuring and sampling equipment are decontaminated prior to sample collection using Alconox or equivalent detergent followed by steam cleaning with deionized water. During field sampling, equipment placed in a well are decontaminated before purging or sampling the next well by cleaning with Alconox or equivalent detergent followed by steam cleaning with deionized water.

Water-Level Measurements

Prior to sampling each well, the static water level is measured using an electric sounder and/or calibrated portable oil-water interface probe. Both static water-level and separate-phase product thickness are measured to the nearest ± 0.01 foot. The presence of separate-phase product is confirmed using a clean, acrylic or polyvinylchloride (PVC) bailer, measured to the nearest ± 0.01 foot with a decimal scale tape. The monofilament line used to lower the bailer is replaced between borings with new line to preclude the possibility of cross-contamination. Field observations (e.g. product color, turbidity, water color, odors, etc.) are noted. Water-levels are measured in wells with known or suspected lowest dissolved chemical concentrations to the highest dissolved concentrations.

Sample Collection and Labeling

A temporary PVC screen is installed in the boring to facilitate a grab groundwater sample collection. Samples of groundwater are collected from the surface of the water in each well or boring using the teflon bailer or a pump. The water samples are then gently poured into laboratory-cleaned containers and sealed with teflon-lined caps, and inspected for air bubbles to check for headspace. The samples are then labeled by an adhesive label, noted in permanent ink, and promptly placed in an ice storage. A Chain-of-Custody Record is initiated and updated throughout handling of the samples, and accompanies the samples to the laboratory certified by the State of California for analyses requested.

SITE SAFETY PLAN, JOB #140107.02

GENERAL INFORMATION

SITE: Client/Company: Tosco Marketing Company Service Station No. 7376
Site Location: 4191 First Street, Pleasanton, CA

PLAN PREPARED BY: Gettler-Ryan, May 19, 1998

OBJECTIVES: To provide a safety plan for the safe completion of the site work.

EFFECTIVE DATES: June, 1998

SUMMARY: Hazardous material may be present, caution is advised. Site work includes advancing seven soil borings to a minimum of 75 feet bgs, collecting soil samples, and installing two monitoring wells as stated in the Kaprealian Engineering Incorporated Work Plan/Proposal dated May 6, 1997 and the GR Work Plan Addendum dated May 1998.

SITE/WASTE CHARACTERISTICS

WASTE TYPE(S): Solids (drill cuttings)
Liquids (steam cleaning rinsate)

CHARACTERISTIC(S): Volatile, combustible, toxic (not expected)

FACILITY: Active Unocal Service Station and former railroad right-of-way.

HAZARD EVALUATION

PARAMETER: TLV 300 ppm organic vapors, as measured in the breathing zone with a photoionization detector.

HEALTH CONCERNS: Ingestion, inhalation, adsorption (not expected)

PRECAUTIONS: Correct safety procedures shall be followed, per GR Health and Safety Plan.

SITE SAFETY WORK PLAN:

PERIMETER PROTECTION: Fencing, cones and flagging as needed.

PERSONAL PROTECTION: EPA Level D
Modifications: latex gloves, hard hats, and safety vests.
All personnel will wear safety vests.
Surveillance equipment: PID (if needed).

DECONTAMINATION: Personal: wash thoroughly with detergent solution and water.
Equipment: wash thoroughly with detergent solution and water, or steam clean.

FIRST AID: As applicable. At least one member of the crew will have current first aid/CPR certification.

WORK LIMITATIONS: None

**INVESTIGATION-DERIVED
MATERIAL DISPOSAL:**

All soil cuttings will be stored in approved storage containers (drums) or wrapped in visqueen until disposal. Steam cleaning rinsate will be stored in approved storage containers (drums) until disposal. All waste material will be transported in accordance with the appropriate regulations and statutes regarding these materials.

TEAM COMPOSITION:

Foreman/Safety Officer: Clyde J. Galantine
Subcontractors: Woodward Drilling

EMERGENCY:
Ambulance: 911
Fire Department: 911
Sheriff/Highway Patrol: 911

TELEPHONES: Pay telephones are available at the station

SITE RESOURCES: Fire extinguisher
First aid kit

EMERGENCY CONTACT: Dave Vossler, GR
415-893-1515
Mr. Dave Byron
510-551-7555

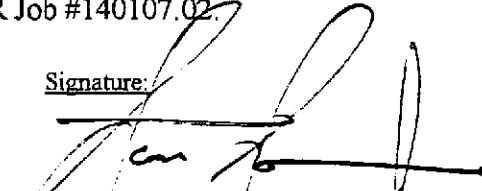
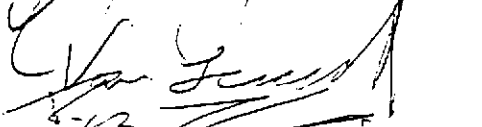

EMERGENCY ROUTES: Nearest emergency hospital and/or medical attention:

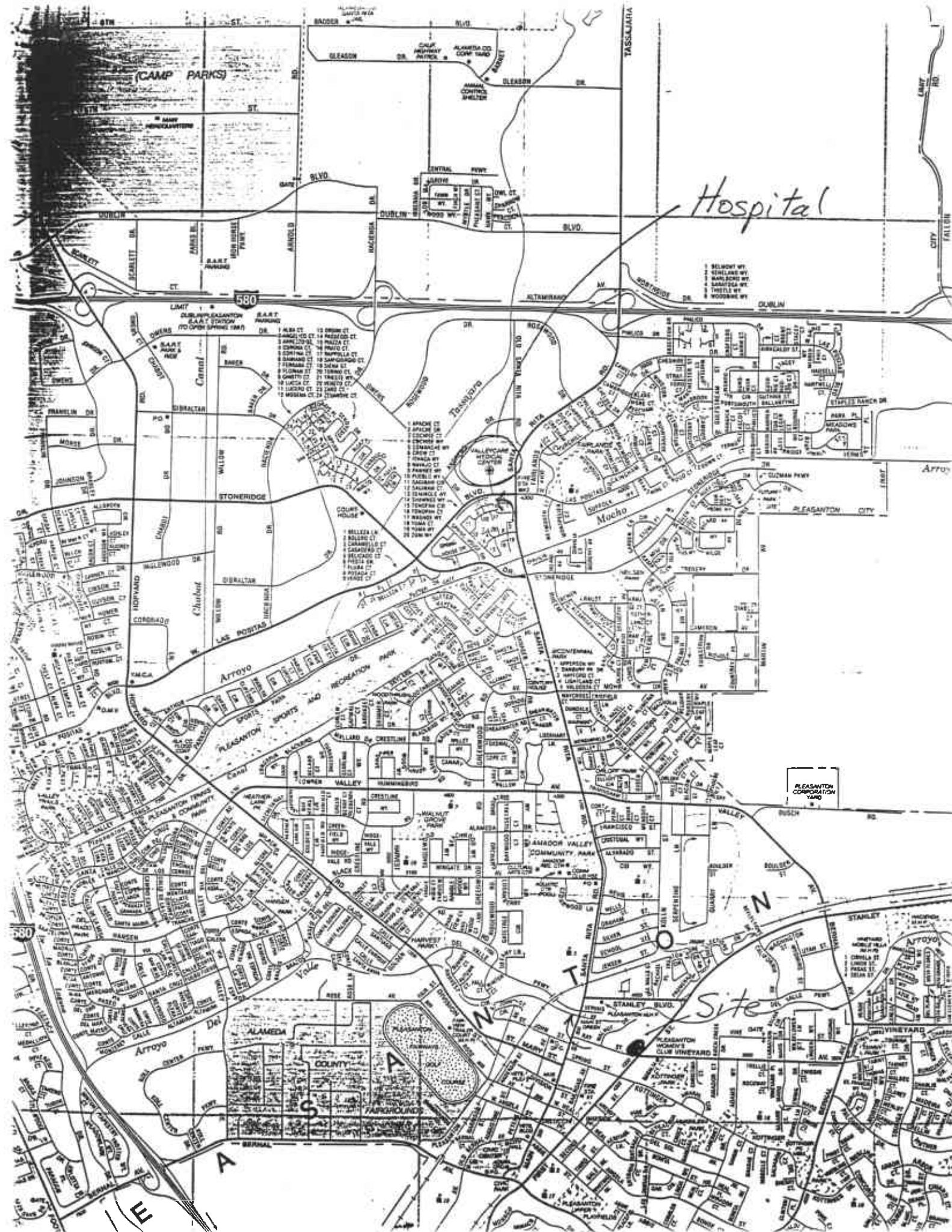
Valley Care Medical Center
5555 West Las Positas Boulevard
Pleasanton, California
(510) 847-3000

DIRECTIONS:

Go right (west) on Ray Street to Santa Rita Road and turn right. Go north 2 miles on Santa Rita Road and turn left (west) on Las Positas Boulevard. Go 0.25 miles and turn right into Hospital parking lot.

I have read and understand the Site Safety Plan for GR Job #140107.02.

<u>Date:</u>	<u>Name (print):</u>	<u>Signature:</u>
6-8-98	SCOTT SEERY	
6-8-98	Van Leonard	
6-8-98	Ryan Kubli	
6/8/98	Clyde Galantine	Clyde Galantine B-R
8/14/98	Clyde Galantine	Clyde Galantine
8/14/98	Robert Madrigal	Robert Madrigal
8/14/98	AMADOR ARROYO III	AMADOR ARROYO III
8-14-98	Van Leonard	Van Leonard



Hospital

PLEASANTON CORPORATION YARD

Site

- 1 BELMONT WY
- 2 STERLING WY
- 3 WAINSCOTT WY
- 4 SANFORD WY
- 5 THURLE WY
- 6 WOODBINE WY

580

DUBLIN PLEASANTON
S.A.T. STATION
(TO OPEN SPRING 1987)

S.A.T. PARK & RIDE

STONERIDGE

ARROYO

VALLEY

VALLEY

VALLEY

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APPENDIX B

Permits, Boring Logs, and Well Construction Details



ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE

PLEASANTON, CALIFORNIA 94588-5127

PHONE (510) 484-2600 FAX (510) 462-3914

February 23, 1998

Mr. Clyde Galantine
Gettler-Ryan, Inc.
6747 Sierra Court, Ste. J
Dublin, CA 94568

Dear Mr. Galantine:

Enclosed is drilling permit 98020 for a monitoring well construction project at 4191 First Street in Pleasanton for Tosco Marketing Company.

Please note that permit condition A-2 requires that a well construction report be submitted after completion of the work. The report should include drilling and completion logs, location sketch, and permit number. Please submit the original of your completion report. We will forward your submittal to the California Department of Water Resources.

If you have any questions, please contact Wyman Hong at extension 235 or me at extension 240.

Very truly yours,

Wyman Hong for

Craig A. Mayfield
Water Resources Engineer III

CAM:WH:arr
Enc.

Work Order Number: 80001

Permit Number: R00-LD0401
Permit Issuance Date: 7/26/98
Permit Expiration Date: open

COUNTY OF ALAMEDA

Public Works Agency
399 Elmhurst St., Hayward, CA 94544
(510) 670-5429

GETTLER-RYAN INC.
GENERAL CONTRACTORS

ROADWAY ENCROACHMENT PERMIT

This Permit is issued in accordance with Chapter 12.08 of the Alameda County Ordinance Code.

Name & Address of Permittee:
Gettlers - Ryan Inc.
6747 Sierra Ct., Ste J
Dublin, CA 94568
Phone Number: 551-7555

Job Site Address:
Transportation Corrs.
(4191) 1st St., PLS

Name & Address of Contractor:

Phone Number: _____

This Permit authorizes an encroachment into the roadway right-of-way at the above address; this encroachment shall be subject to the terms and conditions of the said Chapter 12.08 and to all other provisions attached and written hereto.

The Permittee intends to perform the following work scope:

Install and operate 3 monitoring wells within the Corridor as shown on the attached map.

Unless otherwise specified below, all work or access shall be subject to the terms and conditions of the attached General Provisions:
See attached.

Bond Information:
\$ 9000 Surety

Insp. Fee:
\$125

BY: J. Kloiger Alameda County

Work Completed (Date): _____
Inspector: _____

I certify that the information that I have entered into this permit application is correct, and I agree to comply with all of the terms and conditions and other requirements of the issued Permit.
See Appl.
Signature of Applicant: _____ Date: _____

The Permittee is responsible for notifying the Inspection Office listed on the back of this form.
THIS PERMIT IS INCOMPLETE WITHOUT THE ATTACHED GENERAL PROVISIONS

Installation of the subject wells shall be in accordance with the requirements of the Alameda County Flood Control & Water Conservation District (Zone 7).

Removal or abandonment of the subject wells shall require a separate permit from the Public Works Agency.

LAND DEVELOPMENT (510) 670-5429
ALAMEDA COUNTY PUBLIC WORKS AGENCY
399 Elmhurst Street, Hayward, CA 94544

RECEIPT NO. **LD-0401**

Date: 1/26/98 Amount \$ 150
Received From: Gottlieb - Rivers, Inc. Cash
Address: 6747 Sierra Ct. S.W.T. Warrant or
Dublin, CA 94568 Check No. 039559
MEMO: Monitoring, Wash. Co - Trans. Comm. Bank No. 90-2267
Phone 551-7555

\$ 25 20-509/2311
\$125 20-509/6081

DIRECTOR OF PUBLIC WORKS

Note: \$10 fee for returned checks

By: DK Royle

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
			GP		POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
		GRAVELS WITH OVER 15% FINES	GM		SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC		CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
		SANDS WITH OVER 15% FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS	ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS	
		CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS	
		OL		ORGANIC SILTS OR CLAYS OF LOW PLASTICITY	
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%	MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS	
		CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
		OH		ORGANIC SILTS OR CLAYS OF MEDIUM TO HIGH PLASTICITY	
HIGHLY ORGANIC SOILS		PT		PEAT AND OTHER HIGHLY ORGANIC SOILS	

- LL - Liquid Limit (%)
- PI - Plastic Index (%)
- PID - Volatile Vapors in ppm
- MA - Particle Size Analysis
- 2.5 YR 6/2 - Soil Color according to Munsell Soil Color Charts (1975 Edition)
- 5 GY 5/2 - GSA Rock Color Chart

- No Soil Sample Recovered
- "Undisturbed" Sample
- Bulk or Classification Sample
- First Encountered Ground Water Level
- Piezometric Ground Water Level
- Penetration - Sample drive hammer weight - 140 pounds falling 30 inches. Blows required to drive sampler 1 foot are indicated on the logs

Unified Soil Classification - ASTM D 2488-85
and Key to Test Data

Gettler-Ryan Inc.

Log of Boring MW-7

PROJECT: *Tosco (Unocal) Service Station No. 7376*

LOCATION: *419 First Street, Pleasanton, CA*

PROJECT NO.: *140107.02*

CASING ELEVATION: *355.97 feet MSL*

DATE STARTED: *08/14/98*

WL (ft. bgs): *61.8* DATE: *08/14/98* TIME: *2:00 pm*

DATE FINISHED: *08/14/98*

WL (ft. bgs): *64.30* DATE: *08/14/98* TIME: *2:00 pm*

DRILLING METHOD: *8" hollow-stem auger*

TOTAL DEPTH: *75 Feet*

DRILLING COMPANY: *Woodward Drilling*

GEOLOGIST: *Clyde Galantine*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
5	2	11	MW-7-6	□	[Symbol]	ML	SILT (ML) - dark brown (10YR 3/3), damp, stiff, slight plasticity, 80% silt, 15% clay, 5% fine sand, trace gravel.	<p>2" blank Schedule 40 PVC</p> <p>neat cement</p>
10	1	42	MW-7-11	□	[Symbol]	GM	SILTY GRAVEL (GM) - brown (7.5YR 4/4), damp, very dense, 65% subangular to rounded fine gravel, 20% silt, 15% fine to coarse sand.	
15	0	66	MW-7-16.5	□	[Symbol]	ML	SILT WITH SAND (ML) - dark yellowish brown (10YR 4/4), damp, hard, 70% silt, 20% fine to coarse sand, 10% clay.	
20		51	MW-7-21.5	□	[Symbol]	ML	SILT (ML) - yellowish brown (10YR 5/4), damp, hard, 60% silt, 35% clay, 5% fine to medium sand.	
25	0	26	MW-7-26.5	□	[Symbol]	SW GM	Color change to olive gray (5Y 4/2) with greenish gray (5G 5/1) mottling. SAND (SW) - olive gray (5Y 4/2), moist, medium dense, 95% fine to medium sand, 5% clay.	
3.2	3.2	34	MW-7-28	□	[Symbol]	GM	SILTY GRAVEL (GM) - olive gray (5Y 4/2), moist, very dense, 75% subangular to rounded gravel, 20% silt, 5% fine to coarse sand.	

Gettler-Ryan Inc.

Log of Boring MW-7

PROJECT: *Tosco (Unocal) Service Station No. 7376*

LOCATION: *419 First Street, Pleasanton, CA*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
	2	73	MW-7-29			GM	Silt strata from 27.25 to 27.75 feet.	
	-	44	MW-7-30.5			GW	GRAVEL WITH SAND (GW) - olive gray (10YR 4/2), saturated, very dense, 70% subangular to rounded fine gravel, 25% fine to coarse sand, 5% silt.	
33	1.4	77	MW-7-32.5			GW	Becomes 55% fine gravel, 45% medium to coarse sand.	
		78	MW-7-34.5			CL	CLAY (CL) - dark yellowish brown (10YR 4/8), saturated, very stiff, medium plasticity, 60% clay, 35% silt, 5% fine sand.	
38	0	18	MW-7-36.5			CL		
							Sand strata from 40.25 to 40.5 feet. Becomes dry, hard at 41 feet.	
43	0	66	MW-7-42					
48	0	48	MW-7-46.5					
						ML	SILT (ML) - yellowish brown (10YR 5/4), moist, very stiff, no plasticity, 80% silt, 15% clay, 5% fine sand.	
53	0	32	MW-7-51.5					
						SM	SILTY SAND (SM) - dark yellowish brown (10YR 4/6), moist to damp, dense, 70% subangular to rounded fine sand, 25% silt, 5% clay.	
58	0	50	MW-7-58.5					

PROJECT: *Tosco (Unocal) Service Station No. 7376*

LOCATION: *419 First Street, Pleasanton, CA*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
0		70	MW-7-60.5	▣		GW GC	GRAVEL WITH CLAY AND SAND (GW-GC) - dark yellowish brown (10YR 4/6), moist, very dense, 70% subangular to rounded fine gravel, 25% medium to coarse sand, 10% clay.	<p>2" machine-slotted PVC (0.02 inch)</p> <p>sand Lonestar #3</p> <p>cap</p>
0		79	MW-7-62.5	▣		GW GC	Color change to olive gray (5Y 5/2) at 62 feet, becomes saturated.	
4.4		86	MW-7-64.5	▣		GW GC	Sand layer from 64.25 to 64.5 feet.	
-		57	MW-7-66.5	▣		GW GC	Abundant water at 66 feet.	
10		57	MW-7-68.5	▣		GW GC		
0		58	MW-7-70.5	▣		SW SC	SAND WITH CLAY (SW-SC) - strong brown (7.5YR 4/6), saturated, very dense, 85% subangular to rounded fine to very coarse sand, 10% clay, 5% fine gravel.	
0		60	MW-7-73.5	▣		CL	CLAY (CL) - dark yellowish brown (10YR 4/6), moist, hard, medium plasticity, 85% clay, 10% silt, 5% fine sand.	
							(* Converted to standard penetration blows/foot.)	

Gettler-Ryan Inc.

Log of Boring MW-8

PROJECT: *Tosco (Unocal) Service Station No. 7376*

LOCATION: *419 First Street, Pleasanton, CA*

PROJECT NO. : *140107.02*

CASING ELEVATION: *362.37 feet MSL*

DATE STARTED: *06/12/98*

WL (ft. bgs): *40* DATE: TIME:

DATE FINISHED: *06/12/98*


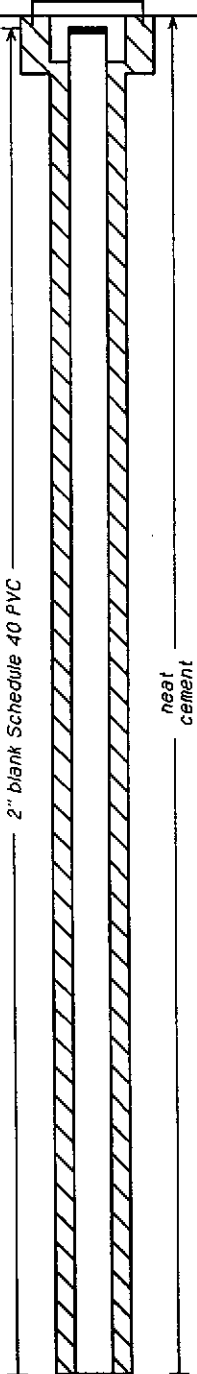


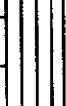

WL (ft. bgs): DATE: TIME:

DRILLING METHOD: *8" hollow-stem auger*

TOTAL DEPTH: *87.2 Feet*

DRILLING COMPANY: *Woodward Drilling*

GEOLOGIST: *Clyde Galantine*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
5	5	16	MW-8-8			GM	SILTY GRAVEL (GM) - dark brown (10YR 3/3), damp, medium dense, 70% subangular to rounded fine gravel, 20% silt, 10% fine to coarse sand.	 <p>2" blank Schedule 40 PVC</p> <p>neat cement</p>
10	3	21	MW-8-11			GM		
15	2	14	MW-8-16.5			ML	SILT (ML) - very dark grayish brown (10YR 3/2), damp to moist, very stiff, non plastic, 75% silt, 20% clay, 5% fine sand.	
20	4	22	MW-8-21.5			ML	Color change to dark brown (10YR 4/4).	
25	2	33	MW-8-28			ML	Becomes damp, hard, non plastic, 70% silt, 20% clay, 10% fine to coarse sand.	

Gettler-Ryan Inc.

Log of Boring MW-8

PROJECT: Tosco (Unocal) Service Station No. 7376

LOCATION: 419 First Street, Pleasanton, CA

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
33	2	38	MW-8-32	12"	[Solid black]	ML		<p>2" blank Schedule 40 PVC</p> <p>neat cement</p>
38	2	66	MW-8-37	12"	[Dotted pattern]	SP	Color change to olive gray (5Y 4/2) with dark greenish gray (5BG 4/1) mottling, becomes moist, hard, slight plasticity, 80% silt, 35% clay, 5% fine sand. SAND (SP) - olive gray (5Y 4/2), moist, very dense, 95% subangular to rounded fine to medium sand, 5% clay.	
43	7	41	MW-8-41	12"	[Dotted pattern with larger circles]	GW	GRAVEL WITH SAND (GW) - dark greenish gray (5GY 4/1), saturated, very dense, 70% subangular to rounded fine gravel, 25% fine to coarse sand, 5% clay.	
48	321	11	MW-8-45.5	12"	[Solid black]	ML	SILT (ML) - dark yellowish brown (10YR 4/4), moist to damp, hard, non plastic, 80% silt, 20% clay, trace fine sand.	
53	23	21	MW-8-46.5	12"	[Solid black]	ML	Becomes moist, 75% silt, 20% clay, 5% fine to medium sand.	
58	20	29	MW-8-51.5	12"	[Solid black]	CL	CLAY (CL) - light brownish gray (10YR 6/2) to brown (10YR 4/3), damp to moist, hard, medium plasticity, 80% clay, 20% silt, trace fine to medium sand.	
	39	51	MW-8-57	12"	[Diagonal hatching]	CL		

Gettler-Ryan Inc.

Log of Boring MW-8

PROJECT: Tosco (Unocal) Service Station No. 7376

LOCATION: 419 First Street, Pleasanton, CA

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
65	0	32	MW-8-62			CL		
						ML	SILT (ML) - light brownish gray (10YR 6/2) to brown (10YR 4/3), damp to moist, hard, slight plasticity, 65% silt, 30% clay, 5% fine sand.	
		35	MW-8-67			GW		
70	11	48	MW-8-71			GW/GC	GRAVEL WITH SAND (GW) - strong brown (10YR 4/6), saturated to moist, very dense, 60% subangular to rounded fine grass, 35% fine to very coarse sand, 5% clay.	
	6	16	MW-8-72.5			GW/GC	GRAVEL WITH CLAY AND SAND (GW-GC) - strong brown (10YR 4/6), saturated, very dense, 60% subangular to rounded fine gravel, 30% fine to very coarse sand, 10% clay.	
75	-	16	MW-8-75.5			GW/GC		
						ML	SILT WITH SAND (ML) - strong brown (10YR 4/6), damp to moist, hard, non plastic, 80% silt, 25% clay, 15% fine to very coarse sand, trace fine gravel.	
80	12	71	MW-8-80			SW/SC	SAND WITH CLAY AND GRAVEL (SW-SC) - yellowish brown (10YR 5/4), damp to moist, very dense, 70% subangular to rounded fine to very coarse sand, 20% fine gravel, 10% clay.	
	3	65	MW-8-81.5			SW/SC		
	3	69	MW-8-83			SW/SC		
85	6	18	MW-8-84.5			SW/SC		
	5	25					No sample.	
	5	44						
90							(* Converted to standard penetration blows/foot.)	

Gettler-Ryan Inc.

Log of Boring B-8

PROJECT: *Tosco (Unocal) Service Station No. 7376*

LOCATION: *419 First Street, Pleasanton, CA*

PROJECT NO.: *140107.02*

CASING ELEVATION:

DATE STARTED: *06/08/98*

WL (ft. bgs): *65* DATE: TIME:

DATE FINISHED: *06/08/98*

WL (ft. bgs): DATE: TIME:

DRILLING METHOD: *8" hollow-stem auger*

TOTAL DEPTH: *71.5 Feet*

DRILLING COMPANY: *Woodward Drilling*

GEOLOGIST: *Clyde Galantine*

DEPTH feet	PTD (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT. GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
0					CL	Asphalt. CLAY (CL) - very dark grayish brown (10YR 3/2), damp, stiff, medium plasticity, 70% clay, 30% silt.	Boring backfilled to ground surface with neat cement containing 5% bentonite powder.
5	1	20	B-8-8		CL	Color change to dark yellowish brown (10YR 4/6), becomes damp, hard, 60% clay, 30% silt, 10% fine to medium sand, trace gravel.	
10	2	26	B-8-11.5		ML	SILT (ML) - dark yellowish brown (10YR 4/6), damp, hard, no plasticity, 55% silt, 40% clay, 5% fine sand.	
15	2	37	B-8-16		ML	30% gravel layer from 15 to 15.5 feet.	
20	2	50	B-8-21		GW	GRAVEL WITH SAND (GW) - dark yellowish brown (10YR 4/6), moist, dense, 65% subangular to rounded fine gravel, 30% fine to coarse sand, 5% clay.	
25	2	66	B-8-25.5		GW	Color change to brown (10YR 4/3).	




PROJECT: Tosco (Unocal) Service Station No. 7376

LOCATION: 419 First Street, Pleasanton, CA

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
33	1	70	B-8-31	1		GW	Becomes 60% gravel, 35% sand, 5% clay.	
38	3	62	B-8-36	1		SW	SAND (SW) - yellowish brown (10YR 5/4), damp, very dense, 95% subangular to rounded fine to medium sand, 5% clay.	
43	2	67	B-8-40.5	1		ML	Becomes fine to coarse sand, trace fine gravel.	
48	1	38	B-8-46.5	1		ML	SILT WITH GRAVEL (ML) - light yellowish brown (2.5Y 6/3), damp, hard, no plasticity, 60% silt, 20% clay, 15% fine gravel, 5% fine to coarse sand.	
53	1	57	B-8-50.5	1		GW/GC	GRAVEL WITH CLAY AND SAND (GW-GC) - strong brown (7.5YR 4/6), moist, very dense, 60% semiangular to rounded fine gravel, 30% fine to coarse sand, 10% clay.	
58	1	44	B-8-58.5	1		CL	CLAY (CL) - brown (10YR 5/3) to dark yellowish brown (10YR 3/6), damp, hard, medium plasticity, 70% clay, 25% silt, trace fine gravel, trace fine sand, iron oxide staining.	
						ML		

PROJECT: Tosco (Unocal) Service Station No. 7376

LOCATION: 419 First Street, Pleasanton, CA

DEPTH feet	PTD (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
	1	39	B-8-61.5			ML	SILT (ML) - strong brown (7.5YR 4/8), damp, hard, no plasticity, 60% silt, 30% clay, 5% fine to coarse sand, 5% fine gravel.	
65	1	48	B-8-66			SW	SAND (SW) - dark brown (7.5YR 4/4), saturated, very dense, 95% subangular to rounded fine to very coarse sand, 5% clay, trace fine gravel.	
70	1	41	B-8-71.5			CL	CLAY (CL) - light yellowish brown (2.5Y 6/3) to strong brown (7.5YR 4/8), damp, hard, high plasticity, 100% clay, trace fine gravel in thin layers, iron oxide staining layers.	

Gettler-Ryan Inc.

Log of Boring B-9

PROJECT: *Tosco (Unocal) Service Station No. 7376*

LOCATION: *419 First Street, Pleasanton, CA*

PROJECT NO.: *140107.02*

CASING ELEVATION:

DATE STARTED: *06/08/98*

WL (ft. bgs): *65* DATE: TIME:

DATE FINISHED: *06/08/98*

WL (ft. bgs): DATE: TIME:

DRILLING METHOD: *8" hollow-stem auger*

TOTAL DEPTH: *81 Feet*

DRILLING COMPANY: *Woodward Drilling*

GEOLOGIST: *Clyde Galantine*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
0						ML	Asphalt. SILT (ML) - yellowish brown (10YR 5/4), damp, hard, no plasticity, 100% silt, trace fine sand.	Boring backfilled to ground surface with neat cement containing 5% bentonite powder.
5		55					No recovery.	
10	1	35	B-9-11				Color change to yellowish brown (10YR 5/6), becomes 80% silt, 20% clay, non oxide crenulations.	
15	0	58	B-9-15.5			GC	CLAYEY GRAVEL WITH SAND (GC) - dark yellowish brown (10YR 4/4), damp, very dense, 80% subangular to rounded fine gravel, 25% fine to coarse sand, 15% clay.	
20	1	49	B-9-21.5			CL	CLAY WITH SAND (CL) - dark yellowish brown (10YR 4/6), damp, hard, slight plasticity, 60% clay, 20% silt, 20% fine to medium sand, trace fine gravel.	
25	1	43	B-9-28			SW	SAND (SW) - yellowish brown (10YR 5/4), damp, very dense, 95% subangular to rounded fine to very coarse sand, 5% silt, trace fine gravel.	

Gettler-Ryan Inc.

Log of Boring B-9

PROJECT: *Tosco (Unocal) Service Station No. 7376*

LOCATION: *419 First Street, Pleasanton, CA*

DEPTH feet	PTD (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
33		70				SW GW	No sample; rock in shoe. GRAVEL (GW) - olive brown (2.5Y 4/3), damp, very dense, 85% subangular to rounded fine to coarse gravel, 35% fine to coarse sand, trace silt.	
38	1	70	B-9-38			ML	Becomes 60% gravel, 20% sand, 20% clay at contact. SILT (ML) - dark yellowish brown (10YR 4/6), damp, hard, no plasticity, 85% silt, 35% clay, trace sand.	
43	1	44	B-9-41			SC	Color change to dark brown (10YR 3/3), 65% silt, 25% clay, 10% fine to medium sand.	
48	1	38	B-9-48			SC	CLAYEY SAND (SC) - dark brown (10YR 4/4), damp, dense, 80% subangular to rounded fine to very coarse sand, 20% clay, trace fine gravel.	
53	-	58	B-9-50.5			GC	CLAYEY GRAVEL WITH SAND (GC) - strong brown (7.5YR 4/6), damp, very dense, 80% subangular to rounded fine gravel, 25% fine to coarse sand, 15% clay.	
58	-	53	B-9-55.5			GC		
						ML		

PROJECT: *Tosco (Unocal) Service Station No. 7376*

LOCATION: *419 First Street, Pleasanton, CA*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
	1	33	B-9-81.5			ML	SILT (ML) - dark yellowish brown (10YR 4/4), damp, hard, no plasticity, 95% silt, 5% clay, trace fine sand.	
65	1	41	B-9-86			GW	GRAVEL WITH SAND (GW) - olive brown (2.5Y 4/3), saturated, dense, 60% subangular to rounded fine gravel, 35% fine to coarse sand, 5% clay.	
70	1	64	B-9-70.5					
75	2	59				SW		
		68	B-9-76			GW GC	SAND (SW) - olive gray (5Y 4/2), moist, very dense, 100% subangular to rounded fine to coarse sand. GRAVEL WITH CLAY AND SAND (GW-GC) - dark yellowish brown (10YR 4/4), saturated, very dense, 60% subangular to rounded fine gravel, 30% fine to very coarse sand, 10% clay.	
80	65 746	11 29	B-9-80.5 B-9-81			ML	SILT (ML) - yellowish brown (10YR 5/4), damp, hard, no plasticity, 80% silt, 20% clay, trace fine sand. (* Converted to standard penetration blows/foot.)	
85								
90								

Gettler-Ryan Inc.

Log of Boring B-10

PROJECT: *Tosco (Unocal) Service Station No. 7376*

LOCATION: *419 First Street, Pleasanton, CA*

PROJECT NO.: *140107.02*

CASING ELEVATION:

DATE STARTED: *06/11/98*

WL (ft. bgs): *77* DATE: TIME:

DATE FINISHED: *06/11/98*

WL (ft. bgs): DATE: TIME:

DRILLING METHOD: *8" hollow-stem auger*

TOTAL DEPTH: *86.5 Feet*

DRILLING COMPANY: *Woodward Drilling*

GEOLOGIST: *Clyde Galantine*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							Asphalt.	
						ML	GRAVEL WITH SAND - fill material.	Boring backfilled to ground surface with neat cement containing 5% bentonite powder.
5	2	43	B-10-6			ML	SANDY SILT WITH GRAVEL (ML) - very dark gray (10YR 3/1), damp, hard, no plasticity, 65% silt, 15% fine gravel, 15% fine to coarse sand, 5% clay.	
							Gravel strata from 7 to 7.25 feet.	
							Color change to dark brown (10YR 3/3).	
							Color change to very dark grayish brown (2.5Y 3/2), becomes saturated, stiff, no plasticity.	
						GW	GRAVEL WITH SAND (GW) - black (7.5YR N2/), saturated, very dense, 70% subangular to rounded fine gravel, 25% fine to coarse sand, 5% clay.	
						ML	SILT WITH SAND (ML) - olive brown (2.5Y 4/3) to dark yellowish brown (10YR 4/4), damp, hard, no plasticity, 75% silt, 15% fine to coarse sand, 5% fine gravel, 5% clay, hydrocarbons (?) in cracks.	
						SM	SILTY SAND (SM) - very dark grayish brown (2.5Y 3/2), damp to moist, very dense, 50% subangular to rounded fine to coarse sand, 40% silt, 10% fine gravel, hydrocarbons (?) in cracks.	
						ML	SILT WITH SAND (ML) - dark grayish brown (2.5Y 4/2), damp, hard, no plasticity, 50% silt, 25% clay, 20% fine to coarse sand, 5% fine gravel, hydrocarbons (?) in cracks.	
						SM	SILTY SAND (SM) - dark greenish gray (5G 4/1), damp to moist, dense, 70% subangular to rounded fine to coarse sand, 25% silt, 5% fine gravel, hydrocarbons (?) in void space and cracks.	
						GW	GRAVEL WITH SAND (GW) - dark greenish gray (5G 4/1), moist, very dense, 75% subangular to rounded fine gravel, 20% fine to coarse sand, 5% silt, hydrocarbons (?) in void spaces and cracks. Sand layer at contact.	
						ML	SILT (ML) - olive gray (5Y 4/2), damp to moist, hard, no plasticity, 75% silt, 20% clay, 5% fine to coarse sand, hydrocarbons (?) in void spaces.	

PROJECT: Tosco (Unocal) Service Station No. 7376

LOCATION: 419 First Street, Pleasanton, CA

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
470	32		B-10-29			ML	Color change to dark greenish gray (5G4/1) at 29 feet.	
691	18		B-10-30.5					
401	60		B-10-32			GW	GRAVEL (GW) - olive gray (5Y 4/2), moist, very dense, 80% subangular to rounded fine gravel, 15% fine to coarse sand, 5% clay, abundant hydrocarbons (?) in void spaces.	
636	44		B-10-34				No sample recovery; rock in shoe.	
4	18		B-10-37.5			ML	Abundant moisture/hydrocarbons (?) at contact.	
462	73		B-10-38				SILT WITH GRAVEL (ML) - yellowish brown (10YR 5/4), damp, hard, no plasticity, 70% silt, 20% fine gravel, 10% clay, hydrocarbons (?) in cracks and void spaces.	
250	62		B-10-40				Color change to olive brown (2.5Y 4/4) to light yellowish brown (2.5Y 6/4).	
89	62		B-10-41.5					
120	50		B-10-44				Color change to strong brown (7.5YR 4/6) at 45.25 feet, becomes damp to moist, hard, no plasticity, 70% silt, 15% clay, 10% fine to coarse sand, 5% fine gravel, decrease in hydrocarbons (?).	
31	75		B-10-47				Becomes 60% silt, 35% clay, 5% fine to coarse sand, trace gravel, no hydrocarbons (?) at 47.5 feet.	
3	46		B-10-49					
6	40		B-10-51				Localized fine to coarse sand at 51.25 to 51.75 feet.	
8	41		B-10-53				Color change to strong brown (7.5YR 4/6) with light brownish gray (10YR 6/3) mottling from 53.25 to 54 feet.	
347	25		B-10-54.5				Localized fine gravel and fine to coarse gravel strata from 55.75 to 56.25 feet.	
290	56		B-10-57			SM		
58	24		B-10-58				SILTY SAND WITH GRAVEL (SM) - dark yellowish brown (10YR 4/4), damp, very dense, 65% subangular to rounded sand, 20% silt, 15% fine gravel.	

PROJECT: *Tosco (Unocal) Service Station No. 7376*

LOCATION: *419 First Street, Pleasanton, CA*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
65	50	79	B-10-60.5			SM SW	SAND WITH GRAVEL (SW) - dark yellowish brown (10YR 4/4), moist, very dense, 75% subangular to rounded fine to coarse sand, 20% fine gravel, 5% silt.	
	11	79	B-10-62					
	8	62	B-10-64					
	-	66	B-10-65.5			ML	SILT (ML) - dark yellowish brown (10YR 4/6), damp, hard, no plasticity, 75% silt, 20% clay, 5% fine sand. Fine gravel strata at 69.75 feet. Becomes 85% silt, 15% clay, trace fine sand at 70 feet.	
70	6	69	B-10-69					
	7	50	B-10-71					
	6	63	B-10-72.5					
	8	60	B-10-73.5					
75	4	70	B-10-75.5			SW	SAND (SW) - yellowish brown (10YR 5/4), damp, very dense, 90% subangular to rounded fine to very coarse sand, 5% silt, 5% fine gravel.	
	5	72	B-10-78			GW		
	-	72	B-10-79.5				GRAVEL WITH SAND (GW) - dark grayish brown (10YR 4/2), saturated, very dense, 80% subangular to rounded fine gravel, 35% fine to very coarse sand, 5% clay.	
80						SW	SAND (SW) - saturated, very dense, 95% medium to very coarse sand, 5% fine gravel. Becomes 80% sand, 20% fine gravel at 84 feet.	
	5	63	B-10-82.5					
	6	19	B-10-84					
85	6	88	B-10-86.5			ML	SILT WITH SAND (ML) - dark yellowish brown (10YR 4/6), moist, hard, no plasticity, 80% silt, 20% fine to medium sand. (* Converted to standard penetration blows/foot.)	
90								

Gettler-Ryan Inc.

Log of Boring B-11

PROJECT: <i>Tosco (Unocal) Service Station No. 7376</i>	LOCATION: <i>419 First Street, Pleasanton, CA</i>
PROJECT NO.: <i>140107.02</i>	CASING ELEVATION:
DATE STARTED: <i>06/09/98</i>	WL (ft. bgs): <i>68</i> DATE: TIME:
DATE FINISHED: <i>06/09/98</i>	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: <i>8" hollow-stem auger</i>	TOTAL DEPTH: <i>74 Feet</i>
DRILLING COMPANY: <i>Woodward Drilling</i>	GEOLOGIST: <i>Clyde Galantine</i>

DEPTH feet	PTD (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							Asphalt.	Boring backfilled to ground surface with neat cement containing 5% bentonite powder.
						GW	GRAVEL WITH SAND (GW) - dark grayish brown (2.5Y 4/2), damp, dense, 85% subangular to rounded fine gravel, 30% fine to coarse sand, 5% clay: FILL.	
						CL	CLAY (CL) - very dark gray (5Y 3/1), damp, very stiff, medium plasticity, 90% clay, 10% silt: FILL.	
5	202	72	B-11-5.5			GW	GRAVEL (GW) - dark grayish brown (2.5Y 4/2), damp, dense, 85% subangular to rounded fine gravel, 10% fine to coarse sand, 5% clay, asphalt: FILL.	
						ML	SILT WITH SAND (ML) - black (10YR 2/1), damp, hard, no plasticity, 75% silt, 20% fine to very coarse sand, 5% fine gravel.	
10	584	26	B-11-10.5			ML	Color change to very dark grayish brown (2.5Y 3/2) at 11 feet, trace gravel, sand fining.	
						ML	Asphalt at 14 feet; may still be backfill.	
15	202	81	B-11-16			ML	Color change to olive brown (2.5Y 4/3) at 15 feet, becomes 85% silt, 30% clay, 5% fine sand, hydrocarbons (?) in void spaces.	
						ML	Localized fine gravel strata from 19.25 to 19.5 feet.	
20	483	62	B-11-19.5			ML	Localized fine gravel strata from 20.25 to 20.75 feet.	
						GC	CLAYEY GRAVEL WITH SAND (SC) - olive brown (2.5Y 4/3), damp, very dense, 60% subangular to rounded fine gravel, 25% fine to coarse sand, 15% clay, abundant hydrocarbons (?) in all cracks and void spaces.	
25	311	32	B-11-25.5			ML	SILT (ML) - dark olive gray (5Y 3/2), damp, hard, slight plasticity, 70% silt, 25% clay, 5% fine to coarse sand, localized fine gravel.	
						ML		
	459	32	B-11-27			ML		

Gettler-Ryan Inc.

Log of Boring B-11

PROJECT: Tosco (Unocal) Service Station No. 7376

LOCATION: 419 First Street, Pleasanton, CA

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
33	359	79	B-11-29.5			ML		
	372	32	B-11-31				Localized fine gravel and sand from 30.5 to 31.25 feet.	
	292	88	B-11-32.5				Sand strata from 32.4 to 32.6 feet.	
	231	70	B-11-35			GW	GRAVEL WITH SAND (GW) - very dark gray (5Y 3/1), damp, very dense, 70% subangular to rounded fine gravel, 25% fine to coarse sand, 5% clay, abundant hydrocarbons (?) in all cracks and void spaces.	
	310	63	B-11-37					
38	115	74	B-11-39.5			ML	SILT (ML) - greenish gray (5G 5/1) to dark yellowish brown (10YR 4/4), damp, hard, slight plasticity, 65% silt, 35% clay, trace fine sand to fine gravel, hydrocarbons (?) in cracks.	
	30	77	B-11-41			CL	CLAY (CL) - dark yellowish brown (10YR 4/4), damp, hard, high plasticity, 80% clay, 20% silt, trace fine to coarse sand, hydrocarbons (?) decreasing with depth.	
43	320	72	B-11-43.5			ML	SILT (ML) - olive brown (2.5Y 4/4), damp, hard, no plasticity, 70% silt, 30% clay, trace fine sand, hydrocarbons (?) in cracks.	
	356	82	B-11-45.5				Color change to olive gray (5Y 4/2) with dark greenish gray (5BG 4/1) mottling at 44 feet, increase in hydrocarbons (?) in cracks.	
	209	70	B-11-47					
48	321	70	B-11-49				Sand layer from 48.4 to 48.8 feet, abundant hydrocarbons (?) in cracks, trace fine gravel.	
	97	70	B-11-51.5				Color change to dark grayish brown (2.5Y 4/2) at 50 feet, becomes 60% silt, 30% clay, 10% fine to coarse sand, trace fine gravel.	
53	62	63	B-11-53				Decrease in hydrocarbons (?) at 52 feet, iron oxide staining from 52.2 to 52.8 feet.	
	141	77	B-11-55					
							Abundant hydrocarbons (?) in sand at 57 feet.	
58	148	79	B-11-58					
	428	76	B-11-59			SW-SC	SAND WITH CLAY (SW-SC) - very dark grayish brown (2.5Y 3/2), damp to moist, very dense, 85% subangular to rounded fine to coarse sand, 10% clay, 5% fine gravel, saturated with hydrocarbons (?).	

PROJECT: Tosco (Unocal) Service Station No. 7376

LOCATION: 419 First Street, Pleasanton, CA

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS	
65	455	62	B-11-61	□		SW-SC	SAND WITH CLAY (SW-SC) - very dark grayish brown (2.5Y 3/2) to dark brown (10YR 4/3), damp, very dense, 80% subangular to rounded fine to coarse sand, 10% clay, 10% fine gravel, abundant hydrocarbons (?) from 61 to 62.25 feet.		
	451	63	B-11-62.5	□		GW-GC	GRAVEL WITH CLAY AND SAND (GW-GC) - dark yellowish brown (10YR 4/6), damp, very dense, 60% subangular to rounded fine gravel, 30% fine to coarse sand, 10% clay.		
70	74	62	B-11-65	□		GW-GC	Becomes 50% gravel, 40% sand, 10% clay at 66 feet.		
	51	62	B-11-66.5	□			▽	Saturated above 68 feet, sand strata above 68.2 feet.	
	24	57	B-11-69	□				Abundant water.	
	6	62	B-11-70.5	□			CL	CLAY (CL) - brownish yellow (10YR 6/6), damp, hard, medium plasticity, 80% clay, 20% silt, trace fine sand.	
75	6	62	B-11-73.5	□			(* Converted to standard penetration blows/foot.)		

Gettler-Ryan Inc.

Log of Boring B-12

PROJECT: <i>Tosco (Unocal) Service Station No. 7376</i>	LOCATION: <i>419 First Street, Pleasanton, CA</i>
PROJECT NO.: <i>140107.02</i>	CASING ELEVATION:
DATE STARTED: <i>06/10/98</i>	WL (ft. bgs): <i>73</i> DATE: TIME:
DATE FINISHED: <i>06/10/98</i>	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: <i>8" hollow-stem auger</i>	TOTAL DEPTH: <i>79 Feet</i>
DRILLING COMPANY: <i>Woodward Drilling</i>	GEOLOGIST: <i>Clyde Galantine</i>

DEPTH feet	PTD (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							Asphalt.	
						CL	GRAVEL WITH SILT - fill material.	Boring backfilled to ground surface with neat cement containing 5% bentonite powder.
						CL	CLAY (CL) - very dark gray (5Y 3/1), damp, very stiff, medium plasticity, 90% clay, 10% silt.	
						CL	CLAYE WITH GRAVEL (CL) - yellowish brown (10YR 5/6), damp, hard, no plasticity, 80% clay, 20% fine gravel, 20% fine to coarse sand.	
5	19	63	B-12-5.5				Color change to very dark gray (10YR 3/1) at 5 feet; fill material.	
							Asphalt in soil from 7 to 8 feet.	
	93	44	B-12-8				Asphalt, burnt wood, and wood in soil.	
10	144	18	B-12-10				Asphalt, burnt wood, and wood in soil.	
	118	12	B-12-12				Brick shards from 13 to 13.25 feet.	
	39	18	B-12-14.5				Color change to dark grayish brown (2.5Y 4/2) at 13.5 feet, becomes moist.	
15	56	79	B-12-16.5			ML	SANDY SILT (ML) - dark yellowish brown (10YR 4/6), damp, hard, no plasticity, 55% silt, 35% fine to coarse sand, 10% clay.	
	32	70	B-12-17.5				Fine sand layer from 16.4 to 18.5 feet.	
							Becomes SILT (ML), 60% silt, 40% clay, trace fine sand at 17.5 feet.	
20	44	79	B-12-20.5				SILT WITH SAND (ML) - olive gray (5Y 5/2), damp to wet, no plasticity, 75% silt, 15% very fine to medium sand, 10% clay.	
							Medium sand layer from 19.25 to 19.5 feet.	
	58	70	B-12-22.5			GC	SANDY SILT (ML) - dark yellowish brown (10YR 4/6), damp, hard, no plasticity, 60% silt, 30% fine to medium sand, 10% clay.	
	46	42	B-12-24			ML	CLAYEY GRAVEL WITH SAND (GC) - damp, very dense, 55% subangular to rounded fine gravel, 25% fine to coarse sand, 20% clay.	
25	37	76	B-12-26			SW SC	CLAYEY SILT strata from 24 to 24.5 feet.	
						SC	SAND WITH CLAY (SW-SC) - olive gray (5Y 4/2), damp, very dense, 80% subangular to rounded fine to very coarse sand, 10% clay, 10% fine gravel.	
						SC	CLAYEY SAND (SC) - dark greenish gray (5GY 4/1), damp to moist, very dense, 70% subangular to rounded very fine to fine sand, 30% clay.	

PROJECT: *Tosco (Unocal) Service Station No. 7376*

LOCATION: *419 First Street, Pleasanton, CA*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
415		78	B-12-28.5			SC GW	GRAVEL WITH SAND (GW) - olive gray (5Y 4/2), damp, very dense, 80% subangular to rounded fine gravel, 15% fine to coarse sand, 5% clay.	
449		70	B-12-30					
-		59	B-12-31.5					
33		447	B-12-33.5				Visible hydrocarbon (?) liquid on surface of gravel.	
		377	B-12-36				Localized increase in clay content to 70% gravel, 15% sand, 15% clay.	
		399	B-12-37.5				Becomes saturated.	
38						ML	SILT (ML) - dark olive gray (5Y 3/2) to greenish gray (5G 5/1) with yellowish brown (10YR 5/4) mottling, damp, hard, no plasticity, 70-85% silt, 10-25% clay, 5% fine to coarse sand, trace fine gravel, abundant hydrocarbons (?) in void spaces and cracks.	
		397	B-12-41				Decrease in hydrocarbons (?) at 41 feet.	
43		192	B-12-43				Color change to dark yellowish brown (10YR 4/6) with dark greenish gray (5GY 4/1) mottling at 43 feet, occasional hydrocarbons (?) in cracks.	
		278	B-12-44.5					
		245	B-12-47				No hydrocarbons (?) visible below 47 feet.	
48		48	B-12-48.5					
		20	B-12-50.5				Increase in medium sand from 50.75 to 51.25 feet.	
							Increase in coarse sand from 52.25 to 52.75 feet.	
53		3	B-12-53				Color change to strong brown (7.5YR 5/6) at 53.5 feet, becomes moist to wet.	
		2	B-12-55					
		2	B-12-56.5					
58							Fine gravel strata from 58 to 58.5 feet.	
		3	B-12-59				Fine gravel strata from 59 to 59.5 feet.	

PROJECT: *Tosco (Unocal) Service Station No. 7376*

LOCATION: *419 First Street, Pleasanton, CA*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
						ML	Gravel strata from 80 to 80.5 feet.	
65	3	53	B-12-61					
	3	75	B-12-62.5			SW SC	SAND WITH CLAY (SW-SC) - strong brown (7.5YR 5/6), damp to moist, very dense, 80% subangular to rounded fine to very coarse sand, 10% fine gravel, 10% clay.	
	4	83	B-12-64				Silt layer from 63.25 to 63.5 feet.	
	5	55	B-12-65.5				Localized gravel at 65.5 feet.	
						GW GC	No sample recovery; rock in shoe.	
70	3	79	B-12-70				GRAVEL WITH CLAY (GW-GC) - strong brown (7.5YR 4/6), moist, very dense, 75% subangular to rounded fine gravel, 15% fine to coarse sand, 10% clay.	
	3	82	B-12-72					
	5	55	B-12-73.5				∇ Becomes wet to saturated.	
75	5	53	B-12-75.5					
	4	60	B-12-79			ML	SILT (ML) - dark yellowish brown (10YR 4/6), damp, hard, no plasticity, 70% silt, 30% clay, trace sand and gravel. (* Converted to standard penetration blows/foot.)	
80								
85								
90								

APPENDIX C

Well Development and Groundwater Sampling Field Data Sheets

DAILY REPORT

Gettler - Ryan Inc.

TAGS

FORMS

COMPANY

Unocal/Tosco #7376

JOB NO.

140107.02

LOCATION

4191 First Street
Pleasanton, CA

DATE

6-22-98

ARRIVAL TIME

DEPARTURE TIME:

JOB INSTRUCTIONS:

Develop well.

WORK PERFORMED (CONT. ON REVERSE SIDE):

Travel to site

Develop new well ANW-8 via Sauge &

Purge Method, Well Sarged with

Block in ~~the~~ screen interval. Well then

Bailed with Baiter then pump with

Gundfos to ~~clearing~~ clearing

No Samples

MATERIALS:

SUBCONTRACTORS:

EQUIPMENT:

AIR COMPRESSOR

CONCRETE SAWING

HELIUM TESTER

DUMP TRUCK

STEAM CLEANER

HYDROCARBON SURVEYOR

SPECIALTY TRUCK

20-30(2)

WATER/TRANSFER PUMP

HORIBA

BACKHOE/LOADER

PETRO-TITE LINE TESTER

VR-3

KOMATSU

PETRO-TITE TANK TESTER

OVA

PAVING EQUIPMENT

VAPOR TESTER

ELECTRONIC INTERFACE
PROBE

FOREMAN

WELL MONITORING/DEVELOPMENT

FIELD DATA SHEET

Client/Facility: Unocal 705cc #7376 Job#: 140107-02
 Address: 4191 First Way Date: 6-22-98
 City: Pleasanton CA Sampler: F. Chin

Well ID: MW-8 Well Condition: okay

Well Diameter: 2" in. Hydrocarbon Thickness: 0 Ft. Amount Bailed: 0 (gal.)
 Total Depth: 85' (88') ft. (product/water):

Depth to Water: 62.91 ft.

Volume Factor (VF)	2" = 0.17	3" = 0.38	4" = 0.66
	6" = 1.50	12" = 5.80	

$25109 \times VF_{0.17} = 4.2 \times 16 \text{ (base volume)} = \text{Estimated Purge Volume: } 42 \text{ (gal.)}$

Purge Equipment: Disposable Bailer, Stack, Suction, Grundfos, Other: _____
 Sampling Equipment: Disposable Bailer, Bailer, Pressure Bailer, Grab Sample, Other: _____

Starting Time: 17:15 Weather Conditions: clear warm
 Sampling Time: 18:25 Water Color: clear Odor: None
 Purging Flow Rate: 1 gpm. Sediment Description: None
 Did well de-water? _____ If yes; Time: _____ Volume: _____ (gal.)

Time	Volume (gal.)	pH	Conductivity $\mu\text{mhos/cm}$	Temperature $^{\circ}\text{C}$	Clarity D.O. (mg/L)	Color ORP (mV)	Alkalinity (ppm)
17:15	0	6.77	1414	20.9	clear	Initial	Initial
17:40	5	6.71	1305	19.8	Muddy	Surge	Surge
17:45							
17:50	10	6.55	1147	20.5	Muddy	Brown	Pumping
17:55	15	6.51	1112	17.5	Muddy/clay	Brown	
18:00	20	6.44	1076	18.7	Muddy		
18:05	25	6.44	1069	18.6	cloudy		
18:10	30	6.46	1070	18.7	cloudy		
18:15	35	6.44	1037	18.6	cloudy		
18:20	40	6.45	1090	18.7	cloud		
18:25	45	6.44	1098	18.6	cloudy	Brown	

LABORATORY INFORMATION

SAMPLE ID	(#) - CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES

COMMENTS: Develop only Sampling to be done
with 1/4"



**MONITORING WELL
OBSERVATION SUMMARY SHEET**

CLIENT FACILITY #: U/T 7
 LOCATION: 4191 First Street
 CITY: Livermore CA
Pleasanton CA

G-R JOB #: 140107.02
 DATE: 8-18-98
 TIME: F.C. Line

Well ID	Total Depth	Depth to Water	Product Thickness	TOB or TOC	Comments
MW-1	N/A	79.93	Ø	TOC	
MW-2B		83.99			
MW-3		83.29			
MW-4		78.75	Ø	↓	
MW-5	73.00	70.40	0.005 to heavy film	TOC	
MW-6		84.86	Ø		
MW-7	77'	68.75	↓	↓	
MW-8	N/A	73.38	↓	↓	

Comments: _____

Sampler: [Signature] Assistant: _____



GETTLER-RYAN INC.

DAILY SAMPLING REPORT

Site Location: Unocal Toxic # 7376
4191 First Street
Phasanton CA

Job # 140107, 02

Date: 8-18-98

DESCRIPTION OF WORK PERFORMED:

Monitor ✓
 Purge ✓
 Sample ✓
 Develop ✓

Total # of Wells @ site: 8
 Water levels only: 7
 Monitored/Sampled: 1
 Bailed Product: _____

CHECK LIST:

Transfer Purge Water To:
 Drums on site: _____
 Holding tank: ✓
 Total Purge Water (gals): 20 gals
 Sampling Truck: 2030
 Purge water trailer: NC
 Traffic Control: NC
 Arrow board/road signs/cones _____

PURGING EQUIPMENT:

Disposal bailer _____
 Teflon bailer ✓
 3/8" stack pumps _____
 1" double diaphragm _____
 Grundfo's ✓

SAMPLING EQUIPMENT:

Teflon bailer _____
 Disposable bailer ✓
 Grab sample _____
 Pressure bailer _____

OTHER EQUIPMENT:

Gloves 5 pairs
 Bailer cord 150'
 Well plug size _____ # _____

SPECIAL EQUIPMENT:

Turbidity Meter _____
 D O Meter _____
 Re-Dox Meter _____
 Alkalinity test _____

COMMENTS: Developed & sampled MW-7. Water levels in
other 7 wells. Floating product (Waste Oil like)
found in MW-5. Heavy film to 0.005 thickness coated

Sampled by: [Signature]
 Assistant: _____

Time Billed: 3 hrs.

**WELL MONITORING/DEVELOPMENT
FIELD DATA SHEET**

Client/Facility: Unocal/Hosec # 7376 Job#: 140107.C2
 Address: 4191 First Street Date: 8-18-98
 City: Greenware CA Sampler: F. Cline
Pleasanton

Well ID: MW-7 Well Condition: okay
 Well Diameter: 2" in. Hydrocarbon Thickness: 0 Ft. Amount Bailed: 0 (gal.)
 Total Depth: 77 (75) ft. Volume Factor (VF): 2" = 0.17, 3" = 0.38, 4" = 0.66
 Depth to Water: 68.75 ft. 6" = 1.50, 12" = 5.80

Purge Equipment: 8.25 x VF 0.17 = 1.4 x 10 (case volume) = Estimated Purge Volume: 14 (gal.)
6.25 x 0.17 = 1.06 x 10 = 10.6
 Disposable Bailer Sampling Equipment: Disposable Bailer
Bailer Bailer
 Stack Pressure Bailer
 Suction Grab Sample
Grundfos
 Other: _____

Starting Time: 9:30 Weather Conditions: clear warm
 Sampling Time: 10:30 Water Color: Brown Odor: None
 Purging Flow Rate: 0.6 gpm Sediment Description: light silt
 Did well de-water? No If yes; Time: _____ Volume: _____ (gal.)

Time	Volume (gal.)	pH	Conductivity μ mhos/cm	Temperature $^{\circ}$ C	D.O. (mg/L)	ORP (mV)	Alkalinity (ppm)
9:30	0	7.28	1460	18.6	Brown	Muddy	Initial
9:50	6	7.05	1250	18.9	↓	↓	Source @ Bail
10:05	7	7.03	1250	19.1	Brown	Muddy	Pump @ 0.6 gpm
10:08	9	6.86	1205	18.8	↓	cloudy	
10:11	11	6.79	1097	19.0	↓	cloudy	
10:14	13	6.79	1040	19.3	↓	cloudy	
10:17	15	6.78	1046	20.1	↓	clearing	
10:20	17	6.77	1045	20.1	↓	clearing	Sampled.

LABORATORY INFORMATION

SAMPLE ID	(#) - CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
MW-7	3 x 40ml VOA	Y	HCL	SBC	Geobiose ATPC
MW-7	2 x 100ml	Y	None	SBC	TPH. Diesel

COMMENTS: Cement around casing dropped below ground surface -

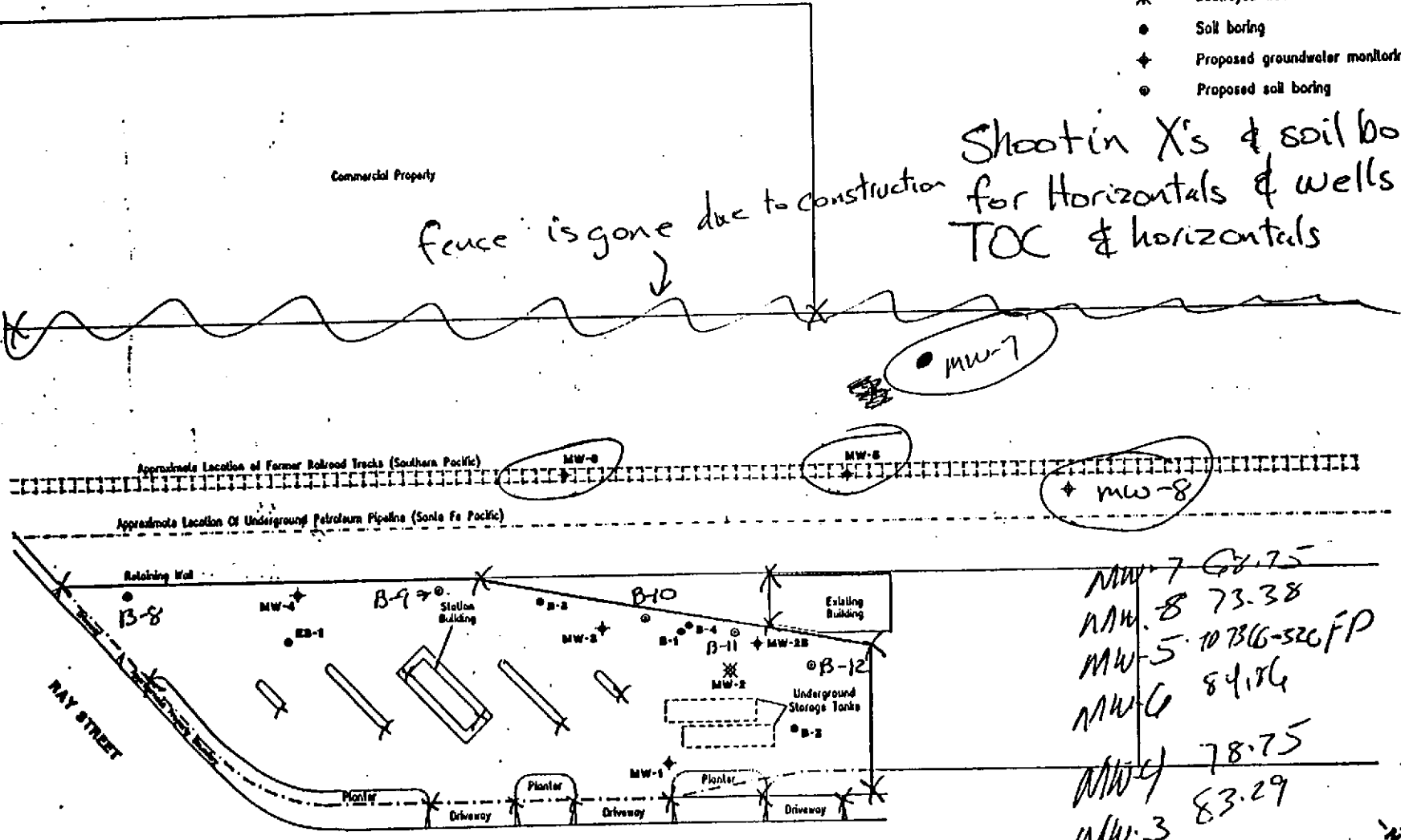
EXPLANATION

- ◆ Groundwater monitoring well
- * Destroyed well
- Soil boring
- ◆ Proposed groundwater monitoring well
- Proposed soil boring

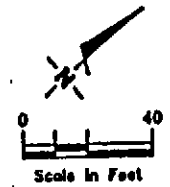
Commercial Property

fence is gone due to construction

Shootin X's & soil borings for Horizontals & wells for TOC & horizontals



MW-7	87.75
MW-8	73.38
MW-5	10736-526 FP
MW-6	84.86
MW-4	78.75
MW-3	83.29
MW-1	79.95
MW-2B	83.99



SITE PLAN
 Tesco 76 Branded Facility No. 7376
 4191 First Street
 Pleasanton, California
 DATE: 1/11/00
 REVISION: 0000
Gettler - Ryan Inc.
 8747 Shaw Ct. Suite J
 Dallas, TX 75248
 (972) 951-7255
 JOB NUMBER: _____
 REVISION BY: _____

COMPANY Tosco Marketing Co # 7376 JOB NO. 140107.02
 JOB LOCATION 491 First St./Ray
 CITY Pleasanton PHONE NO. _____

AUTHORIZED Clyde Galandine DATE 8/14/98 P.O. NO. _____

JOB DESCRIPTION Take DTW for all wells.
Develop & sample well MW-7 (it's
in a stovepipe in drainage swale). Analyze for
preset analytical parameters (TPH, d, BTEX, MTBE 2015/800)

Do not leave any purge water onsite.

WORK PERFORMED/MATERIAL DONE
8/18/98
Frank Cline

COMP. HRS. _____ PICKUP HRS. _____ DUMP HRS. _____ ROLLER HRS. _____ CONC. SAW LF. _____
 DATE COMPLETED _____ FOREMAN _____



GETTLER-RYAN INC.

DAILY SAMPLING REPORT

Site Location: UNOCAL SS #7376 (Tosco)
4191 FIRST STREET
PLEASANTON, CA

Job # 180075

Date: 6-26-98

DESCRIPTION OF WORK PERFORMED:

Monitor ✓
 Purge ✓
 Sample ✓
 Develop _____

CHECK LIST:

Transfer Purge Water To:
 Drums on site: _____
 Holding tank: ✓
 Total Purge Water (gals): 48.5
 Sampling Truck: ✓
 Purge water trailer: _____
 Traffic Control: _____
 Arrow board/road signs/cones _____

Total # of Wells @ site: 7
 Water levels only: _____
 Monitored/Sampled: 7
 Bailed Product: _____

PURGING EQUIPMENT:

Disposal bailer _____
 Teflon bailer ✓
 3/8" stack pumps _____
 1" double diaphragm _____
 Grundfos ✓

SAMPLING EQUIPMENT:

Teflon bailer _____
 Disposable bailer 7
 Grab sample _____
 Pressure bailer _____

OTHER EQUIPMENT:

Gloves 14 PAIRS
 Bailer cord 400
 Well plug size _____ # _____

SPECIAL EQUIPMENT:

Turbidity Meter _____
 D O Meter _____
 Re-Dox Meter _____
 Alkalinity test _____

COMMENTS: _____

Sampled by: STEVE BALIAN
 Assistant: _____

MILEAGE: _____
 Time Billed: 8 HRS

**MONITORING WELL
OBSERVATION SUMMARY SHEET**

CLIENT/
FACILITY #: UNOCAL SS # 7376 (TOSCO)

G-R JOB #: 180075

LOCATION: 4191 FIRST STREET

DATE: 6-26-98

CITY: PLEASANTON, CA

TIME: _____

Well ID	Total Depth	Depth to Water	Product Thickness	TOB or TOC	Comments
<u>MW-1</u>	<u>86.43</u>	<u>79.29</u>	<u>∅</u>	<u>TOC</u>	
<u>MW-2B</u>	<u>85.26</u>	<u>77.78</u>	<u>∅</u>	↓	
<u>MW-3</u>	<u>94.11</u>	<u>79.65</u>	<u>∅</u>		
<u>MW-4</u>	<u>93.07</u>	<u>73.81</u>	<u>∅</u>		
<u>MW-5</u>	<u>72.51</u>	<u>64.13</u>	<u>∅</u>		<u>SHEEN</u>
<u>MW-6</u>	<u>88.00</u>	<u>75.71</u>	<u>∅</u>		
<u>MW-8</u>	<u>86.40</u>	<u>63.00</u>	<u>∅</u>		

Comments: _____

Sampler: STEVE BALIAN

Assistant: _____

**WELL MONITORING/SAMPLING
FIELD DATA SHEET**

Client/ Facility UNOCAL SS# 7376 (Tosco) Job#: 180075
 Address: 4191 FIRST STREET Date: 6-26-98
 City: PLEASANTON, CA Sampler: STEVE BAIAN

Well ID MW-1 Well Condition: OK

Well Diameter 2" in. Hydrocarbon Amount Bailed
 Thickness: ∅ (feet) (product/water): _____ (Gallons)
 Total Depth 86.43 ft.
 Depth to Water 79.29 ft.

Volume	2" = 0.17	3" = 0.38	4" = 0.66
Factor (VF)	6" = 1.50	12" = 5.80	

7.14 x VF 1.21 = _____ X 3 (case volume) = Estimated Purge Volume: 2.64 (gal.)

Purge Equipment: Disposable Bailer Sampling Equipment: Disposable Bailer
Bailer Bailer
 Stack Pressure Bailer
 Suction Grab Sample
 Grundfos Other: _____
 Other: _____

Starting Time: 14:09 Weather Conditions: SUNNY
 Sampling Time: 14:35 Water Color: CLEAR Odor: -
 Purging Flow Rate: _____ gpm. Sediment Description: _____
 Did well de-water? NO If yes; Time: _____ Volume: _____ (gal.)

Time	Volume (gal.)	pH	Conductivity μ mhos/cm	Temperature $^{\circ}$ F	D.O. (mg/L)	ORP (mV)	Alkalinity (ppm)
<u>14:13</u>	<u>1.5</u>	<u>6.68</u>	<u>452</u>	<u>74.7</u>	_____	_____	_____
<u>14:16</u>	<u>3</u>	<u>6.77</u>	<u>477</u>	<u>73.2</u>	_____	_____	_____
<u>14:19</u>	<u>4</u>	<u>6.79</u>	<u>481</u>	<u>73.0</u>	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

LABORATORY INFORMATION

SAMPLE ID	(#) - CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
<u>MW-1</u>	<u>3-VOA'S</u>	<u>Y</u>	<u>Hel</u>	<u>SEQUOIA</u>	<u>TPH(GI)/btex/mtbe</u>
<u>MW-1</u>	<u>1-AMBER</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>TPH-DIESEL</u>
_____	_____	_____	_____	_____	_____

COMMENTS: _____

**WELL MONITORING/SAMPLING
FIELD DATA SHEET**

Client/ Facility UNOCAL SS# 7376 (TOSCO) Job#: 180075
 Address: 4191 FIRST STREET Date: 6-26-98
 City: PLEASANTON, CA Sampler: STEVE BAIAN

Well ID MW-2B Well Condition: O.K.
 Well Diameter 2" in. Hydrocarbon Amount Bailed
 Thickness: Ø (feet) (product/water): _____ (Gallons)
 Total Depth 85.26 ft. Volume 2" = 0.17 3" = 0.38 4" = 0.66
 Depth to Water 77.78 ft. Factor (VF) 6" = 1.50 12" = 5.80

7.48 x VF 0.17 = 1.27 x 3 (case volume) = Estimated Purge Volume: 3.81 (gal.)

Purge Equipment: Disposable Bailer
Bailer
 Stack
 Suction
 Grundfos
 Other: _____

Sampling Equipment: Disposable Bailer
Bailer
 Pressure Bailer
 Grab Sample
 Other: _____

Starting Time: 14:48 Weather Conditions: SUNNY
 Sampling Time: 15:10 Water Color: CLEAR Odor: -
 Purging Flow Rate: _____ gpm. Sediment Description: _____
 Did well de-water? NO If yes; Time: _____ Volume: _____ (gal.)

Time	Volume (gal.)	pH	Conductivity μ mhos/cm	Temperature $^{\circ}$ F	D.O. (mg/L)	ORP (mV)	Alkalinity (ppm)
<u>14:51</u>	<u>1.5</u>	<u>6.61</u>	<u>555</u>	<u>72.6</u>	_____	_____	_____
<u>14:55</u>	<u>3</u>	<u>6.63</u>	<u>552</u>	<u>72.0</u>	_____	_____	_____
<u>14:58</u>	<u>4</u>	<u>6.66</u>	<u>552</u>	<u>71.7</u>	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

LABORATORY INFORMATION

SAMPLE ID	(#) - CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
<u>MW-2B</u>	<u>3-VOA'S</u>	<u>Y</u>	<u>Hel</u>	<u>SEQUOIA</u>	<u>TPH(G)/btex/mtbe</u>
<u>MW-2B</u>	<u>1-AMBER</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>TPH-DIESEL</u>
_____	_____	_____	_____	_____	_____

COMMENTS: _____

**WELL MONITORING/SAMPLING
FIELD DATA SHEET**

Client/ Facility UNOCAL SS# 7376 (Tosco) Job#: 180075
 Address: 4191 FIRST STREET Date: 6-26-98
 City: PLEASANTON, CA Sampler: STEVE BAIAN

Well ID MW-3 Well Condition: O.K
 Well Diameter 2" in. Hydrocarbon Thickness: 0 (feet) Amount Bailed (Gallons)
 Total Depth 94.11 ft. Volume 2" = 0.17 3" = 0.38 4" = 0.66
 Depth to Water 79.65 ft. Factor (VF) 6" = 1.50 12" = 5.80

14.46 x VF 0.17 = 2.46 x 3 (case volume) = Estimated Purge Volume: 7.37 (gal.)

Purge Equipment: Disposable Bailer
 Bailer
 Stack
 Suction
Grundfos
 Other: _____
 Sampling Equipment: Disposable Bailer
 Bailer
 Pressure Bailer
 Grab Sample
 Other: _____

Starting Time: 15:24 Weather Conditions: SUNNY
 Sampling Time: 15:40 Water Color: CLEAR Odor: -
 Purging Flow Rate: 1.5 gpm. Sediment Description: _____
 Did well de-water? No If yes; Time: _____ Volume: _____ (gal.)

Time	Volume (gal.)	pH	Conductivity μ mhos/cm	Temperature $^{\circ}$ F	D.O. (mg/L)	ORP (mV)	Alkalinity (ppm)
<u>15:26</u>	<u>2.5</u>	<u>6.72</u>	<u>517</u>	<u>75.5</u>	_____	_____	_____
<u>15:27</u>	<u>5</u>	<u>6.69</u>	<u>494</u>	<u>75.1</u>	_____	_____	_____
<u>15:29</u>	<u>7.5</u>	<u>6.69</u>	<u>497</u>	<u>74.6</u>	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

LABORATORY INFORMATION

SAMPLE ID	(#) - CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
<u>MW-3</u>	<u>3-VOA'S</u>	<u>Y</u>	<u>Hcl</u>	<u>SEQUOIA</u>	<u>TPH(G)/btex/mtbe</u>
<u>MW-3</u>	<u>1-AMBER</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>TPH-DIESEL</u>
_____	_____	_____	_____	_____	_____

COMMENTS: _____

**WELL MONITORING/SAMPLING
FIELD DATA SHEET**

Client/
Facility UNGRAL SS# 7376 (TOSCO) Job#: 180075
Address: 4191 FIRST STREET Date: 6-26-98
City: PLEASANTON, CA Sampler: STEVE BAIAN

Well ID MW-4 Well Condition: O.K
Well Diameter 2" in. Hydrocarbon Thickness: 0 (feet) Amount Bailed (Gallons)
Total Depth 93.07 ft. Volume 2" = 0.17 3" = 0.38 4" = 0.66
Depth to Water 73.81 ft. Factor (VF) 6" = 1.50 12" = 5.80

19.26 x VF 0.17 = 3.27 x 3 (case volume) = Estimated Purge Volume: 9.82 (gal.)

Purge Equipment: Disposable Bailer
Bailer
Stack
Suction
Grundfos
Other: _____

Sampling Equipment: Disposable Bailer
Bailer
Pressure Bailer
Grab Sample
Other: _____

Starting Time: 13:30 Weather Conditions: SUNNY
Sampling Time: 13:50 Water Color: CLEAR Odor: _____
Purging Flow Rate: 1.5 gpm. Sediment Description: _____
Did well de-water? NO If yes; Time: _____ Volume: _____ (gal.)

Time	Volume (gal.)	pH	Conductivity μ mhos/cm	Temperature $^{\circ}$ F	D.O. (mg/L)	ORP (mV)	Alkalinity (ppm)
<u>13:32</u>	<u>3.5</u>	<u>6.96</u>	<u>436</u>	<u>78.4</u>	_____	_____	_____
<u>13:34</u>	<u>7</u>	<u>7.11</u>	<u>440</u>	<u>76.7</u>	_____	_____	_____
<u>13:36</u>	<u>10</u>	<u>7.25</u>	<u>430</u>	<u>77.0</u>	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

LABORATORY INFORMATION

SAMPLE ID	(#) - CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
<u>MW-4</u>	<u>3-VOA'S</u>	<u>Y</u>	<u>Hcl</u>	<u>SEQUOIA</u>	<u>TPH(G)/btax/mtbe</u>
<u>MW-4</u>	<u>1-AMBER</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>TPH-DIESEL</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

COMMENTS: _____

**WELL MONITORING/SAMPLING
FIELD DATA SHEET**

Client/Facility UNOCAL SS# 7376 (TORCO) Job#: 180075
 Address: 4191 FIRST STREET Date: 6-26-98
 City: PLEACANTON, CA Sampler: STEVE BALIAN

Well ID MW-5 Well Condition: OK
 Well Diameter 2" in. Hydrocarbon Amount Bailed
 Thickness: Ø (feet) (product/water): _____ (Gallons)
 Total Depth 72.51 ft.
 Depth to Water 64.13 ft.

Volume Factor (VF)	2" = 0.17	3" = 0.38	4" = 0.66
	6" = 1.50	12" = 5.80	

8.38 x VF 0.17 = 1.42 x 3 (case volume) = Estimated Purge Volume: 4.27 (gal.)

Purge Equipment: Disposable Bailer
 Stack
 Suction
 Grundfos
 Other: _____

Sampling Equipment: Disposable Bailer
 Bailer
 Pressure Bailer
 Grab Sample
 Other: _____

Starting Time: 16:55 Weather Conditions: SUNNY
 Sampling Time: 17:20 Water Color: CLEAR Odor: YES
 Purging Flow Rate: _____ gpm. Sediment Description: _____
 Did well de-water? NO If yes; Time: _____ Volume: _____ (gal.)

Time	Volume (gal.)	pH	Conductivity µmhos/cm	Temperature °F	D.O. (mg/L)	ORP (mV)	Alkalinity (ppm)
<u>16:59</u>	<u>1.5</u>	<u>6.59</u>	<u>481</u>	<u>76.2</u>	_____	_____	_____
<u>17:03</u>	<u>3</u>	<u>6.59</u>	<u>489</u>	<u>73.6</u>	_____	_____	_____
<u>17:06</u>	<u>4.5</u>	<u>6.60</u>	<u>491</u>	<u>73.3</u>	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

LABORATORY INFORMATION

SAMPLE ID	(#) - CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
<u>MW-5</u>	<u>3-VOA(1)</u>	<u>Y</u>	<u>H-2</u>	<u>SEQUOIA</u>	<u>TPH(GI)/btex/mtbe</u>
<u>MW-5</u>	<u>1-AMBER</u>	<u>Y</u>	<u>-</u>	<u>#</u>	<u>TPH-D</u>
_____	_____	_____	_____	_____	_____

COMMENTS: SHEEN

**WELL MONITORING/SAMPLING
FIELD DATA SHEET**

Client/Facility UNCLAL SS# 7376 (TOSCO) Job#: 180075
 Address: 4191 FIRST STREET Date: 6-26-98
 City: PLEASANTON, CA Sampler: STEVE BAIAN

Well ID MW-6 Well Condition: OK
 Well Diameter 2" in. Hydrocarbon Thickness: ∅ (feet) Amount Bailed (product/water): (Gallons)
 Total Depth 88.00 ft. Volume 2" = 0.17 3" = 0.38 4" = 0.66
 Depth to Water 75.71 ft. Factor (VF) 6" = 1.50 12" = 5.80

12.29 x VF 0.17 = 2.09 x 3 (case volume) = Estimated Purge Volume: 6.27 (gal.)

Purge Equipment: Disposable Bailer
 Bailer
 Stack
~~Suction~~
Grundfos
 Other: _____

Sampling Equipment: Disposable Bailer
 Bailer
 Pressure Bailer
 Grab Sample
 Other: _____

Starting Time: 15:49 Weather Conditions: SUNNY
 Sampling Time: 16:10 Water Color: CLEAR Odor: —
 Purging Flow Rate: 1 gpm. Sediment Description: _____
 Did well de-water? NO If yes; Time: _____ Volume: _____ (gal.)

Time	Volume (gal.)	pH	Conductivity μ mhos/cm	Temperature $^{\circ}$ F	D.O. (mg/L)	ORP (mV)	Alkalinity (ppm)
<u>15:53</u>	<u>2.5</u>	<u>6.64</u>	<u>517</u>	<u>79.1</u>			
<u>15:55</u>	<u>4.5</u>	<u>6.63</u>	<u>512</u>	<u>75.1</u>			
<u>15:58</u>	<u>6.5</u>	<u>6.64</u>	<u>517</u>	<u>74.4</u>			
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

LABORATORY INFORMATION

SAMPLE ID	(#) - CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
<u>MW-6</u>	<u>3-VOA'S</u>	<u>Y</u>	<u>Hcl</u>	<u>SEQUOIA</u>	<u>TPH(G)/btex/mtbe</u>
<u>MW-6</u>	<u>1-AMBER</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>TPH-DIESEL</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

COMMENTS: _____

**WELL MONITORING/SAMPLING
FIELD DATA SHEET**

Client/
Facility UNCAL SS# 7376 (TOSCO) Job#: 180075
Address: 4191 FIRST STREET Date: 6-26-98
City: PLEASANTON, CA Sampler: STEVE BAIAN

Well ID MW-8 Well Condition: O.K
Well Diameter 2" in. Hydrocarbon Thickness: 0 (feet) Amount Bailed (product/water): _____ (Gallons)
Total Depth 86.40 ft. Volume 2" = 0.17 3" = 0.38 4" = 0.66
Depth to Water 63.00 ft. Factor (VF) 6" = 1.50 12" = 5.80

23.4 x VF 0.17 = 3.98 x 3 (case volume) = Estimated Purge Volume: 11.93 (gal.)

Purge Equipment: Disposable Bailer
Bailer
Stack
Suction
Grundfos
Other: _____

Sampling Equipment: Disposable Bailer
Bailer
Pressure Bailer
Grab Sample
Other: _____

Starting Time: 16:19 Weather Conditions: SUNNY
Sampling Time: 16:40 Water Color: CLEAR Odor: —
Purging Flow Rate: 1.5 gpm. Sediment Description: _____
Did well de-water? No If yes; Time: _____ Volume: _____ (gal.)

Time	Volume (gal.)	pH	Conductivity μ mhos/cm	Temperature $^{\circ}$ F	D.O. (mg/L)	ORP (mV)	Alkalinity (ppm)
<u>16:22</u>	<u>4</u>	<u>6.45</u>	<u>514</u>	<u>74.5</u>	_____	_____	_____
<u>16:25</u>	<u>8</u>	<u>6.48</u>	<u>523</u>	<u>72.8</u>	_____	_____	_____
<u>16:28</u>	<u>12</u>	<u>6.48</u>	<u>548</u>	<u>72.4</u>	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

LABORATORY INFORMATION

SAMPLE ID	(#) - CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
<u>MW-8</u>	<u>3-VOA'S</u>	<u>Y</u>	<u>Hcl</u>	<u>SEQUOIA</u>	<u>TPH(G)/btex/mtbe</u>
<u>MW-8</u>	<u>1-AMBER</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>TPH-DIESEL</u>
_____	_____	_____	_____	_____	_____

COMMENTS: _____

Chain-of-Custody-Record



TOSCO

Tosco Marketing Company
2000 Crow Canyon Pl., Ste. 400
San Ramon, California 94583

Facility Number TOSCO (UNOCAL) SS#7376
 Facility Address 4191 First Street, Pleasanton, CA
 Consultant Project Number 180075.85
 Consultant Name Gettler-Ryan Inc. (G-R Inc.)
 Address 6747 Sierra Court, Suite J, Dublin, CA 94568
 Project Contact (Name) Deanna L. Harding
 (Phone) 510-551-7555 (Fax Number) 510-551-7888

Contact (Name) Ms. Tina R. Berry
 (Phone) (510) 277-2321
 Laboratory Name Sequoia Analytical
 Laboratory Release Number _____
 Samples Collected by (Name) STEVE BAIAN
 Collection Date 6-26-98
 Signature STEVE BAIAN *[Signature]*

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes or No)	Analytes To Be Performed											DO NOT BILL TB-LB ANALYSIS	Remarks		
								TPH Gas + BTEX w/MTBE (8015)	TPH Diesel (8015)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd, Cr, Pb, Zn, Ni (ICAP or AA)							
B-LB		1	W	G		Hcl	Y	X														
W-1		4	"	"	14:35	"	Y	X	X													
W-2B		4	"	"	15:10	"	Y	X	X													
W-3		4	"	"	15:40	"	Y	X	X													
W-4		4	"	"	13:50	"	Y	X	X													
W-5		4	"	"	17:20	"	Y	X	X													
W-6		4	"	"	16:10	"	Y	X	X													
W-8		4	"	"	16:40	"	Y	X	X													

Requested By (Signature) <i>STEVE BAIAN</i>	Organization G-R Inc.	Date/Time 6-26-98	Received By (Signature) <i>D. Harding</i>	Organization G-R	Date/Time 6/26/98	Turn Around Time (Circle Choice) 24 Hrs. 48 Hrs. 5 Days 10 Days <u>As Contracted</u>
Requested By (Signature) <i>Harding</i>	Organization G-R	Date/Time 6/29/98	Received By (Signature) <i>[Signature]</i>	Organization Sequoia	Date/Time 6/29/98 2:50	
Requested By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time	

APPENDIX D

Surveyor's Report

Virgil Chavez Land Surveying

312 Georgia Street, Suite 200
Vallejo, California 94590
(707) 553-2476 • Fax (707) 553-8698

RECEIVED

SEP 02 1998

August 21, 1998

YASIN INC.
Project No. 1604-20
GENERAL CONTRACTORS

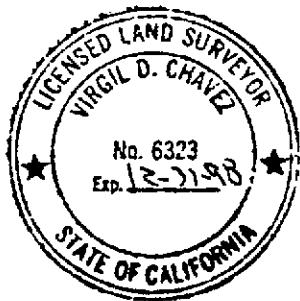
Clyde Galantine
Gettler-Ryan, Inc.
6747 Sierra Ct. Suite J
Dublin, Ca. 94568

Subject: Monitoring Well Survey
Unocal Service Sta. #7376
4191 First Street
Pleasanton, Ca.

Dear Clyde:

This is to confirm that we have proceeded at your request to survey the monitoring wells at the above referenced location. Our findings for the are shown in the table below. The survey was performed August 15, 1998. Measurements were taken at notches on the top of casing. Please find attached a Site Plan, based on our survey. The benchmark for the survey was a cut "+" on a concrete transformer pad on the north side of the project under construction adjacent to this site. Benchmark Elev. = 353.92 feet, MSL.

<u>Well No.</u>	<u>Rim Elevation</u>	<u>TOC Elevation</u>
MW-1	367.45	366.98
MW-2B	365.64	365.05
MW-3	367.47	367.03
MW-4	369.09	368.81
MW-5	363.67	363.21
MW-6	363.72	363.13
MW-7	353.82 (grd)	355.97
MW-8	362.87	362.37



Sincerely,

Virgil D. Chavez
Virgil D. Chavez, PLS 6323

COORDINATE FILE NAME: C:\SURVEY\160420.CRD

Job Number: 1604-20

Job Description: Pleasanton -Ray & First

First Point Number: 1 Last Point Number: 90

Number of characters in description: 20

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	5000.000	5000.000	367.195	SET N&S
2	5200.000	5000.000	367.195	BS ONLY
3	5381.430	4950.357	353.920	BM
4	5179.411	5073.641	362.865	MW-8 RIM
5	5179.301	5073.655	362.375	MW-8 TOC
6	5114.585	5012.980	363.673	MW-5 RIM
7	5114.599	5012.973	363.672	MW-5 RIM
8	5114.424	5012.945	363.212	MW-5 TOC
9	5071.607	5032.074	365.312	BLD COR
10	5057.946	5050.250	364.923	-.5BLD COR
11	5032.315	4954.418	363.718	MW-6 RIM
12	5032.082	4954.415	363.127	MW-6 TOC
13	5047.784	5047.673	365.817	TC
14	5056.222	5068.794	365.411	B
15	5045.076	5050.139	365.645	MW-2B RIM
16	5044.852	5050.346	365.054	MW-2B TOC
17	5035.760	5042.523	365.936	B
18	5011.759	5018.753	367.002	B
19	5000.226	5007.950	367.473	MW-3 RIM
20	4999.740	5008.071	367.035	MW-3 TOC
21	4961.145	4994.826	368.951	P. IS
22	4965.333	5028.103	368.897	P. IS
23	4989.568	5033.696	368.125	P. IS
24	4987.513	5022.023	368.127	P. IS
25	4941.497	5061.143	368.483	TC
26	4978.757	5088.290	367.342	TC
27	4984.642	5080.153	367.266	TCFC
28	4986.710	5077.092	367.740	PO
29	4999.328	5078.836	367.539	RET
30	4991.859	5074.790	367.625	POC
31	4990.015	5066.070	367.449	MW-1 RIM
32	4989.647	5066.311	366.985	MW-1 TOC
33	5008.348	5091.923	367.041	TCRET
34	5009.213	5098.048	366.434	TCRET
35	5009.401	5094.446	366.930	POC
36	5004.005	5106.734	366.279	TC
37	5032.638	5127.687	364.791	TC
38	5039.208	5120.050	364.952	TCFC
39	5044.772	5120.247	365.684	WALL
40	5061.760	5097.790	365.872	WALL
41	5065.730	5085.273	365.691	TCFC
42	4936.627	4974.754	369.549	BLD.COR
43	4940.833	5007.408	369.685	BLD.COR
44	4965.263	4961.736	368.679	TC.ANG.
45	4968.350	4958.848	368.863	FWALL
46	4954.504	4958.928	368.565	B
47	4909.367	4925.944	369.095	MW-4 RIM
48	4909.071	4925.932	368.806	MW-4 TOC
49	4863.822	4893.409	368.551	B
50	4864.509	4887.996	368.967	TC COR
51	4856.982	4880.402	369.016	T

52	4858.935	4878.509	368.933 FWALL
53	4888.958	5016.127	370.165 N-S
54	4903.702	4954.229	369.944 P.IS
55	4878.966	4944.254	369.756 P.IS
56	4895.909	4935.617	369.722 B
57	5000.018	4999.993	367.207 BS
58	4863.870	4893.424	368.527 B
59	4833.748	4862.129	367.999 TC
60	4837.812	4902.952	369.215 TC
61	4844.164	4915.147	369.904 TC.RET
62	4849.356	4919.729	369.757 TC.RET
63	4847.486	4915.865	369.841 POC
64	4852.719	4953.353	370.275 RET
65	4864.073	4981.554	370.378 POC
66	4884.083	5001.124	370.214 RET
67	4899.653	5012.700	370.107 RET
68	4899.478	5018.081	369.969 RET
69	4900.674	5015.045	370.030 POC
70	4893.207	5025.820	369.750 TC
71	4929.273	5052.283	368.768 TC
72	4947.313	5053.075	368.547 RET
73	4947.549	5043.355	368.974 RET
74	4941.974	5037.487	369.280 POC
75	4935.981	5039.685	369.320 RET
76	4933.399	5042.923	369.007 RET
77	4932.545	5008.148	369.770 BLD
78	4928.611	4975.456	373.032 BLD
79	4908.552	4987.470	370.252 P.IS
80	4880.683	4955.912	369.875 P.IS
81	4839.123	4863.796	369.189 FWALL
82	4990.023	5066.094	367.445 MW-1 RIM
83	5045.041	5050.033	365.632 MW-2B RIM
84	5000.238	5007.969	367.470 MW-3 RIM
85	5045.200	5050.376	365.627 MW-2B RIM
86	5032.321	4954.586	363.757 MW-6 RIM
87	5114.598	5012.960	363.683 MW-5 RIM
88	5179.504	5073.801	362.864 MW-8 RIM
89	5157.796	4986.814	355.971 MW-7 RIM TOC
90	5158.280	4986.743	353.818 GRD

Quick
check
only.

Exited COGO

Tue Sep 01 07:10:08 1998

coordinates are arbitrary.
- north assumed.

APPENDIX E

Laboratory Reports and Chain-of-Custody Forms

RECEIVED

SEP 02 1998

GETTLER-RYAN INC.
GENERAL CONTRACTORS



September 1, 1998

Service Request No.: S9802144

Clyde Galantine
Gettler-Ryan, Inc.
6747 Sierra Court
Suite J
Dublin, CA 94568

RE: 7376 PLEASANTON

Dear Mr. Galantine:

The following pages contain analytical results for sample(s) received by the laboratory on August 18, 1998. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 13, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,

Steven L. Green
Project Chemist

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

ACRONLST.DOC 7/14/95

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 PLEASANTON
Sample Matrix: Soil

Service Request: S9802144
Date Collected: 8/14/98
Date Received: 8/18/98

TPH as Diesel

Prep Method: LUFT
Analysis Method: California DHS LUFT
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Sample Name	Lab Code	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
MW-7-11	S9802144-002	1	1	8/19/98	8/21/98	ND	
MW-7-28	S9802144-006	1	1	8/19/98	8/21/98	ND	
MW-7-30.5	S9802144-008	1	1	8/19/98	8/21/98	ND	
MW-7-42	S9802144-012	1	1	8/19/98	8/22/98	ND	
MW-7-60.5	S9802144-016	1	1	8/19/98	8/22/98	ND	
Method Blank	S980819-MB	1	1	8/19/98	8/21/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 PLEASANTON
Sample Matrix: Soil

Service Request: S9802144
Date Collected: 8/14/98
Date Received: 8/18/98

TPH as Oil

Prep Method: LUFT
Analysis Method: Modified EPA 8015
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Sample Name	Lab Code	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
MW-7-11	S9802144-002	1	1	8/19/98	8/21/98	ND	
MW-7-28	S9802144-006	1	1	8/19/98	8/21/98	ND	
MW-7-30.5	S9802144-008	1	1	8/19/98	8/21/98	ND	
MW-7-42	S9802144-012	1	1	8/19/98	8/22/98	ND	
MW-7-60.5	S9802144-016	1	1	8/19/98	8/22/98	ND	
Method Blank	S980819-MB	1	1	8/19/98	8/21/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 PLEASANTON
Sample Matrix: Soil

Service Request: S9802144
Date Collected: 8/14/98
Date Received: 8/18/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-7-11
Lab Code: S9802144-002
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	8/18/98	8/20/98	ND	
Benzene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Toluene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	8/18/98	8/20/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 PLEASANTON
Sample Matrix: Soil

Service Request: S9802144
Date Collected: 8/14/98
Date Received: 8/18/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-7-28
Lab Code: S9802144-006
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	8/18/98	8/20/98	ND	
Benzene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Toluene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	8/18/98	8/20/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 PLEASANTON
Sample Matrix: Soil

Service Request: S9802144
Date Collected: 8/14/98
Date Received: 8/18/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-7-30.5
Lab Code: S9802144-008
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	8/18/98	8/20/98	ND	
Benzene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Toluene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	8/18/98	8/20/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 PLEASANTON
Sample Matrix: Soil

Service Request: S9802144
Date Collected: 8/14/98
Date Received: 8/18/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-7-42
Lab Code: S9802144-012
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	8/18/98	8/20/98	ND	
Benzene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Toluene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	8/18/98	8/20/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 PLEASANTON
Sample Matrix: Soil

Service Request: S9802144
Date Collected: 8/14/98
Date Received: 8/18/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-7-60.5
Lab Code: S9802144-016
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	8/18/98	8/20/98	ND	
Benzene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Toluene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	8/18/98	8/20/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	8/18/98	8/20/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 PLEASANTON
Sample Matrix: Soil

Service Request: S9802144
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S980818-SB1
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	8/18/98	8/19/98	ND	
Benzene	EPA 5030	8020	0.005	1	8/18/98	8/19/98	ND	
Toluene	EPA 5030	8020	0.005	1	8/18/98	8/19/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	8/18/98	8/19/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	8/18/98	8/19/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	8/18/98	8/19/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7376 PLEASANTON
Sample Matrix: Soil

Service Request: S9802144
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
Hydrocarbon Scan

Prep Method: LUFT
Analysis Method: Modified EPA 8015

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery p-Terphenyl
MW-7-11	S9802144-002		46
MW-7-28	S9802144-006		60
MW-7-30.5	S9802144-008		57
MW-7-42	S9802144-012		46
MW-7-60.5	S9802144-016		51
Method Blank	S980819-MB		58

CAS Acceptance Limits: 41-140

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7376 PLEASANTON
Sample Matrix: Soil

Service Request: S9802144
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
BTEX and TPH as Gasoline

Prep Method: EPA 5030
Analysis Method: 8020 CA/LUFT

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
MW-7-11	S9802144-002		104	89
MW-7-28	S9802144-006		104	89
MW-7-30.5	S9802144-008		105	86
MW-7-42	S9802144-012		101	87
MW-7-60.5	S9802144-016		101	84
Method Blank	S980818-SB1		103	90

CAS Acceptance Limits: 51-137 51-137

5980 2144

1 of 3

Company Name: Gettler-Ryan 140107.02 Project Name: 7376
 Address: 6747 Sierra Ct Suite J UNOCAL Project Manager: Tina Berry
 City: Dublin State: CA Zip Code: 94568 Release #:
 Telephone: (510) 551-7855 FAX #: (510) 551-7888 Site #: 7376 Pleasanton, CA
 Report To: Clyde Galantine Sampler: Clyde Galantine QC Data: Level D (Standard) Level C Level B Level A

Turnaround 10 Work Days 5 Work Days 3 Work Days Drinking Water
 Time: 2 Work Days 1 Work Day 2-8 Hours Waste Water
 CODE: Misc. Detect. Eval. Remed. Demol. Closure Other

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested										Comments										
1. MW-7-6	8/14/98 9:55	soil	1	tube	1	TPHs BTEX MTBE SO ₂ S / SO ₂ S TPH d/o																				
2. MW-7-11	10:00				2											X	X									
3. MW-7-16.5	10:05				3																					
4. MW-7-21.5	10:15				4																					
5. MW-7-26.5	10:25				5																					
6. MW-7-28	10:30				6											X	X									
7. MW-7-29	10:35				7																					
8. MW-7-30.5	10:40				8											X	X									
9. MW-7-32.5	10:45				9																					
10. MW-7-34.5	10:50				10																					

Relinquished By: Clyde Galantine Date: 8/14/98 Time: 17:15 Received By: [Signature] Date: 8/18/98 Time: 11:20 A
 Relinquished By: _____ Date: _____ Time: _____ Received By: _____ Date: _____ Time: _____
 Relinquished By: _____ Date: _____ Time: _____ Received By Lab: _____ Date: _____ Time: _____

Were Samples Received in Good Condition? Yes No Samples on Ice? Yes No Method of Shipment _____ Page ___ of ___

To be completed upon receipt of report:
 1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____
 2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____
 Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
 Yellow - Laboratory
 White - Laboratory

59802144

2 of 3

Company Name: <u>Gottler-Ryan</u> <u>140107.02</u>			Project Name: <u>7376</u>		
Address: <u>6747 Sierra Ct Suite J</u>			UNOCAL Project Manager: <u>Tina Berry</u>		
City: <u>Dublin</u>	State: <u>CA</u>	Zip Code: <u>94568</u>	Release #:		
Telephone: <u>(510) 551-7555</u>		FAX #: <u>(510) 551-7888</u>	Site #: <u>7376 Pleasanton, CA</u>		
Report To: <u>Clyde Galantine</u>	Sampler: <u>Clyde Galantine</u>		QC Data: <input type="checkbox"/> Level D (Standard) <input type="checkbox"/> Level C <input type="checkbox"/> Level B <input type="checkbox"/> Level A		

Turnaround 10 Work Days 5 Work Days 3 Work Days
 Time: 2 Work Days 1 Work Day 2-8 Hours

CODE: Misc. Detect. Eval. Remed. Demol. Closure

Analyses Requested

Drinking Water
 Waste Water
 Other

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	TPHs BTEX VOA 8/15/98 TPH 2/0										Comments				
1. <u>MW-7-36.5</u>	<u>8/14/98 10:55</u>	<u>soil</u>	<u>1</u>	<u>tube</u>	<u>11</u>															
2. <u>MW-7-42</u>	<u>11:10</u>				<u>12</u>	X	X													
3. <u>MW-7-46.5</u>	<u>11:15</u>				<u>13</u>															
4. <u>MW-7-51.5</u>	<u>11:20</u>				<u>14</u>															
5. <u>MW-7-56.5</u>	<u>11:30</u>				<u>15</u>															
6. <u>MW-7-60.5</u>	<u>11:35</u>				<u>16</u>	X	X													
7. <u>MW-7-62.5</u>	<u>11:40</u>				<u>17</u>															
8. <u>MW-7-64.5</u>	<u>11:45</u>				<u>18</u>															
9. <u>MW-7-66.5</u>	<u>11:50</u>				<u>19</u>															
10. <u>MW-7-68.5</u>	<u>12:05</u>				<u>20</u>															

Relinquished By: <u>Clyde Galantine</u>	Date: <u>8/14/98</u>	Time: <u>17:15</u>	Received By: <u>Ryan S. Lee</u>	Date: <u>8/18/98</u>	Time: <u>11:20</u>
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab:	Date:	Time:

Were Samples Received in Good Condition? Yes No
 Samples on Ice? Yes No
 Method of Shipment _____
 Page ___ of ___

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____

2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____

Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
 Yellow - Laboratory
 White - Laboratory



RECEIVED

SEP 09 1998

September 4, 1998

Service Request No.: S9801483

GETTLER-RYAN INC.
GENERAL CONTRACTORS

Mr. Clyde Galantine
Gettler- Ryan Inc.
6747 Sierra Court
Suite J
Dublin, CA 94568

RE: 7376 TOSCO/140107.02

Dear Mr. Galantine:

The following pages contain analytical results for sample(s) received by the laboratory on June 10, 1998. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 30, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,

Steven L. Green
Project Chemist

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLIC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/8 - 6/9/98
Date Received: 6/10/98

TPH as Diesel

Prep Method: LUFT
Analysis Method: California DHS LUFT
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Sample Name	Lab Code	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
B-9-61.5	S9801483-004	1	1	6/16/98	6/17/98	ND	
B-9-80.5	S9801483-008	1	1	6/16/98	6/17/98	280	D1
B-9-81	S9801483-009	1	1	6/16/98	6/17/98	ND	
B-11-31	S9801483-013	1	4	6/16/98	6/18/98	2200	
B-11-41	S9801483-018	1	1	6/16/98	6/17/98	84	
B-11-45.5	S9801483-020	1	20	6/16/98	6/18/98	7300	
B-11-53	S9801483-024	1	1	6/16/98	6/18/98	700	
B-11-61	S9801483-028	1	10	6/16/98	6/18/98	4000	
B-11-66.5	S9801483-031	1	1	6/16/98	6/17/98	140	D1
B-11-73.5	S9801483-034	1	1	6/16/98	6/17/98	ND	
B-8-61.5	S9801483-046	1	1	6/16/98	6/17/98	ND	
B-8-71.5	S9801483-048	1	1	6/16/98	6/17/98	ND	
B-11-5.5	S9801483-055	1	1	6/16/98	6/18/98	23	D1
B-11-10.5	S9801483-057	1	20	6/16/98	6/18/98	66	D1
B-11-18	S9801483-061	1	10	6/16/98	6/19/98	3500	
B-11-23	S9801483-064	1	20	6/16/98	6/19/98	6500	
Method Blank	S980616-MB	1	1	6/16/98	6/17/98	ND	

D1 Quantitated as diesel. The sample contains components that eluted in the diesel range, but the chromatogram does not match the typical diesel fingerprint.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/8 - 6/9/98
Date Received: 6/10/98

TPH as Oil

Prep Method: LUFT
Analysis Method: 8015M
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Sample Name	Lab Code	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
B-9-61.5	S9801483-004	5	1	6/16/98	6/17/98	ND	
B-9-80.5	S9801483-008	5	1	6/16/98	6/17/98	ND	
B-9-81	S9801483-009	5	1	6/16/98	6/17/98	ND	
B-11-31	S9801483-013	5	4	6/16/98	6/18/98	<20	C1
B-11-41	S9801483-018	5	1	6/16/98	6/17/98	ND	
B-11-45.5	S9801483-020	5	20	6/16/98	6/18/98	<100	C1
B-11-53	S9801483-024	5	1	6/16/98	6/18/98	ND	
B-11-61	S9801483-028	5	10	6/16/98	6/18/98	<50	C1
B-11-66.5	S9801483-031	5	1	6/16/98	6/17/98	ND	
B-11-73.5	S9801483-034	5	1	6/16/98	6/17/98	ND	
B-8-61.5	S9801483-046	5	1	6/16/98	6/17/98	ND	
B-8-71.5	S9801483-048	5	1	6/16/98	6/17/98	ND	
B-11-5.5	S9801483-055	5	1	6/16/98	6/18/98	590	
B-11-10.5	S9801483-057	5	20	6/16/98	6/18/98	5200	
B-11-18	S9801483-061	5	10	6/16/98	6/19/98	<50	C1
B-11-23	S9801483-064	5	20	6/16/98	6/19/98	<100	C1
Method Blank	S980616-MB	5	1	6/16/98	6/17/98	ND	

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801483
Date Collected: 6/9/98
Date Received: 6/10/98

Hydrocarbon Scan

Sample Name: B-11
Lab Code: S9801483-065
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	EPA 3510	Modified EPA 8015	50	1	6/20/98	6/22/98	600	LBPT
Oil	EPA 3510	Modified EPA 8015	250	1	6/20/98	6/22/98	ND	

LBPT

The sample contains a lower boiling point hydrocarbon mixture quantitated as diesel. The chromatogram does not match the typical diesel fingerprint.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801483
Date Collected: NA
Date Received: NA

Hydrocarbon Scan

Sample Name: Method Blank
Lab Code: S980620-MB
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	EPA 3510	Modified EPA 8015	50	1	6/20/98	6.22/98	ND	
Oil	EPA 3510	Modified EPA 8015	250	1	6/20/98	6.22/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/8/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-9-61.5
Lab Code: S9801483-004
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/16/98	6/21/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/16/98	6/21/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/16/98	6/21/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/8/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-9-80.5
Lab Code: S9801483-008
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	2.5	6/16/98	6/21/98	5	
Benzene	EPA 5030	8020	0.005	2.5	6/16/98	6/21/98	0.32	
Toluene	EPA 5030	8020	0.005	2.5	6/16/98	6/21/98	0.025	
Ethylbenzene	EPA 5030	8020	0.005	2.5	6/16/98	6/21/98	0.032	
Xylenes, Total	EPA 5030	8020	0.005	2.5	6/16/98	6/21/98	0.43	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	2.5	6/16/98	6/21/98	<0.12	C1

C1

The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/8/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-9-81
Lab Code: S9801483-009
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/16/98	6/22/98	4	
Benzene	EPA 5030	8020	0.005	1	6/16/98	6/22/98	0.29	
Toluene	EPA 5030	8020	0.005	1	6/16/98	6/22/98	0.59	
Ethylbenzene	EPA 5030	8020	0.005	1	6/16/98	6/22/98	0.039	
Xylenes, Total	EPA 5030	8020	0.005	1	6/16/98	6/22/98	0.31	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/16/98	6/22/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/9/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-11-31
Lab Code: S9801483-013
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	25	6/16/98	6/23/98	290	
Benzene	EPA 5030	8020	0.005	25	6/16/98	6/23/98	4.1	
Toluene	EPA 5030	8020	0.005	25	6/16/98	6/23/98	0.89	
Ethylbenzene	EPA 5030	8020	0.005	25	6/16/98	6/23/98	4.7	
Xylenes, Total	EPA 5030	8020	0.005	25	6/16/98	6/23/98	11	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	25	6/16/98	6/23/98	2	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/9/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-11-41
Lab Code: S9801483-018
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/16/98	6/21/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	0.02	
Toluene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/16/98	6/21/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/16/98	6/21/98	0.25	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/9/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-11-45.5
Lab Code: S9801483-020
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/16/98	6/21/98	2	
Benzene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	0.036	
Toluene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	0.15	
Ethylbenzene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	0.022	
Xylenes, Total	EPA 5030	8020	0.005	1	6/16/98	6/21/98	0.15	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/16/98	6/21/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/9/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-11-53
Lab Code: S9801483-024
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/16/98	6/21/98	14	
Benzene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	0.008	
Toluene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	0.008	
Ethylbenzene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	0.02	
Xylenes, Total	EPA 5030	8020	0.005	1	6/16/98	6/21/98	0.025	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/16/98	6/21/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/9/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-11-61
Lab Code: S9801483-028
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	25	6/16/98	6/23/98	370	
Benzene	EPA 5030	8020	0.005	25	6/16/98	6/23/98	2.8	
Toluene	EPA 5030	8020	0.005	25	6/16/98	6/23/98	16	
Ethylbenzene	EPA 5030	8020	0.005	25	6/16/98	6/23/98	5.2	
Xylenes, Total	EPA 5030	8020	0.005	25	6/16/98	6/23/98	24	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	25	6/16/98	6/23/98	2.5	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/9/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-11-66.5
Lab Code: S9801483-031
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/16/98	6/20/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/16/98	6/20/98	0.12	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/9/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-11-73.5
Lab Code: S9801483-034
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/16/98	6/20/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/16/98	6/20/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/8/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-8-61.5
Lab Code: S9801483-046
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/16/98	6/20/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/16/98	6/20/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/8/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-8-71.5
Lab Code: S9801483-048
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/16/98	6/20/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/16/98	6/20/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/9/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-11-5.5
Lab Code: S9801483-055
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA-LUFT	1	12.5	6/16/98	6/22/98	54	
Benzene	EPA 5030	8020	0.005	12.5	6/16/98	6/22/98	0.28	
Toluene	EPA 5030	8020	0.005	12.5	6/16/98	6/22/98	0.2	
Ethylbenzene	EPA 5030	8020	0.005	12.5	6/16/98	6/22/98	0.3	
Xylenes, Total	EPA 5030	8020	0.005	12.5	6/16/98	6/22/98	3.6	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	12.5	6/16/98	6/22/98	0.72	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/9/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-11-10.5
Lab Code: S9801483-057
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	50	6/16/98	6/22/98	560	
Benzene	EPA 5030	8020	0.005	50	6/16/98	6/22/98	16	
Toluene	EPA 5030	8020	0.005	50	6/16/98	6/22/98	8.0	
Ethylbenzene	EPA 5030	8020	0.005	50	6/16/98	6/22/98	5.2	
Xylenes, Total	EPA 5030	8020	0.005	50	6/16/98	6/22/98	25	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	50	6/16/98	6/22/98	<2.5	C1

C1

The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/9/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-11-18
Lab Code: S9801483-061
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/16/98	6/21/98	16	
Benzene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	0.17	
Toluene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	0.031	
Ethylbenzene	EPA 5030	8020	0.005	1	6/16/98	6/21/98	0.21	
Xylenes, Total	EPA 5030	8020	0.005	1	6/16/98	6/21/98	0.52	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/16/98	6/21/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: 6/9/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-11-23
Lab Code: S9801483-064
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	50	6/16/98	6/22/98	580	
Benzene	EPA 5030	8020	0.005	50	6/16/98	6/22/98	12	
Toluene	EPA 5030	8020	0.005	50	6/16/98	6/22/98	1.3	
Ethylbenzene	EPA 5030	8020	0.005	50	6/16/98	6/22/98	6.0	
Xylenes, Total	EPA 5030	8020	0.005	50	6/16/98	6/22/98	17	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	50	6/16/98	6/22/98	<2.5	C1

C1

The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S980616-SB1
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/16/98	6/20/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/16/98	6/20/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/16/98	6/20/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801483
Date Collected: 6/9/98
Date Received: 6/10/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-11
Lab Code: S9801483-065
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	100	NA	6/18/98	<5000	C1
Benzene	EPA 5030	8020	0.5	100	NA	6/18/98	110	
Toluene	EPA 5030	8020	0.5	100	NA	6/18/98	220	
Ethylbenzene	EPA 5030	8020	0.5	100	NA	6/18/98	<50	C1
Xylenes, Total	EPA 5030	8020	0.5	100	NA	6/18/98	240	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	100	NA	6/18/98	6200	

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801483
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S980617-WB1
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	6/17/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	6/17/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	6/17/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	6/17/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	6/17/98	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	1	NA	6/17/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
TPH as Diesel and Oil

Prep Method: LUFT
Analysis Method: California DHS LUFT

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery p-Terphenyl
B-9-61.5	S9801483-004		74
B-9-80.5	S9801483-008		81
B-9-81	S9801483-009		81
B-11-31	S9801483-013		56
B-11-41	S9801483-018		72
B-11-45.5	S9801483-020		61
B-11-53	S9801483-024		64
B-11-61	S9801483-028		64
B-11-66.5	S9801483-031		74
B-11-73.5	S9801483-034		74
B-8-61.5	S9801483-046		67
B-8-71.5	S9801483-048		66
B-11-5.5	S9801483-055		57
B-11-10.5	S9801483-057		59
B-11-18	S9801483-061		62
B-11-23	S9801483-064		68
Method Blank	S980616-MB		83

CAS Acceptance Limits: 41-140

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801483
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
Hydrocarbon Scan

Prep Method: EPA 3510
Analysis Method: Modified EPA 8015

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery p-Terphenyl
B-11	S9801483-065		106
Method Blank	S980620-MB		94

CAS Acceptance Limits: 41-140

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801483
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

**Surrogate Recovery Summary
 BTEX and TPH as Gasoline**

Prep Method: EPA 5030
Analysis Method: 8020 CA/LUFT

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
B-9-61.5	S9801483-004		72	82
B-9-80.5	S9801483-008		82	80
B-9-81	S9801483-009		88	93
B-11-31	S9801483-013		85	113
B-11-41	S9801483-018		75	79
B-11-45.5	S9801483-020		80	87
B-11-53	S9801483-024		83	82
B-11-61	S9801483-028		88	115
B-11-66.5	S9801483-031		81	81
B-11-73.5	S9801483-034		73	80
B-8-61.5	S9801483-046		72	85
B-8-71.5	S9801483-048		78	84
B-11-5.5	S9801483-055		77	91
B-11-10.5	S9801483-057		78	119
B-11-18	S9801483-061		85	126
B-11-23	S9801483-064		97	105
Method Blank	S980616-SB1		74	86

CAS Acceptance Limits: 51-137 51-137

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801483
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
BTEX, MTBE and TPH as Gasoline

Prep Method: EPA 5030
Analysis Method: 8020 CA/LUFT

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
E-11	S9801483-065		99	98
Method Blank	S980617-WB1		108	101

CAS Acceptance Limits: 69-116 69-116



RECEIVED

June 29, 1998

Service Request No.: S9801550

JUL 02 1998

GETTLER-RYAN INC.
GENERAL CONTRACTORS

Mr. Clyde Galantine
Gettler-Ryan Inc.
6747 Sierra Court
Suite J
Dublin, CA 94568

RE: 7376 TOSCO/140107.02

Dear Mr. Galantine:

The following pages contain analytical results for sample(s) received by the laboratory on June 15, 1998. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 37, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,

Bernadette T. Cox
Project Chemist

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLc	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

Hydrocarbon Scan

Sample Name: B-10
Lab Code: S9801550-001
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	EPA 3510	Modified EPA 8015	50	1	6/20/98	6/23/98	930	
Motor Oil	EPA 3510	Modified EPA 8015	250	1	6/20/98	6/23/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801550
Date Collected: NA
Date Received: NA

Hydrocarbon Scan

Sample Name: Method Blank
Lab Code: S980620-MB
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	EPA 3510	Modified EPA 8015	50	1	6/20/98	6/22/98	ND	
Motor Oil	EPA 3510	Modified EPA 8015	250	1	6/20/98	6/22/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

Hydrocarbon Scan

Sample Name: B-10-12
Lab Code: S9801550-005
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/22/98	6/23/98	1.8	D1
Motor Oil	LUFT	Modified EPA 8015	5	1	6/22/98	6/23/98	ND	

D1 Quantitated as diesel. The sample contains components that eluted in the diesel range, but the chromatogram does not match the typical diesel fingerprint.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

Hydrocarbon Scan

Sample Name: B-10-24.5
Lab Code: S9801550-012
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	4	6/22/98	6/24/98	1900	
Motor Oil	LUFT	Modified EPA 8015	5	4	6/22/98	6/24/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

Hydrocarbon Scan

Sample Name: B-10-31
Lab Code: S9801550-016
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	2	6/22/98	6/24/98	970	
Motor Oil	LUFT	Modified EPA 8015	5	2	6/22/98	6/24/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

Hydrocarbon Scan

Sample Name: B-10-38
Lab Code: S9801550-020
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/22/98	6/24/98	90	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/22/98	6/24/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

Hydrocarbon Scan

Sample Name: B-10-49
Lab Code: S9801550-025
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/22/98	6.23/98	ND	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/22/98	6.23/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

Hydrocarbon Scan

Sample Name: B-10-57
Lab Code: S9801550-029
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/22/98	6.23/98	ND	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/22/98	6.23/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

Hydrocarbon Scan

Sample Name: B-10-75.5
Lab Code: S9801550-039
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/22/98	6/23/98	ND	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/22/98	6/23/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/12/98
Date Received: 6/15/98

Hydrocarbon Scan

Sample Name: MW-8-11
Lab Code: S9801550-046
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/22/98	6.24.98	ND	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/22/98	6.24.98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/12/98
Date Received: 6/15/98

Hydrocarbon Scan

Sample Name: MW-8-37
Lab Code: S9801550-051
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/22/98	6-24-98	ND	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/22/98	6-24-98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/12/98
Date Received: 6/15/98

Hydrocarbon Scan

Sample Name: MW-8-45.5
Lab Code: S9801550-053
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/22/98	6/24/98	79	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/22/98	6/24/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/12/98
Date Received: 6/15/98

Hydrocarbon Scan

Sample Name: MW-8-51.5
Lab Code: S9801550-055
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/22/98	6/24/98	ND	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/22/98	6/24/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/12/98
Date Received: 6/15/98

Hydrocarbon Scan

Sample Name: MW-8-67
Lab Code: S9801550-058
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/22/98	6.24/98	ND	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/22/98	6.24/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: NA
Date Received: NA

Hydrocarbon Scan

Sample Name: Method Blank
Lab Code: S980622-MB
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/22/98	6/23/98	ND	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/22/98	6/23/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

BTEX, MTBE and TPH as Gasoline

Sample Name: 13-10
Lab Code: S9801550-001
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	4	NA	6/23/98	980	
Benzene	EPA 5030	8020	0.5	4	NA	6/23/98	39	
Toluene	EPA 5030	8020	0.5	4	NA	6/23/98	13	
Ethylbenzene	EPA 5030	8020	0.5	4	NA	6/23/98	23	
Xylenes, Total	EPA 5030	8020	0.5	4	NA	6/23/98	100	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	4	NA	6/23/98	250	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801550
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S9806222-WB1
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	6/22/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	6/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	6/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	6/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	6/22/98	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	1	NA	6/22/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-10-12
Lab Code: S9801550-005
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/22/98	6/25/98	1	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.013	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.013	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.021	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.13	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/25/98	0.23	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-10-24.5
Lab Code: S9801550-012
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA LUFT	1	100	6/22/98	6/25/98	760	
Benzene	EPA 5030	8020	0.005	100	6/22/98	6/25/98	5.1	
Toluene	EPA 5030	8020	0.005	100	6/22/98	6/25/98	0.9	
Ethylbenzene	EPA 5030	8020	0.005	100	6/22/98	6/25/98	22	
Xylenes, Total	EPA 5030	8020	0.005	100	6/22/98	6/25/98	25	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	100	6/22/98	6/25/98	<5	CI

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-10-31
Lab Code: S9801550-016
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	125	6/22/98	6/25/98	720	
Benzene	EPA 5030	8020	0.005	125	6/22/98	6/25/98	7.3	
Toluene	EPA 5030	8020	0.005	125	6/22/98	6/25/98	31	
Ethylbenzene	EPA 5030	8020	0.005	125	6/22/98	6/25/98	11	
Xylenes, Total	EPA 5030	8020	0.005	125	6/22/98	6/25/98	68	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	125	6/22/98	6/25/98	<6	C1

C1

The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-10-38
Lab Code: S9801550-020
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA:LUFT	1	1	6/22/98	6/25/98	4	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.033	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.006	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.010	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.032	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/25/98	0.08	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-10-49
Lab Code: S9801550-025
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA-LUFT	1	1	6/22/98	6-24-98	ND	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6-24-98	ND	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6-24-98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6-24-98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6-24-98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6-24-98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-10-57
Lab Code: S9801550-029
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/22/98	6/25/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.012	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.012	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.006	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.048	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/25/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/11/98
Date Received: 6/15/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-10-75.5
Lab Code: S9801550-039
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA LUFT	1	1	6/22/98	6/24/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/24/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/24/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/24/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/24/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/24/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/12/98
Date Received: 6/15/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-8-11
Lab Code: S9801550-046
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/22/98	6/25/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.007	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.010	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/25/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
 Project: 7376 TOSCO/140107.02
 Sample Matrix: Soil

Service Request: S9801550
 Date Collected: 6/12/98
 Date Received: 6/15/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-8-37
 Lab Code: S9801550-051
 Test Notes:

Units: mg/Kg (ppm)
 Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/22/98	6/25/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	0.006	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/25/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/25/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/12/98
Date Received: 6/15/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-8-45.5
Lab Code: S9801550-053
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	10	6/22/98	6/25/98	60	
Benzene	EPA 5030	8020	0.005	10	6/22/98	6/25/98	<0.05	C1
Toluene	EPA 5030	8020	0.005	10	6/22/98	6/25/98	0.058	
Ethylbenzene	EPA 5030	8020	0.005	10	6/22/98	6/25/98	0.27	
Xylenes, Total	EPA 5030	8020	0.005	10	6/22/98	6/25/98	0.58	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	10	6/22/98	6/25/98	<0.5	C1

C1

The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/12/98
Date Received: 6/15/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-8-51.5
Lab Code: S9801550-055
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA-LUFT	1	1	6/22/98	6/25/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/25/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/25/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: 6/12/98
Date Received: 6/15/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-8-67
Lab Code: S9801550-058
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/22/98	6/25/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/25/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/25/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/25/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S980622-SB1
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/22/98	6/24/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/24/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/24/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/24/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/24/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/24/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801550
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
Hydrocarbon Scan

Prep Method: EPA 3510
Analysis Method: Modified EPA 8015

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery p-Terphenyl
B-10	S9801550-001		117
Method Blank	S980620-MB		94

CAS Acceptance Limits: 41-140

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
Hydrocarbon Scan

Prep Method: LUFT
Analysis Method: Modified EPA 8015

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery p-Terphenyl
B-10-12	S9801550-005		82
B-10-24.5	S9801550-012		60
B-10-31	S9801550-016		61
B-10-38	S9801550-020		67
B-10-49	S9801550-025		75
B-10-57	S9801550-029		74
B-10-75.5	S9801550-039		70
MW-8-11	S9801550-046		76
MW-8-37	S9801550-051		64
MW-8-45.5	S9801550-053		72
MW-8-51.5	S9801550-055		74
MW-8-67	S9801550-058		82
Method Blank	S980622-MB		60

CAS Acceptance Limits: 41-140

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801550
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
BTEX, MTBE and TPH as Gasoline

Prep Method: EPA 5030
Analysis Method: 8020 CALUFT

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
B-10	S9801550-001		95	96
Method Blank	S9806222-WB1		97	98

CAS Acceptance Limits: 69-116 69-116

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801550
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

**Surrogate Recovery Summary
 BTEX and TPH as Gasoline**

Prep Method: EPA 5030
Analysis Method: 8020 CA/LUFT

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
B-10-12	S9801550-005		99	97
B-10-24.5	S9801550-012		89	114
B-10-31	S9801550-016		95	93
B-10-38	S9801550-020		98	96
B-10-49	S9801550-025		80	81
B-10-57	S9801550-029		99	94
B-10-75.5	S9801550-039		67	82
MW-8-11	S9801550-046		79	82
MW-8-37	S9801550-051		74	83
MW-8-45.5	S9801550-053		94	116
MW-8-51.5	S9801550-055		76	81
MW-8-67	S9801550-058		76	81
Method Blank	S980622-SB1		72	88

CAS Acceptance Limits: 51-137 51-137

59801550

UNOCAL 76

PH, PC, F EXT

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- East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
- 1900 Bates Ave., Suite LM • Concord, CA 94520 • (510) 686-9600
- 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Company Name: <u>Gottler-Ryan Inc</u> <u>140107.02</u>			Project Name: <u>7376</u>		
Address: <u>6747 Sierra Ct Suite J</u>			UNOCAL Project Manager: <u>Tina Berry</u>		
City: <u>Dublin</u>	State: <u>CA</u>	Zip Code: <u>94568</u>	Release #:		
Telephone: <u>(510) 551-7555</u>		FAX #: <u>(510) 551-7888</u>		Site #: <u>7376 Pleasanton CA</u>	
Report To: <u>Clyde Galantine</u>		Sampler: <u>Clyde Galantine</u>		QC Data: <input type="checkbox"/> Level D (Standard) <input type="checkbox"/> Level C <input type="checkbox"/> Level B <input type="checkbox"/> Level A	

Turnaround <input checked="" type="checkbox"/> 10 Work Days <input type="checkbox"/> 5 Work Days <input type="checkbox"/> 3 Work Days	<input type="checkbox"/> Drinking Water <input type="checkbox"/> Waste Water <input type="checkbox"/> Other	Analyses Requested																																								
Time: <input type="checkbox"/> 2 Work Days <input type="checkbox"/> 1 Work Day <input type="checkbox"/> 2-8 Hours		<table border="1" style="width: 100%; height: 100px;"> <tr><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> <tr><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> <tr><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> <tr><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> <tr><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> <tr><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> <tr><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> <tr><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> <tr><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> <tr><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> </table>																																								
CODE: <input type="checkbox"/> Misc. <input checked="" type="checkbox"/> Detect. <input type="checkbox"/> Eval. <input type="checkbox"/> Remed. <input type="checkbox"/> Demol. <input type="checkbox"/> Closure																																										

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested	Comments
1. <u>B-10</u>	<u>6/4/98 3:15</u>	<u>H2O</u>	<u>5</u>	<u>VOCS ambers</u>	<u>1</u>	<div style="transform: rotate(-45deg); font-size: small;"> TPA 1315/12/18/F 805/19020 TPAHQ/TPHCO </div> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							

Relinquished By: <u>Clyde Galantine</u>	Date: <u>6/4/98</u>	Time: <u>18:30</u>	Received By: <u>RAY CAS</u>	Date: <u>6/15/98</u>	Time: <u>16:15</u>
Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____
Relinquished By: _____	Date: _____	Time: _____	Received By Lab: _____	Date: _____	Time: _____

Were Samples Received in Good Condition? Yes No Samples on Ice? Yes No Method of Shipment _____ Page 1 of 8

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____

2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____

Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
Yellow - Laboratory
White - Laboratory

59801550

UNOCAL 76

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- 18939 120th Ave., N.E., Suite 101 • Bothell, WA 98011 • (206) 481-9200
- East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
- 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: <u>Gottler-Ryan 14010702</u>			Project Name: <u>7376</u>		
Address: <u>6747 Sierra Ct Suite J</u>			UNOCAL Project Manager: <u>Tina Berry</u>		
City: <u>Dublin</u>	State: <u>CA</u>	Zip Code: <u>94568</u>	AFE #:		
Telephone: <u>(510) 551-7555</u>		FAX #: <u>(510) 551-7888</u>		Site #, City, State: <u>7376 Pleasanton, CA</u>	
Report To: <u>Clyde Galantine</u>		Sampler: <u>Clyde Galantine</u>		QC Data: <input type="checkbox"/> Level D (Standard) <input type="checkbox"/> Level C <input type="checkbox"/> Level B <input type="checkbox"/> Level A	

Turnaround 10 Work Days 5 Work Days 3 Work Days
 Time: 2 Work Days 1 Work Day 2-8 Hours

CODE: Misc. Detect. Eval. Remed. Demol. Closure

Analyses Requested

Drinking Water
 Waste Water
 Other

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested										Comments
1. B-10-6	6/11/98 9:00	tube	1	Soil	2	TPH5, BTEX, WTR/E, TPAH, SO2, TPAH O										- No sample - but this was B-10-5.5 - RN 6-16
2. B-10-8	9:05				3											
3. B-10-9.5	9:10				4											
4. B-10-12	9:15				5											
5. B-10-14	9:20				6											
6. B-10-15	9:20				7											
7. B-10-16.5	9:25				8											
8. B-10-18	9:30				9											
9. B-10-21	10:10				10											
10. B-10-22.5	10:15				11											

Relinquished By: <u>Clyde Galantine</u>	Date: <u>6/11/98</u>	Time: <u>18:30</u>	Received By: <u>[Signature]</u>	Date: <u>6/15/98</u>	Time: <u>10:51</u>
Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____
Relinquished By: _____	Date: _____	Time: _____	Received By Lab: _____	Date: _____	Time: _____

Were Samples Received in Good Condition? Yes No Samples on Ice? Yes No Method of Shipment _____ Page 2 of 8

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____

2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____

Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
Yellow - Laboratory
White - Laboratory

59801550

UNOCAL

76

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East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: Gottler-Ryan Inc 14010702 Project Name: 7376
 Address: 6747 Sierra Ct Suite J UNOCAL Project Manager: Tina Berry
 City: Dublin State: CA Zip Code: 94568 AFE #:
 Telephone: (510) 551-7555 FAX #: (510) 551-7888 Site #, City, State: 7376 Pleasanton, CA
 Report To: Clyde Galantine Sampler: Clyde Galantine QC Data: Level D (Standard) Level C Level B Level A

Turnaround 10 Work Days 5 Work Days 3 Work Days Drinking Water
 Time: 2 Work Days 1 Work Day 2-8 Hours Waste Water
 CODE: Misc. Detect. Eval. Remed. Demol. Closure Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested										Comments				
1. B-10-24.5	6/11/98 10:45	soil	1	tube	12	X	X													
2. B-10-26	10:50				13															
3. B-10-29	10:55				14															
4. B-10-30.5	11:00				15															
5. B-10-31	11:00				16	X	X													
6. B-10-32	11:05				17															
7. B-10-34	11:25				18															
8. B-10-37.5	11:35				19															
9. B-10-38	11:35				20	X	X													
10. B-10-40	11:40				21															

TPH, BTEX, MTBE, XCL, TOX, TPHo

CAS

Relinquished By: Clyde Galantine Date: 6/11/98 Time: 18:30 Received By: [Signature] Date: 6/15/98 Time: 60:15
 Relinquished By: _____ Date: _____ Time: _____ Received By: _____ Date: _____ Time: _____
 Relinquished By: _____ Date: _____ Time: _____ Received By Lab: _____ Date: _____ Time: _____

Were Samples Received in Good Condition? Yes No Samples on Ice? Yes No Method of Shipment _____ Page 3 of 8

To be completed upon receipt of report:
 1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____
 2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____
 Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
Yellow - Laboratory
White - Laboratory

59801550

UNOCAL 76

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 East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: Gettley-Ryan Inc 140107.02 Project Name: 7376
 Address: 6947 Sierra Ct Suite J UNOCAL Project Manager: Tina Berry
 City: Dublin State: CA Zip Code: 94568 AFE #:
 Telephone: (510) 551-7555 FAX #: (510) 551-7888 Site #, City, State: 7376 Pleasanton, CA
 Report To: Clyde Galantine Sampler: Clyde Galantine QC Data: Level D (Standard) Level C Level B Level A

Turnaround 10 Work Days 5 Work Days 3 Work Days Drinking Water
 Time: 2 Work Days 1 Work Day 2-8 Hours Waste Water
 CODE: Misc. Detect. Eval. Remed. Demol. Closure Other

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested										Comments									
1. B-10-415	6/11/98 11:50	soil	1	tube	22	TYPED BY MT/D/E 8/25/2016 TPH/TPH																			
2. B-10-44	11:55				23																				
3. B-10-47	12:00				24																				
4. B-10-49	12:05				25											X	X								
5. B-10-51	12:10				26																				
6. B-10-53	12:15				27																				
7. B-10-54.5	12:20				28																				
8. B-10-57	12:30				29											X	X								
9. B-10-58	1:20				30																				
10. B-10-60.5	1:25				31																				

RAY CAS

Relinquished By: <u>Clyde Galantine</u>	Date: <u>6/11/98</u>	Time: <u>18:30</u>	Received By: <u>Angela Bolen</u>	Date: <u>6/15/98</u>	Time: <u>10:15 A</u>
Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____
Relinquished By: _____	Date: _____	Time: _____	Received By Lab: _____	Date: _____	Time: _____

Were Samples Received in Good Condition? Yes No Samples on Ice? Yes No Method of Shipment _____ Page 4 of 8

To be completed upon receipt of report:
 1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____
 2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____
 Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
Yellow - Laboratory
White - Laboratory

59801550

UNOCAL 76

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- 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: <u>Gettler-Ryan Inc 140107.02</u>			Project Name: <u>7376</u>		
Address: <u>6747 Sierra Ct Suite J</u>			UNOCAL Project Manager: <u>Tina Berry</u>		
City: <u>Dublin</u>	State: <u>CA</u>	Zip Code: <u>94568</u>	AFE #:		
Telephone: <u>(510) 551-7555</u>		FAX #: <u>(510) 551-7888</u>		Site #, City, State: <u>7376 Pleasanton, CA</u>	
Report To: <u>Clyde Galantine</u>		Sampler: <u>Clyde Galantine</u>		QC Data: <input type="checkbox"/> Level D (Standard) <input type="checkbox"/> Level C <input type="checkbox"/> Level B <input type="checkbox"/> Level A	

Turnaround 10 Work Days 5 Work Days 3 Work Days
 Time: 2 Work Days 1 Work Day 2-8 Hours

CODE: Misc. Detect. Eval. Remed. Demol. Closure

Analyses Requested

Drinking Water
 Waste Water
 Other

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested										Comments
1. B-10-62	6/11/98 1:30	Soil	1	tube	32	ANALYSES REQUESTED (SEE CHAIN OF CUSTODY)										
2. B-10-64	1:35				33											
3. B-10-65.5	1:45				34											
4. B-10-69	1:50				35											
5. B-10-71	2:00				36											
6. B-10-72.5	2:05				37											
7. B-10-73.5	2:10				38											
8. B-10-75.5	2:20				39											
9. B-10-78	2:25				40											
10. B-10-79.5	2:35				41											

Relinquished By: <u>Clyde Galantine</u>	Date: <u>6/11/98</u>	Time: <u>18:30</u>	Received By: <u>Paul S. [Signature]</u>	Date: <u>6/15/98</u>	Time: <u>10:15</u>
Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____
Relinquished By: _____	Date: _____	Time: _____	Received By Lab: _____	Date: _____	Time: _____

Were Samples Received in Good Condition? Yes No Samples on Ice? Yes No Method of Shipment: _____ Page 5 of 8

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____

2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____

Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
Yellow - Laboratory
White - Laboratory

59801550

UNOCAL 76

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 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: Gottler-Ryan Inc 140107.02 Project Name: 7376
 Address: 6747 Sierra Ct Suite J UNOCAL Project Manager: Tina Berry
 City: Dublin State: CA Zip Code: 94568 AFE #:
 Telephone: (510) 551-7555 FAX #: (510) 551-7888 Site #, City, State: 7376 Pleasanton
 Report To: Plyde Golan inc Sampler: Plyde Galantine QC Data: Level D (Standard) Level C Level B Level A

Turnaround 10 Work Days 5 Work Days 3 Work Days
 Time: 2 Work Days 1 Work Day 2-8 Hours
 CODE: Misc. Detect. Eval. Remed. Demol. Closure
 Drinking Water Waste Water Other

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested										Comments								
1. B-10-82.5	6/11/98 2:40	soil	1	tube	42	<div style="position: absolute; top: 0; left: 0; transform: rotate(-45deg); font-size: small;"> TPH4, BTEX, MTBE, 8DCS, 8020, TP14, TP140 </div>																		
2. B-10-84	2:50		1		43																			
3. B-10-86.5	3:35		1		44																			
4. MW-8-6	6/12/98 10:00				45																			
5. MW-8-11	10:05				46											X	X							
6. MW-8-16.5	10:10				47																			
7. MW-8-21.5	10:12				48																			
8. MW-8-26	10:20				49																			
9. MW-8-32	10:25				50																			
10. MW-8-37	10:30				51											X	X							

Relinquished By: Plyde Galantine Date: 6/11/98 Time: 18:30 Received By: Paul S. Bon Date: 6/15/98 Time: 10:15
 Relinquished By: _____ Date: _____ Time: _____ Received By: _____ Date: _____ Time: _____
 Relinquished By: _____ Date: _____ Time: _____ Received By Lab: _____ Date: _____ Time: _____

Were Samples Received in Good Condition? Yes No Samples on Ice? Yes No Method of Shipment _____ Page 6 of 8

To be completed upon receipt of report:
 1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____
 2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____
 Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
Yellow - Laboratory
White - Laboratory

59801550

UNOCAL 76

680 Chesapeake Drive • Redwood City, CA 94063 • (415) 364-9600

18939 120th Ave., N.E., Suite 101 • Bothell, WA 98011 • (206) 481-9200

819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600

East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200

1900 Bates Ave., Suite LM • Concord, CA 94520 • (510) 686-9600

15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Company Name: <u>Gottler-Ryan Inc 142107.02</u>			Project Name: <u>7306</u>		
Address: <u>6747 Sierra Ct Suite J</u>			UNOCAL Project Manager: <u>Tina Berry</u>		
City: <u>Dublin</u>	State: <u>CA</u>	Zip Code: <u>94568</u>	Release #:		
Telephone: <u>(510) 551-7555</u>	FAX #: <u>(510) 551-7888</u>	Site #: <u>7376</u>	<u>Pleasanton, CA</u>		
Report To: <u>Clyde Galantine</u>	Sampler: <u>Clyde Galantine</u>	QC Data: <input type="checkbox"/> Level D (Standard) <input type="checkbox"/> Level C <input type="checkbox"/> Level B <input type="checkbox"/> Level A			

Turnaround <input checked="" type="checkbox"/> 10 Work Days <input type="checkbox"/> 5 Work Days <input type="checkbox"/> 3 Work Days	Analyses Requested
Time: <input type="checkbox"/> 2 Work Days <input type="checkbox"/> 1 Work Day <input type="checkbox"/> 2-8 Hours	
CODE: <input type="checkbox"/> Misc. <input checked="" type="checkbox"/> Detect. <input type="checkbox"/> Eval. <input type="checkbox"/> Remed. <input type="checkbox"/> Demol. <input type="checkbox"/> Closure	<input type="checkbox"/> Drinking Water <input type="checkbox"/> Waste Water <input type="checkbox"/> Other

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested										Comments								
1. MW-8-41	6/12/98 10:40	soil	1	tube	52																			
2. MW-8-45.S	10:45				53	X	X																	
3. MW-8-46.S	10:45				54																			
4. MW-8-51.S	10:50				55	X	X																	
5. MW-8-57	11:20				56																			
6. MW-8-62	11:25				57																			
7. MW-8-67	11:30				58	X	X																	
8. MW-8-71	11:40				59																			
9. MW-8-72.S	12:00				60																			
10. MW-8-75.S	12:05				61																			

Relinquished By: <u>Clyde Galantine</u>	Date: <u>6/12/98</u>	Time: <u>18:30</u>	Received By: <u>Ray CAS</u>	Date: <u>6/15/98</u>	Time: <u>10K</u>
Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____
Relinquished By: _____	Date: _____	Time: _____	Received By Lab: _____	Date: _____	Time: _____

Were Samples Received in Good Condition? Yes No Samples on Ice? Yes No Method of Shipment _____ Page 7 of 8

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____

2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____

Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
Yellow - Laboratory
White - Laboratory

59801550

UNOCAL 76

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819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600

1900 Bates Ave., Suite LM • Concord, CA 94520 • (510) 686-9600

18939 120th Ave., N.E., Suite 101 • Bothell, WA 98011 • (206) 481-9200

East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200

15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Company Name: Gettler-Ryan Inc 140107.02 Project Name: 7376
 Address: 6747 Sierra Ct Suite J UNOCAL Project Manager: Tina Berry
 City: Dublin State: CA Zip Code: 94568 Release #:
 Telephone: (510) 551-7555 FAX # (510) 551-7888 Site #: 7376 Pleasanton CA
 Report To: Clyde Galantine Sampler: Clyde Galantine QC Data: Level D (Standard) Level C Level B Level A

Turnaround 10 Work Days 5 Work Days 3 Work Days
 Time: 2 Work Days 1 Work Day 2-8 Hours
 CODE: Misc. Detect. Eval. Remed. Demol. Closure

Analyses Requested
 Drinking Water
 Waste Water
 Other

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Comments
1. MW-8-80	6/12/98 12:10	Soil	1	tube	63	
2. MW-8-81.5	1:10		1		63	Sample reads MW-8-81.5 - RA 6-16
3. MW-8-83	1:15		1		64	Change COC to MW-8-81.5 per Clyde Galantine
4. MW-8-84.5	1:20		1		65	
5.				HCL, HX03		
6. MW-4	6-12-98 10:40 AM	H ₂ O	9	7000, 11, 14, 16, 18, 20, 22	66	8563 Livingston
7. TPH 6/B TEX / MTRB / 8260(5)				ORV - Comp / 42 DCA & IDB		
8.						
9. TB - CB	6-12-98	H ₂ O	1	1 HCL Van	67	8563 Livingston
10. TPH 6/B TEX						

Relinquished By: Clyde Galantine Date: 6/12/98 Time: 10:30 Received By: [Signature] Date: 6/15/98 Time: 10:15
 Relinquished By: _____ Date: _____ Time: _____ Received By: _____ Date: _____ Time: _____
 Relinquished By: _____ Date: _____ Time: _____ Received By Lab: _____ Date: _____ Time: _____

Were Samples Received in Good Condition? Yes No Samples on Ice? Yes No Method of Shipment _____ Page 8 of 8

To be completed upon receipt of report:
 1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____
 2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____
 Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
Yellow - Laboratory
White - Laboratory



June 25, 1998

Service Request No.: S9801512

RECEIVED

JUN 29 1998

GETTLER-RYAN INC.
GENERAL CONTRACTORS

Mr. Clyde Galantine
Gettler-Ryan Inc.
6747 Sierra Court
Suite J
Dublin, CA 94568

RE: 7376 TOSCO/140107.02

Dear Mr. Galantine:

The following pages contain analytical results for sample(s) received by the laboratory on June 11, 1998. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 29, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,

Steven L. Green
Project Chemist

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, II A, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLIC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

Hydrocarbon Scan

Sample Name: 13-12
Lab Code: S9801512-002
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	EPA 3510	Modified EPA 8015	50	1	6/20/98	6/22/98	64	D1
Motor Oil	EPA 3510	Modified EPA 8015	250	1	6/20/98	6/22/98	ND	

DI Quantitated as diesel. The sample contains components that eluted in the diesel range, but the chromatogram does not match the typical diesel fingerprint.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801512
Date Collected: NA
Date Received: NA

Hydrocarbon Scan

Sample Name: Method Blank
Lab Code: S980620-MB
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	EPA 3510	Modified EPA 8015	50	1	6/20/98	6/22/98	ND	
Motor Oil	EPA 3510	Modified EPA 8015	250	1	6/20/98	6/22/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

Hydrocarbon Scan

Sample Name: B-12-10
Lab Code: S9801512-005
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/19/98	6/20/98	ND	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/19/98	6/20/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

Hydrocarbon Scan

Sample Name: B-12-16.5
Lab Code: S9801512-008
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/19/98	6/19/98	ND	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/19/98	6/19/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

Hydrocarbon Scan

Sample Name: B-12-28.5
Lab Code: S9801512-014
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	50	6/19/98	6/23/98	14000	
Motor Oil	LUFT	Modified EPA 8015	5	50	6/19/98	6/23/98	<250	C1

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

Hydrocarbon Scan

Sample Name: B-12-37.5
Lab Code: S9801512-019
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	10	6/19/98	6/23/98	4700	
Motor Oil	LUFT	Modified EPA 8015	5	10	6/19/98	6/23/98	<50	C1

C1

The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

Hydrocarbon Scan

Sample Name: B-12-47
Lab Code: S9801512-023
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	5	6/19/98	6/23/98	2600	
Motor Oil	LUFT	Modified EPA 8015	5	5	6/19/98	6/23/98	<25	C1

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

Hydrocarbon Scan

Sample Name: B-12-55
Lab Code: S9801512-027
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/19/98	6/19/98	ND	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/19/98	6/19/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

Hydrocarbon Scan

Sample Name: B-12-72
Lab Code: S9801512-035
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/19/98	6/19/98	ND	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/19/98	6/19/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: NA
Date Received: NA

Hydrocarbon Scan

Sample Name: Method Blank
Lab Code: S980619-MB
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/19/98	6/19/98	ND	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/19/98	6/19/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
 Project: 7376 TOSCO/140107.02
 Sample Matrix: Water

Service Request: S9801512
 Date Collected: 6/10/98
 Date Received: 6/11/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-8
 Lab Code: S9801512-001
 Test Notes:

Units: ug/L (ppb)
 Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	6/17/98	ND	G3
Benzene	EPA 5030	8020	0.5	1	NA	6/17/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	6/17/98	1.6	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	6/17/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	6/17/98	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	1	NA	6/17/98	ND	

G3

The sample contains a single non-fuel component eluting in the gasoline range.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
 Project: 7376 TOSCO/140107.02
 Sample Matrix: Water

Service Request: S9801512
 Date Collected: 6/10/98
 Date Received: 6/11/98

BTEX, MTBE and TPH as Gasoline

Sample Name: 13-12
 Lab Code: S9801512-002
 Test Notes:

Units: ug/L (ppb)
 Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	5	NA	6/18/98	<250	C1
Benzene	EPA 5030	8020	0.5	5	NA	6/18/98	5	
Toluene	EPA 5030	8020	0.5	5	NA	6/18/98	<2.5	C1
Ethylbenzene	EPA 5030	8020	0.5	5	NA	6/18/98	<2.5	C1
Xylenes, Total	EPA 5030	8020	0.5	5	NA	6/18/98	5	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	5	NA	6/18/98	220	

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801512
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S980616-WB1
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	6/16/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	6/16/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	6/16/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	6/16/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	6/16/98	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	1	NA	6/16/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801512
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S980617-WB1
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	6/17/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	6/17/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	6/17/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	6/17/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	6/17/98	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	1	NA	6/17/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-12-10
Lab Code: S9801512-005
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/22/98	6/23/98	5	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/23/98	0.16	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/23/98	0.073	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/23/98	0.02	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/23/98	0.22	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/23/98	1.1	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-12-16.5
Lab Code: S9801512-008
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/22/98	6/23/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/23/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/23/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/23/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/23/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/23/98	0.64	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

BTEX, MTBE and TPH as Gasoline

Sample Name: 13-12-28.5
Lab Code: S9801512-014
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	50	6/22/98	6/23/98	430	
Benzene	EPA 5030	8020	0.005	50	6/22/98	6/23/98	5.1	
Toluene	EPA 5030	8020	0.005	50	6/22/98	6/23/98	3.2	
Ethylbenzene	EPA 5030	8020	0.005	50	6/22/98	6/23/98	6.6	
Xylenes, Total	EPA 5030	8020	0.005	50	6/22/98	6/23/98	15	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	50	6/22/98	6/23/98	2.6	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

BTEX, MTBE and TPH as Gasoline

Sample Name: 13-12-37.5
Lab Code: S9801512-019
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	125	6/22/98	6/23/98	1700	
Benzene	EPA 5030	8020	0.005	125	6/22/98	6/23/98	21	
Toluene	EPA 5030	8020	0.005	125	6/22/98	6/23/98	3.8	
Ethylbenzene	EPA 5030	8020	0.005	125	6/22/98	6/23/98	8.7	
Xylenes, Total	EPA 5030	8020	0.005	125	6/22/98	6/23/98	7.6	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	125	6/22/98	6/23/98	<6.2	C1

C1

The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-12-47
Lab Code: S9801512-023
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	12.5	6/22/98	6/24/98	98	
Benzene	EPA 5030	8020	0.005	12.5	6/22/98	6/24/98	1.5	
Toluene	EPA 5030	8020	0.005	12.5	6/22/98	6/24/98	1.2	
Ethylbenzene	EPA 5030	8020	0.005	12.5	6/22/98	6/24/98	2.0	
Xylenes, Total	EPA 5030	8020	0.005	12.5	6/22/98	6/24/98	4.4	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	12.5	6/22/98	6/24/98	1.5	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-12-55
Lab Code: S9801512-027
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/22/98	6/22/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/22/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/22/98	0.005	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/22/98	0.01	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/22/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: 6/10/98
Date Received: 6/11/98

BTEX, MTBE and TPH as Gasoline

Sample Name: B-12-72
Lab Code: S9801512-035
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/22/98	6/23/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/23/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/23/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/23/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/23/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/23/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S980622-SB1
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/22/98	6/22/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/22/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/22/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/22/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801512
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
Hydrocarbon Scan

Prep Method: EPA 3510
Analysis Method: Modified EPA 8015

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery p-Terphenyl
B-12	S9801512-002		109
Method Blank	S980620-MB		94

CAS Acceptance Limits: 41-140

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
Hydrocarbon Scan

Prep Method: LUFT
Analysis Method: Modified EPA 8015

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery p-Terphenyl
B-12-10	S9801512-005		80
B-12-16.5	S9801512-008		86
B-12-28.5	S9801512-014		62
B-12-37.5	S9801512-019		68
B-12-47	S9801512-023		68
B-12-55	S9801512-027		77
B-12-72	S9801512-035		68
Method Blank	S980619-MB		108

CAS Acceptance Limits: 41-140

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Water

Service Request: S9801512
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
BTEX, MTBE and TPH as Gasoline

Prep Method: EPA 5030
Analysis Method: 8020 CA/LUFT

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
B-8	S9801512-001		100	106
B-12	S9801512-002		101	92
Method Blank	S980616-WB1		112	96
Method Blank	S980617-WB1		108	101

CAS Acceptance Limits: 69-116 69-116

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7376 TOSCO/140107.02
Sample Matrix: Soil

Service Request: S9801512
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
 BTEX and TPH as Gasoline

Prep Method: EPA 5030
Analysis Method: 8020 CALUFT

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
B-12-10	S9801512-005		93	101
B-12-16.5	S9801512-008		79	84
B-12-28.5	S9801512-014		97	98
B-12-37.5	S9801512-019		71	85 B1
B-12-47	S9801512-023		92	99
B-12-55	S9801512-027		75	80
B-12-72	S9801512-035		75	75
Method Blank	S980622-SB1		77	85

CAS Acceptance Limits: 51-137 51-137

B1 The surrogate used for this sample was 4-Bromofluorobenzene.

UNOCAL 76

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 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

59801512

Company Name: <u>Gettler-Ryan</u> <u>170107.02</u>			Project Name: <u>7376</u>		
Address: <u>6747 Sierra Ct Suite J</u>			UNOCAL Project Manager: <u>Tina Berry</u>		
City: <u>Dublin</u>	State: <u>CA</u>	Zip Code: <u>94568</u>	Release #:		
Telephone: <u>(510) 551-7555</u>		FAX #: <u>(510) 551-7888</u>	Site #: <u>7376</u>	<u>Pleasanton CA</u>	
Report To: <u>Clyde Galantine</u>		Sampler: <u>Clyde Galantine</u>		QC Data: <input type="checkbox"/> Level D (Standard) <input type="checkbox"/> Level C <input type="checkbox"/> Level B <input type="checkbox"/> Level A	
Turnaround <input checked="" type="checkbox"/> 10 Work Days <input type="checkbox"/> 5 Work Days <input type="checkbox"/> 3 Work Days			Analyses Requested <input type="checkbox"/> Drinking Water <input type="checkbox"/> Waste Water <input type="checkbox"/> Other		
Time: <input type="checkbox"/> 2 Work Days <input type="checkbox"/> 1 Work Day <input type="checkbox"/> 2-8 Hours					
CODE: <input type="checkbox"/> Misc. <input checked="" type="checkbox"/> Detect. <input type="checkbox"/> Eval. <input type="checkbox"/> Remed. <input type="checkbox"/> Demol. <input type="checkbox"/> Closure					

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested				Comments
1. B-12-5.5	6/10/98 9:20	soil	1	Tube	3					
2. B-12-8	9:25				4					
3. B-12-10	9:30				5	X	X			
4. B-12-12	9:40				6					
5. B-12-14.5	9:45				7					
6. B-12-16.5	9:50				8	X	X			
7. B-12-17.5	10:00				9					
8. B-12-20.5	10:05				10					
9. B-12-22.5	10:10				11					
10. B-12-24	10:15				12					

TPH₃ BTEX TRES
 TPH₄ BTEX TRES
 TPH₄ TPAH

Relinquished By: <u>Clyde Galantine</u>	Date: <u>6/10/98</u>	Time: <u>18:00</u>	Received By: <u>Paul Baker</u>	Date: <u>6/11/98</u>	Time: <u>12:00 PM</u>
Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____
Relinquished By: _____	Date: _____	Time: _____	Received By Lab: _____	Date: _____	Time: _____

Were Samples Received in Good Condition? Yes No
 Samples on Ice? Yes No
 Method of Shipment: _____
 Page 2 of 5

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____
 2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____

Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
 Yellow - Laboratory
 White - Laboratory

UNOCAL 76

R 9801512

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Company Name: Gettler-Ryan 140107.02 Project Name: 7376
 Address: 6747 Sierra Ct Suite J UNOCAL Project Manager: Tina Berry
 City: Dublin State: CA Zip Code: 94568 Release #:
 Telephone: (510) 551-7555 FAX #: (510) 551-7888 Site #: 7376 Pleasanton CA
 Report To: Clyde Galantino Sampler: Clyde Galantino QC Data: Level D (Standard) Level C Level B Level A

Turnaround: 10 Work Days 5 Work Days 3 Work Days Drinking Water
 Time: 2 Work Days 1 Work Day 2-8 Hours Waste Water
 CODE: Misc. Detect. Eval. Remed. Demol. Closure Other

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested										Comments		
1. <u>B-8</u>	<u>6/10/98 3:45</u>	<u>H₂O</u>	<u>4</u>	<u>UOUS Amber</u>	<u>1</u>	<u>X</u>												
2.																		
3. <u>B-12</u>	<u>6/10/98 3:15</u>	<u>H₂O</u>	<u>5</u>	<u>UOUS Amber</u>	<u>2</u>	<u>X</u>	<u>X</u>											
4.																		
5.																		
6.																		
7.																		
8.																		
9.																		
10.																		

Relinquished By: Clyde Galantino Date: 6/10/98 Time: 18:00 Received By: Paula Balon Date: 6/11/98 Time: 12:00 PM
 Relinquished By: _____ Date: _____ Time: _____ Received By: _____ Date: _____ Time: _____
 Relinquished By: _____ Date: _____ Time: _____ Received By Lab: _____ Date: _____ Time: _____

Were Samples Received in Good Condition? Yes No Samples on Ice? Yes No Method of Shipment _____ Page 1 of 5

To be completed upon receipt of report:
 1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____
 2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____
 Approved by: _____ Signature: _____ Company: _____ Date: 6/10/98

Pink - Client
 Yellow - Laboratory
 White - Laboratory

UNOCAL 76

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 East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
 1900 Bates Ave., Suite LM • Concord, CA 94520 • (510) 686-9600
 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

S9801512

Company Name: Gottler - Ryan 142107.02 Project Name: 7376
 Address: _____ UNOCAL Project Manager: Tina Berry
 City: _____ State: _____ Zip Code: _____ Release #: _____
 Telephone: _____ FAX #: _____ Site #: 7376 Pleasanton, CA
 Report To: Clyde Galantine Sampler: Clyde Galantine QC Data: Level D (Standard) Level C Level B Level A

Turnaround: 10 Work Days 5 Work Days 3 Work Days Drinking Water
 Time: 2 Work Days 1 Work Day 2-8 Hours Waste Water
 CODE: Misc. Detect. Eval. Remed. Demol. Closure Other

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested										Comments				
1. B-12-26	6/10/98 10:40	soil	1	tube	13															
2. B-12-28.5	10:50				14	X	X													
3. B-12-30	11:00				15															
4. B-12-31.5	11:05				16															
5. B-12-33.5	11:10				17															
6. B-12-36	11:15				18															
7. B-12-37.5	11:25				19	X	X													
8. B-12-41	11:30				20															
9. B-12-43	11:45				21															
10. B-12-44.5	11:50				22															

Relinquished By: Clyde Galantine Date: 6/10/98 Time: 18:00 Received By: RAY C-AS Date: 6/11/98 Time: 12:00 PM
 Relinquished By: _____ Date: _____ Time: _____ Received By: _____ Date: _____ Time: _____
 Relinquished By: _____ Date: _____ Time: _____ Received By Lab: _____ Date: _____ Time: _____

Were Samples Received in Good Condition? Yes No
 Samples on Ice? Yes No
 Method of Shipment: _____
 Page 3 of 5

To be completed upon receipt of report:
 1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____
 2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____
 Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
 Yellow - Laboratory
 White - Laboratory

59801512

Company Name: Gettler-Ryan 140107.02 Project Name: 7376
 Address: 6747 Sierra Ct Suite J UNOCAL Project Manager: Tina Berry
 City: Dublin State: CA Zip Code: 94568 Release #:
 Telephone: (510) 551-7555 FAX #: (510) 551-7888 Site #: 7376 Pleasanton, CA
 Report To: Clyde Galantine Sampler: Clyde Galantine QC Data: Level D (Standard) Level C Level B Level A

Turnaround 10 Work Days 5 Work Days 3 Work Days Drinking Water
 Time: 2 Work Days 1 Work Day 2-8 Hours Waste Water
CODE: Misc. Detect. Eval. Remed. Demol. Closure Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested										Comments				
1. B-12-47	6/10/98 11:55	Soil	1	tube	23	X	X													
2. B-12-48.5	12:45				24															
3. B-12-50.5	12:50				25															
4. B-12-53	1:00				26															
5. B-12-55	1:05				27	X	X													
6. B-12-56.5	1:10				28															
7. B-12-59	1:15				29															
8. B-12-61	1:20				30															
9. B-12-62.5	1:30				31															
10. B-12-64	1:35				32															

TPH, BTEX, M, SE
SOIL, 18020
TPH, MTPH 0

RAY CAS

Relinquished By: Clyde Galantine Date: 6/10/98 Time: 18:00 Received By: Paul S. Belton Date: 6/11/98 Time: 12:00 PM
 Relinquished By: _____ Date: _____ Time: _____ Received By: _____ Date: _____ Time: _____
 Relinquished By: _____ Date: _____ Time: _____ Received By Lab: _____ Date: _____ Time: _____

Were Samples Received in Good Condition? Yes No
 Samples on Ice? Yes No
 Method of Shipment _____
 Page 4 of 5

To be completed upon receipt of report:
 1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____
 2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____
 Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
 Yellow - Laboratory
 White - Laboratory

UNOCAL 76

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 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

59801512

Company Name: <u>Gettler - Ryan</u> <u>14010702</u>		Project Name: <u>7376</u>	
Address: <u>6747 Sierra Ct Suite J</u>		UNOCAL Project Manager: <u>Tina Berry</u>	
City: <u>Dublin</u> State: <u>CA</u> Zip Code: <u>94568</u>	Release #:		
Telephone: <u>(510) 551-7555</u> FAX #: <u>(510) 551-7888</u>	Site #: <u>7376 Pleasanton</u>		
Report To: <u>Clyde Galantine</u> Sampler: <u>Clyde Galantine</u>	QC Data: <input type="checkbox"/> Level D (Standard) <input type="checkbox"/> Level C <input type="checkbox"/> Level B <input type="checkbox"/> Level A		

Turnaround 10 Work Days 5 Work Days 3 Work Days
Time: 2 Work Days 1 Work Day 2-8 Hours
CODE: Misc. Detect. Eval. Remed. Demol. Closure

Drinking Water
 Waste Water
 Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested										Comments									
1. B-12-65.5	4/10/98 1:40	Soil	1	tube	33																				
2. B-12-70	1:55				34																				
3. B-12-72	2:00				35	X	X																		
4. B-12-73.5	2:05				36																				
5. B-12-75.5	2:20				37																				
6. B-12-79	2:35				38																				
7.																									
8.																									
9.																									
10.																									

Relinquished By: <u>Clyde Galantine</u> Date: <u>6/10/98</u> Time: <u>1:50</u>	Received By: <u>Ray CAS</u> Date: <u>6/11/98</u> Time: <u>12:00 PM</u>
Relinquished By: _____ Date: _____ Time: _____	Received By: _____ Date: _____ Time: _____
Relinquished By: _____ Date: _____ Time: _____	Received By Lab: _____ Date: _____ Time: _____

Were Samples Received in Good Condition? Yes No
 Samples on Ice? Yes No
 Method of Shipment _____
 Page 5 of 5

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____
 2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____

Approved by: _____ Signature: _____ Company: _____ Date: _____

R11103, R2&101, 07.

Pink - Client
 Yellow - Laboratory
 White - Laboratory

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7676 Pleasanton/140107.02
Sample Matrix: Soil

Service Request: S9801564
Date Collected: 6/15/98
Date Received: 6/17/98

Total Metals

Sample Name: Comp US-1-(1.2,COMP,4)
Lab Code: S9801564-005
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
Antimony	EPA 3050BM	6010A	5	1	6/24/98	6/24/98	ND	
Arsenic	EPA 3050BM	6010A	5	1	6/24/98	6/24/98	ND	
Barium	EPA 3050BM	6010A	1	1	6/24/98	6/24/98	130	
Beryllium	EPA 3050BM	6010A	0.5	1	6/24/98	6/24/98	ND	
Cadmium	EPA 3050BM	6010A	0.5	1	6/24/98	6/24/98	ND	
Chromium	EPA 3050BM	6010A	1	1	6/24/98	6/24/98	66	
Cobalt	EPA 3050BM	6010A	1	1	6/24/98	6/24/98	10	
Copper	EPA 3050BM	6010A	1	1	6/24/98	6/24/98	21	
Lead	EPA 3050BM	6010A	5	1	6/24/98	6/24/98	8	
Mercury	METHOD	7470	0.4	1	6/29/98	6/29/98	ND	
Molybdenum	EPA 3050BM	6010A	1	1	6/24/98	6/24/98	5	
Nickel	EPA 3050BM	6010A	2	1	6/24/98	6/24/98	58	
Selenium	EPA 3050BM	6010A	5	1	6/24/98	6/24/98	ND	
Silver	EPA 3050BM	6010A	2	1	6/24/98	6/24/98	ND	
Thallium	EPA 3050BM	6010A	5	1	6/24/98	6/24/98	ND	
Vanadium	EPA 3050BM	6010A	1	1	6/24/98	6/24/98	31	
Zinc	EPA 3050BM	6010A	2	1	6/24/98	6/24/98	43	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7676 Pleasanton/140107.02
Sample Matrix: Soil

Service Request: S9801564
Date Collected: NA
Date Received: NA

Total Metals

Sample Name: Method Blank Units: mg/Kg (ppm)
Lab Code: S980624-MB Basis: Wet
Test Notes:

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
Antimony	EPA 3050BM	6010A	5	1	6/24/98	6/24/98	ND	
Arsenic	EPA 3050BM	6010A	5	1	6/24/98	6/24/98	ND	
Barium	EPA 3050BM	6010A	1	1	6/24/98	6/24/98	ND	
Beryllium	EPA 3050BM	6010A	0.5	1	6/24/98	6/24/98	ND	
Cadmium	EPA 3050BM	6010A	0.5	1	6/24/98	6/24/98	ND	
Chromium	EPA 3050BM	6010A	1	1	6/24/98	6/24/98	ND	
Cobalt	EPA 3050BM	6010A	1	1	6/24/98	6/24/98	ND	
Copper	EPA 3050BM	6010A	1	1	6/24/98	6/24/98	ND	
Lead	EPA 3050BM	6010A	5	1	6/24/98	6/24/98	ND	
Mercury	METHOD	7470	0.4	1	6/29/98	6/29/98	ND	
Molybdenum	EPA 3050BM	6010A	1	1	6/24/98	6/24/98	ND	
Nickel	EPA 3050BM	6010A	2	1	6/24/98	6/24/98	ND	
Selenium	EPA 3050BM	6010A	5	1	6/24/98	6/24/98	ND	
Silver	EPA 3050BM	6010A	2	1	6/24/98	6/24/98	ND	
Thallium	EPA 3050BM	6010A	5	1	6/24/98	6/24/98	ND	
Vanadium	EPA 3050BM	6010A	1	1	6/24/98	6/24/98	ND	
Zinc	EPA 3050BM	6010A	2	1	6/24/98	6/24/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7676 Pleasanton/140107.02
Sample Matrix: Soil

Service Request: S9801564
Date Collected: 6/15/98
Date Received: 6/17/98

Hydrocarbon Scan

Sample Name: Comp US-1-(1.2.COMP,4)
Lab Code: S9801564-005
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	2	6/22/98	6/24/98	1100	
Motor Oil	LUFT	Modified EPA 8015	5	2	6/22/98	6/24/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7676 Pleasanton/140107.02
Sample Matrix: Soil

Service Request: S9801564
Date Collected: NA
Date Received: NA

Hydrocarbon Scan

Sample Name: Method Blank
Lab Code: S980622-MB
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Diesel	LUFT	Modified EPA 8015	1	1	6/22/98	6/23/98	ND	
Motor Oil	LUFT	Modified EPA 8015	5	1	6/22/98	6/23/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7676 Pleasanton/140107.02
Sample Matrix: Soil

Service Request: S9801564
Date Collected: 6/15/98
Date Received: 6/17/98

BTEX, MTBE and TPH as Gasoline

Sample Name: Comp US-1-(1.2.COMP.4)
Lab Code: S9801564-005
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	10	6/22/98	6/27/98	100	
Benzene	EPA 5030	8020	0.005	10	6/22/98	6/27/98	0.27	
Toluene	EPA 5030	8020	0.005	10	6/22/98	6/27/98	0.16	
Ethylbenzene	EPA 5030	8020	0.005	10	6/22/98	6/27/98	0.82	
Xylenes, Total	EPA 5030	8020	0.005	10	6/22/98	6/27/98	1.9	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	10	6/22/98	6/27/98	<0.5	C1

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: TOSCO
Project: 7676 Pleasanton/140107.02
Sample Matrix: Soil

Service Request: S9801564
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S980622-SB1
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	1	1	6/22/98	6/22/98	ND	
Benzene	EPA 5030	8020	0.005	1	6/22/98	6/22/98	ND	
Toluene	EPA 5030	8020	0.005	1	6/22/98	6/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.005	1	6/22/98	6/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.005	1	6/22/98	6/22/98	ND	
Methyl-tert-butyl ether	EPA 5030	8020	0.05	1	6/22/98	6/22/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7676 Pleasanton/140107.02
Sample Matrix: Soil

Service Request: S9801564
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
Hydrocarbon Scan

Prep Method: LUFT
Analysis Method: Modified EPA 8015

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery p-Terphenyl
Comp US-1-(1,2,COMP.4)	S9801564-005		62
Method Blank	S980622-MB		60

CAS Acceptance Limits: 41-140

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: TOSCO
Project: 7676 Pleasanton/140107.02
Sample Matrix: Soil

Service Request: S9801564
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
BTEX and TPH as Gasoline

Prep Method: EPA 5030
Analysis Method: 8020 CALUFT

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
Comp US-1-(1,2,COMP.4)	S9801564-005		110	96
Method Blank	S980622-SB1		100	103

CAS Acceptance Limits: 51-137 51-137

Consultant Company: Gottler-Ryan 14010702 Project Name: 7376
 Address: 6747 Sierra Ct Suite J UNOCAL Project Manager: Tina Berry
 City: Dublin State: CA Zip Code: 94568 AFE #:
 Telephone: (510) 551-7555 FAX #: (510) 551-7888 Site #, City, State: 7376, Pleasanton, CA
 Report To: Clyde Galantine Sampler: Clyde Galantine QC Data: Level D (Standard) Level C Level B Level A

Turnaround 10 Work Days 5 Work Days 3 Work Days
 Time: 2 Work Days 1 Work Day 2-8 Hours
 CODE: Misc. Detect. Eval. Remed. Demol. Closure
 Drinking Water
 Waste Water
 Other

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested										Comments			
						TPHs	BTEX	VOCs	TPHs/TPNO	Total Pb	TPHs/TPNO	TPHs/TPNO	TPHs/TPNO	TPHs/TPNO	TPHs/TPNO		TPHs/TPNO		
1. <u>US-1 (Comp)</u> <u>(5)</u>	<u>6/15/98</u>	<u>soil</u>	<u>4</u>	<u>tube</u>	<u>1-4</u>	<u>X</u>	<u>X</u>	<u>X</u>											
2.																			
3.																			
4.																			
5.																			
6.																			
7.																			
8.																			
9.																			
10.																			

Relinquished By: Clyde Galantine Date: 6/15/98 Time: 17:30 Received By: RAY CAS Date: 6/17/98 Time: 10:05
 Relinquished By: _____ Date: _____ Time: _____ Received By: _____ Date: _____ Time: _____
 Relinquished By: _____ Date: _____ Time: _____ Received By Lab: _____ Date: _____ Time: _____

Were Samples Received in Good Condition? Yes No Samples on Ice? Yes No Method of Shipment _____ Page 1 of 1

To be completed upon receipt of report:
 1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____
 2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____
 Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
 Yellow - Laboratory
 White - Laboratory



Sequoia Analytical

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FAX (707) 792-0342

Gettler-Ryan - Dublin
6747 Sierra Court, Suite J
Dublin, CA 94568
Attention: Deanna Harding

Client Project ID: Tosco (Unocal) SS#7376, Pleasanton
Sample Matrix: Water
Analysis Method: EPA 5030/8015 Mod./8020
First Sample #: 807-0071

Sampled: Jun 26, 1998
Received: Jun 30, 1998
Reported: Jul 15, 1998

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX / MTBE

Analyte	Reporting Limit µg/L	Sample I.D. 807-0071 TB-LB	Sample I.D. 807-0072 MW-1	Sample I.D. 807-0073 MW-2B	Sample I.D. 807-0074 MW-3	Sample I.D. 807-0075 MW-4	Sample I.D. 807-0076 MW-5
Purgeable Hydrocarbons	50	N.D.	59	N.D.	400	100	490
Benzene	0.50	N.D.	0.90	N.D.	15	62	6.3
Toluene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	2.8
Ethyl Benzene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	4.2
Total Xylenes	0.50	N.D.	N.D.	N.D.	1.9	N.D.	5.1
MTBE	2.5	N.D.	570	4,000	490	N.D.	10
Chromatogram Pattern:		--	Discrete Peaks	--	Discrete Peaks & Unidentified Hydrocarbons <C7	Discrete Peaks	Gasoline & Unidentified Hydrocarbons >C8

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	2.0	1.0	1.0
Date Analyzed:	7/10/98	7/10/98	7/10/98	7/11/98	7/10/98	7/10/98
Instrument Identification:	HP-5	HP-5	HP-5	HP-4	HP-5	HP-5
Surrogate Recovery, %: (QC Limits = 70-130%)	78	77	76	123	84	82

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Julianne Fegley

Julianne Fegley
Project Manager



Gettler-Ryan - Dublin 6747 Sierra Court, Suite J Dublin, CA 94568 Attention: Deanna Harding	Client Project ID: Tosco (Unocal) SS#7376, Pleasanton Sample Matrix: Water Analysis Method: EPA 5030/8015 Mod./8020 First Sample #: 807-0077	Sampled: Jun 26, 1998 Received: Jun 30, 1998 Reported: Jul 15, 1998
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TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX / MTBE

Analyte	Reporting Limit µg/L	Sample I.D. 807-0077 MW-6	Sample I.D. 807-0078 MW-8
Purgeable Hydrocarbons	50	530	N.D.
Benzene	0.50	300	6.0
Toluene	0.50	8.3	N.D.
Ethyl Benzene	0.50	2.8	N.D.
Total Xylenes	0.50	8.7	N.D.
MTBE	2.5	81	150

Chromatogram Pattern: Gasoline

Quality Control Data

Report Limit Multiplication Factor:	4.0	1.0
Date Analyzed:	7/11/98	7/10/98
Instrument Identification:	HP-5	HP-5
Surrogate Recovery, %: (QC Limits = 70-130%)	81	76

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Julianne Fegley

Julianne Fegley
Project Manager



Sequoia Analytical

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Gettler-Ryan - Dublin
6747 Sierra Court, Suite J
Dublin, CA 94568
Attention: Deanna Harding

Client Project ID: Tosco (Unocal) SS#7376, Pleasanton
Sample Matrix: Water
Analysis Method: EPA 3510/8015 Mod.
First Sample #: 807-0072

Sampled: Jun 26, 1998
Received: Jun 30, 1998
Reported: Jul 15, 1998

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 807-0072 MW-1	Sample I.D. 807-0073 MW-2B	Sample I.D. 807-0074 MW-3	Sample I.D. 807-0075 MW-4	Sample I.D. 807-0076 MW-5	Sample I.D. 807-0077 MW-6
Extractable Hydrocarbons	50	N.D.	790	63	630	230,000	180
Chromatogram Pattern:		--	Diesel & Unidentified Hydrocarbons >C20	Discrete Peaks	Diesel & Unidentified Hydrocarbons <C15	Diesel & Unidentified Hydrocarbons <C15 & >C20	Diesel & Unidentified Hydrocarbons >C20

Quality Control Data

Report Limit Multiplication Factor:	1.1	1.1	1.2	1.1	100	1.1
Date Extracted:	7/1/98	7/1/98	7/1/98	7/1/98	7/1/98	7/1/98
Date Analyzed:	7/7/98	7/7/98	7/7/98	7/7/98	7/7/98	7/7/98
Instrument Identification:	GCHP-3A	GCHP-3A	GCHP-3A	GCHP-3B	GCHP-3B	GCHP-3B

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Juianne Fegley
Juianne Fegley
Project Manager



Gettler-Ryan - Dublin
6747 Sierra Court, Suite J
Dublin, CA 94568
Attention: Deanna Harding

Client Project ID: Tosco (Unocal) SS#7376, Pleasanton
Sample Matrix: Water
Analysis Method: EPA 3510/8015 Mod.
First Sample #: 807-0078

Sampled: Jun 26, 1998
Received: Jun 30, 1998
Reported: Jul 15, 1998

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 807-0078 MW-8
Extractable Hydrocarbons	50	80

Chromatogram Pattern: Unidentified Hydrocarbons >C16

Quality Control Data

Report Limit Multiplication Factor:	1.1
Date Extracted:	7/1/98
Date Analyzed:	7/7/98
Instrument Identification:	GCHP-3B

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Julianne Fegley
Julianne Fegley
Project Manager



Gettler-Ryan - Dublin
6747 Sierra Court, Suite J
Dublin, CA 94568
Attention: Deanna Harding

Client Project ID: Tosco (Unocal) SS#7376, Pleasanton
Matrix: Liquid

QC Sample Group: 8070071-078

Reported: Jul 15, 1998

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes	Diesel
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015M
Analyst:	C. Westwater	C. Westwater	C. Westwater	C. Westwater	L. Diaz

MS/MSD	Benzene	Toluene	Ethyl Benzene	Xylenes	Diesel
Batch#:	8062743	8062743	8062743	8062743	BLK070198
Date Prepared:	7/11/98	7/11/98	7/11/98	7/11/98	7/1/98
Date Analyzed:	7/11/98	7/11/98	7/11/98	7/11/98	7/1/98
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4	HP-3B
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	500 µg/L
Matrix Spike % Recovery:	105	105	105	108	88
Matrix Spike Duplicate % Recovery:	105	100	105	107	80
Relative % Difference:	0.0	4.9	0.0	1.6	9.5

LCS Batch#:	4LCS071198	4LCS071198	4LCS071198	4LCS071198	LCS070198
Date Prepared:	7/11/98	7/11/98	7/11/98	7/11/98	7/1/98
Date Analyzed:	7/11/98	7/11/98	7/11/98	7/11/98	7/1/98
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4	HP-3B
LCS % Recovery:	95	100	105	107	74

% Recovery Control Limits:	70-130	70-130	70-130	70-130	60-140
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Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL, #1271

Julianne Fegley
Julianne Fegley
Project Manager



Gettler-Ryan - Dublin
6747 Sierra Court, Suite J
Dublin, CA 94568
Attention: Deanna Harding

Client Project ID: Tosco (Unocal) SS#7376, Pleasanton
Matrix: Liquid

QC Sample Group: 8070071-078

Reported: Jul 15, 1998

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	C. Westwater	C. Westwater	C. Westwater	C. Westwater

MS/MSD	Benzene	Toluene	Ethyl Benzene	Xylenes
Batch#:	8062520	8062520	8062520	8062520
Date Prepared:	7/10/98	7/10/98	7/10/98	7/10/98
Date Analyzed:	7/10/98	7/10/98	7/10/98	7/10/98
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Matrix Spike % Recovery:	100	95	110	102
Matrix Spike Duplicate % Recovery:	90	100	100	103
Relative % Difference:	11	5.1	9.5	1.6

LCS Batch#:	5LCS071098	5LCS071098	5LCS071098	5LCS071098
Date Prepared:	7/10/98	7/10/98	7/10/98	7/10/98
Date Analyzed:	7/10/98	7/10/98	7/10/98	7/10/98
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5
LCS % Recovery:	90	100	105	105

% Recovery Control Limits:	70-130	70-130	70-130	70-130
-------------------------------	--------	--------	--------	--------

Please Note:

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL, #1271

Julianne Fegley
Project Manager



Sequoia Analytical

680 Chesapeake Drive
404 N. Wiget Lane
819 Striker Avenue, Suite B
1455 McDowell Blvd, North, Ste. D

Redwood City, CA 94063
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(650) 364-9600
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(707) 792-1865

FAX (650) 364-9233
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FAX (916) 921-0100
FAX (707) 792-0342

Gettler-Ryan - Dublin
6747 Sierra Court, Suite J
Dublin, CA 94568
Attention: Deanna Harding

Client Project ID: Tosco (Unocal) SS#7376, Pleasanton
Matrix: Liquid

QC Sample Group: 8070071-078

Reported: Jul 15, 1998

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	C. Westwater	C. Westwater	C. Westwater	C. Westwater

MS/MSD	Benzene	Toluene	Ethyl Benzene	Xylenes
Batch#:	8070042	8070042	8070042	8070042
Date Prepared:	7/11/98	7/11/98	7/11/98	7/11/98
Date Analyzed:	7/11/98	7/11/98	7/11/98	7/11/98
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Matrix Spike % Recovery:	90	95	95	97
Matrix Spike Duplicate % Recovery:	90	95	95	98
Relative % Difference:	0.0	0.0	0.0	1.7

LCS Batch#:	5LCS071198	5LCS071198	5LCS071198	5LCS071198
Date Prepared:	7/11/98	7/11/98	7/11/98	7/11/98
Date Analyzed:	7/11/98	7/11/98	7/11/98	7/11/98
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5
LCS % Recovery:	100	100	100	102

% Recovery Control Limits:	70-130	70-130	70-130	70-130
----------------------------	--------	--------	--------	--------

Please Note:

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL, #1271

Julianne Fegley
Project Manager



Tosco Marketing Company
2000 Crow Canyon Pl., Box 400
San Ramon, California 94583

Facility Number TOSCO (UNOCAL) SS#7376
 Facility Address 4191 First Street, Pleasanton, CA
 Consultant Project Number 180075.85
 Consultant Name Gettler-Ryan Inc. (G-R Inc.)
 Address 6747 Sierra Court, Suite J, Dublin, CA 94568
 Project Contact (Name) Deanna L. Harding
 (Phone) 510-551-7555 (Fax Number) 510-551-7888

Contact (Name) Ms. Tina R. Berry
 (Phone) (510) 277-2321
 Laboratory Name Sequoia Analytical
 Laboratory Release Number _____
 Samples Collected by (Name) STEVE BALIAN
 Collection Date 6-26-98
 Signature STEVE BALIAN *[Signature]* **9807016**

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iod (Yes or No)	Analyses To Be Performed											Remarks
								TPH G + STEK W/MTBE (8015)	TPH Diesel (8015)	Oil and Grease (8520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd, Cr, Pb, Zn, Ni (ICAP or AA)				
HB ⁵ LB ²	2	1	W	G		Hcl	Y	X											8070071
MW-1	1	4	"	"	14:35	"	Y	X	X										8070072
MW-2B	1	4	"	"	15:10	"	Y	X	X										8070073
MW-3	1	4	"	"	15:40	"	Y	X	X										8070074
MW-4	1	4	"	"	13:50	"	Y	X	X										8070075
MW-5	1	4	"	"	17:20	"	Y	X	X										8070076
MW-6	1	4	"	"	16:10	"	Y	X	X										8070077
MW-8	1	4	"	"	16:40	"	Y	X	X										8070078

DO NOT BILL
TB-LB ANALYSIS

Relinquished By (Signature) <i>STEVE BALIAN</i>	Organization G-R Inc.	Date/Time 6-26-98	Received By (Signature) <i>D. Harding</i>	Organization G-R	Date/Time 6/26/98
Relinquished By (Signature) <i>D. Harding</i>	Organization G-R	Date/Time 6/29/98	Received By (Signature) <i>[Signature]</i>	Organization Sequoia	Date/Time 6/29/98 2:50
Relinquished By (Signature) <i>[Signature]</i>	Organization Sequoia	Date/Time 6/29/98	Received For Laboratory By (Signature) <i>[Signature]</i>	Organization 630 158	Date/Time 6/30/98

Turn Around Time (Circle Choice)

- 24 Hrs.
- 48 Hrs.
- 5 Days
- 10 Days
- As Contracted**

APPENDIX F

Entrix Inc. and Global Geochemistry Corporation Reports

ENTRIX INC.
PRODUCTION
99 MAR -5 PM 3:50

ENTRIX

Since 1984 - Environmental Excellence

ENTRIX, Inc.
590 Ygnacio Valley Road
Suite 200
Walnut Creek, CA 94596
(510) 935-9920
(510) 935-5368 FAX
Project 351301

December 12, 1997

Ms. T. Berry
TOSCO, Environmental Compliance
2000 Crow Canyon Place, Suite 400
San Ramon, CA 94583

Mr. Sarkis A. Soghomonian
Kaprealian Engineering Inc.,
2401 Stanwell Dr., Suite 400
Concord, CA 94520

Re: Forensic Geochemical Analysis of Free Product from MW-5, UNOCAL SS# 7376,
Pleasanton, CA

Dear Tina and Sarkis:

At your request, I have reviewed the following data sets and present the following conclusions:

- Elevation data and associated laboratory analytical data for ground water from site monitoring wells (Tables 1 and 2 from an April 10, 1997 ground water monitoring report);
- High resolution gas chromatography and simulated distillation data recently obtained for free product from the MW-5 well.

The free product obtained from the MW-5 well contains hydrocarbons in the nC_3 - nC_{33} range (i.e., in the gasoline, diesel, and residual ranges). Evaluation of the high resolution gas chromatograph (HRGC) trace indicates that the free product is most likely composed of a mixture of refined gasoline and heavier hydrocarbons. The refined gasoline appears to be moderately fresh based on compound distributions and comparison with similar distributions in fresh gasoline. The heavier hydrocarbon mixture has a carbon distribution ranging from about nC_{13} to nC_{33} and, based on the hydrocarbon distribution, does not appear to contain refined petroleum products (e.g., diesel #2, motor oil, lube oil, etc.). Rather, the distribution is similar in nature to what might be expected from the HRGC analysis of a very weathered crude oil. The simulated distillation results clearly support the presence of both gasoline and heavier hydrocarbon fractions in the MW-5 free product and are consistent with the

L L L L
L L L L
L L L L
L L L L

conclusions derived from evaluation of the HRGC analysis presented above regarding the presence of both gasoline and a heavier hydrocarbon mixture.

The integration of both chromatographic and simulated distillation data types indicates that over 50% of the MW-5 free product is derived from the gasoline source and that this material is relatively fresh. Additionally, the data indicate that the MW-5 free product (1) must contain material which has an ending boiling point similar to crude oils or residual Bunker C fuel, (2) has a distribution of heavier hydrocarbons which are not chromatographically related to refined petroleum mixtures (e.g., motor or lube oils), (3) contains a full range of hydrocarbon compounds in the nC_{10} - nC_{33} range (i.e., hydrocarbons in both the diesel range [e.g., the isoprenoids] and the nC_{20} - nC_{30} range [e.g., the UCM]), and (4) has a heavier hydrocarbon distribution chromatographically consistent with a weathered crude oil.

INTRODUCTION

In June, 1997, free product was found in the MW-5 well at the UNOCAL Service Station #7376 in Pleasanton, California. At your request, a sample of this free product was forwarded by Kaprealian Engineering Inc. (KEI) to ENTRIX and on to Global Geochemistry Corporation (GGC) for (1) high resolution gas chromatography (HRGC) and (2) simulated distillation using a modified ASTM 2887.¹ The objective of this analysis was to evaluate the nature (i.e., hydrocarbon distribution) of the free product and to assess potential source(s) of the free product.

RESULTS AND DISCUSSION

The results of the GGC HRGC and simulated distillation analyses (see Attachment 1) consist of (1) a high resolution gas chromatogram for the sample (MW-5) and for a duplicate analysis (MW-5[D]), (2) quantification and tabulation of the hydrocarbon compounds found in both analyses in the gasoline range (nC_3 - nC_{12}), and (3) simulated distillation curves for MW-5 and MW-5(D). An initial review of both the HRGC analyses and the simulated distillation results suggests that the MW-5 free product is composed of gasoline and a heavier hydrocarbon eluting in the nC_{13} - nC_{33} (i.e., the diesel and heavier) hydrocarbon ranges. The following discussion will first focus on the nC_3 - nC_{10} hydrocarbon range in terms of evaluating the likely source(s) of these hydrocarbons and providing an estimate of the degree of weathering that they have been subjected to. The heavier hydrocarbons (nC_{10} - nC_{33}) will also be discussed in terms of their potential source(s) and degree of weathering. These

¹ GGC data report and chain of custody are presented as Attachment 1 to this letter report.

analyses will then be integrated into a conclusion regarding the potential sources of the hydrocarbons measured in the MW-5 free product.

GASOLINE FRACTION EVALUATION

Table 1 presents the relative percent concentrations of gasoline compounds found in the nC_3 - nC_{10} range of the sample and duplicate. Of specific interest is the abundance of compounds identified in the nC_3 - nC_7 range, especially 2,2,4-trimethylpentane (iso-octane). The presence of this compound provides evidence that the free product contains refined gasoline. The overall nC_3 - nC_{10} hydrocarbon distribution as presented in Table 1 and in the gas chromatogram (Figure 1) also indicate that the free product contains gasoline. Finally, Figure 2 provides a comparison of the major compound classes found in the nC_3 - C_{10} fraction of the MW-5 free product. These classes include the paraffins (straight chain alkanes), the isoparaffins (branched alkanes), the aromatics, the naphthenes (cyclic alkanes), and the olefins (unsaturated -alkenes and alkynes). The analysis is often called the PIANO analysis. Figure 2 provides a comparison of PIANO results from the MW-5 free product with those obtained using the same analysis from 18 fresh gasolines contained in the ENTRIX gasoline database. While this comparison shows some subtle differences (e.g., lower total aromatics - see below), the general agreement for the relative amount of the various major compound classes supports the prior contention that the MW-5 free product contains gasoline.

In order to assess the degree of weathering of the gasoline component of the MW-5 free product, it is important to understand that environmental weathering processes include (1) evaporation, solubilization (water washing), and biodegradation. Each of these processes affects the hydrocarbon distribution in a predictable way. For example, if the gasoline was subjected to considerable evaporation, one would predict a preferential loss of the lighter relative to the heavy ends of the mixture. If one looked at a ratio of nC_3 - nC_7 versus nC_7 - nC_{13} compounds, evaporative losses would be expected to move the ratio to lower values as the mixture became preferentially enriched in the higher molecular weight compounds. Thus, comparison of this type of parameter between free product samples and fresh gasolines can provide a sense of the degree of evaporation to which the gasoline in the MW-5 free product has been subjected to. Similarly, parameters such as benzene/cyclohexane or total aromatics/total paraffins can provide insight into the degree to which the gasoline in the free product has been solubilized into the ground water. Finally, comparing branched and non-branched alkanes can be useful in determining the degree to which the gasoline in the free product has been subjected to biodegradation. Due to energetic needs, bacteria will preferentially degrade straight chain hydrocarbons relative to branched hydrocarbons. Thus, comparison of 3-methylhexane to n-heptane can provide information regarding the degree of biodegradation.

The nC_3 - nC_7 range of the MW-5 free product sample accounts for $55.1 \pm 0.4\%$ of the compounds quantified in the nC_3 - nC_{10} range. Comparing this value to values obtained from the ENTRIX fresh gasoline database ($n=18$ separate gasolines; 35.1 to 57%), suggests that the gasoline present in the MW-5 free product contains a substantial amount of material in the nC_3 - nC_7 range (relative to the $> nC_7$ range). This comparison suggests that the gasoline fraction of the MW-5 free product has not undergone substantial evaporative weathering. A similar comparison of the total aromatic/total paraffins ratios calculated for the MW-5 free product (0.38) and obtained from the ENTRIX fresh gasoline database (range: 0.66 to 1.25) argues that the gasoline in the MW-5 free product has preferentially lost aromatic compounds, most likely due to preferential loss of aromatics due to their increased aqueous solubility from the gasoline mixture. Finally, a comparison of 3-methylhexane to n-heptane ratios (1.11 versus 1.28 to 2.33) argues against a substantial amount of biodegradation (biodegradation would preferentially remove the n-heptane and lead to an increase in the ratio).

Taken altogether, the weathering parameters are consistent with the conclusion that the gasoline found in the MW-5 free product has only been subjected to a moderate degree of weathering (predominantly due to aqueous solubilization). Further, these individual parameters are consistent with the results presented in the PIANO analysis (see Figure 2) and support the hypothesis that the gasoline component of the MW-5 free product is relatively fresh.

HEAVIER HYDROCARBON EVALUATION

As noted above, Figure 1 is the gas chromatogram from the HRGC analysis of the MW-5 free product and demonstrates that the sample contains hydrocarbons extending from nC_3 into the nC_{30} range. The slight hump in the gas chromatogram's baseline in the nC_{20} - nC_{33} range is termed an unresolved complex mixture (UCM) and is often indicative of petroleum derived material. In general, a UCM or "hump" results from the inability of the HRGC analysis to completely resolve and separate the complex compounds associated with petroleum mixtures. In environmental samples not related with crude oil, UCM humps are often found in the nC_{10} - nC_{25} or diesel range. Complex compounds known as petroleum biomarkers (e.g., steranes and pentacyclic triterpanes) are found to elute in the nC_{30} range and have been known to be fairly stable to degradation processes (e.g., Peters and Moldowan, 1993²). The fact that the MW-5 free product (1) does not contain a diesel range UCM and (2) does contain a UCM hump in nC_{20} - nC_{33} range is consistent with a heavily degraded crude oil

² Peters, K.E. and Moldowan, J.M. (1993) *The Biomarker Guide, Interpreting Molecular Fossils in Petroleum and Ancient Sediments*. Prentice-Hall, Inc.

source. Further, the presence of apparently low amounts of isoprenoids in the nC_{10} - nC_{20} range (e.g., pristane and phytane) would seem to indicate that (1) the MW-5 free product has some source of hydrocarbons in the nC_{10} - nC_{20} range and (2) rule out the possibility that the heavier hydrocarbons are derived solely from refined heavier hydrocarbon mixtures (e.g., motor and/or lube oils).

Figure 3 contains the results of the simulated distillation performed on standard mixtures of gasoline, diesel #2, and a bunker C. This figure is presented as a comparison of the amount of material which is distilled from (i.e., boiled off of) the hydrocarbon mixture as a function of the boiling point. The curves provide a view of the cumulative % material that distills out of the mixture (% OFF). For example, the simulated distillation results for the gasoline standard shows that (1) this material has an initial boiling point <200 degrees F, (2) approximately 65% of the gasoline boils off below 300 F, and (3) the mixture has a final boiling point of about 400 F. Comparing this with the Bunker C standard simulated distillation curve indicates that (1) the Bunker C mixture has an initial oiling point well above that of gasoline (>300 F *versus* <200 F), and (2) contains components that do not boil off at temperatures less than 1000 F. As might be expected for a mid-range distillate, the diesel #2 fuel has a simulated distillation curve between that of the heavy Bunker C residual fuel and the much lighter gasoline. One additional point to be made in this discussion of the simulated distillation curves is that a fresh crude oil contains compounds that boil below 200 F and above 1000 F. Thus, the simulated distillation curve for a fresh crude would be expected to begin at about 100-150 F move across the diesel #2 curve and end at a final boiling point over 1000 F.

Figure 4 contains the same standard simulated distillation curves along with the curves produced from a simulated distillation analysis of the MW-5 free product. The MW-5 curve closely follows the gasoline simulated distillation curve until about 60% of the MW-5 material has distilled off. After this point, the MW-5 curve clearly indicates the presence of a much heavier (higher boiling point) hydrocarbon. Comparison of the final boiling points shows that the MW-5 free product has a final boiling point comparable to that of residual Bunker C fuel. These results are consistent with a hydrocarbon mixture containing both gasoline and a heavier hydrocarbon fraction. The fact that the final boiling point for the MW-5 free product is similar to what one would see in a residual Bunker C fuel or in a crude oil supports prior assertions that the heavier hydrocarbon mixture is not simply derived from a motor oil or lube oil.

CONCLUSIONS

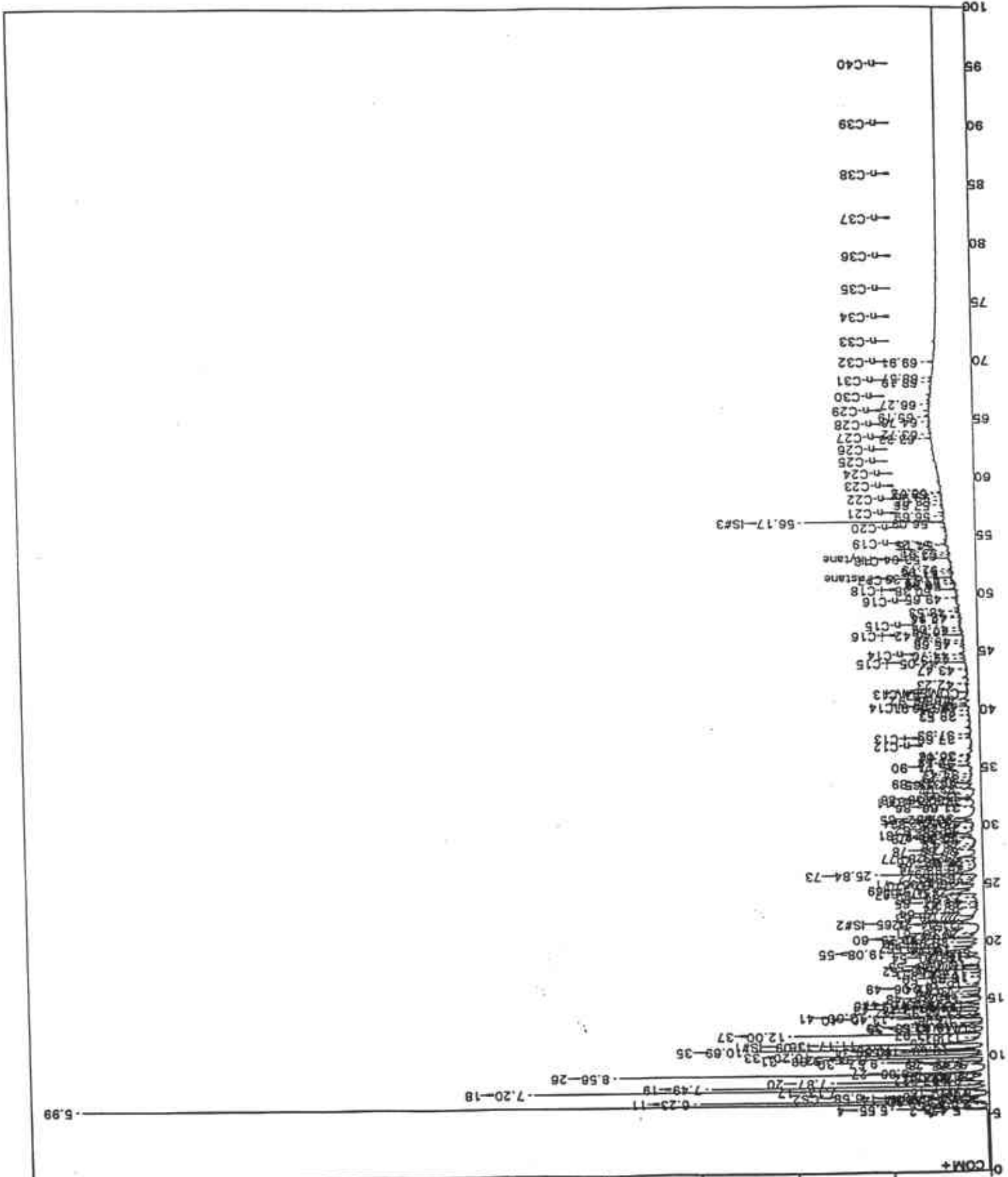
The free product obtained from the MW-5 well contains hydrocarbons in the nC_3 - nC_{33} range (i.e., in the gasoline, diesel, and residual ranges). Evaluation of the HRGC trace indicates that the free product is most likely composed of a mixture of refined gasoline and heavier

Global Geochemistry Corp. C3-C10 Gasoline analysis
 ENTRIX Project # 351301
 UNOCAL SS#7376 Pleasanton

Matrix	FP	FP
Sample ID	MW-5	MW-5D
Date Collected	6/27/97	6/27/97
Date Extracted	7/19/97	7/19/97
Date Analyzed	7/31/97	7/31/97
Lab ID	4027-1	4027-1D
Test	C3-C10	C3-C10
Units	Rel%*	Rel%
1 n-Propane		
2 Isobutane	0.13	0.14
3 Isobutene		
4 Butane/Methanol	0.85	0.87
5 trans-2-Butene		
6 cis-2-Butene		
7 3-Methyl-1-butene	0.07	0.07
8 Isopentane	7.65	7.73
9 1-Pentene	0.29	0.29
10 2-Methyl-1-butene	0.38	0.39
11 n-Pentane	3.27	3.27
12 trans-2-Pentene	0.78	0.78
13 cis-2-Pentene/t-Butanol		
14 2-Methyl-2-butene	1.05	1.06
15 2, 2-Dimethylbutane	0.19	0.19
16 Cyclopentane	0.17	0.17
17 2, 3-Dimethylbutane/MTBE	2.14	2.11
18 2-Methylpentane	5.65	5.55
19 3-Methylpentane	3.37	3.32
20 n-Hexane	3.04	2.95
21 trans-2-Hexene	0.28	0.28
22 3-Methylcyclopentene	0.49	0.49
23 3-Methyl-2-pentene	0.46	0.42
24 cis-2-Hexene	0.43	0.39
25 3-Methyl-trans-2-pentene	0.25	0.24
26 Methylcyclopentane	4.9	4.83
27 2, 4-Dimethylpentane	1.37	1.32
28 Benzene	0.3	0.3
29 5-Methyl-1-hexene	0.39	0.36
30 Cyclohexane	1.69	1.66
31 2-Methylhexane	2.26	2.24
32 2, 3-Dimethylpentane	2.02	2.02
33 3-Methylhexane	3.13	3.07
34 2-Methyl-1-hexene	1.2	1.26
35 2, 2, 4-Trimethylpentane	4.05	3.96
36 n-Heptane	3.11	3.03
37 Methylcyclohexane	3.46	3.39
38 2, 5-Dimethylhexane	1.13	1.09
39 2, 4-Dimethylhexane	1.06	1.07
40 2, 3, 4-Trimethylpentane	1.49	1.48
41 Toluene	1.97	1.95
42 2, 3-Dimethylhexane	0.88	0.88
43 2-Methylheptane	1.13	1.16
44 4-Methylheptane	0.56	0.58

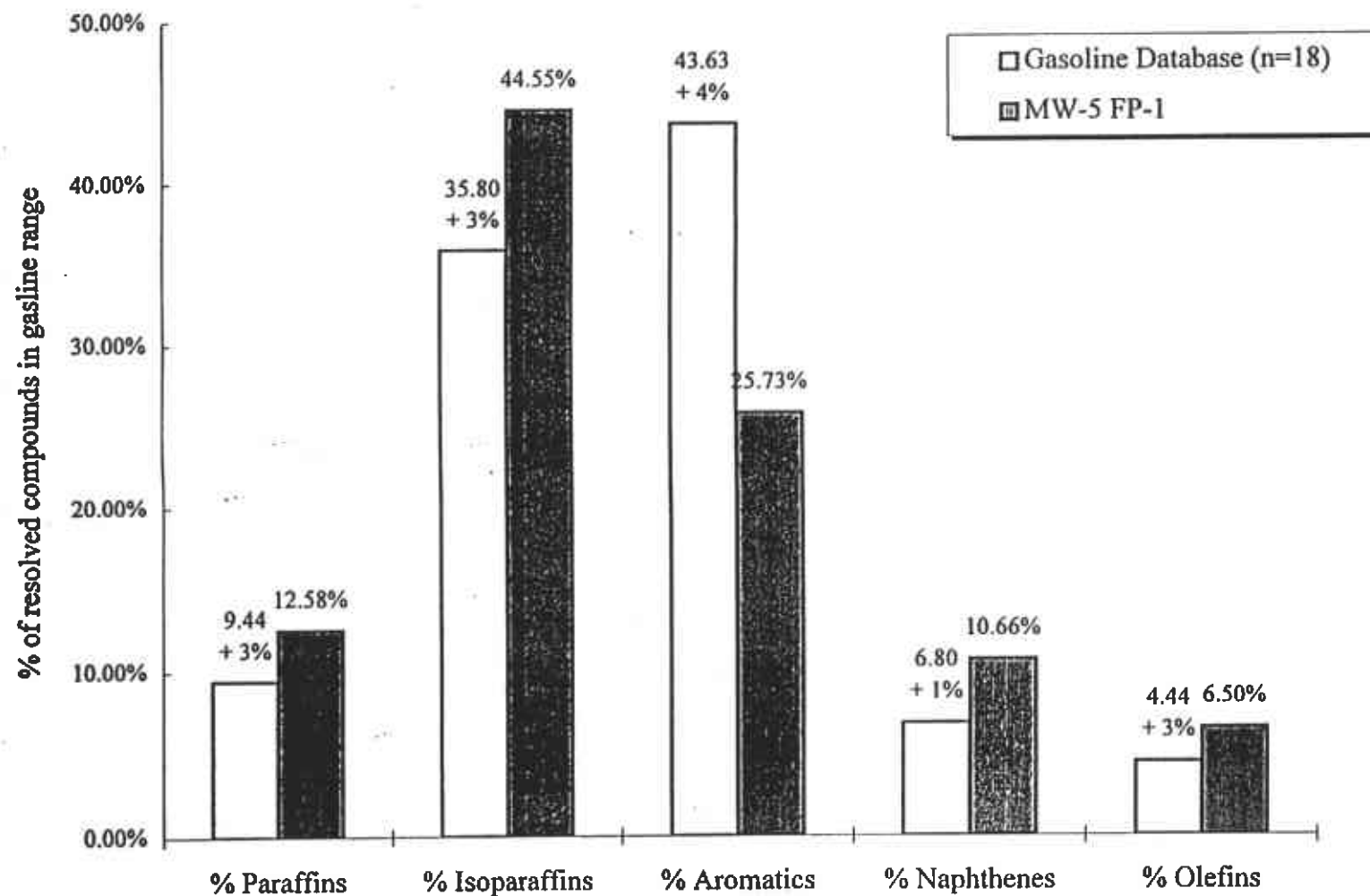
45 3, 4-Dimethylhexane	0.41	0.41
46 3-Ethyl-3-methylpentane	0.96	0.98
47 3-Methylheptane	0.95	0.96
48 2-Methyl-1-heptene	0.43	0.43
49 n-Octane	1.72	1.71
50 2, 2-Dimethylheptane	0.12	0.13
51 2, 4-Dimethylheptane	0.28	0.29
52 Ethylcyclohexane	0.44	0.46
53 2, 6-Dimethylheptane	0.39	0.41
54 Ethylbenzene	0.51	0.54
55 m - p Xylenes	6.09	6.26
56 4-Methyloctane	0.38	0.39
57 2-Methyloctane	1.11	1.12
58 3-Ethylheptane	0.71	0.73
59 3-Methyloctane		
60 o-Xylene	1.75	1.73
61 1-Nonene		
62 n-Nonane	0.27	0.28
63 Isopropylbenzene	0.28	0.3
64 3, 3, 5-Trimethylheptane		
65 2, 4, 5-Trimethylheptane	0.28	0.29
66 n-Propylbenzene	0.12	0.12
67 1-Methyl-3-ethylbenzene	1.12	1.13
68 1-Methyl-4-ethylbenzene	0.9	0.91
69 1, 3, 5-Trimethylbenzene	1.3	1.3
70 3, 3, 4-Trimethylheptane	0.58	0.62
71 1-Methyl-2-ethylbenzene	1	1.04
72 3-Methylnonane	0.17	0.18
73 1, 2, 4-Trimethylbenzene	3.47	3.48
74 Isobutylbenzene	0.18	0.18
75 sec-Butylbenzene	0.11	0.11
76 n-Decane	0.32	0.33
77 1, 2, 3-Trimethylbenzene	0.8	0.84
78 Indan	0.45	0.5
79 1, 3-Diethylbenzene	0.44	0.45
80 1, 4-Diethylbenzene		
81 n-Butylbenzene	0.85	0.88
82 1, 3-Dimethyl-5-ethylbenzene	0.18	0.19
83 1, 4-Dimethyl-2-ethylbenzene	0.21	0.22
84 1, 3-Dimethyl-4-ethylbenzene	1	1
85 1, 2-Dimethyl-4-ethylbenzene	0.78	0.83
86 Undecene		
87 1, 2, 4, 5-Tetramethylbenzene	0.33	0.32
88 1, 2, 3, 5-Tetramethylbenzene	0.94	0.93
89 1, 2, 3, 4-Tetramethylbenzene	0.31	0.31
90 Naphthalene	0.15	0.15
91 2-Methyl-naphthalene	0.04	0.04
92 1-Methyl-naphthalene	0.15	0.16
* = % of C3-C10		
Total	100.02	100

Figure 1

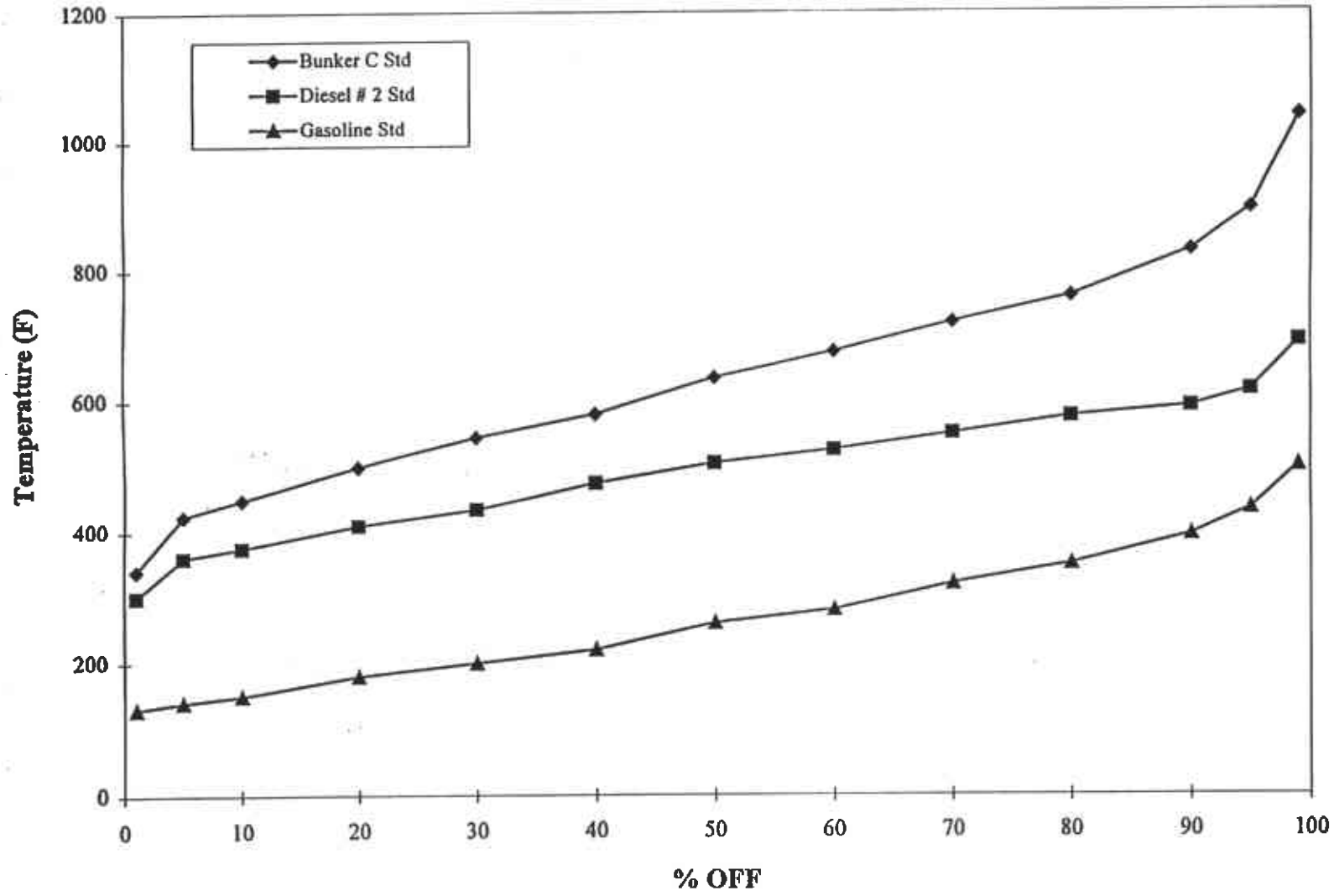


F:\E:\DATA\7\3\1997 Data Printed-07-21-1997 Time= 15:09:10
 Sample Name=4027-1D (MS + IS3-014)
 0.0 to 100.0 uln. Low X=6.29 High X=100.092 Wt Span=174.602

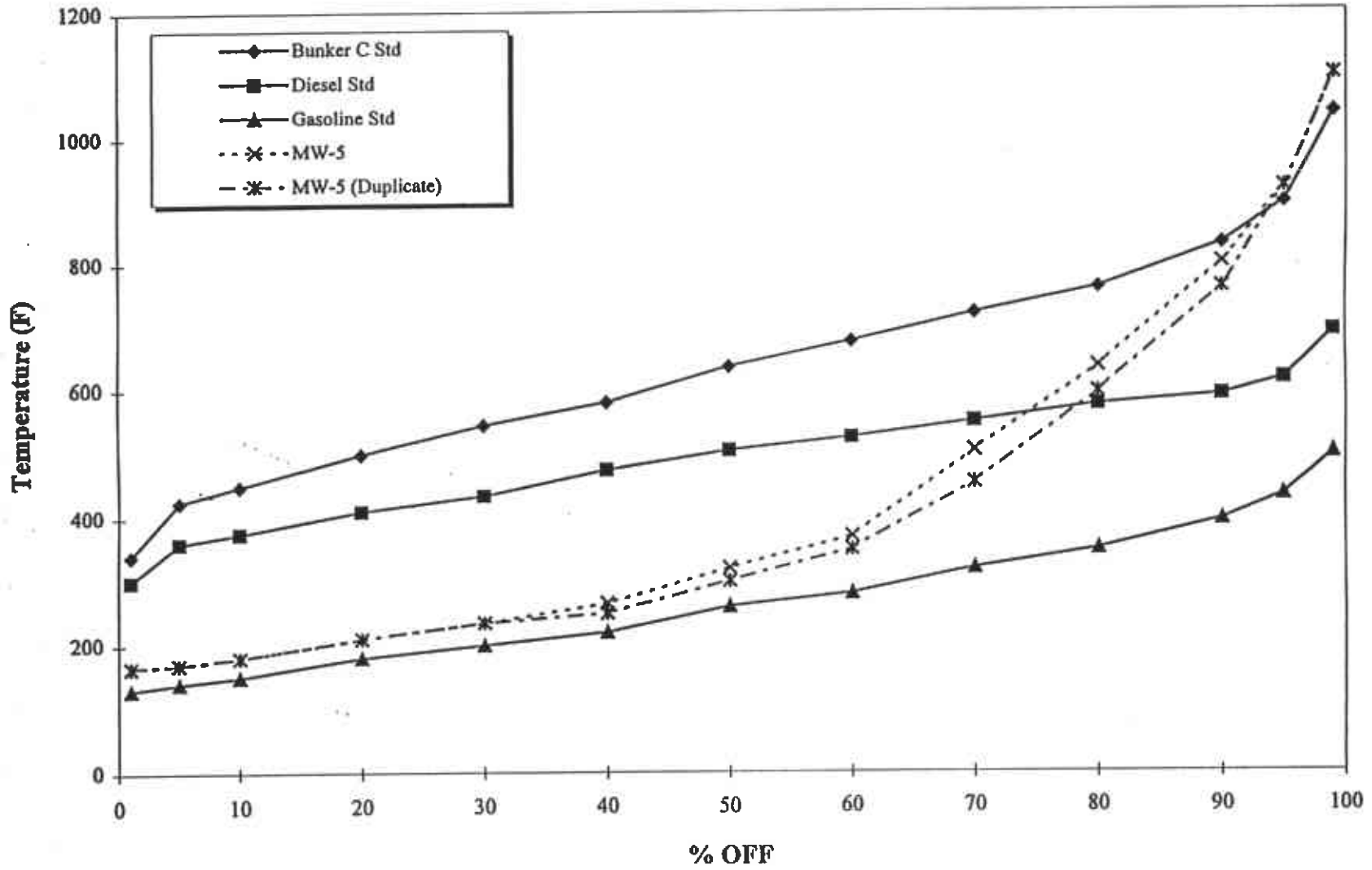
Comparison Between Average "PIANO" Values for
Fresh Gasolines and the Gasoline Component of the MW-5 FP



Simulated Distillation Curve(s) (ASTM 2887)



Simulated Distillation Curve(s) (ASTM 2887)



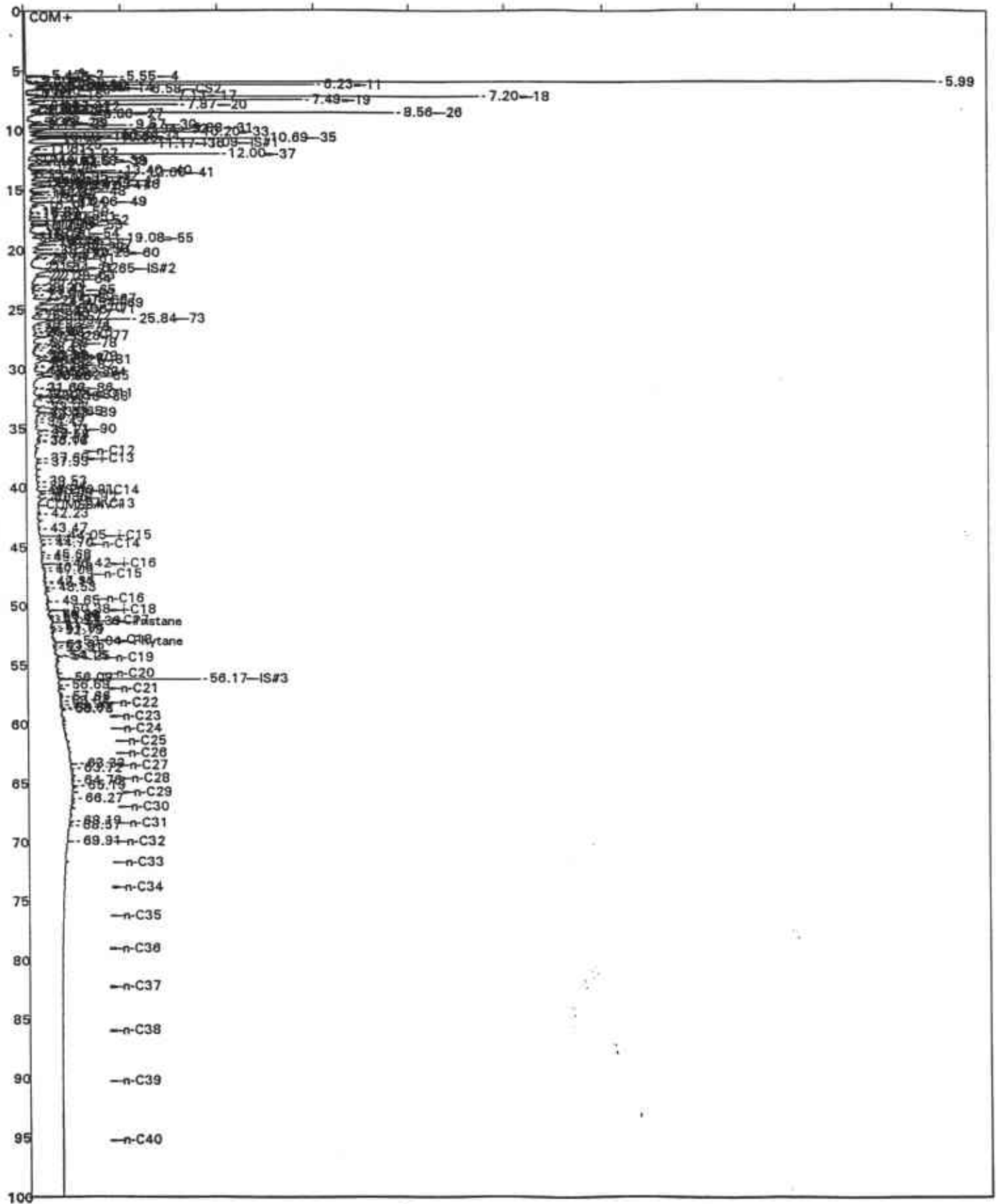
Attachment 1

Laboratory Results from Global Geochemistry Corporation

Chain of Custody Document

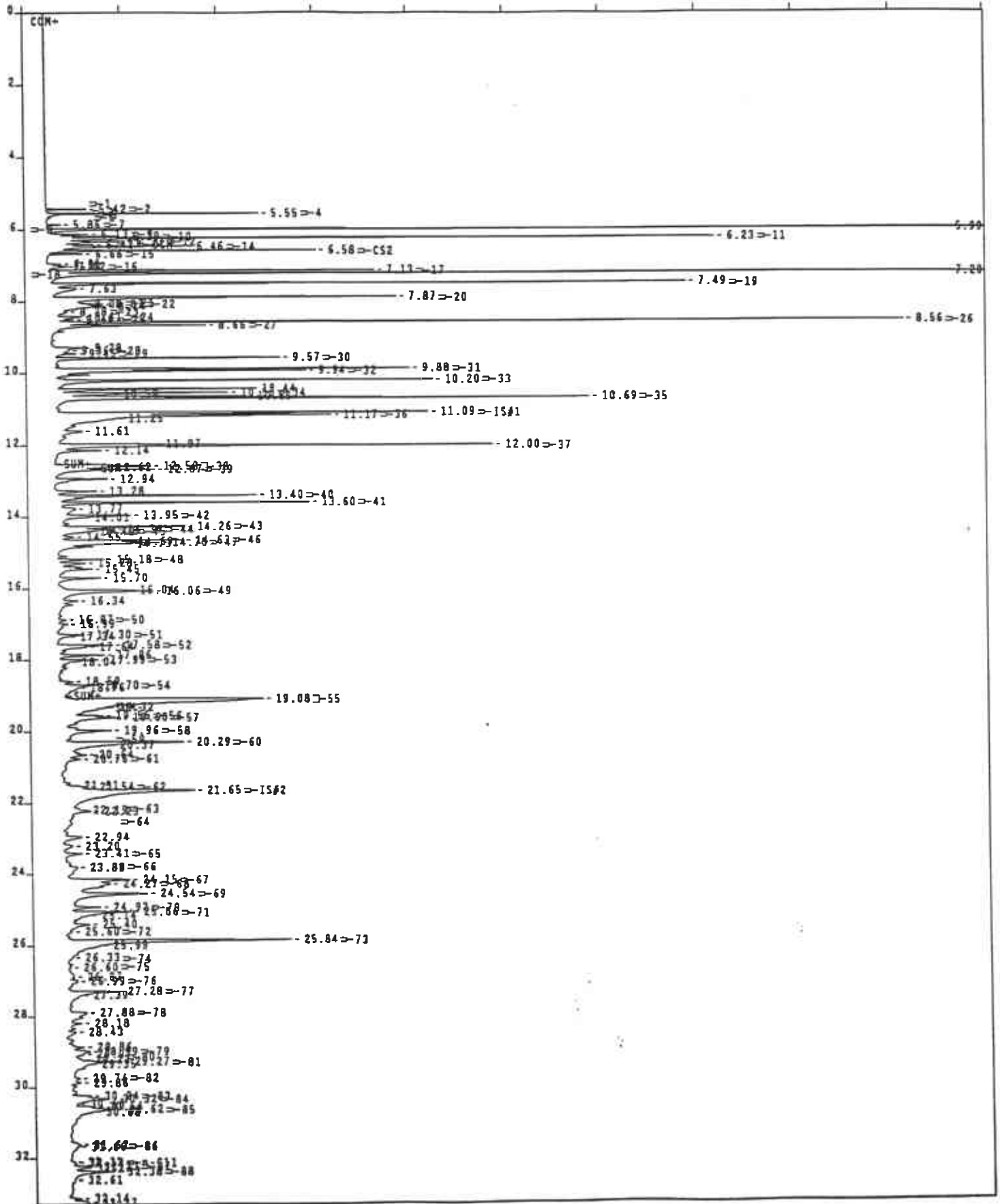
Sample Name=4027-1D (MWS + IS3-014)

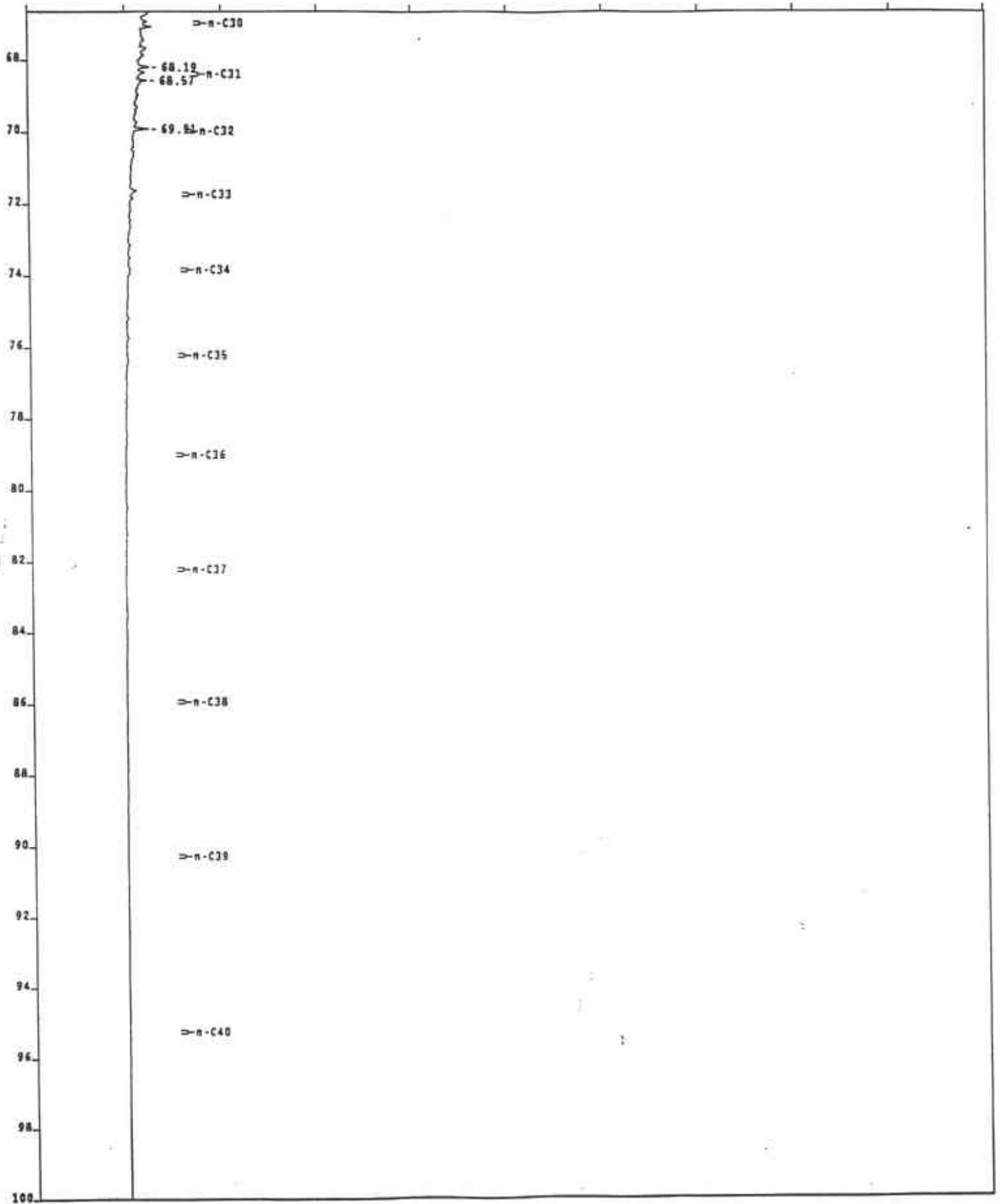
0.0 to 100.0 min. Low Y=6.29 High Y=180.892 mv Span=174.602



Sample Name=4027-1D (MWS + IS3-014)

0.0 to 33.333 min. Low Y=5.0 High Y=80.0 mv Span=75.0





***** Gas Chromatography by Global GeoChemistry *****

```

*
* TODAY'S DATE....07-31-1997          TIME.....15:09:45
* RAW DATA FILE NAME..E:\DATA7\C344199.18R
* SAMPLE NAME.....4027-1D (MWS + IS3-014)
* DATE TAKEN..Jul 19, 1997  19:06:31
* METHOD FILE.....!!!!!!E:\DATA7\C344199Q.MET
* METHOD:..Whole Oil Analysis
* CALIBRATION FILE...!!!!!!E:\DATA7\C344199Q.CALCAL. FILE VERSION...-4
* INSTRUMENT..... HP6890 FID--FID          OPERATOR.... Lev Baycher
* RUN TIME..... 100
* AREA REJECT..... 0          COM PORT.... 7
* HEADING 1..C3-C44 Analysis
* HEADING 2..GC-analysis: method 1 (split 400:1)
* FORMAT FILE..E:\DATA7\NORMAL.FMT
*****

```

***** PEAKS DETECTED IN THIS CHROMATOGRAM *****

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height
1	5.423	2	3085	3136
2	5.548	4	19782	16508
3	5.857	7	1623	1099
4	5.986	8	175907	165187
5	6.132	9	6502	3233
6	6.187	10	8811	5682
7	6.227	11	74552	52230
8	6.326	12	17771	5966
9	6.415	DCM	8013	3655
10	6.462	14	24031	10623
11	6.580	CS2	34240	20996
12	6.663	15	4219	2794
13	6.948		2039	1065
14	7.000		1100	1065
15	7.020	16	3976	1447
16	7.135	17	48011	25669
17	7.205	18	126411	82608
18	7.487	19	75563	49972
19	7.627		17302	2273
20	7.872	20	67140	27380
21	8.046	21	6475	2655
22	8.067	22	11185	4307
23	8.136		17613	4468
24	8.275	23	9546	1480
25	8.411	24	8927	2624
26	8.494	25	5491	1964
27	8.558	26	109900	66832
28	8.661	27	29980	12224
29	9.284		9110	2555
30	9.359	28	6805	1544
31	9.451	29	8175	2091
32	9.575	30	37799	18058
33	9.879	31	51087	28355
34	9.939	32	45901	20020
35	10.196	33	70006	30109
36	10.442		33730	15546
37	10.549	34	28623	13878
38	10.582		6783	5027

39	10.650		26254	15199
40	10.695	35	90149	42314
41	11.087	IS#1	80381	29746
42	11.168	36	68933	21958
43	11.252		34937	5087
44	11.610		14696	2466
45	11.969		12643	7929
46	12.002	37	77208	34750
47	12.144		14561	3936
48	12.581	38	24773	7711
49	12.624		8155	4051
50	12.670	39	24275	8002
51	12.939		19383	4331
52	13.280		11636	3499
53	13.400	40	33736	15925
54	13.596	41	44455	20109
55	13.768		17066	1809
56	13.951	42	19991	6065
57	14.006		9473	2281
58	14.257	43	26426	10234
59	14.339	44	13144	4808
60	14.376		3970	2966
61	14.397	45	9321	2677
62	14.547		7366	1621
63	14.633	46	22365	10057
64	14.689		3291	5900
65	14.703	47	21757	8277
66	14.732		10506	5494
67	15.175	48	9886	3942
68	15.281		9544	2462
69	15.445		18978	3000
70	15.697		14812	3636
71	16.041		6385	5924
72	16.065	49	38929	7678
73	16.337		8145	1816
74	16.874	50	3016	860
75	16.994		3688	983
76	17.298	51	6549	2210
77	17.339		2530	951
78	17.584	52	10459	4432
79	17.636		8764	2437
80	17.859		11359	3759
81	17.989	53	9439	3295
82	18.043		3471	1024
83	18.588		5008	1287
84	18.700	54	12287	2720
85	18.760		9154	1618
86	19.080	55	142622	16105
87	19.316		34984	3838
88	19.549	56	8896	3597
89	19.600	57	25567	4912
90	19.963	58	16667	4175
91	20.291	60	39385	9766
92	20.373		19821	3835
93	20.645		9833	2187
94	20.761	61	9131	1722
95	21.509		1704	983
96	21.536	62	6394	2199
97	21.645	IS#2	118706	10535
98	22.191	63	6855	1611

.99	22.228		12385	2476
100	22.940		11286	1725
101	23.205		8223	972
102	23.413	65	6673	1708
103	23.802	66	2661	1304
104	23.812		7122	1258
105	24.148	67	25840	5351
106	24.274	68	20719	3818
107	24.543	69	29612	6697
108	24.923	70	14039	3027
109	25.055	71	23707	5354
110	25.144		6631	2079
111	25.405		14708	2173
112	25.599	72	4145	761
113	25.839	73	79344	17910
114	25.986		30760	2933
115	26.326	74	4039	742
116	26.598	75	2452	593
117	26.873		10920	862
118	26.987	76	7619	1102
119	27.277	77	19148	3981
120	27.391		12402	1304
121	27.882	78	11342	1788
122	28.179		6893	1357
123	28.434		5740	849
124	28.861		11782	1487
125	28.992	79	10299	1953
126	29.066		5863	1446
127	29.228		6984	1328
128	29.269	81	20048	4350
129	29.350		20844	1793
130	29.737	82	4371	1104
131	29.856		17211	1165
132	30.239	83	5092	1948
133	30.325	84	22819	3334
134	30.458		1726	839
135	30.544		8261	2256
136	30.621	85	18812	3797
137	30.682		33136	2068
138	31.622		3732	1039
139	31.661	86	9891	865
140	32.109		1090	526
141	32.134	n-C11	1892	630
142	32.229	87	7340	1791
143	32.272		2814	1250
144	32.375	88	21104	3599
145	32.614		8689	530
146	33.143		2842	982
147	33.267		15392	1562
148	33.652		17434	3969
149	33.731	89	6977	1321
150	33.913		7038	1219
151	34.187		9927	849
152	34.474		7155	715
153	35.166	90	3452	1148
154	35.214		14460	1526
155	35.582		16327	1435
156	36.023		6384	1154
157	36.161		26109	1100
158	37.599	i-C13	5390	1176

159	37.935		29198	1115
160	39.529		4173	712
161	39.942		5119	684
162	40.239	91	1002	382
163	40.303	i-C14	6339	1845
164	40.528		14615	1694
165	40.860	92	3549	832
166	40.955		36181	1512
167	42.233		2027	624
168	43.469		2492	483
169	44.054	i-C15	9196	3550
170	44.368		3686	820
171	44.698		2727	830
172	45.679		1705	440
173	45.952		2659	532
174	46.420	i-C16	9662	3931
175	46.781		1297	613
176	47.051		1104	413
177	47.956		2635	625
178	48.113		3005	589
179	48.527		1895	688
180	49.653		1551	843
181	50.376	i-C18	7017	2851
182	50.805		1339	757
183	50.961		2142	933
184	51.114		1916	636
185	51.236		2652	595
186	51.389	Pristane	9117	3964
187	51.747		2881	915
188	51.959		3415	1026
189	52.131		2967	725
190	53.040	Phytane	8039	3618
191	53.353		2388	700
192	53.514		1959	519
193	54.163		1772	690
194	54.251		1961	993
195	56.089		2518	1321
196	56.169	IS#3	43425	25709
197	56.688		3251	781
198	57.660		1737	676
199	58.038		2565	404
200	58.346		3438	588
201	58.624		3896	875
202	58.728		1522	851
203	63.330		2202	1210
204	63.719		1664	724
205	64.756		2358	555
206	65.186		2482	1071
207	66.271		4476	765
208	68.190		2634	822
209	68.565		1669	685
210	69.907		3737	1182

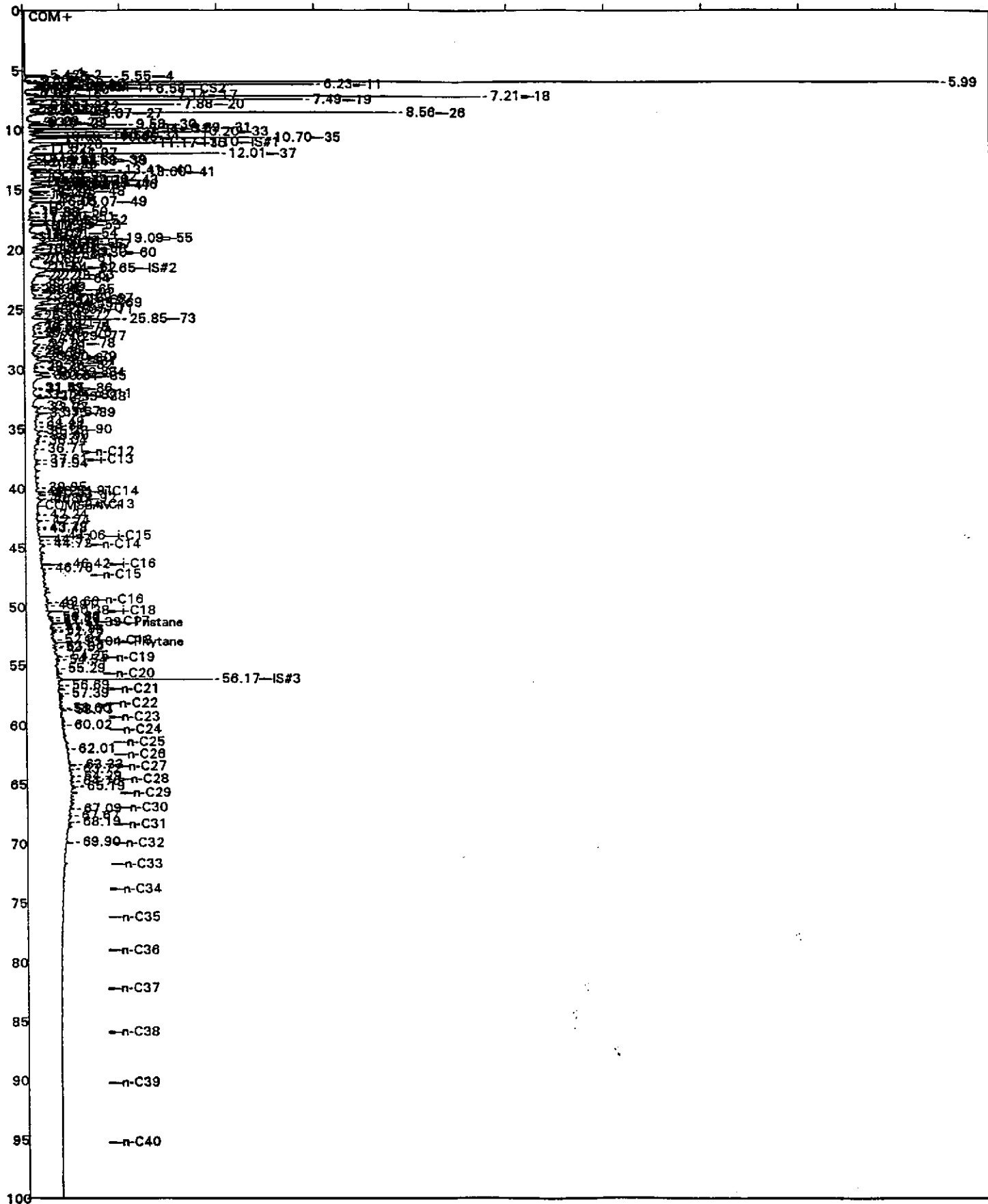
Group	Group Amount	Group Percent
0	0.0000	0.0000%

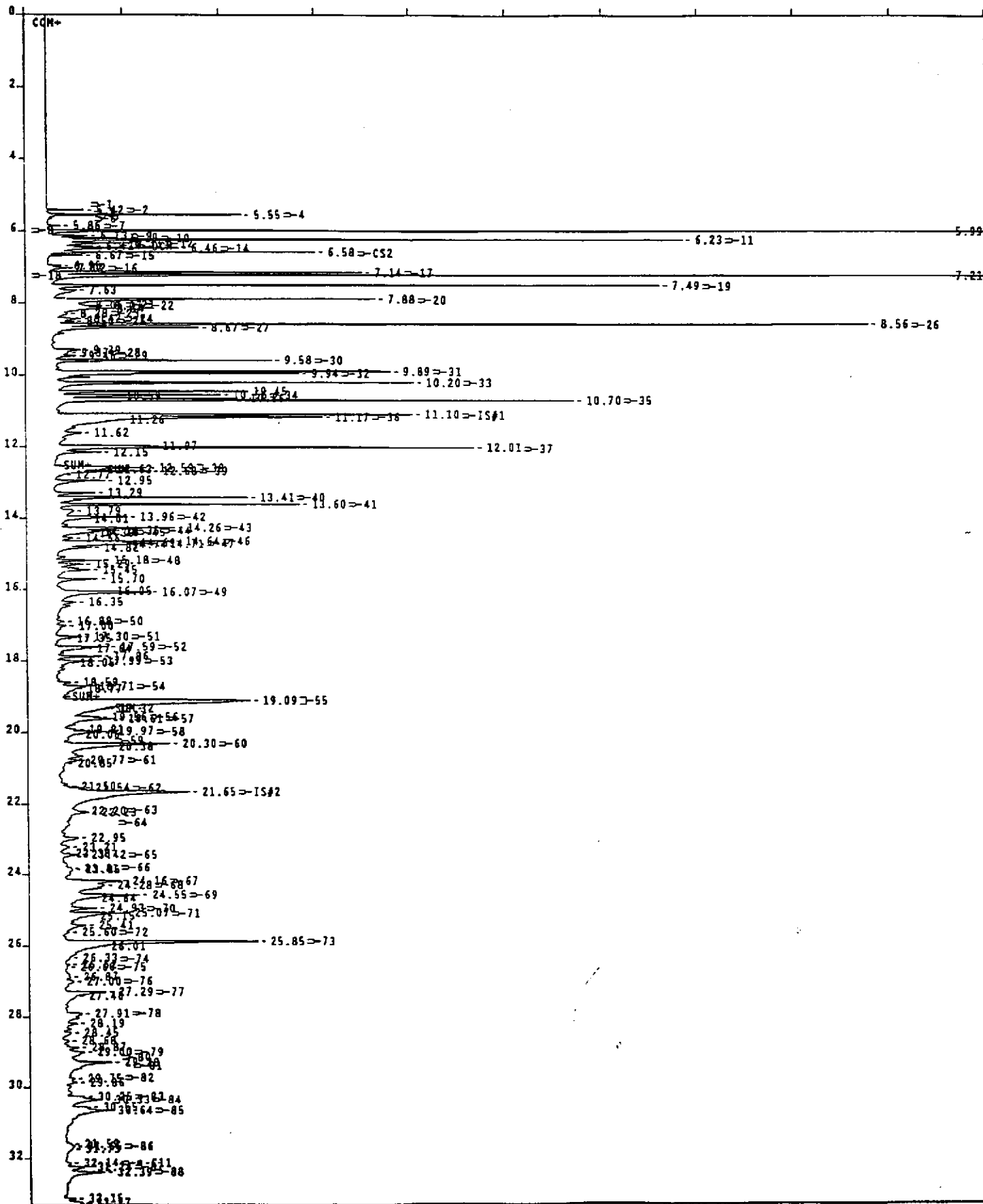
TOTAL AREA DETECTED = 3641084

Checked by Shan K. Lu Date 7/31/97

Sample Name=4027-1 (MWS + IS3-014)

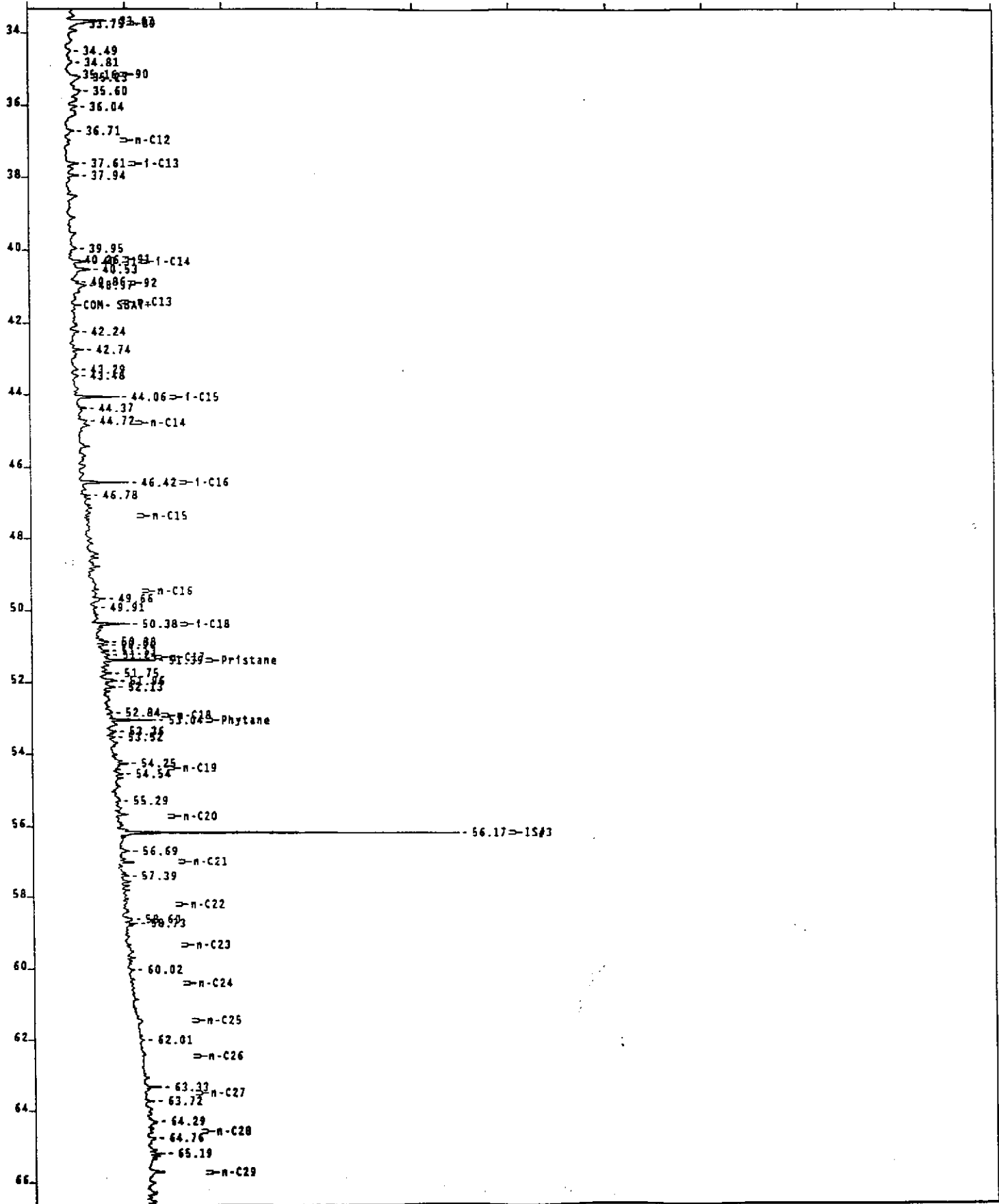
0.0 to 100.0 min. Low Y=6.293 High Y=173.076 uv Span=166.783

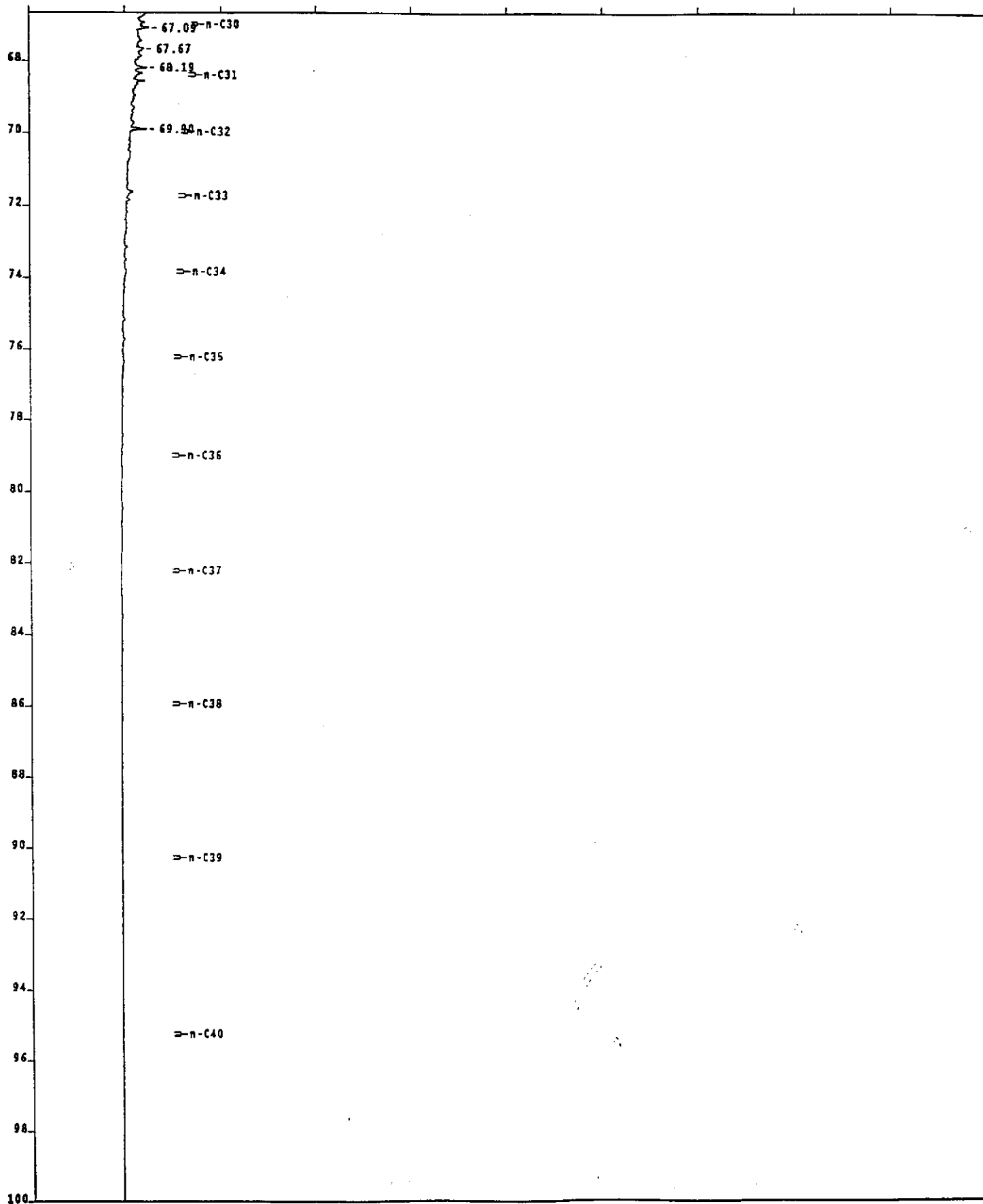




Sample Name=4027-1 (MWS + IS3-014)

33.333 to 66.667 min. Low Y=5.0 High Y=80.0 mv Span=75.0





***** Gas Chromatography by Global GeoChemistry *****

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*
* TODAY'S DATE....07-31-1997          TIME.....13:33:13
* RAW DATA FILE NAME..E:\DATA7\C344199.17R
* SAMPLE NAME.....4027-1 (MWS + IS3-014)
* DATE TAKEN..Jul 19, 1997  17:15:02
* METHOD FILE.....!!!e:\data7\C344199Q.MET
* METHOD:..Whole Oil Analysis
* CALIBRATION FILE...!!!E:\DATA7\C344199Q.CALCAL. FILE VERSION...-2
* INSTRUMENT..... HP6890 FID--FID          OPERATOR.... Lev Baycher
* RUN TIME..... 100
* AREA REJECT..... 0          COM PORT.... 7
* HEADING 1..C3-C44 Analysis
* HEADING 2..GC-analysis: method 1 (split 400:1)
* FORMAT FILE..E:\DATA7\NORMAL.FMT
*****

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***** PEAKS DETECTED IN THIS CHROMATOGRAM *****

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height
1	5.422	2	2791	2819
2	5.547	4	18704	15165
3	5.857	7	1624	1026
4	5.986	8	169098	157758
5	6.133	9	6331	3077
6	6.189	10	8427	5429
7	6.228	11	72262	49811
8	6.329	12	17143	5707
9	6.418	DCM	7900	3521
10	6.465	14	23128	10173
11	6.582	CS2	34379	20985
12	6.665	15	4252	2697
13	6.952		2262	1139
14	7.021		1801	1334
15	7.022	16	3759	1485
16	7.138	17	47247	24812
17	7.208	18	124945	79038
18	7.491	19	74470	48023
19	7.634		18426	2296
20	7.878	20	67087	25781
21	8.053	21	6178	2752
22	8.073	22	10852	4261
23	8.141		25224	4425
24	8.283	23	10175	1548
25	8.421	24	9443	2606
26	8.499	25	5437	2051
27	8.563	26	108271	64165
28	8.667	27	30266	11728
29	9.292		10138	2499
30	9.374	28	6650	1562
31	9.456	29	8634	2120
32	9.581	30	37263	17492
33	9.886	31	50015	26859
34	9.945	32	44719	19597
35	10.202	33	69265	28654
36	10.448		33309	14990

37	10.556	34	26613	13359
38	10.592		8348	4958
39	10.656		25483	14711
40	10.700	35	89586	41092
41	11.096	IS#1	78414	28516
42	11.175	36	68754	21403
43	11.258		35937	5219
44	11.619		15233	2418
45	11.975		12313	7721
46	12.008	37	76372	33284
47	12.150		14808	3899
48	12.588	38	24907	7411
49	12.629		7191	4123
50	12.676	39	23470	7679
51	12.770		4303	1006
52	12.945		16235	4135
53	13.286		11158	3376
54	13.405	40	32893	15350
55	13.601	41	43605	19415
56	13.791		16147	1664
57	13.958	42	19338	5821
58	14.010		9340	2286
59	14.265	43	25041	9487
60	14.346	44	12457	4626
61	14.380		4550	3009
62	14.394	45	8970	2776
63	14.556		7428	1581
64	14.640	46	21152	9320
65	14.689		4439	5824
66	14.709	47	20909	8090
67	14.741		9322	5170
68	14.819		14975	2975
69	15.181	48	9493	3738
70	15.289		8808	2283
71	15.452		15169	2847
72	15.704		13513	3413
73	16.047		4755	4880
74	16.070	49	38110	7412
75	16.345		7405	1667
76	16.884	50	2662	746
77	16.999		6023	869
78	17.303	51	6175	2030
79	17.354		2220	697
80	17.589	52	9629	4060
81	17.642		8009	2237
82	17.863		10148	3542
83	17.994	53	8590	2993
84	18.051		2901	907
85	18.595		4196	1122
86	18.706	54	11295	2383
87	18.774		7477	1445
88	19.092	55	134471	15194
89	19.320		34605	3849
90	19.557	56	8361	3306
91	19.606	57	24578	4551
92	19.913		6481	1496
93	19.968	58	15789	3809
94	20.056		5377	1231
95	20.301	60	38591	8751
96	20.382		19012	3792

97	20.767	61	8246	1536
98	20.851		3574	566
99	21.505		1589	821
100	21.544	62	5917	1885
101	21.651	IS#2	115153	10224
102	22.197	63	6175	1564
103	22.229		12025	2362
104	22.948		9425	1502
105	23.213		5399	824
106	23.379		691	298
107	23.419	65	6230	1497
108	23.809	66	2569	932
109	23.852		5753	1021
110	24.161	67	24845	4677
111	24.283	68	19796	3484
112	24.555	69	28674	6180
113	24.642		13071	2233
114	24.927	70	12709	2826
115	25.066	71	22106	4761
116	25.150		11678	2097
117	25.409		12994	1982
118	25.597	72	3857	672
119	25.849	73	76604	15482
120	26.008		28033	2904
121	26.334	74	3944	707
122	26.522		2641	642
123	26.597	75	2332	501
124	26.873		7661	743
125	27.000	76	7050	978
126	27.292	77	17750	3432
127	27.402		10225	1150
128	27.912	78	9972	1559
129	28.186		5848	1165
130	28.448		4383	698
131	28.677		2500	506
132	28.865		4314	1264
133	29.001	79	9717	1705
134	29.281	81	18747	3804
135	29.749	82	4045	899
136	29.858		12250	1056
137	30.253	83	4588	1613
138	30.333	84	22097	2962
139	30.554		6475	2011
140	30.640	85	17281	3165
141	31.590		1782	500
142	31.653	86	3430	733
143	31.728		4501	585
144	32.135	n-C11	1707	409
145	32.243	87	7245	1446
146	32.390	88	20692	2995
147	33.151		2733	901
148	33.273		14380	1463
149	33.667		17284	3572
150	33.752	89	6837	1254
151	34.485		6698	670
152	34.810		8194	776
153	35.156	90	3279	599
154	35.227		15544	1396
155	35.602		16060	1386
156	36.036		6652	1062

Detailed Gasoline Range (C3-C10) Hydrocarbon Analysis for
 One product sample submitted by ENTRIX, Inc.
 (relative %)

Sample	MWS	MWS
GGC ID	4027-1	4027-1D
1 Propane		
2 Isobutane	0.13	0.14
3 Isobutene		
4 Butane/Methanol	0.85	0.87
5 trans-2-Butene		
6 cis-2-Butene		
7 3-Methyl-1-butene	0.07	0.07
8 Isopentane	7.65	7.73
9 1-Pentene	0.29	0.29
10 2-Methyl-1-butene	0.38	0.39
11 Pentane	3.27	3.27
12 trans-2-Pentene	0.78	0.78
13 cis-2-Pentene/t-Butanol		
14 2-Methyl-2-butene	1.05	1.06
15 2,2-Dimethylbutane	0.19	0.19
16 Cyclopentane	0.17	0.17
17 2,3-Dimethylbutane/MTBE	2.14	2.11
18 2-Methylpentane	5.65	5.55
19 3-Methylpentane	3.37	3.32
20 Hexane	3.04	2.95
21 trans-2-Hexene	0.28	0.28
22 3-Methylcyclopentene	0.49	0.49
23 3-Methyl-2-pentene	0.46	0.42
24 cis-2-Hexene	0.43	0.39
25 3-Methyl-trans-2-pentene	0.25	0.24
26 Methylcyclopentane	4.90	4.83
27 2,4-Dimethylpentane	1.37	1.32
28 Benzene	0.30	0.30
29 5-Methyl-1-hexene	0.39	0.36
30 Cyclohexane	1.69	1.66
31 2-Methylhexane/TAME	2.26	2.24
32 2,3-Dimethylpentane	2.02	2.02
33 3-Methylhexane	3.13	3.07
34 2-Methyl-1-hexene	1.20	1.26
35 2,2,4-Trimethylpentane	4.05	3.96
ISI α, α, α -Trifluorotoluene		
36 n-Heptane	3.11	3.03
37 Methylcyclohexane	3.46	3.39
38 2,5-Dimethylhexane	1.13	1.09
39 2,4-Dimethylhexane	1.06	1.07
40 2,3,4-Trimethylpentane	1.49	1.48
41 Toluene	1.97	1.95
42 2,3-Dimethylhexane	0.88	0.88

Detailed Gasoline Range (C3-C10) Hydrocarbon Analysis for
One product sample submitted by ENTRIX, Inc.
(relative %)

Sample	MWS	MWS
GGC ID	4027-1	4027-1D
81 n-Butylbenzene	0.85	0.88
82 1,3-Dimethyl-5-ethylbenzene	0.18	0.19
83 1,4-Dimethyl-2-ethylbenzene	0.21	0.22
84 1,3-Dimethyl-4-ethylbenzene	1.00	1.00
85 1,2-Dimethyl-4-ethylbenzene	0.78	0.83
86 Undecene		
87 1,2,4,5-Tetramethylbenzene	0.33	0.32
88 1,2,3,5-Tetramethylbenzene	0.94	0.93
89 1,2,3,4-Tetramethylbenzene	0.31	0.31
90 Naphthalene	0.15	0.15
91 2-Methyl-naphthalene	0.04	0.04
92 1-Methyl-naphthalene	0.15	0.16

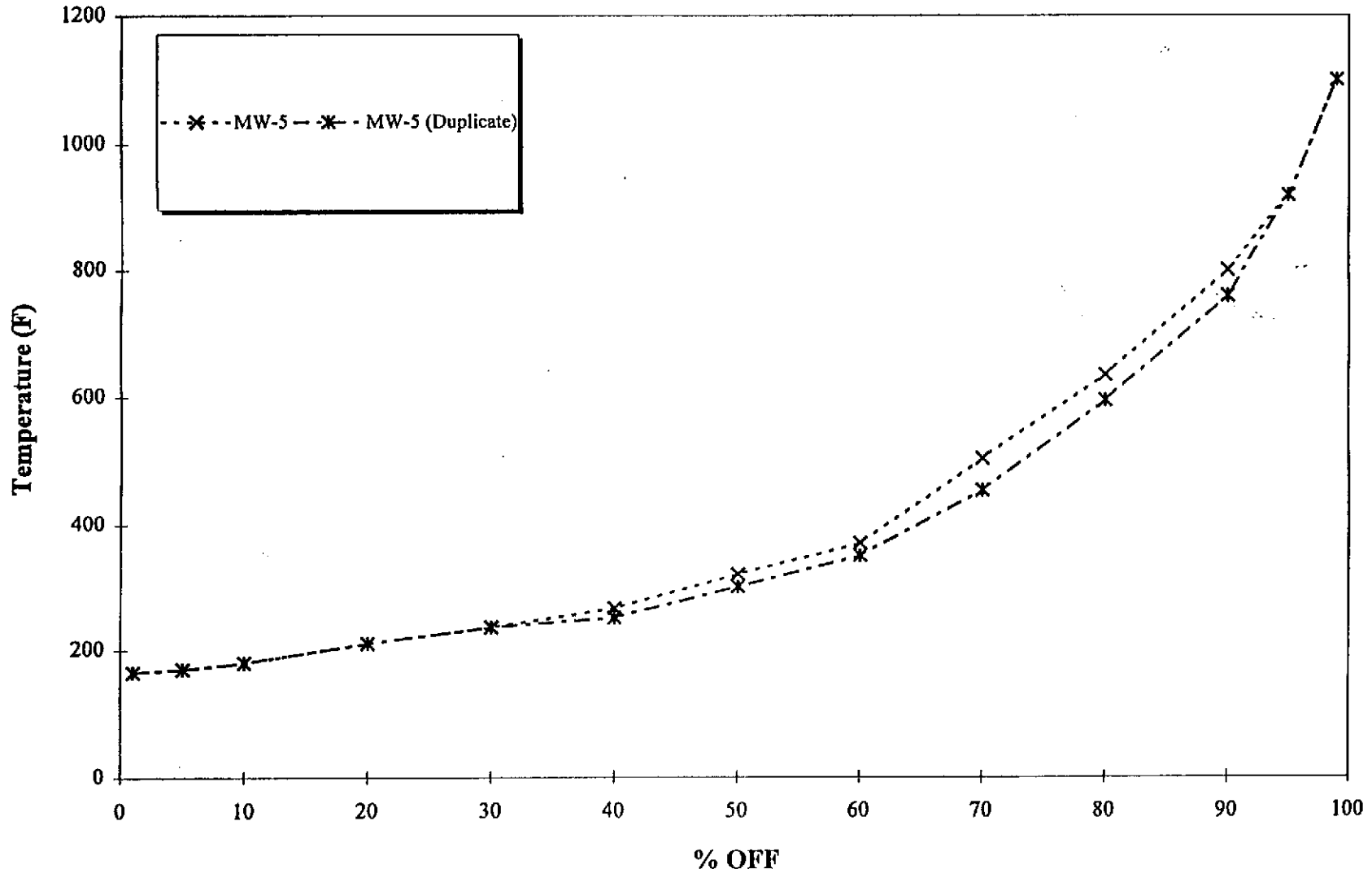
Degradation ratios and bulk composition calculated from the gasoline range (C3-C10) analysis
One product sample submitted by ENTRIX, Inc.

Sample	MWS	MWS
GGC ID	4027-1	4027-1D
Evaporation		
n-Pentane/n-Heptane	1.05	1.08
2-Methylpentane/2-Methylheptane	4.99	4.78
Waterwashing		
Benzene/Cyclohexane	0.18	0.18
Toluene/Methylcyclohexane	0.57	0.58
Aromatics/Total Paraffins(n+iso+cyc)	0.35	0.36
Aromatics/Naphthenes	2.23	2.30
Biodegradation		
(C4-C8 Para+Isopara)/C4-C8 Olefins	8.63	8.61
3-Methylhexane/n-Heptane	1.01	1.02
Methylcyclohexane/n-Heptane	1.11	1.12
Isoparaffins+Naphthenes/Total Paraffins	4.39	4.41
Octane rating		
2,2,4-Trimethylpentane/Methylcyclohexane	1.17	1.17
Relative percentages - Bulk hydrocarbon composition as PIANO		
‡ Paraffinic	12.82	12.69
‡ Isoparaffinic	45.44	45.29
‡ Aromatic	24.25	24.70
‡ Naphthenic	10.86	10.72
‡ Olefinic	6.62	6.59



Supervisor

Simulated Distillation Curve(s) (ASTM 2887)



ENTRIX, Inc.
590 Ygnacio Valley Road
Suite 200
Walnut Creek, CA 94596
(510) 935-9920
(510) 935-5368 FAX

351301

July 16, 1997

Mr. Ian Kaplan
Global Geochemistry Corporation
6919 Eton Ave.
Canoga Park, CA 91303

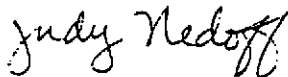
Re: Enclosed Free Product Sample

Dear Mr. Kaplan,

Please analyze the enclosed sample MWS as whole oil and sim-distillation according to ASTM 2887. Please send results to Bob Haddad and invoice directly to ENTRIX referring to project number 351301. Please call Bob Haddad or myself with any questions. Thank you for your assistance.

Sincerely,

ENTRIX, Inc.



Judy Nedoff
Chemist

JN/jn

cc:
Bob Haddad

LLLLL
LLLLL
LLLLL
LLLLL



GLOBAL
GEOCHEMISTRY
CORPORATION

E-mail: globalg1@idt.net
FAX: (818) 992-8940

6919 ETON AVENUE • CANOGA PARK • CALIFORNIA 91303-2194

(818) 992-4103

August 7, 1998

Ms. Tina Berry
Tosco Marketing Company
2000 Crow Canyon, Suite 400
San Ramon, CA 94583

Re: Unocal #7376 - 4191 First Street, Pleasanton, California

Dear Ms. Berry:

I have examined the analytical data derived from the chemical analysis of two soil samples. Several different analytical procedures were used to derive the information needed for interpretation.

The samples were first extracted with carbon disulfide and an aliquot of the extract was injected into a gas chromatograph with an FID detector calibrated to measure the amount and time of elution of a series of n-alkanes at various elution times. This is known as a Simulated Distillation Method developed by ASTM. The curves showed that there is a small amount of volatile components and a larger proportion of semi-volatile and high boiling components, with final boiling temperatures exceeding 1300°F. Based on the curves generated by this method, it is evident that sample B-11-10.5 has a dominantly higher boiling point than sample B-11-61 (see Figure 1).

Because of the presence of a low boiling point components, the soil samples were tested for the presence of gasoline range hydrocarbons using a purge and trap coupled to a gas chromatograph with an FID detector. The results shown in Tables 1 and 2 and the attached chromatograms demonstrate that the low boiling fuel component is a low octane (regular) gasoline. Sample B-11-61 appears to show very little weathering, whereas sample B-11-10.5 is more weathered. This latter sample is highly concentrated in the BTEX hydrocarbons, which constitute about 54% of the total light end composition. This finding suggests that the volatile fuel component appears to constitute a mixture of gasoline and refined aromatics.

Evidence for the presence of a relatively recently released gasoline (post-1987) comes from the presence of MTBE in both sample B-11-61 and sample B-11-10.5. The latter sample contains about ten times higher concentration than B-11-61 (i.e., 2520 versus 228 $\mu\text{g}/\text{kg}$, see Table 3).

Another portion of soil was extracted with methylene chloride and the extracts were analyzed using gas chromatography. The results of analyses are shown in Figures 2-4 and a reference diesel chromatogram is shown in Figure 5. The chromatograms (in duplicate) for sample B-11-61 (Figures 2 and 3) illustrates a highly weathered mid-range to high boiling hydrocarbon component. The individual peaks represent iso-alkanes with no n-alkanes (n-paraffins) present. The gas chromatogram for sample extract B-11-10.5 (Figure 4) demonstrates a very severely weathered component with no recognizable individual peaks (except the internal standard).

To confirm the composition of the soil extracts, they were further analyzed by GC-mass spectrometry. The data shown in the package labeled Figures 6 plus are the mass chromatograms generated at different ion fragments. The data show that sample B-11-61 has a wide range of hydrocarbons from about C_{10} to $>C_{20}$. It has a suite of iso-alkanes, methylcyclohexanes, C_4 -alkylbenzenes, terpanes and steranes all characteristic of a wide-carbon-range petroleum product. This wide range is also visible from the distribution pattern in the bar diagram displaying the PAH compounds. This pattern is indicative of a weathered crude oil. Present in only trace amounts in the PAH measurements are the "pyrogenic" hydrocarbons. This argues against the petroleum derivative being a refined product, such as heating oil #6 or Bunker C oil. Sample B-11-10.5 has almost no recognizable hydrocarbons remaining, with the exception of the highly resistant terpanes and steranes. Among the polynuclear aromatic hydrocarbons, the monoaromatic- and triaromatic steranes dominate with only very small amounts of other PAH compounds. This attests to the state of degradation of the hydrocarbon suite. Because of the state of degradation of the hydrocarbons in sample B-11-10.5 it is more difficult to assign a fuel origin, however, the lack of "pyrogenic" PAH compounds in this sample also suggests that it is a crude oil.

To summarize, hydrocarbons in the soil represent a mixture of about 10% gasoline and 90% semi-volatile and high boiling components identified as crude oil. Whereas the gasoline fraction is not highly weathered, the crude oil fraction varies from highly weathered (B-11-61) to very severely weathered (B-11-10.5).

Sincerely,



Isaac Kaplan, Ph.D.
President

A4483-report.wpd

TABLES

Table 1

Detailed Gasoline Range (C3-C10) Hydrocarbon Analysis for two soil samples submitted by Unocal
(relative %)

Sample	B-11-61	B-11-61	B-11-10.5
GGC ID	4483-1	4483-1D	4483-2
1 Propane	0.01	0.01	0.05
2 Isobutane	0.17	0.19	0.05
3 Isobutene			0.04
4 Butane/Methanol	0.48	0.53	
5 trans-2-Butene			
6 cis-2-Butene	0.03	0.03	
7 3-Methyl-1-butene	0.04	0.04	
8 Isopentane	4.06	4.39	0.34
9 1-Pentene	0.18	0.18	
10 2-Methyl-1-butene	0.13	0.14	0.02
11 Pentane	1.95	2.03	0.17
12 trans-2-Pentene	0.42	0.46	0.03
13 cis-2-Pentene/t-Butanol	0.18	0.19	
14 2-Methyl-2-butene	0.62	0.66	0.28
15 2,2-Dimethylbutane	0.13	0.13	0.05
16 Cyclopentane	0.18	0.18	0.01
17 2,3-Dimethylbutane/MTBE	1.39	1.45	4.09
18 2-Methylpentane	4.12	4.26	1.38
19 3-Methylpentane	2.54	2.62	1.03
20 Hexane	2.59	2.67	1.03
21 trans-2-Hexene	0.42	0.43	0.06
22 3-Methylcyclopentene	0.46	0.48	0.63
23 3-Methyl-2-pentene	0.33	0.31	0.10
24 cis-2-Hexene	0.45	0.46	0.67
25 3-Methyl-trans-2-pentene	0.07	0.07	0.05
26 Methylcyclopentane	4.30	4.35	4.47
27 2,4-Dimethylpentane	0.94	1.01	0.68
28 Benzene	1.50	1.60	28.18
29 5-Methyl-1-hexene	0.21	0.21	0.21
30 Cyclohexane	1.60	1.61	2.26
31 2-Methylhexane/TAME	2.35	2.47	1.69
32 2,3-Dimethylpentane	1.41	1.50	1.47
33 3-Methylhexane	2.54	2.68	2.32
34 2-Methyl-1-hexene	1.77	1.82	1.60
35 2,2,4-Trimethylpentane	2.73	3.00	1.85
IS1 α,α,α -Trifluorotoluene			
36 n-Heptane	2.51	2.62	2.24
37 Methylcyclohexane	4.63	4.49	4.27
38 2,5-Dimethylhexane	1.31	1.37	1.34
39 2,4-Dimethylhexane	0.92	0.99	0.84
40 2,3,4-Trimethylpentane	2.00	2.06	2.35
41 Toluene	13.69	13.60	11.63
42 2,3-Dimethylhexane	0.59	0.62	0.57

Table 1 (cont)

Detailed Gasoline Range (C3-C10) Hydrocarbon Analysis for two soil samples submitted by Unocal
(relative %)

Sample	B-11-61	B-11-61	B-11-10.5
GGC ID	4483-1	4483-1D	4483-2
43 2-Methylheptane	1.32	1.18	0.82
44 4-Methylheptane	0.42	0.45	0.35
45 3,4-Dimethylhexane	0.23	0.24	0.20
46 3-Ethyl-3-methylpentane	1.22	1.30	0.98
47 3-Methylheptane	0.24	0.25	0.22
48 2-Methyl-1-heptene	0.57	0.59	0.27
49 n-Octane	1.03	1.09	0.56
50 2,2-Dimethylheptane	0.20	0.21	0.05
51 2,4-Dimethylheptane	0.19	0.19	0.04
52 Ethylcyclohexane	0.32	0.31	0.06
53 2,6-Dimethylheptane	0.19	0.20	0.07
54 Ethylbenzene	4.11	3.80	4.49
55 m + p Xylenes	9.93	9.00	11.03
56 4-Methyloctane	0.26	0.26	0.08
57 2-Methyloctane	0.42	0.43	0.08
58 3-Ethylheptane	0.51	0.52	0.08
59 3-Methyloctane	0.22	0.22	0.04
60 o-Xylene	3.76	3.39	1.91
61 1-Nonene			
62 n-Nonane	0.36	0.36	0.02
IS2 p-Bromofluorobenzene			
63 Isopropylbenzene	0.30	0.27	0.11
64 3,3,5-Trimethylheptane	0.03	0.03	
65 2,4,5-Trimethylheptane	0.23	0.22	
66 n-Propylbenzene	0.72	0.69	0.11
67 1-Methyl-3-ethylbenzene	1.75	1.63	0.16
68 1-Methyl-4-ethylbenzene	0.78	0.72	0.11
69 1,3,5-Trimethylbenzene	0.61	0.58	
70 3,3,4-Trimethylheptane	0.18	0.17	
71 1-Methyl-2-ethylbenzene	0.63	0.59	0.03
72 3-Methylnonane	0.15	0.15	
73 1,2,4-Trimethylbenzene	1.51	1.40	
74 Isobutylbenzene	0.12	0.13	
75 sec-Butylbenzene	0.09	0.09	
76 n-Decane	0.12	0.12	0.05
77 1,2,3-Trimethylbenzene	0.34	0.35	
78 Indan	0.40	0.40	0.01
79 1,3-Diethylbenzene	0.14	0.13	
80 1,4-Diethylbenzene	0.08	0.08	

Table 1 (cont)

Detailed Gasoline Range (C3-C10) Hydrocarbon Analysis for two soil samples submitted by Unocal
(relative %)

Sample	B-11-61	B-11-61	B-11-10.5
GGC ID	4483-1	4483-1D	4483-2
81 n-Butylbenzene	0.08	0.07	
82 1,3-Dimethyl-5-ethylbenzene	0.04	0.04	
83 1,4-Dimethyl-2-ethylbenzene	0.05	0.05	
84 1,3-Dimethyl-4-ethylbenzene	0.06	0.07	
85 1,2-Dimethyl-4-ethylbenzene	0.04	0.04	
86 Undecene			
87 1,2,4,5-Tetramethylbenzene			
88 1,2,3,5-Tetramethylbenzene			
89 1,2,3,4-Tetramethylbenzene	0.08	0.09	
90 Naphthalene			
91 2-Methyl-naphthalene			
92 1-Methyl-naphthalene			

Table 2

Degradation ratios and bulk composition calculated from the gasoline range (C3-C10) analysis for two soil samples submitted by Unocal

Sample	B-11-61	B-11-61	B-11-10.5
GGC ID	4483-1	4483-1D	4483-2
Evaporation			
n-Pentane/n-Heptane	0.78	0.77	0.08
2-Methylpentane/2-Methylheptane	3.12	3.62	1.68
Waterwashing			
Benzene/Cyclohexane	0.93	1.00	12.46
Toluene/Methylcyclohexane	2.96	3.03	2.73
Aromatics/Total Paraffins(n+iso+cyc)	0.71	0.65	1.40
Aromatics/Naphthenes	3.42	3.28	4.83
Biodegradation			
(C4-C8 Para+Isopara)/C4-C8 Olefins	7.38	7.49	7.20
3-Methylhexane/n-Heptane	1.01	1.02	1.04
Methylcyclohexane/n-Heptane	1.84	1.71	1.91
Isoparaffins+Naphthenes/Paraffins	4.88	4.85	8.28
Octane rating			
2,2,4-Trimethylpentane/Methylcyclohexane	0.59	0.67	0.43
Relative percentages - Bulk hydrocarbon composition as PLANO			
† Paraffinic	9.35	9.71	4.31
† Isoparaffinic	34.28	35.78	24.13
† Aromatic	38.95	36.98	55.85
† Naphthenic	11.38	11.28	11.57
† Olefinic	6.05	6.24	4.14

Table 3

Date sampled:6/9/98
 Date analyzed:7/29/98
 Sample type: Soil
 Method:GGC (OXY)

Oxygenate data for samples submitted by Tosco

Sample ID	GGC ID	Ethanol	tert-Butanol	MTBE	DIPE	ETBE	TAME
		µg/kg					
Method Blank:		<200	<40	<2	<2	<10	<10
B-11-61	4483-1	<1000	<200	228	<10	<50	<50
B-11-10.5	4483-2	<2000	<400	2520	<20	<100	<100

MTBE:Methyl tert-Butyl Ether
 DIPE: Diisopropyl Ether
 ETBE: Ethyl tert-Butyl Ether
 TAME: tert-Amyl Methyl Ether

Table 4

Concentration of extracts and hydrocarbon fractions for samples submitted by Unocal

Sample ID	GGC ID	Sample Weight for Extraction (g)	Extract Weight (mg)	Sample Concentration (mg/g)	Saturate+ Aromatic (%)	Polar+ Asphaltenes (%)
B-11-61	4483-1	30.2	172	5.70	77.1	22.9
B-11-10.5	4483-2	15.0	178	11.9	31.3	68.7



Figure 1: Simulated Distillation Curves
Global Geochemistry Corporation

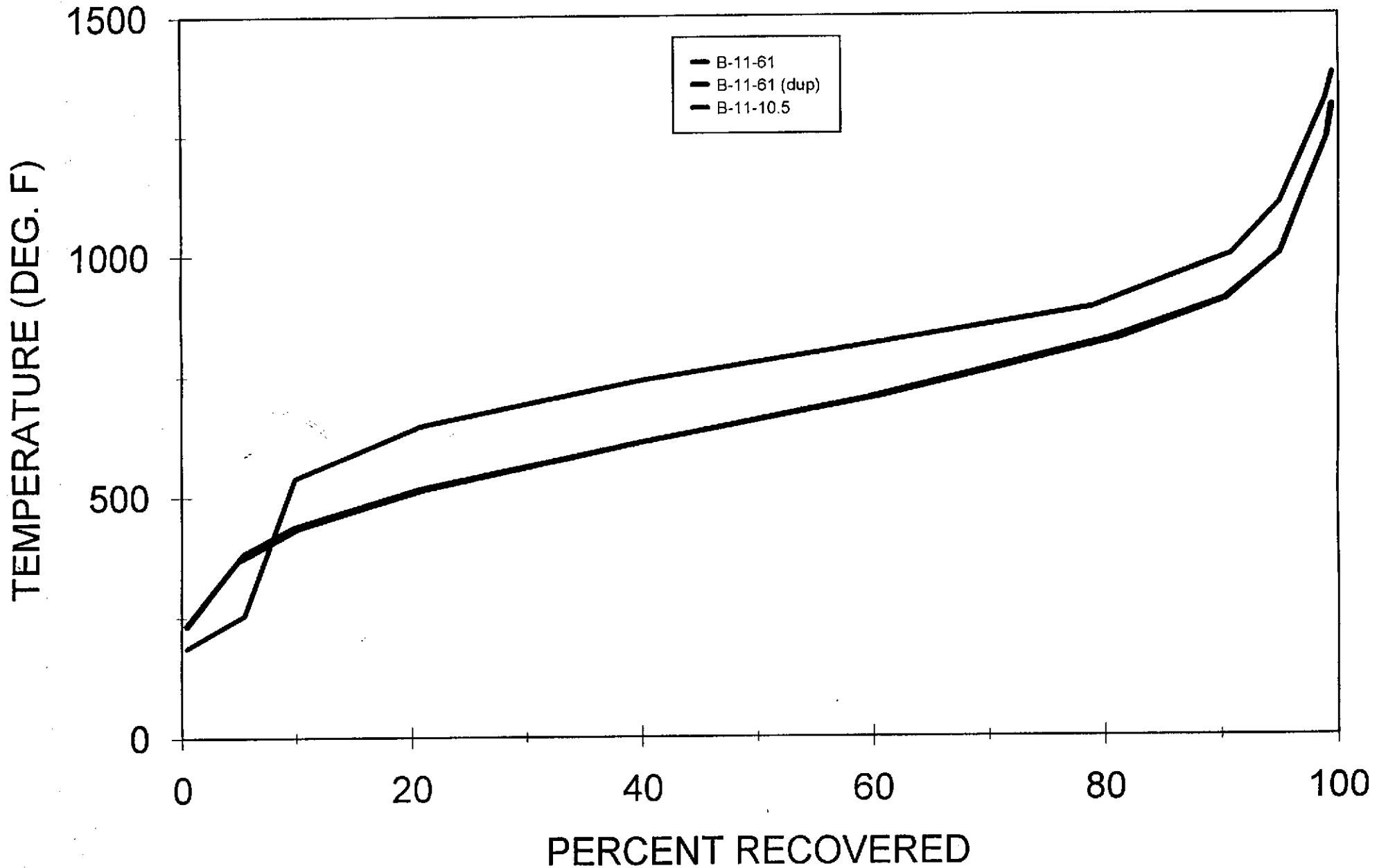


Figure 2 - Sample B-11-61, gas chromatogram of soil extract

B-11-61 (4483-1) 3.0 of 1300ul + (IS) .3ul inj.2

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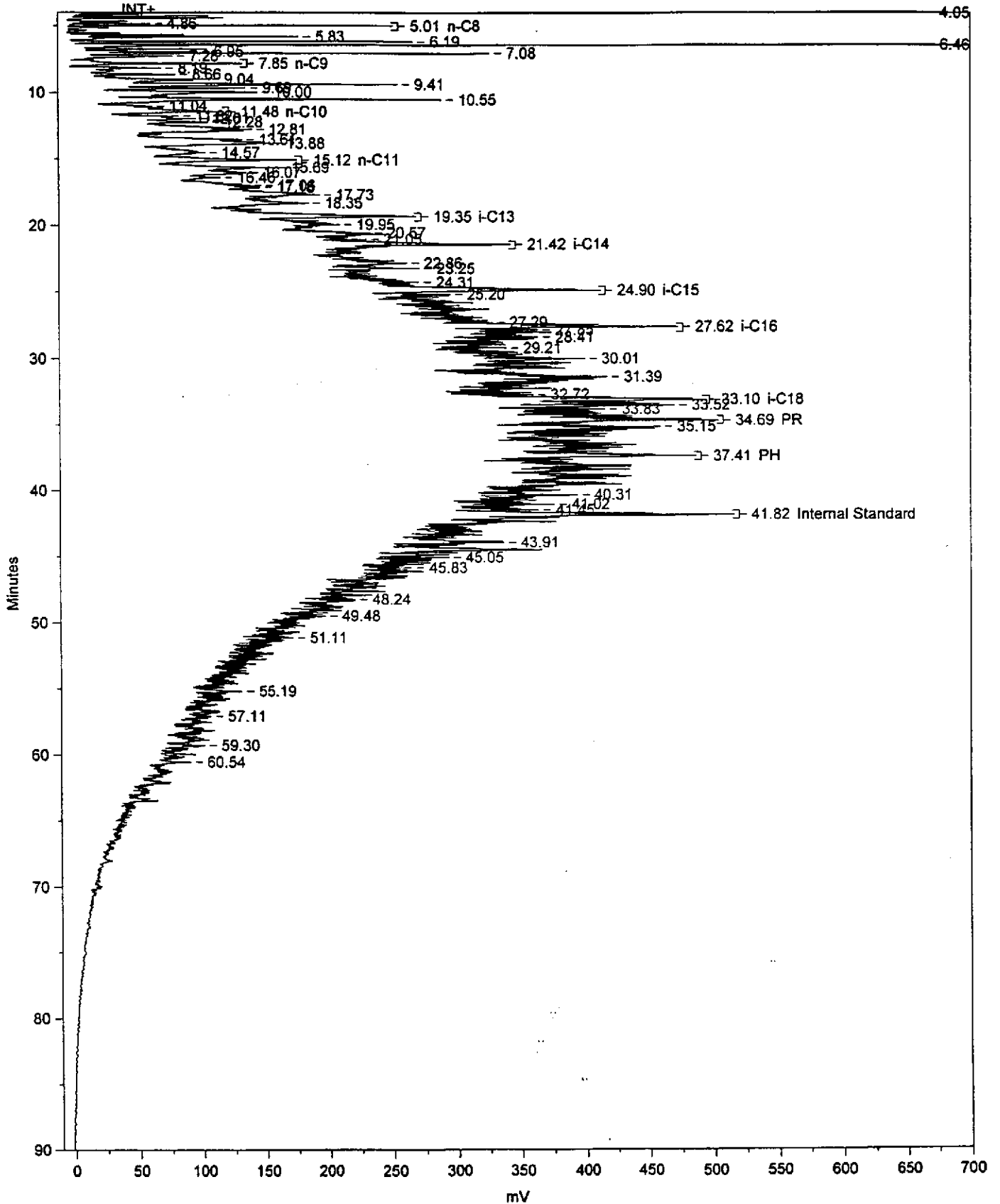


Figure 3 - Sample B-11-61 (duplicate), gas chromatogram of soil extract

B-11-61 (4483-1D) 3.0 of 2000ul + (IS) .3ul inj.1

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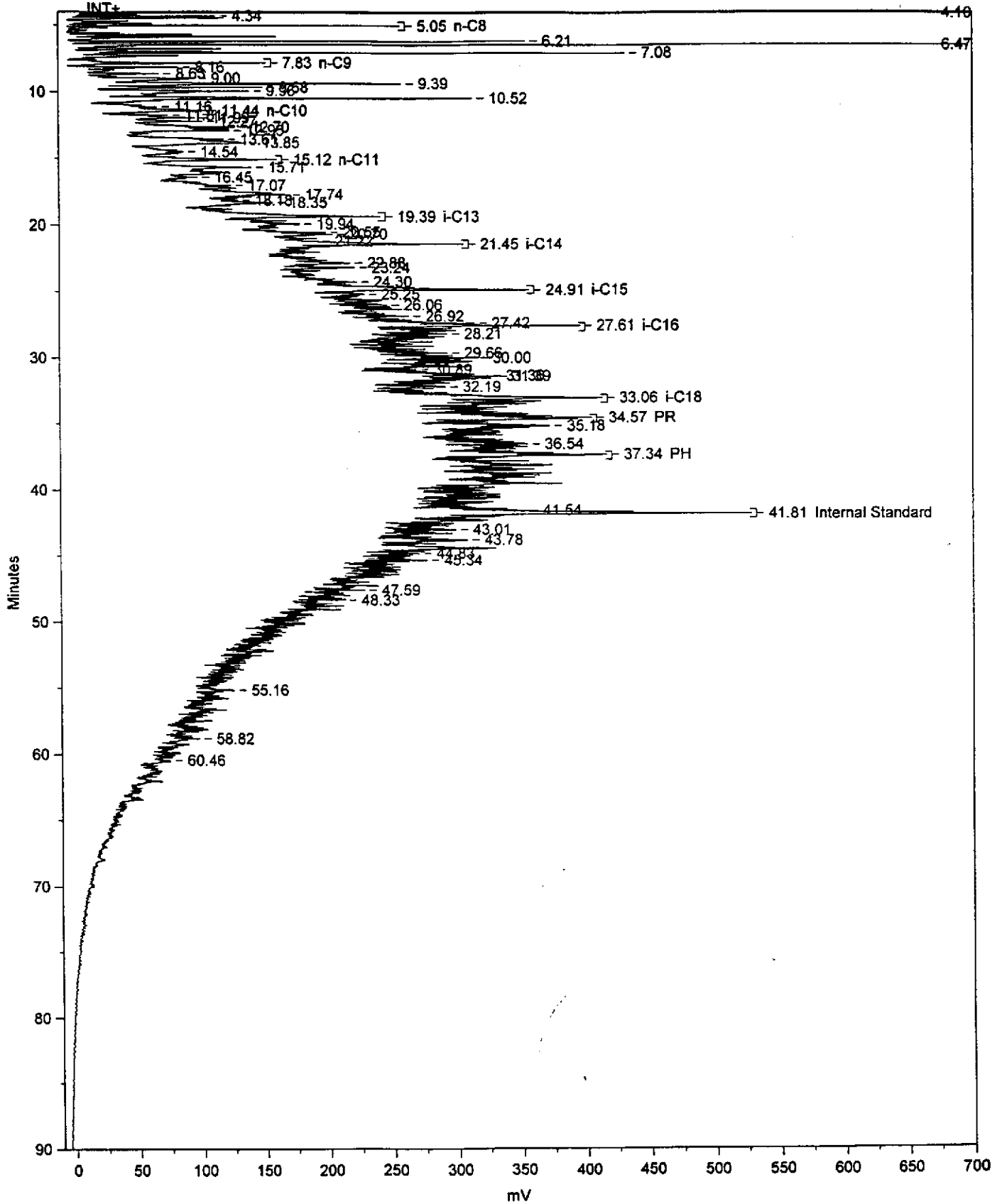
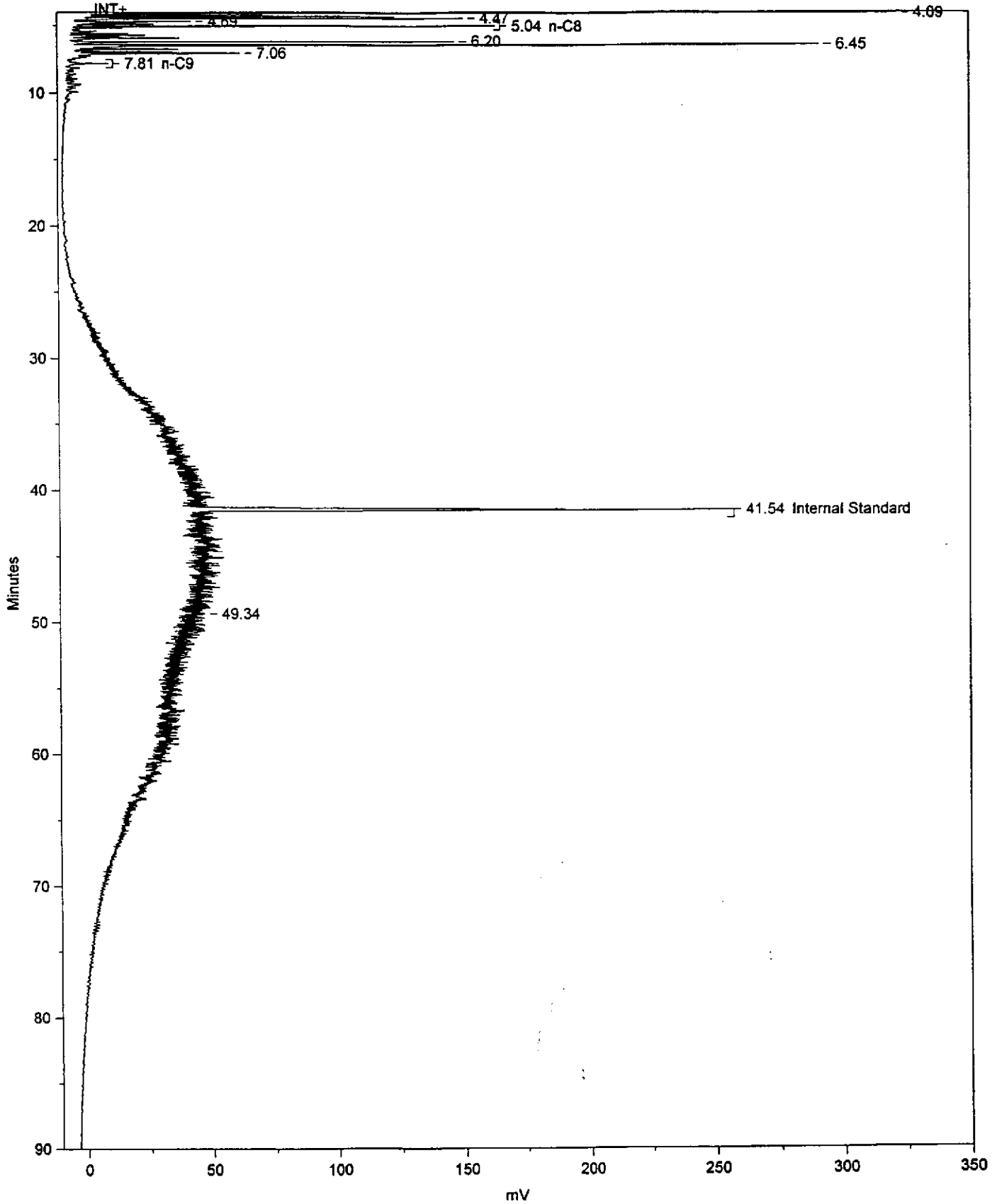


Figure 4 - Sample B-11-10.5, gas chromatogram of soil extract

B-11-10.5 (4483-2) 3.0 of 2000ul + (IS) .3ul inj.1

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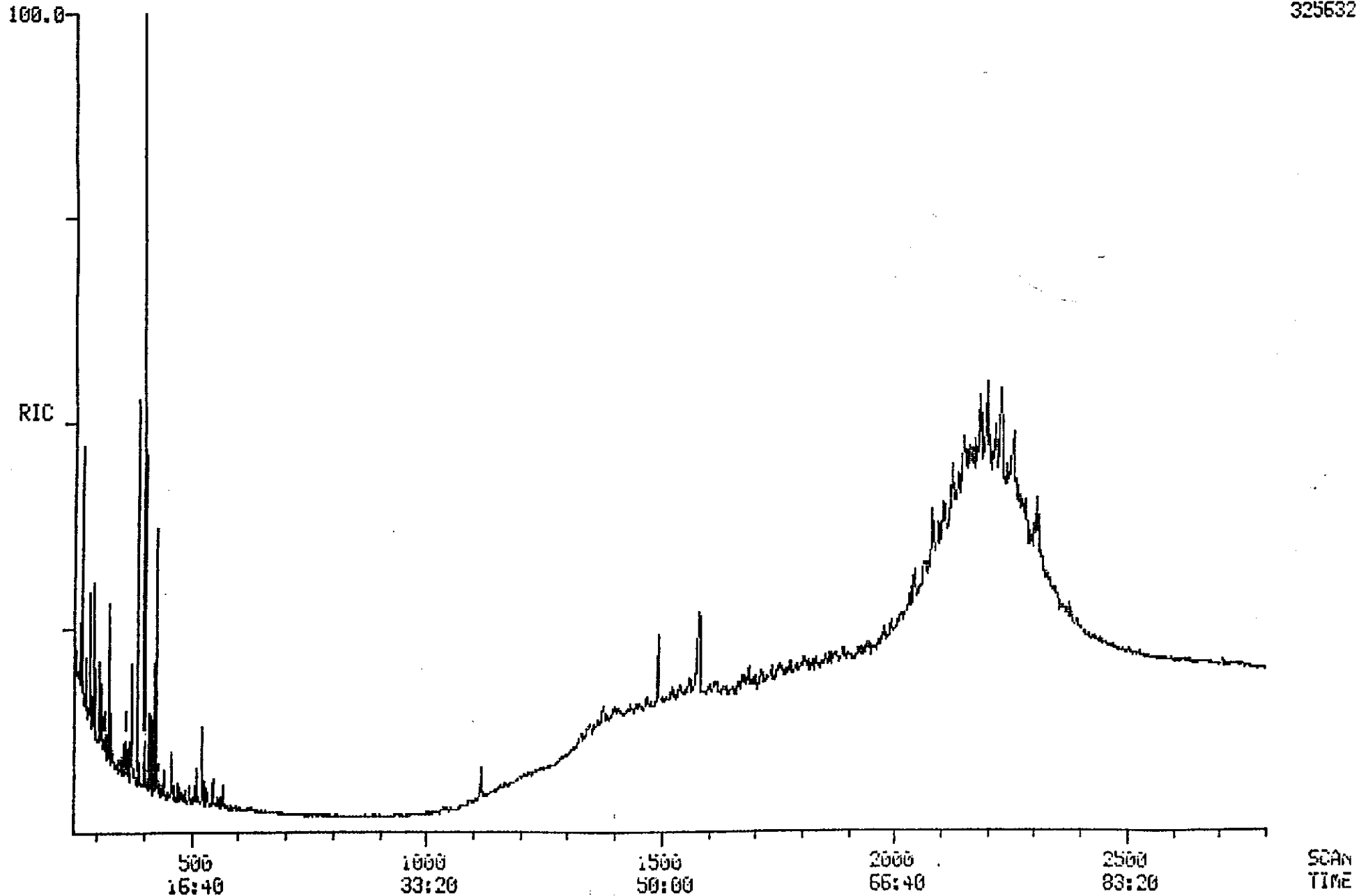


FIGURES 6+

**MASS CHROMATOGRAMS OF
THE EXTRACTS OF TWO SOILS
(B-11-61 & B-11-10.5)
ANALYZED AT VARIOUS MASS
FRAGMENTS**

RIC DATA: G8366 #1 SCANS 250 TO 2800
07/23/98 11:13:00 CALI: G8366 #1
SAMPLE: B-11-10.5 (A4483-2) ALI+AROM 1.0UL OF 275UL +0.5UL STD
CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN
RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

325632.



MASS CHROMATOGRAM

DATA: G8366 #1

SCANS 250 TO 2700

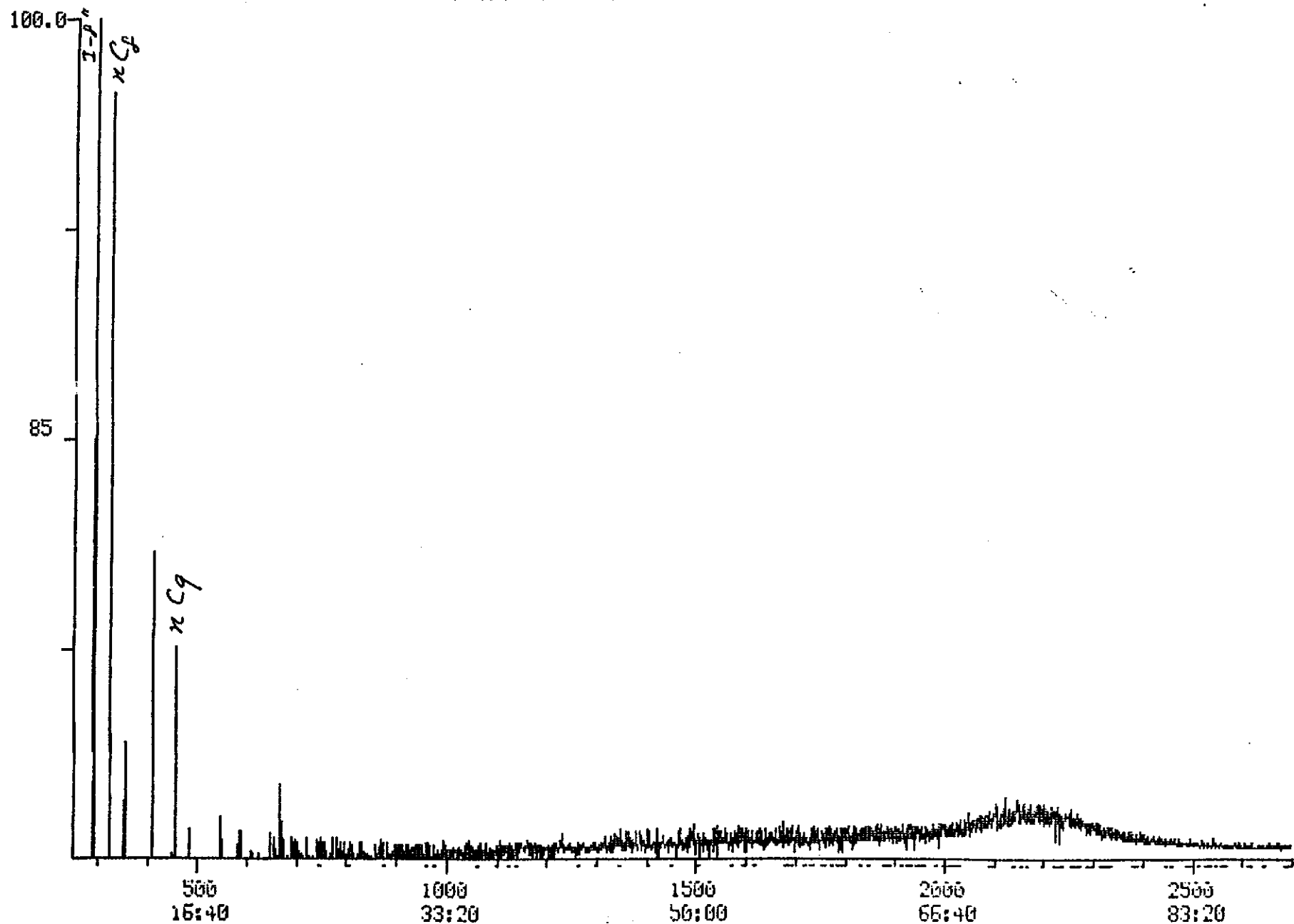
07/23/96 11:13:00

CALI: G8366 #1

SAMPLE: B-11-10.5 (A4483-2) ALI+AROM 1.0UL OF 275UL +0.5UL STD

CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



16448.

85.025
± 0.500

MASS CHROMATOGRAM

07/23/98 9:14:00

SAMPLE: B-11-61 (A4483-1) ALI+AROM 1.0UL OF 935UL +0.5UL STD

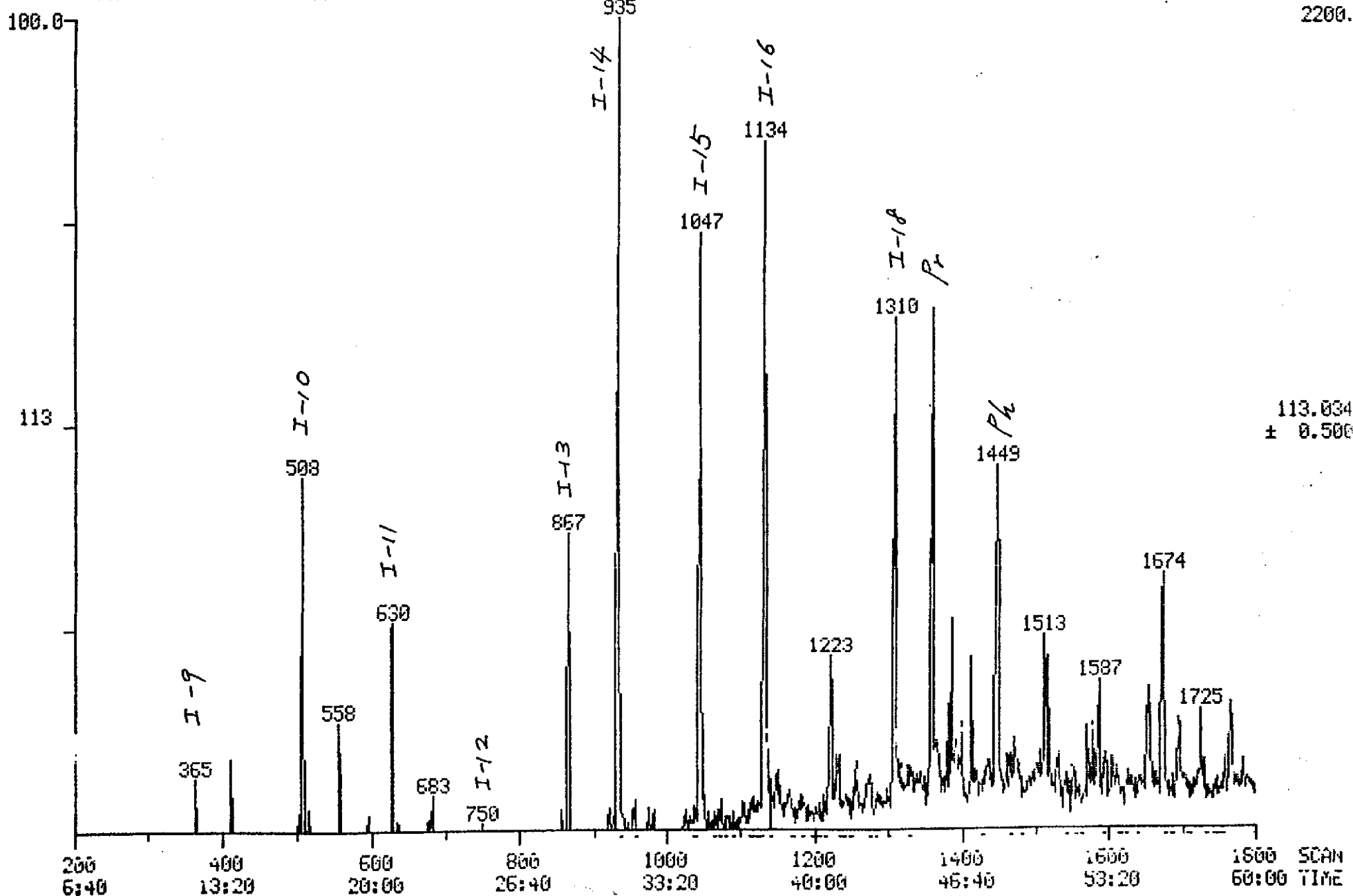
CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: G8365 #1

SCANS 200 TO 1800

CALI: G8365 #1



MASS CHROMATOGRAM

DATA: G8366 #1

SCANS 200 TO 1800

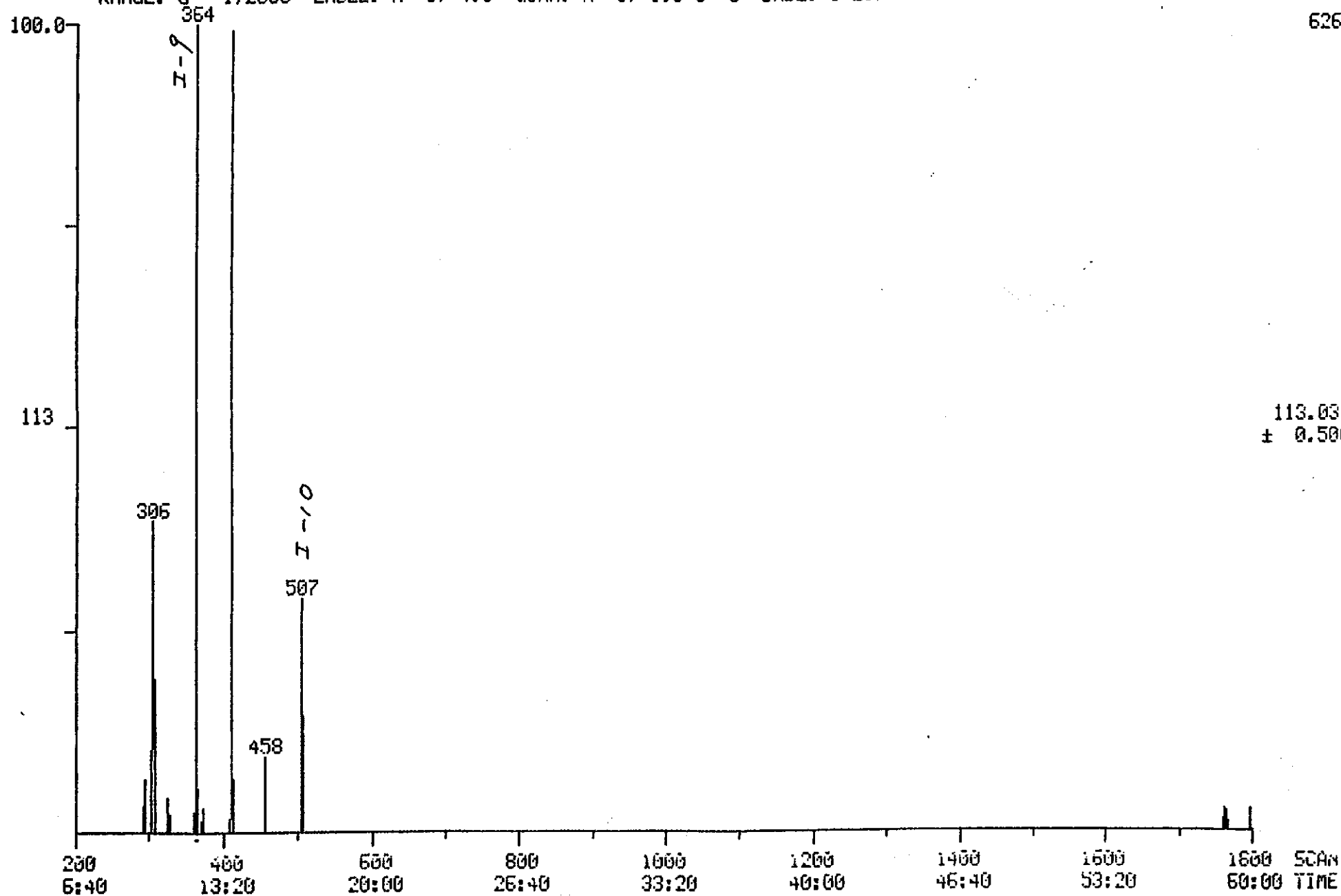
07/23/98 11:13:00

CALI: G8366 #1

SAMPLE: B-11-10.5 (A4483-2) ALI+AROM 1.0UL OF 275UL +0.5UL STD

CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



MASS CHROMATOGRAM

07/23/98 9:14:00

SAMPLE: B-11-61 (A4483-1) ALI+AROM 1.0UL OF 935UL +0.5UL STD

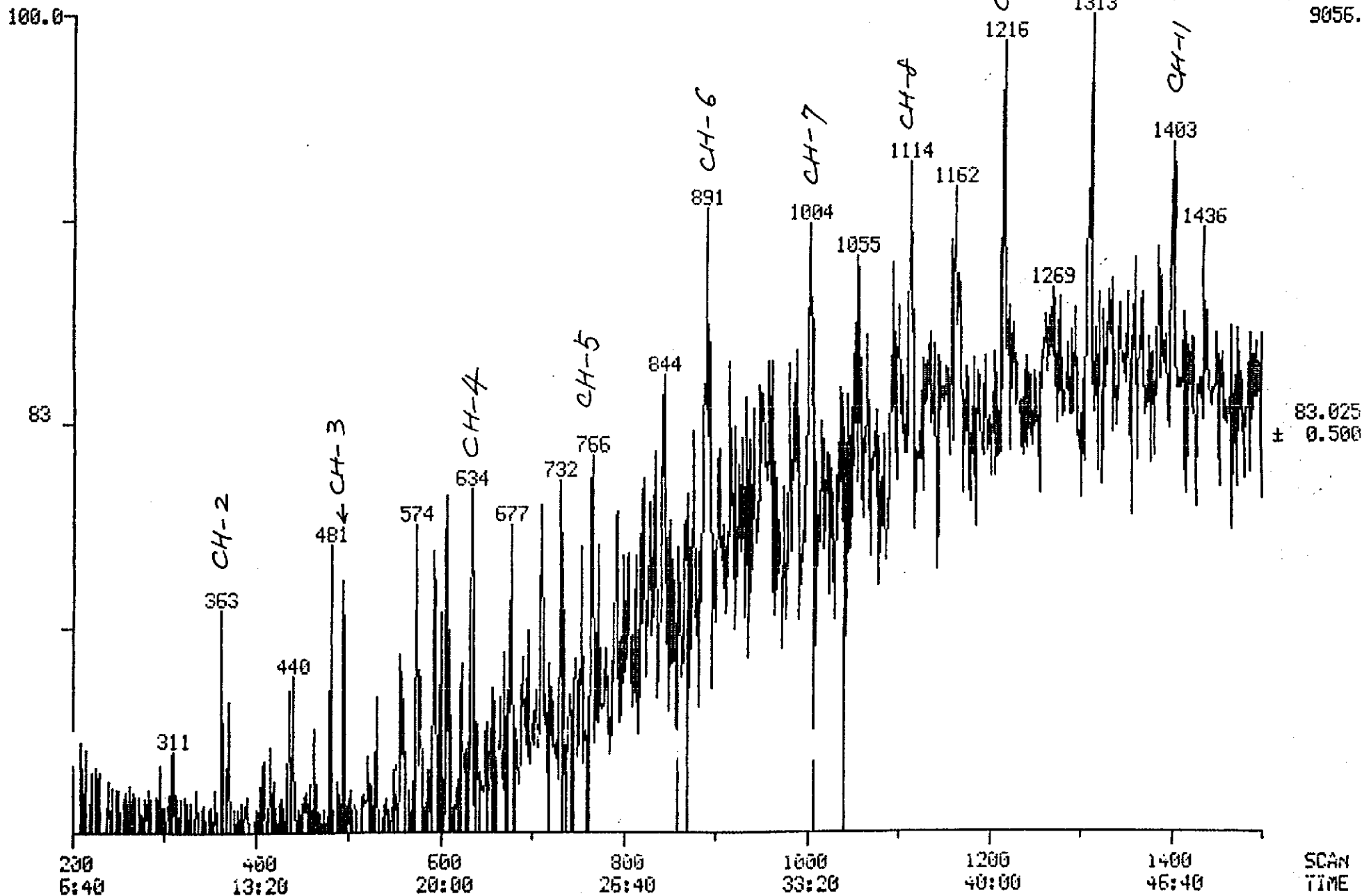
CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: G8365 #1

SCANS 200 TO 1500

CALI: G8365 #1



MASS CHROMATOGRAM

DATA: G8365 #1

SCANS 200 TO 1500

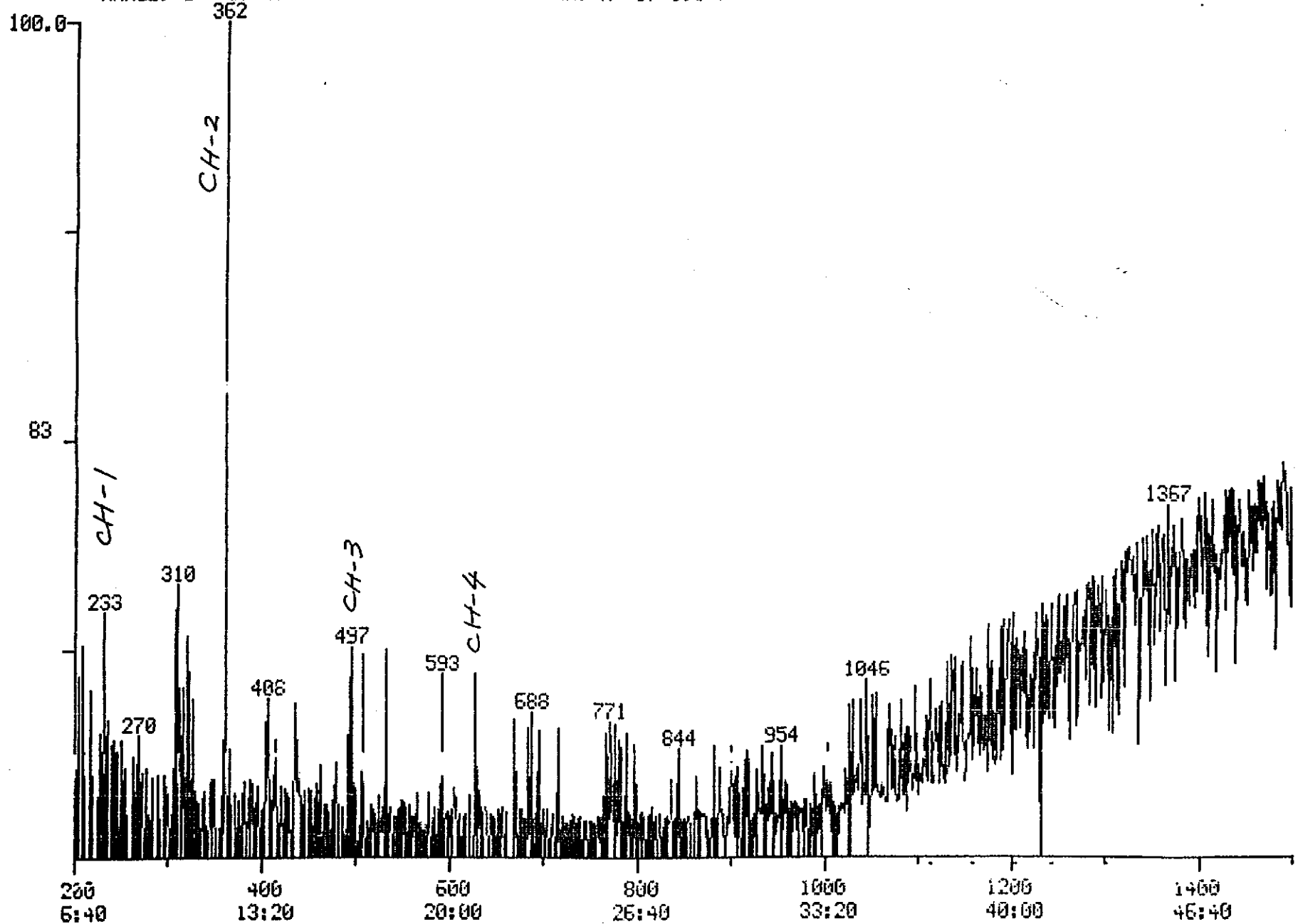
07/23/98 11:13:00

CALI: G8365 #1

SAMPLE: B-11-10.5 (A4483-2) ALI+AROM 1.0UL OF 275UL +0.5UL STD

CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



5136

83.02%
± 0.50%

Scan
TIME

Table

Key for C₄-Alkylbenzenes (m/z 134 chromatogram)

16	Sec-Butylbenzene
17	1-Methyl-3-Isopropylbenzene
18	1-Methyl-4-Isopropylbenzene
19	1-Methyl-2-Isopropylbenzene
20	1,3-Diethylbenzene
21	1-Methyl-3-Propylbenzene
22	Butylbenzene
23	1,3-Dimethyl-5-Ethylbenzene
24	1,2-Diethylbenzene
25	1-Methyl-2-Propylbenzene
26	1,4-Dimethyl-2-Ethylbenzene
27	1,3-Dimethyl-4-Ethylbenzene
28	1,2-Dimethyl-4-Ethylbenzene
29	1,3-Dimethyl-2-Ethylbenzene
30	1,2-Dimethyl-3-Ethylbenzene
31a	1,2,4,5-Tetramethylbenzene
31	1,2,3,5-Tetramethylbenzene
32	1,2,3,4-Tetramethylbenzene

MASS CHROMATOGRAM

DATA: G8365 #1

SCANS 550 TO 800

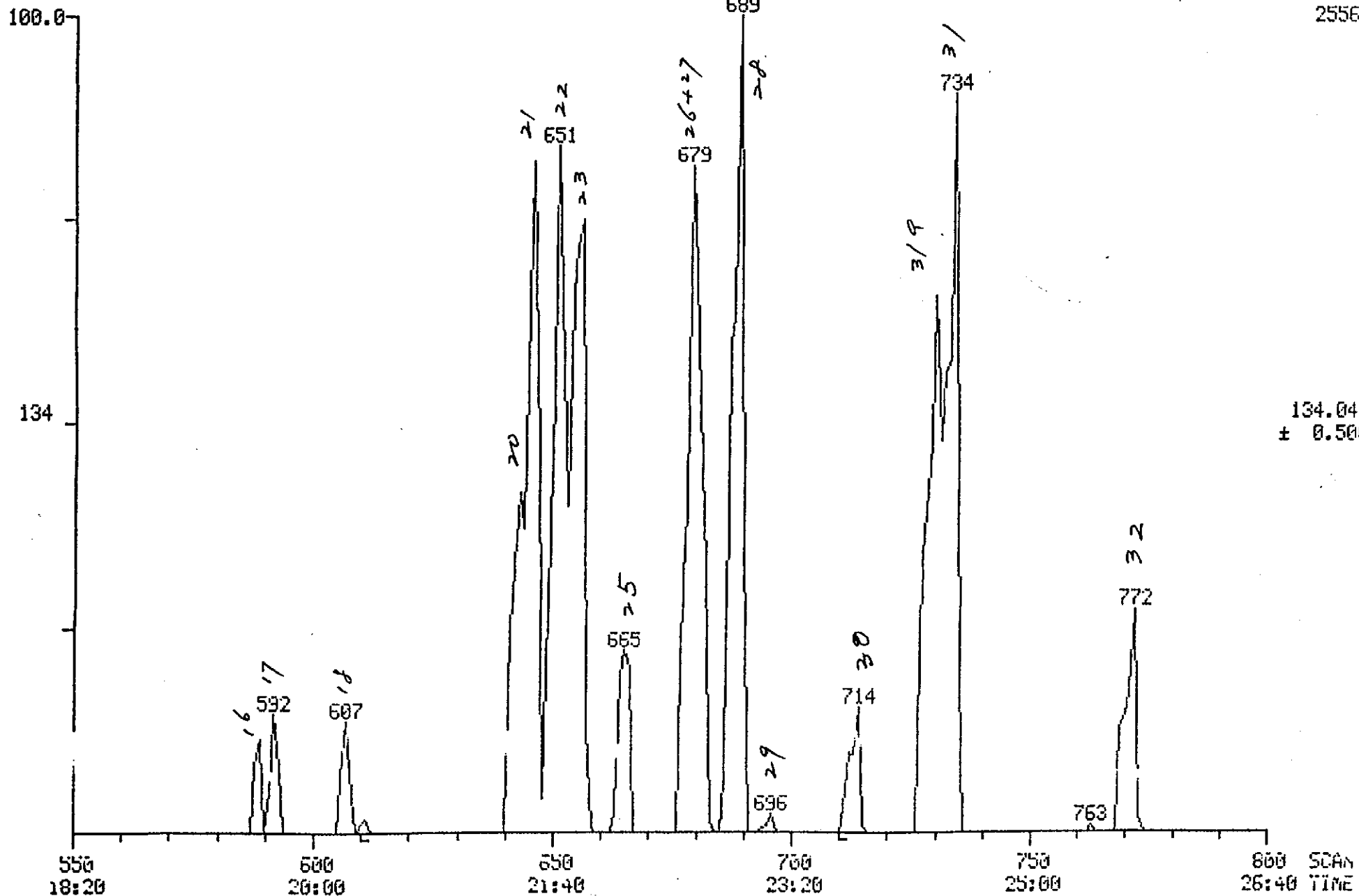
07/23/98 9:14:00

CALI: G8365 #1

SAMPLE: 8-11-61 (A4483-1) ALI+AROM 1.0UL OF 935UL +0.5UL STD

CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1.2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



MASS CHROMATOGRAM

DATA: G8366 #1

SCANS 550 TO 800

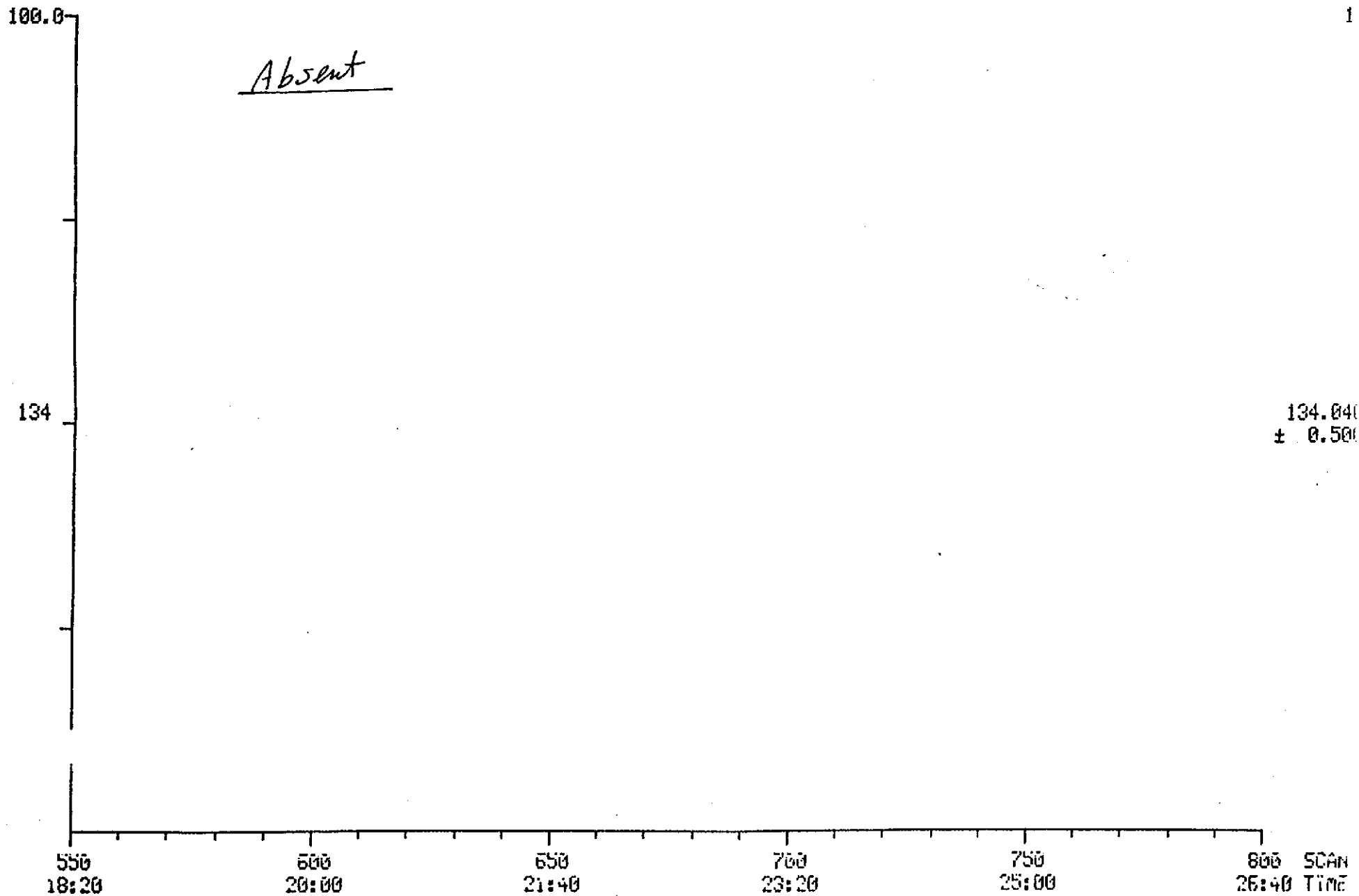
07/23/98 11:13:00

CALI: G8366 #1

SAMPLE: B-11-10.5 (A4483-2) ALI+AROM 1.0UL OF 275UL +0.5UL STD

CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



Key for identification of the bicyclanes (m/z 123)

<u>Peak No.</u>	<u>Identity</u>	<u>Formula</u>	<u>M.W.</u>
a	2,2,3-Trimethylbicycloheptane	$C_{10}H_{18}$	138
b	C_{10} bicyclic	$C_{10}H_{18}$	138
c	3,3,7-Trimethylbicycloheptane	$C_{10}H_{18}$	138
d	C_{11} decalin	$C_{11}H_{20}$	152
f	Nordrimane	$C_{14}H_{26}$	194
g	Nordrimane	$C_{14}H_{26}$	194
h	Rearranged drimane	$C_{15}H_{28}$	208
j	Rearranged drimane	$C_{15}H_{28}$	208
k	Isomer of eudesmane	$C_{15}H_{28}$	208
l	4 β (H) Eudesmane	$C_{15}H_{28}$	208
m	C_{15} bicyclic sesquiterpane	$C_{15}H_{28}$	208
n	8 β (H) Drimane	$C_{15}H_{28}$	208
o	C_{15} bicyclic sesquiterpane	$C_{15}H_{28}$	208
p	C_{16} bicyclic sesquiterpane	$C_{16}H_{30}$	222
q	C_{16} bicyclic sesquiterpane	$C_{16}H_{30}$	222
r	8 β (H) Homodrimane	$C_{16}H_{30}$	222

MASS CHROMATOGRAM

DATA: G8365 #1

SCANS 400 TO 1300

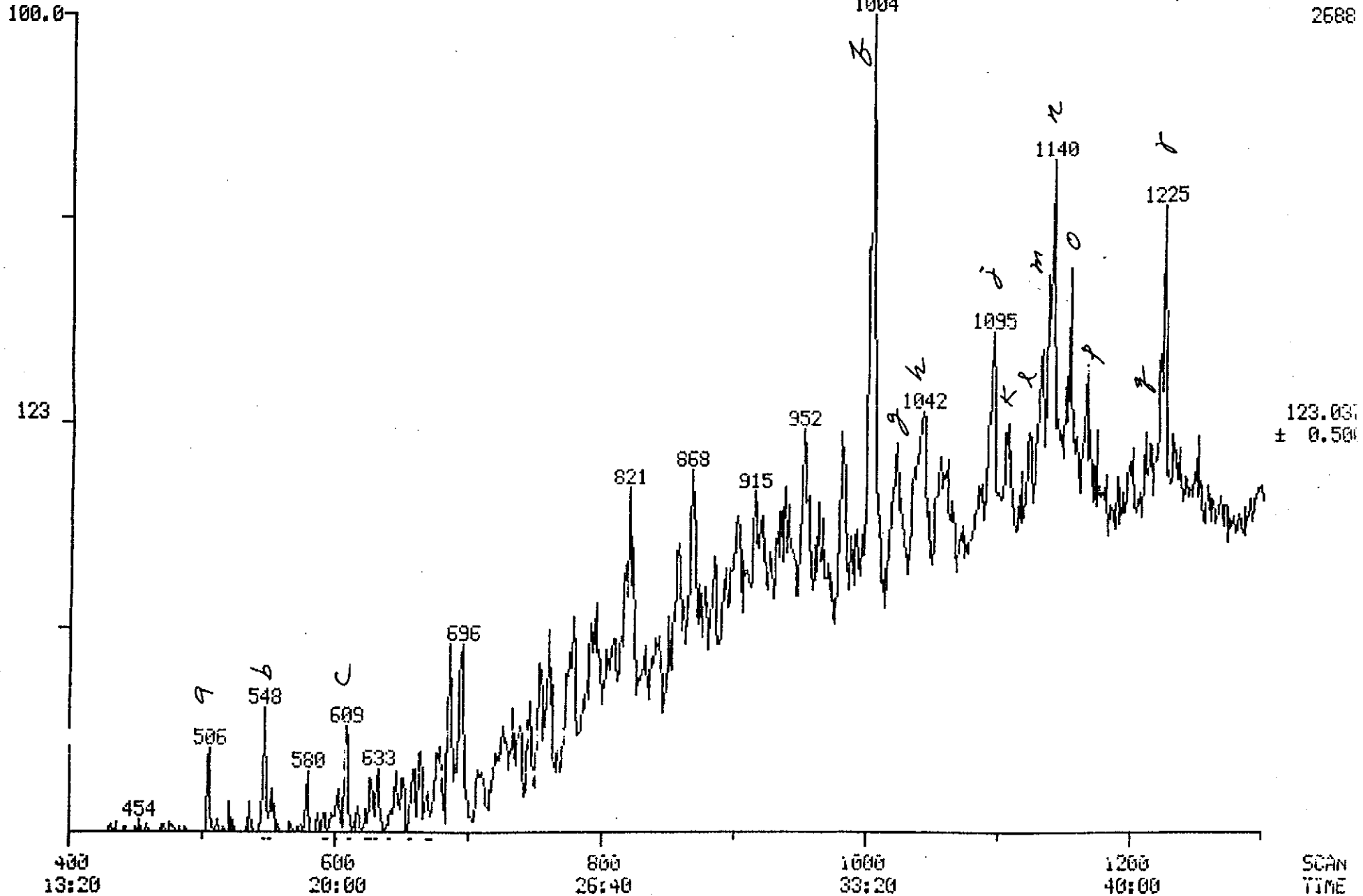
07/23/98 9:14:00

CALI: G8365 #1

SAMPLE: B-11-61 (A4483-1) ALI+AROM 1.0UL OF 935UL +0.5UL STD

CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1.2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



MASS CHROMATOGRAM

DATA: G8366 #1

SCANS 400 TO 1300

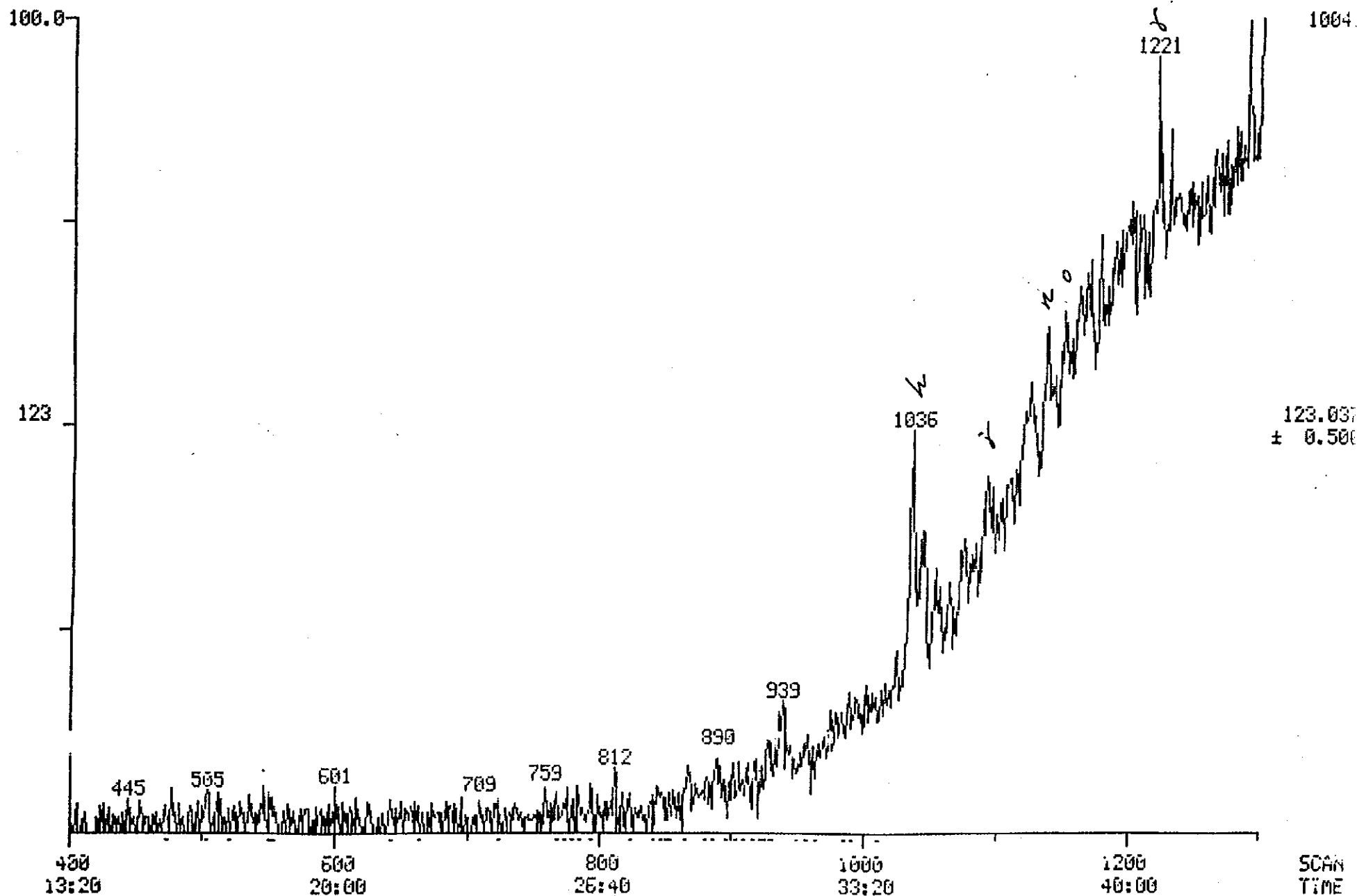
07/23/98 11:13:00

CALI: G8366 #1

SAMPLE: B-11-10.5 (A4483-2) ALI+AROM 1.0UL OF 275UL +0.5UL STD

CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



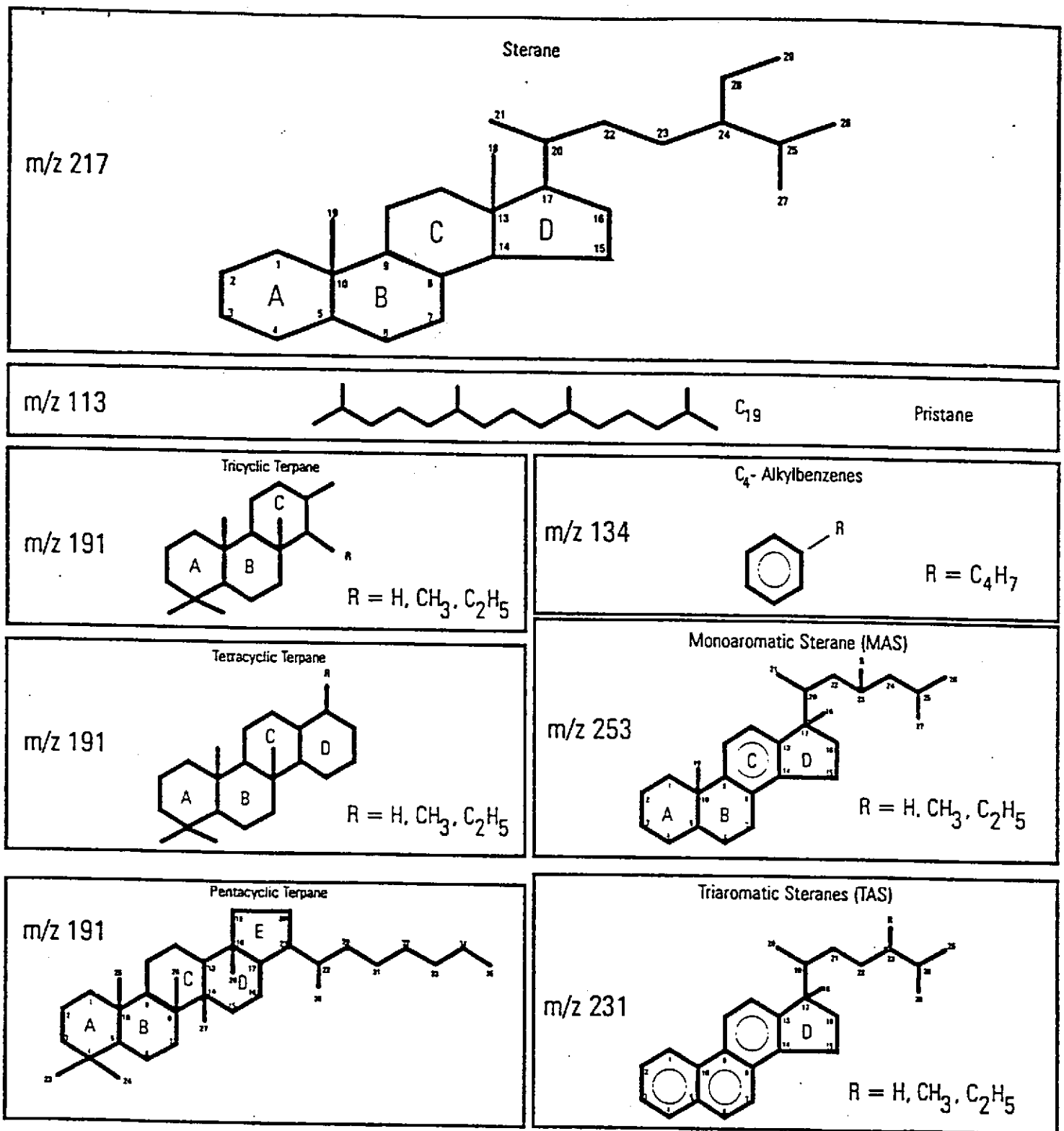


Figure 10: The compound structures of pristane, C₄-alkylbenzene, sterane; terpanes; monoaromatic and triaromatic steranes

Key for Tricyclic, Tetracyclic, and Pentacyclic Terpanes
Identification (m/z 191 mass chromatograms)

Code	Identity	Carbon #
0	C ₂₀ -Tricyclic Terpene	20
1	C ₂₁ -Tricyclic Terpene	21
2	C ₂₂ -Tricyclic Terpene	22
3	C ₂₃ -Tricyclic Terpene	23
4	C ₂₄ -Tricyclic Terpene	24
5	C ₂₅ -Tricyclic Terpene	25
Z4	C ₂₄ -Tetracyclic Terpene	24
6a	C ₂₆ -Tricyclic Terpene	26
6b	C ₂₆ -Tricyclic Terpene	26
7	C ₂₇ -Tricyclic Terpene	27
A	C ₂₈ -Tricyclic Terpene #1	28
B	C ₂₈ -Tricyclic Terpene #2	28
C	C ₂₉ -Tricyclic Terpene #1	29
D	C ₂₉ -Tricyclic Terpene #2	29
E	18 α -22,29,30-Trisnorneohopane (Ts)	27
F	17 α -22,29,30-Trisnorhopane (Tm)	27
G	17 β -22,29,30-Trisnorhopane	27
H	17 α -23,28-Bisnorlupane	28
10a	C ₃₀ -Tricyclic Terpene #1	30
10b	C ₃₀ -Tricyclic Terpene #2	30
I	17 α -28,30-Bisnorhopane	28
11a	C ₃₁ -Tricyclic Terpene #1	31
J	17 α -25-Norhopane	29
11b	C ₃₁ -Tricyclic Terpene #2	31
K	17 α ,21 β -30-Norhopane	29
C ₂₉ Ts	18 α -30-Norneohopane	29
C ₃₀ *	17 α -Diahopane	30
L	17 β -21 α -30-Normoretane	29
Ma	18 α -Oleanane	30
Mb	18 β -Oleanane	30
N	17 α ,21 β -Hopane	30
O	17 β ,21 α -Moretane	30
13a	C ₃₃ -Tricyclic Terpene #1	33
13b	C ₃₃ -Tricyclic Terpene #2	33
P	22S-17 α ,21 β -30-Homohopane	31
Q	22R-17 α ,21 β -30-Homohopane	31
R	Gammacerane	30
14a	C ₃₄ -Tricyclic Terpene #1	34
S	17 β ,21 α -Homomoretane	31
14b	C ₃₄ -Tricyclic Terpene #2	34
T	22S-17 α ,21 β -30-Bishomohopane	32
U	22R-17 α ,21 β -30-Bishomohopane	32
15a	C ₃₅ -Tricyclic Terpene #1	35
15b	C ₃₅ -Tricyclic Terpene #2	35
V	17 β ,21 α -C ₃₂ -Bishomomoretane	32
WS	22S-17 α ,21 β -30,31,32-Trishomohopane	33
WR	22R-17 α ,21 β -30,31,32-Trishomohopane	33
16a	C ₃₆ -Tricyclic Terpene #1	36
16b	C ₃₆ -Tricyclic Terpene #2	36
XS	22S-17 α ,21 β -30,31,32,33-Tetrahomohopane	34
XR	22R-17 α ,21 β -30,31,32,33-Tetrahomohopane	34
YS	22S-17 α ,21 β -30,31,32,33,34-Pentahomohopane	35
YR	22R-17 α ,21 β -30,31,32,33,34-Pentahomohopane	35

MASS CHROMATOGRAM

DATA: G8365 #1

SCANS 1600 TO 2700

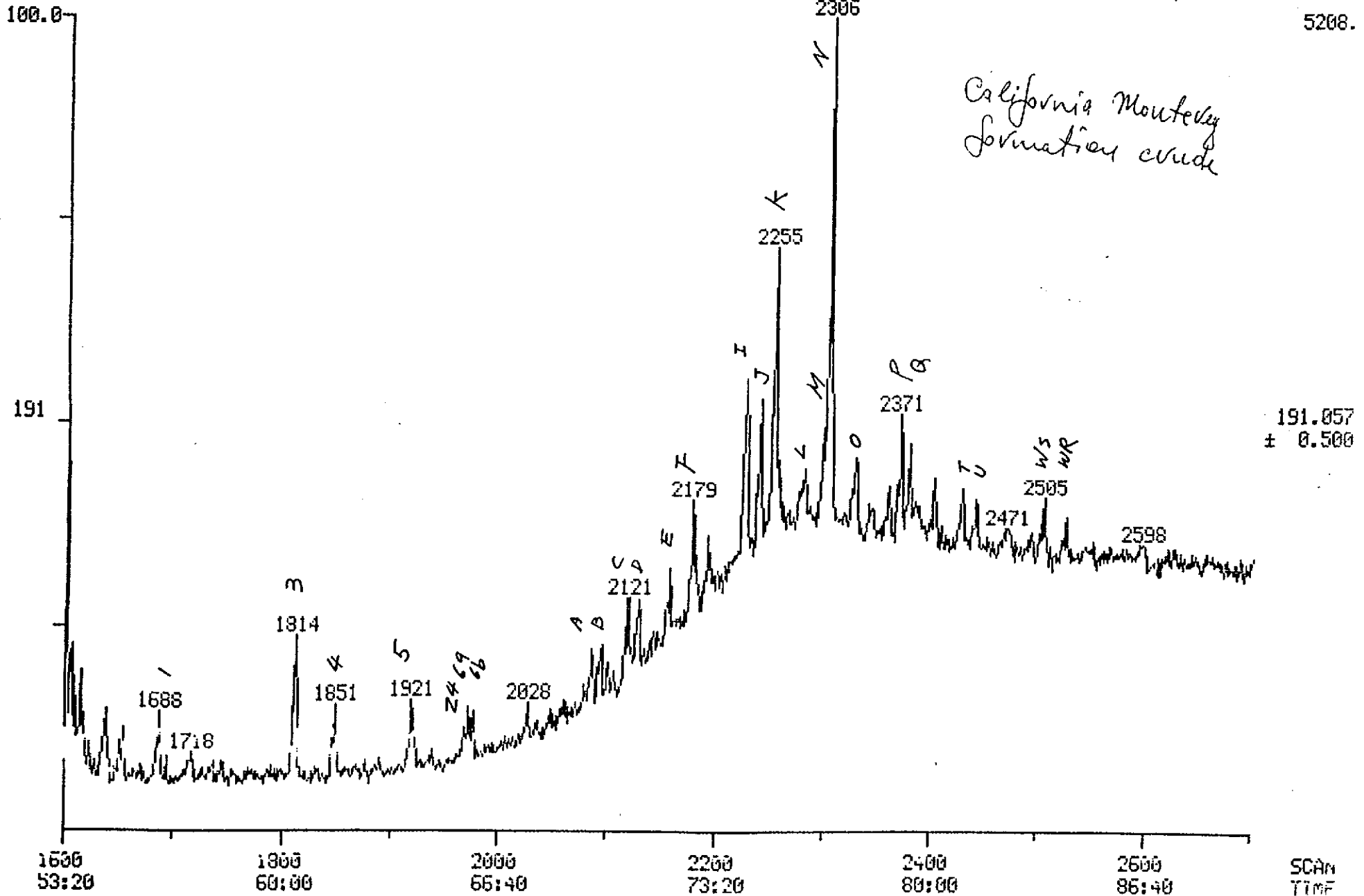
07/23/98 9:14:00

CALI: G8365 #1

SAMPLE: B-11-61 (A4483-1) ALI+AROM 1.0UL OF 935UL +0.5UL STD

CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



MASS CHROMATOGRAM

DATA: G8366 #1

SCANS 1600 TO 2700

07/23/98 11:13:00

CALI: G8366 #1

SAMPLE: B-11-10.5 (A4483-2) ALI+AROM 1.0UL OF 275UL +0.5UL STD

CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

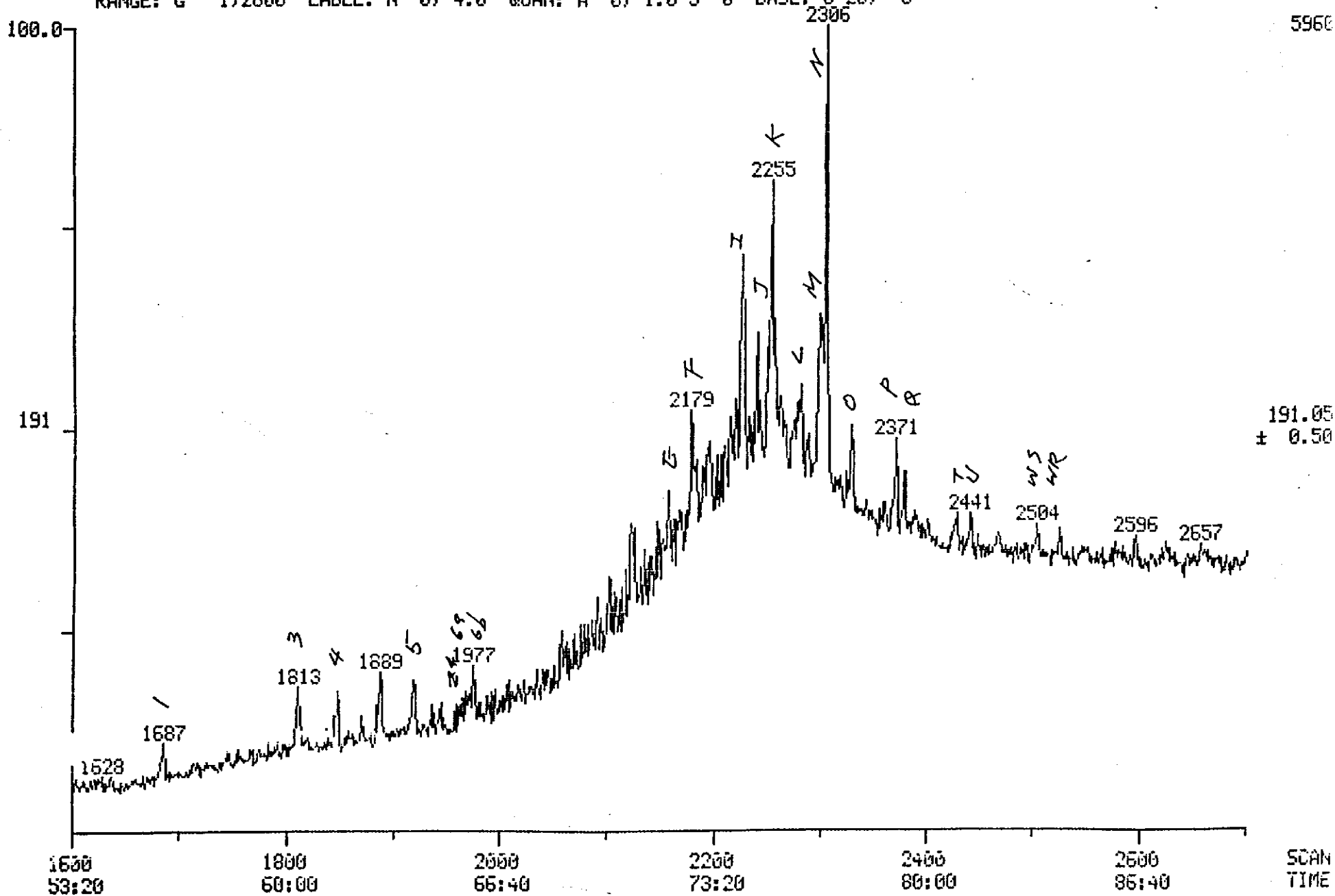


Table : Key for Steranes Identification (m/z 217 chromatogram)

<u>Code</u>	<u>Identity</u>	<u>Carbon No.</u>
1	13 β , 17 α -diacholestane (20S)	27
2	13 β , 17 α -diacholestane (20R)	27
3	13 α , 17 β -diacholestane (20S)	27
4	13 α , 17 β -diacholestane (20R)	27
5	24-methyl-13 β , 17 α -diacholestane (20S)	28
6	24-methyl-13 β , 17 α -diacholestane (20R)	28
7D	24-methyl-13 α , 17 β -diacholestane (20S)	28
7	14 α , 17 α -cholestane (20S)	27
8+8D	14 β , 17 β -cholestane (20R) + 24-ethyl-13 β , 17 α -diacholestane (20S)	27+29
9	14 β , 17 β -cholestane (20S)	27
9D	24-methyl-13 α , 17 β -diacholestane (20R)	28
10	14 α , 17 α -cholestane (20R)	27
11	24-ethyl-13 β , 17 α -diacholestane (20R)	29
12	24-ethyl-13 α , 17 β -diacholestane (20S)	29
13	24-methyl-14 α , 17 α -cholestane (20S)	28
14+14D	24-methyl-14 β , 17 β -cholestane (20R) + 24-ethyl-13 α , 17 β -diacholestane (20R)	28+29
15	24-methyl-14 β , 17 β -cholestane (20S)	28
16	24-methyl-14 α , 17 α -cholestane (20R)	28
17	24-ethyl-14 α -cholestane (20S)	29
18	24-ethyl-14 β , 17 β -cholestane (20R)	29
19	24-ethyl-14 β , 17 β -cholestane (20S)	29
20	24-ethyl-14 α , 17 α -cholestane (20R)	29
21A	24-n-Propylcholestanes	30
21B	4-Methyl-24-ethylcholestane	30

MASS CHROMATOGRAM

DATA: G8365 #1

SCANS 1975 TO 2325

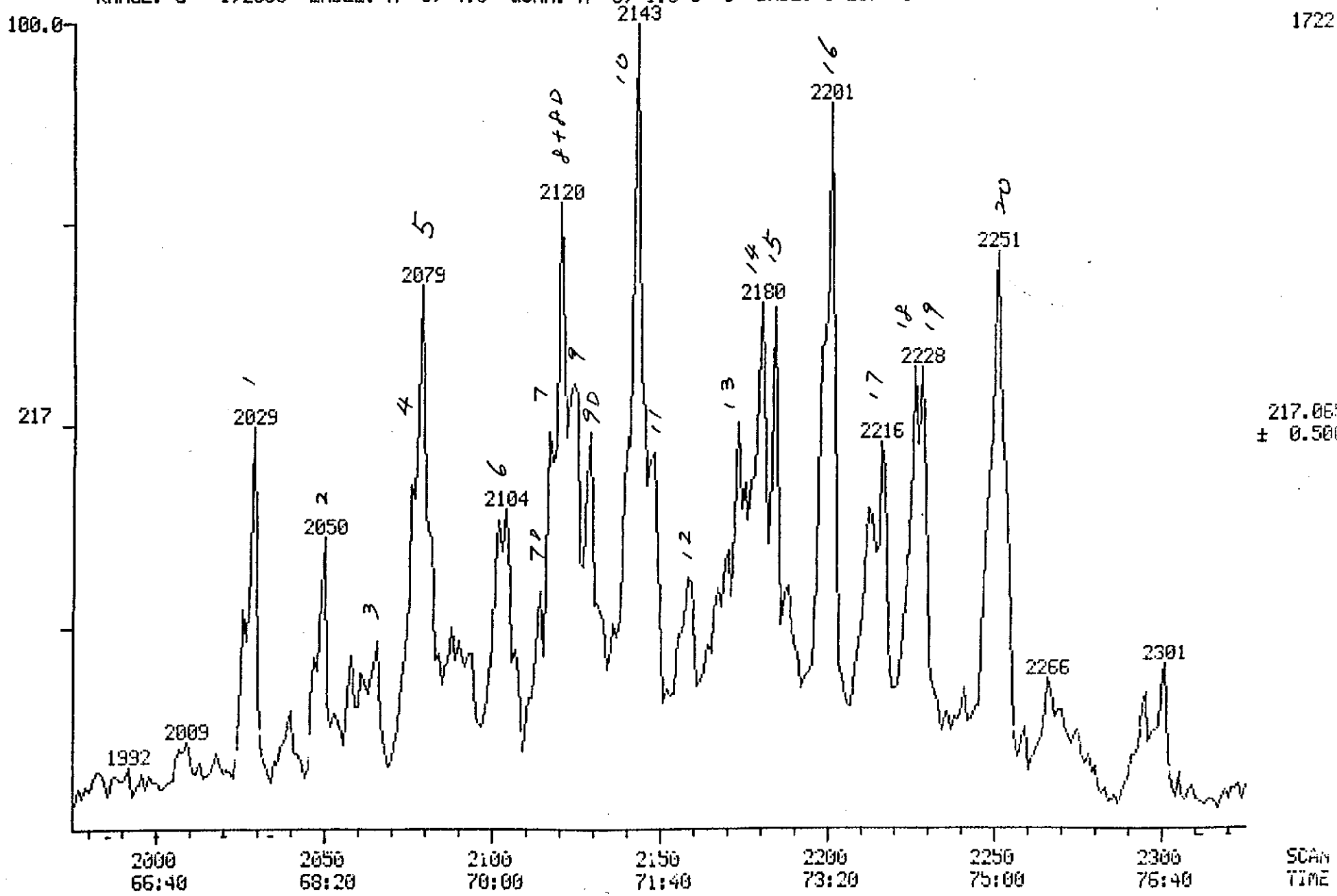
07/23/98 9:14:00

CALI: G8365 #1

SAMPLE: B-11-61 (A4483-1) ALI+AROM 1.0UL OF 935UL +0.5UL STD

CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1.2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



MASS CHROMATOGRAM

DATA: G8366 #1

SCANS 1975 TO 2325

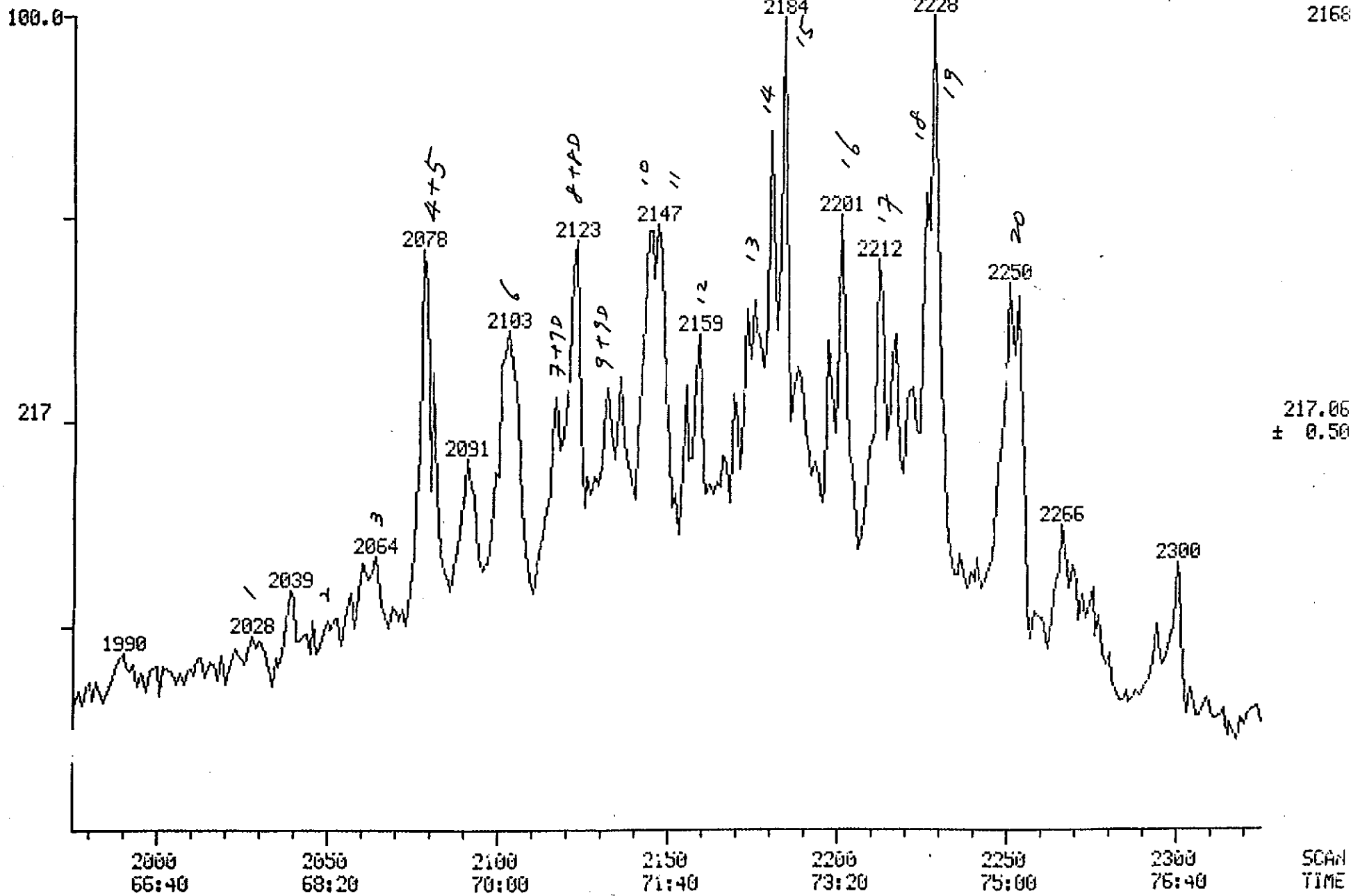
07/23/98 11:13:00

CALI: G8366 #1

SAMPLE: B-11-10.5 (A4483-2) ALI+AROM 1.0UL OF 275UL +0.5UL STD

CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



Key for Monoaromatic Sterane Hydrocarbon Identification
(m/z 253 fragmentograms)

CODE	IDENTITY	ELEMENTAL COMPOSITION
a	20S, 5 β C ₂₇ -Monoaromatic sterane	C ₂₇ H ₄₂
b	20S, dia C ₂₇ -Monoaromatic sterane	C ₂₇ H ₄₂
c	20R, 5 β C ₂₇ -Monoaromatic sterane + 20R C ₂₇ dia MAS	C ₂₇ H ₄₂
d	20S, 5 α C ₂₇ -Monoaromatic sterane	C ₂₇ H ₄₂
e	20S, 5 β C ₂₈ -Monoaromatic sterane + 20S C ₂₈ dia MAS	C ₂₈ H ₄₄
f	20R, 5 α C ₂₇ -Monoaromatic sterane	C ₂₇ H ₄₂
g	20S, 5 α C ₂₈ -Monoaromatic sterane	C ₂₈ H ₄₄
h	20R, 5 β C ₂₈ -Monoaromatic sterane + 20R C ₂₈ dia MAS	C ₂₈ H ₄₄
i	20S, 5 β C ₂₉ -Monoaromatic sterane + 20S C ₂₉ dia MAS	C ₂₉ H ₄₆
j	20S, 5 α C ₂₉ -Monoaromatic sterane	C ₂₉ H ₄₆
k	20R, 5 α C ₂₈ -Monoaromatic sterane	C ₂₈ H ₄₄
l	20R, 5 β C ₂₉ -Monoaromatic sterane + 20R C ₂₉ dia MAS	C ₂₉ H ₄₆
m	20R, 5 α C ₂₉ -Monoaromatic sterane	C ₂₉ H ₄₆

MASS CHROMATOGRAM

DATA: G8365 #1

SCANS 1900 TO 2200

07/23/98 9:14:00

CALI: G8365 #1

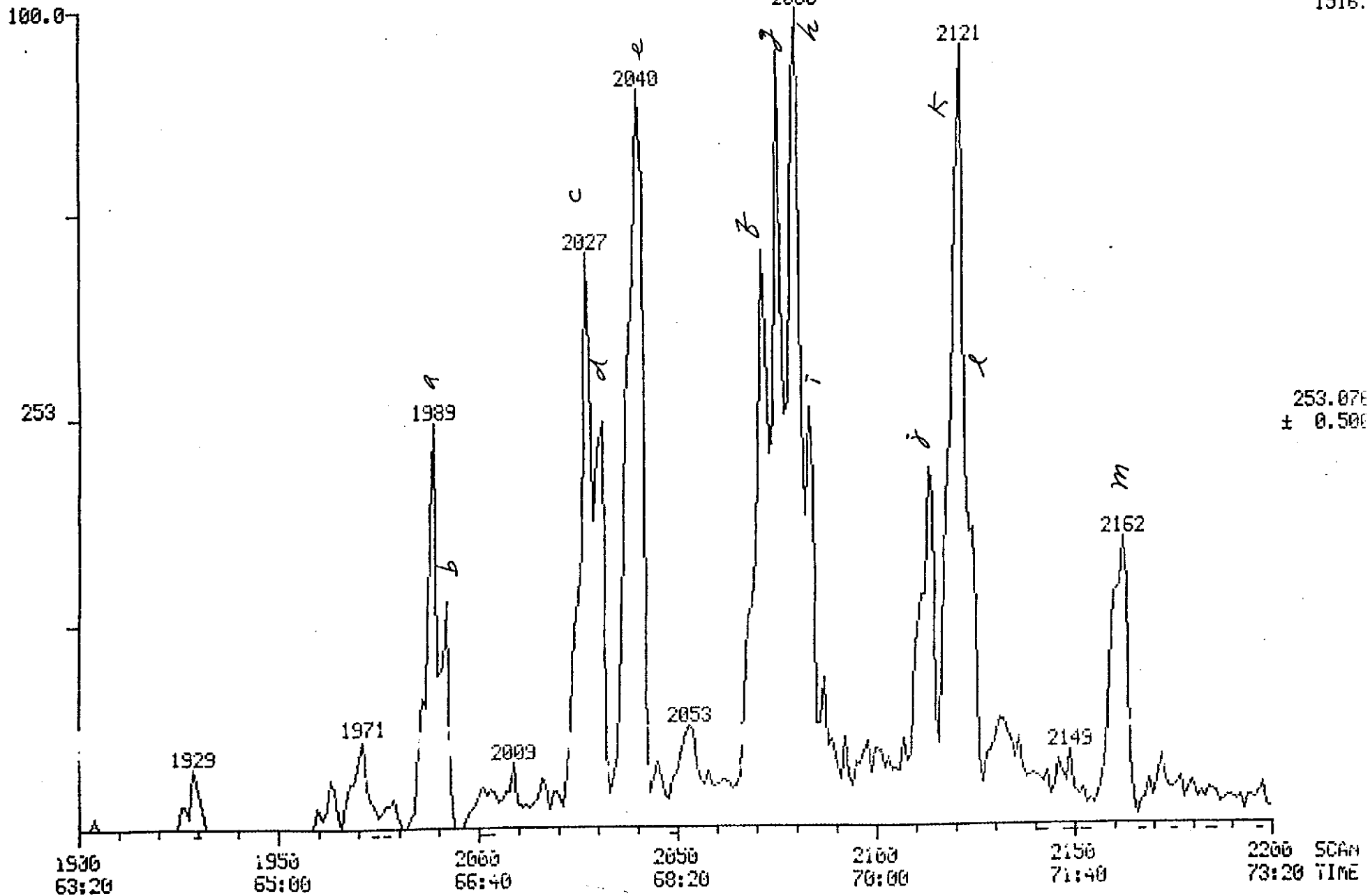
SAMPLE: B-11-61 (A4483-1) ALI+AROM 1.0UL OF 935UL +0.5UL STD

CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

2080

1516.



MASS CHROMATOGRAM

DATA: G8366 #1

SCANS 1900 TO 2200

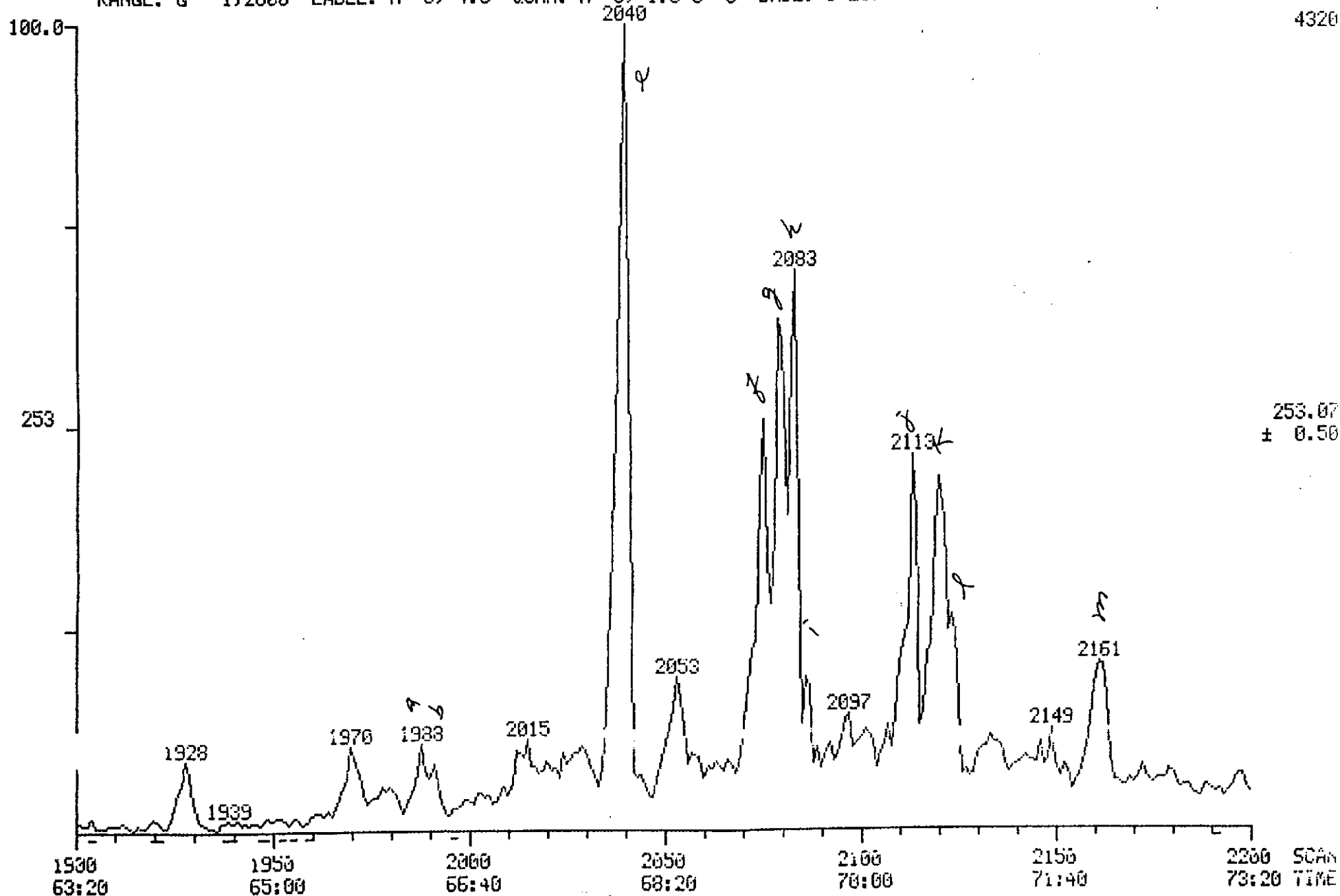
07/23/98 11:13:00

CALI: G8366 #1

SAMPLE: B-11-10.5 (A4483-2) ALI+AROM 1.0UL OF 275UL +0.5UL STD

CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



Key for Triaromatic Steranes Identification
(m/z 231 chromatogram)

Code	Identity	Elemental Composition
T1	C ₂₀ Triaromatic sterane	C ₂₀ H ₂₀
T2	C ₂₁ Triaromatic sterane	C ₂₁ H ₂₂
T3	20S C ₂₆ Triaromatic sterane	C ₂₆ H ₃₂
T4	20R C ₂₆ + 20S C ₂₇ -Triaromatic steranes	C ₂₆ H ₃₂ + C ₂₇ H ₃₄
T5	20S C ₂₈ -Triaromatic sterane	C ₂₈ H ₃₆
T6	20R C ₂₇ -Triaromatic sterane	C ₂₇ H ₃₄
T7	20R C ₂₈ -Triaromatic sterane	C ₂₈ H ₃₆

MASS CHROMATOGRAM

07/23/98 9:14:00

SAMPLE: B-11-61 (A4483-1) ALI+AROM 1.0UL OF 935UL +0.5UL STD

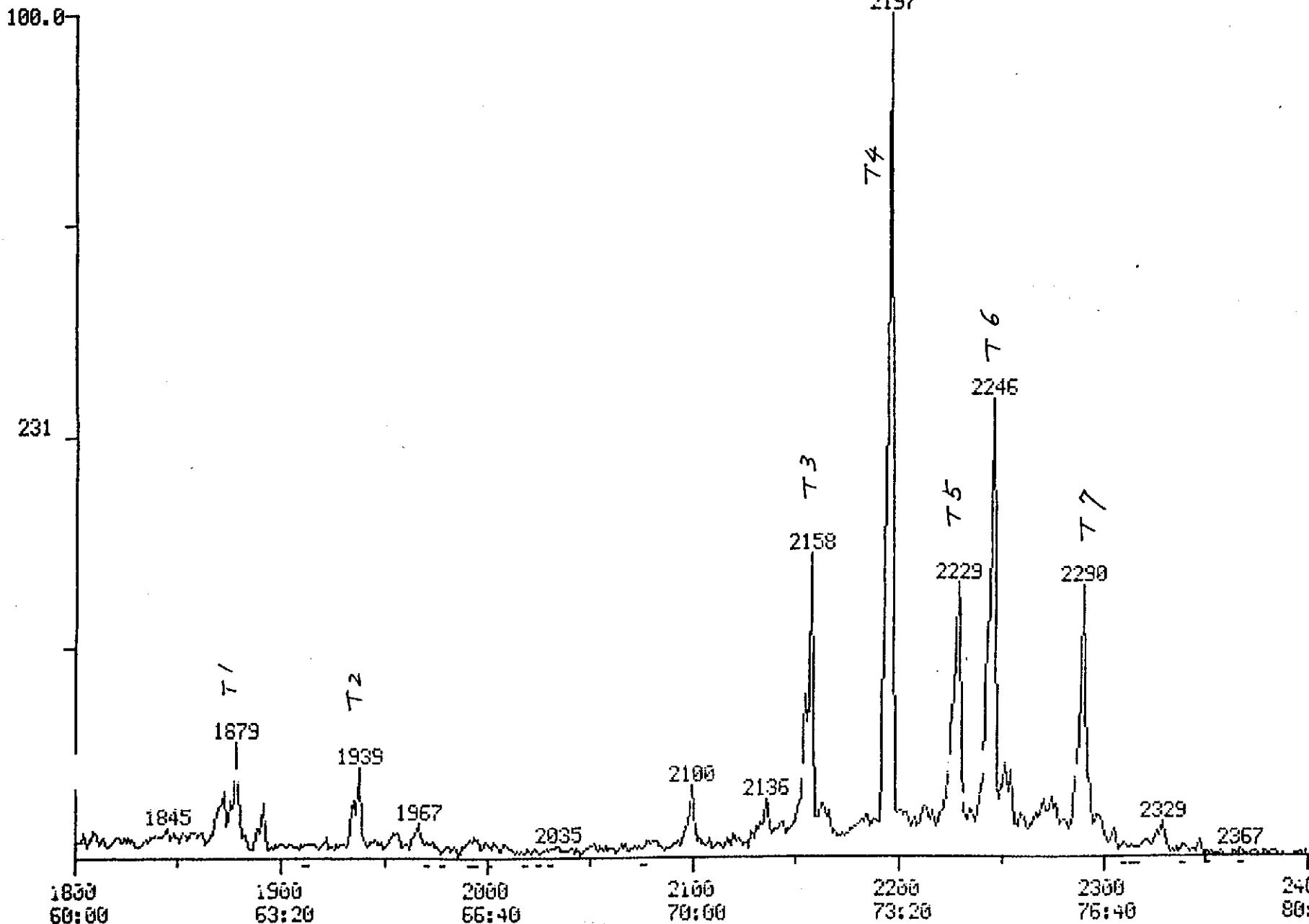
CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: G8365 #1

SCANS 1800 TO 2400

CALI: G8365 #1



5712

231.0E
± 0.50

1830
60:00

1900
63:20

2000
66:40

2100
70:00

2200
73:20

2300
76:40

2400
80:00 TIME

MASS CHROMATOGRAM

07/23/98 11:13:00

SAMPLE: B-11-10.5 (A4483-2) ALI+AROM 1.0UL OF 275UL +0.5UL STD

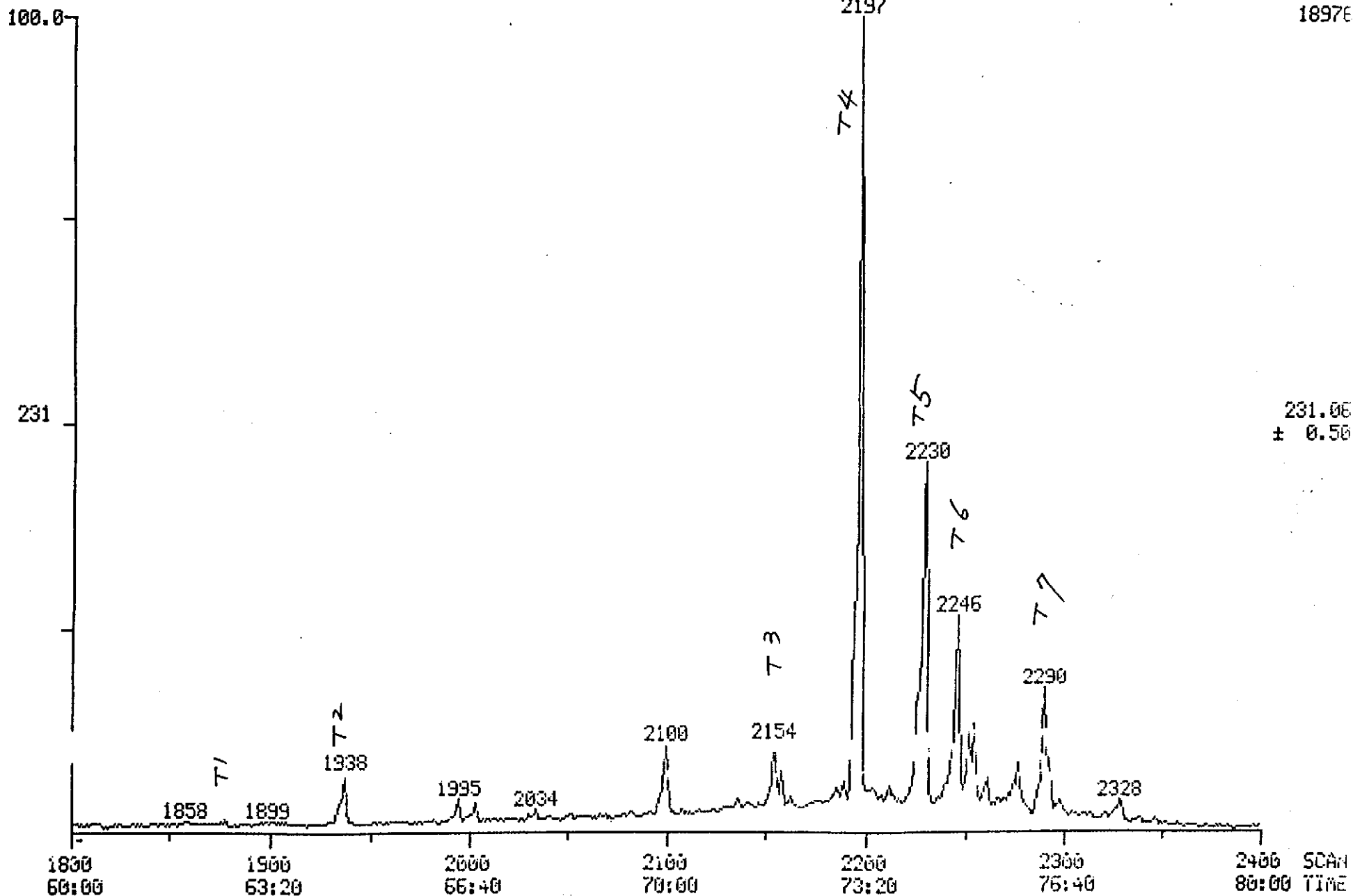
CONDS.: 5 MIN @ 40C 4C/MIN TO 310C (30 MIN) DB-1 60M COLUMN

RANGE: G 1,2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: G8366 #1

SCANS 1800 TO 2400

CALI: G8366 #1



Key for Aromatic Compound Identification

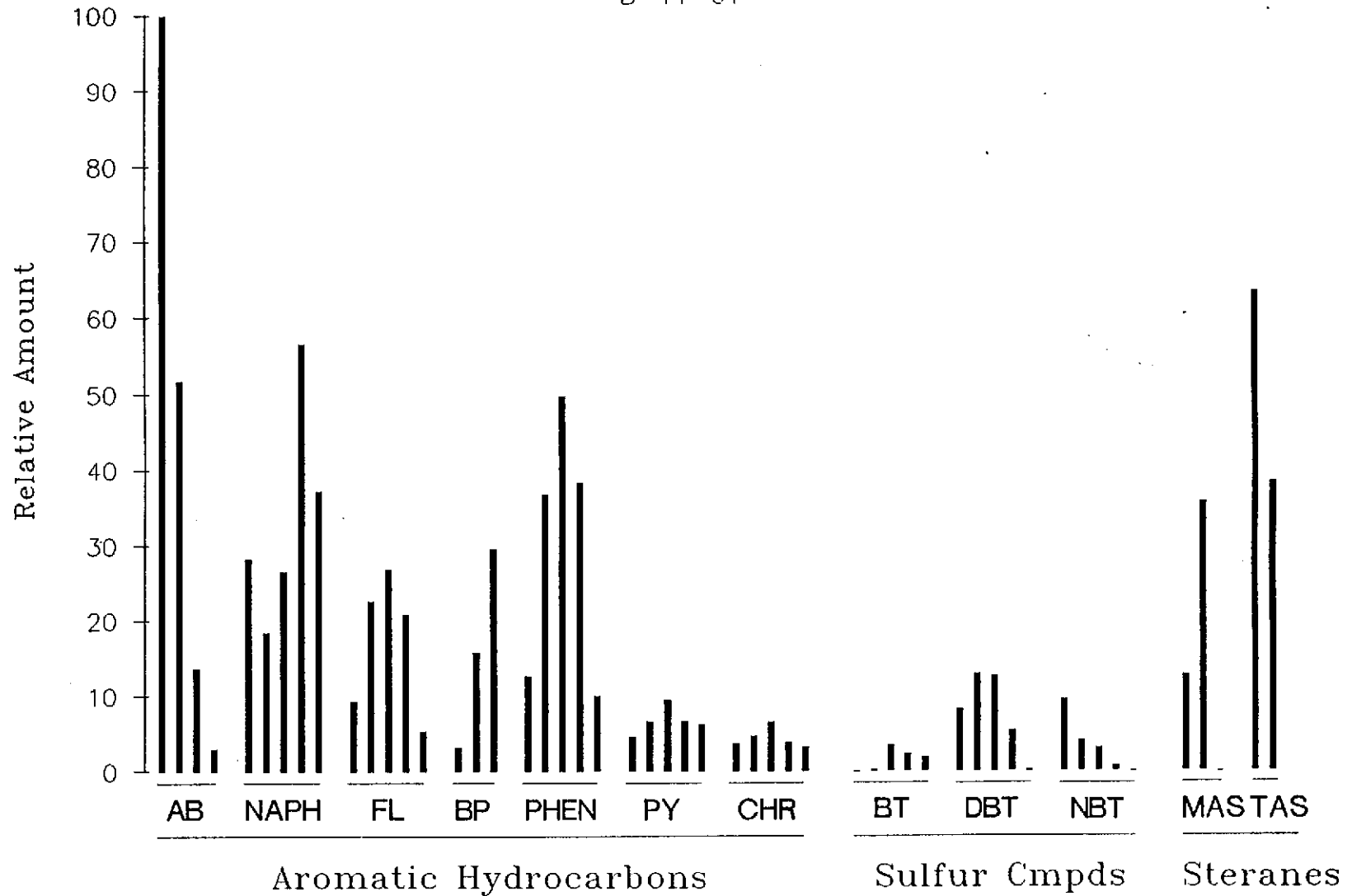
AB:	C ₃ -C ₆ Alkylbenzenes
NAPH:	C ₉ -C ₁₀ Naphthalenes
FL:	C ₉ -C ₁₀ Fluorenes
BP:	C ₉ -C ₁₂ BP Biphenyl/Dibenzofuran
PHEN:	C ₃ -C ₄ Phenanthrenes
PY:	C ₃ -C ₄ Pyrenes/Fluoranthenes
CHR:	C ₃ -C ₂ Chrysenes
BT:	C ₁ -C ₃ Benzothiophenes
DBT:	C ₃ -C ₂ Dibenzothiophenes
NBT:	C ₃ -C ₂ Naphthobenzothiophenes
MAS:	Monoaromatic Steranes
TAS:	Triaromatic Steranes

Key for Identifying Aromatic Hydrocarbons

No.	m/z	Compound
1	120	C ₃ -alkylbenzenes
2	134	C ₄ -alkylbenzenes
3	148	C ₅ -alkylbenzenes
4	162	C ₆ -alkylbenzenes
5	128	C ₀ -naphthalene
6	142	C ₁ -naphthalenes
7	156	C ₂ -naphthalenes
8	170	C ₃ -naphthalenes
9	184	C ₄ -naphthalenes
10	166	C ₀ -fluorene
11	180	C ₁ -fluorenes
12	194	C ₂ -fluorenes
13	208	C ₃ -fluorenes
14	222	C ₄ -fluorenes
15	154	C ₀ -biphenyl
16	168	C ₁ -biphenyls + dibenzofuran
17	182	C ₂ -biphenyls + C ₁ -dibenzofuran
18	178	C ₀ -phenanthrene
19	192	C ₁ -phenanthrenes
20	206	C ₂ -phenanthrenes
21	220	C ₃ -phenanthrenes
22	234	C ₄ -phenanthrenes
23	202	C ₀ -pyrene/fluoranthene
24	216	C ₁ -pyrenes/fluoranthenes
25	230	C ₂ -pyrenes/fluoranthenes
26	244	C ₃ -pyrenes/fluoranthenes
27	258	C ₄ -pyrenes/fluoranthenes
28	228	C ₀ -chrysene
29	242	C ₁ -chrysenes
30	256	C ₂ -chrysenes
31	270	C ₃ -chrysenes
32	284	C ₄ -chrysenes
33	148	C ₁ -benzothiophenes
34	162	C ₂ -benzothiophenes
35	176	C ₃ -benzothiophenes
36	190	C ₄ -benzothiophenes
37	204	C ₅ -benzothiophenes
38	184	C ₀ -dibenzothiophene
39	198	C ₁ -dibenzothiophenes
40	212	C ₂ -dibenzothiophenes
41	226	C ₃ -dibenzothiophenes
42	240	C ₄ -dibenzothiophenes
43	234	C ₀ -naphthobenzothiophene
44	248	C ₁ -naphthobenzothiophenes
45	262	C ₂ -naphthobenzothiophenes
46	276	C ₃ -naphthobenzothiophenes
47	290	C ₄ -naphthobenzothiophenes
48	253	Monoaromatic steranes
49	267	Monoaromatic steranes
50	239	Monoaromatic steranes
51	231	Triaromatic steranes
52	245	Triaromatic steranes

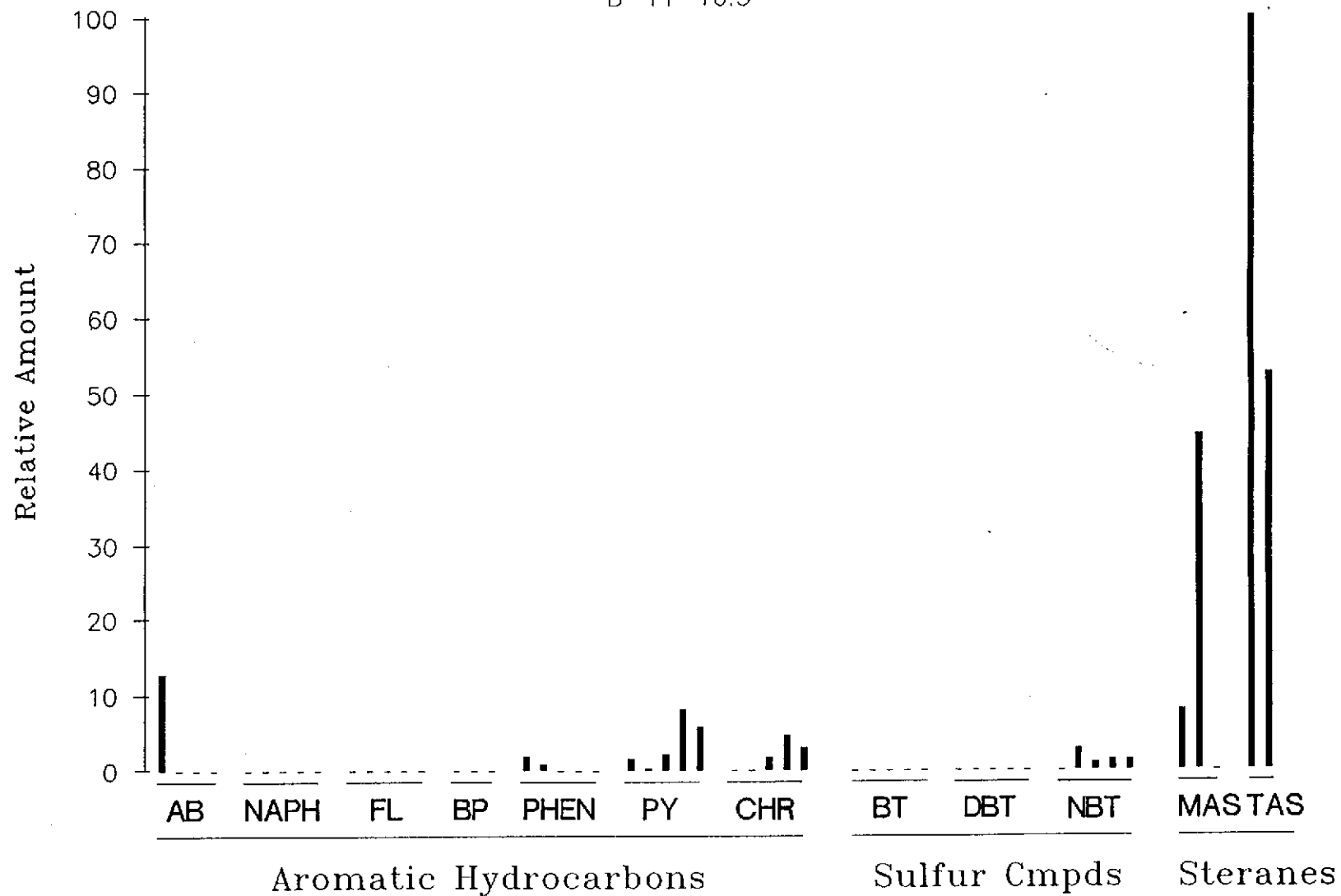
Aromatic Hydrocarbon Distribution

B-11-61



Aromatic Hydrocarbon Distribution

B-11-10.5



APPENDIX

QA/QC DATA

&

CHAIN OF CUSTODY

Date analyzed: 7/29/98

August 3, 1998

Surrogate Recovery

Sample ID	GGC ID	Acetone Recovery (%)
Method Blank		106
B-11-61	4483-1	87
B-11-10.5	4483-2	88
	Blk MS	103
	Blk MSD	97

Batch Matrix Spike and Matrix Spike Duplicate Recovery

Sample ID	GGC ID	Ethanol	tert-Butanol	MTBE	DIPE	ETBE	TAME
		Recovery %					
METHOD BLANK		ND	ND	ND	ND	ND	ND
	Blk MS	118	117	101	96	100	102
	Blk MSD	117	109	94	90	94	93
Spike Added (ppb):		25000	2000	250	250	250	250

MS = Matrix Spike

MSD = Matrix Spike Duplicate

Date analyzed: 7/29/98

August 3, 1998

Quality control data for oxygenate analysis

Sample ID	GGCID	Ethanol	Acetone (surrogate)	tert- Butanol	MTBE	DIPE	ETBE	TAME	Acceptance Limit
Standard oxygenate		16.41	17.14	18.05	20.48	22.11	22.99	25.74	±0.5
B-11-61	4483-1	ND	17.17	ND	20.47	ND	ND	ND	±0.5
B-11-10.5	4483-2	ND	17.11	ND	20.40	ND	ND	ND	±0.5
	Blk MS	16.44	17.15	18.09	20.45	22.06	22.93	25.64	±0.5
	Blk MSD	16.52	17.17	18.18	20.46	22.06	22.93	25.63	±0.5

ND: Not Detected

Date analyzed:7/29/98

August 3, 1998

Instrument calibration control for oxygenate analysis

Analytes	RF	RF _D	% Difference	Acceptance Limit (%)
Ethanol	7649	7732	1.1	± 15
tert-Butanol	73070	75193	2.9	± 15
MTBE	752379	696332	-7.4	± 15
DIPE	996303	1030148	3.4	± 15
ETBE	807293	768404	-4.8	± 15
TAME	1018701	946068	-7.1	± 15

RF = Linear response factor from 3 point calibration

RF_D = Daily response factor from calibration check standards

MTBE: Methyl tert-Butyl Ether

DIPE: Diisopropyl Ether

ETBE: Ethyl tert-Butyl Ether

TAME: tert-Amyl Methyl Ether

Calibration file:OXPT208.CAL

Chromatography by GLOBAL GEOCHEMISTRY CORPORATION

TODAY'S DATE...7/20/98 TIME.....1:51:10 PM
 RAW DATA FILE NAME..E:\DATA3\C10196.04R
 SAMPLE NAME.....B-11-61 (4483-1) 3.0 of 1300ul + (IS) .3ul inj.2
 DATE TAKEN..07-15-1998 18:05:24
 METHOD FILE.....E:\DATA3\C8196B.MET
 METHOD...C8+ Analysis
 CALIBRATION FILE...E:\DATA3\C8_196B.CAL
 INSTRUMENT.....Carlo Erba-FID
 RUN TIME.....90
 AREA REJECT.....100
 HEADING 1..C8+ Analysis
 HEADING 2..
 FORMAT FILE..E:\DATA3\NORMAL.FMT

CAL. FILE VERSION....3
 OPERATOR....Lev Baycher
 COM PORT....3

PEAKS DETECTED IN THIS CHROMATOGRAM

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height	Component Amount
1	4.053		2552158	987681	
2	4.857		396961	63775	
3	5.012	n-C8	499708	254919	
4	5.833		1136658	180108	
5	6.185		1126375	269016	
6	6.455		3638945	712368	
7	6.953		516796	99535	
8	7.084		1320067	328052	
9	7.284		786289	79704	
10	7.846	n-C9	996798	134043	
11	8.194		507247	69183	
12	8.664		503262	76496	
13	9.038		1524207	99228	
14	9.408		2157651	245071	
15	9.689		875285	123859	
16	9.995		2054476	130706	
17	10.554		2629337	270529	
18	11.043		302928	39989	
19	11.479	n-C10	1226522	91865	
20	11.819		407750	52536	
21	12.005		538086	63692	
22	12.28		868581	70824	
23	12.807		2306020	99924	
24	13.607		975446	83735	
25	13.884		1769190	102952	
26	14.574		903882	44882	
27	15.116	n-C11	1329393	111430	
28	15.689		1238540	87546	
29	16.071		929298	60444	
30	16.456		396112	35235	
31	17.055		813850	59412	
32	17.177		513678	56866	
33	17.726		2647513	97111	
34	18.348		1276845	80915	
35	19.35	i-C13	2192441	132187	
36	19.953		796096	44872	
37	20.568		220293	34512	
38	21.05		141761	34014	
39	21.417	i-C14	2074284	144783	
40	22.86		1529467	62530	
41	23.252		477079	69458	

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height	Component Amount
42	42		1054552	54195	
43	43	i-C15	2540591	174667	
44	44		372272	46860	
45	45		1056033	38783	
46	46	i-C16	1954788	176067	
47	47		294277	54582	
48	48		868251	66930	
49	49		785165	55952	
50	50		4949878	112956	
51	51		3667110	124737	
52	52		402962	61820	
53	53	i-C18	2880145	193454	
54	54		3068158	167159	
55	55		2288922	112401	
56	56	PR	4668803	196549	
57	57		7572944	149708	
58	58	PH	4037997	167913	
59	59		1174061	77155	
60	60		758480	70919	
61	61		395144	65865	
62	62	Internal Standard	4661651	224276	
63	63		1157831	80109	
64	64		540855	54723	
65	65		320027	38179	
66	66		489846	41486	
67	67		329540	34526	
68	68		1837148	40127	
69	69		339403	36221	
70	70		253303	19554	
71	71		887357	31494	
72	72		285934	30741	

Group	Group Amount	Amount %
0	0.000	N/A

TOTAL AREA DETECTED = 1.049907E+08

Analyzed by Baycher

Lev Baycher

Checked by Shan-tu Lu

Date 7/20/98

Chromatography by GLOBAL GEOCHEMISTRY CORPORATION

TODAY'S DATE...7/20/98 TIME.....1:37:40 PM
 RAW DATA FILE NAME..E:\DATA3\C10196.02R
 SAMPLE NAME.....B-11-61 (4483-1D) 3.0 of 2000ul + (IS) .3ul inj.1
 DATE TAKEN..07-15-1998 13:48:14
 METHOD FILE.....E:\DATA3\C8196B.MET
 METHOD:..C8+ Analysis
 CALIBRATION FILE...E:\DATA3\C8_196B.CAL CAL. FILE VERSION....3
 INSTRUMENT.....Carlo Erba-FID OPERATOR....Lev Baycher
 RUN TIME.....90 COM PORT....3
 AREA REJECT.....100
 HEADING 1..C8+ Analysis
 HEADING 2..
 FORMAT FILE..E:\DATA3\NORMAL.FMT

PEAKS DETECTED IN THIS CHROMATOGRAM

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height	Component Amount
1	1		1726340	865018	
2	2		278956	115493	
3	3	n-C8	2765850	260078	
4	4		1042705	358255	
5	5		3358173	699185	
6	6		2403341	433895	
7	7	n-C9	1054272	154714	
8	8		821251	84956	
9	9		487145	67142	
10	10		939831	92099	
11	11		1933300	251931	
12	12		872045	141193	
13	13		1990665	128931	
14	14		2444279	299801	
15	15		622813	48801	
16	16	n-C10	1145921	83115	
17	17		383981	51423	
18	18		540200	70452	
19	19		611864	73824	
20	20		1125045	95900	
21	21		1242008	89261	
22	22		928251	78793	
23	23		1609015	93428	
24	24		922337	38902	
25	25	n-C11	1210875	107391	
26	26		1967879	81738	
27	27		365512	31807	
28	28		721347	52127	
29	29		1828933	90799	
30	30		605918	46176	
31	31		1076892	71780	
32	32	i-C13	2391492	142231	
33	33		1536158	70287	
34	34		747613	81196	
35	35		1126303	84075	
36	36		851302	64665	
37	37	i-C14	3511124	174136	
38	38		1578967	63930	
39	39		864810	61573	
40	40		654288	46557	
41	41	i-C15	2095295	170201	

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height	Component Amount
42	42	25.253	522228	37245	
43	43	26.057	123783	38501	
44	44	26.916	553838	51753	
45	45	27.42	910959	99321	
46	46	27.614	1721015	179490	i-C16
47	47	28.214	1976261	71857	
48	48	29.662	787595	61230	
49	49	30.001	2150413	80767	
50	50	30.892	101453	28618	
51	51	31.355	834922	80621	
52	52	31.389	1430743	85272	
53	53	32.189	255685	40286	
54	54	33.059	2227365	155862	i-C18
55	55	34.566	5932445	136105	PR
56	56	35.18	2491068	98299	
57	57	36.536	1637664	70867	
58	58	37.34	1687716	126239	PH
59	59	41.541	2103052	84537	
60	60	41.814	3452867	262513	Internal Standard
61	61	43.01	786408	43610	
62	62	43.785	602712	59703	
63	63	44.828	414481	43026	
64	64	45.337	749046	57107	
65	65	47.591	207639	42181	
66	66	48.334	143230	37943	
67	67	55.159	766143	30559	
68	68	58.816	302380	25569	
69	69	60.462	183723	15990	

Group	Group Amount	Amount %
0	0.000	N/A

TOTAL AREA DETECTED = 8.944111E+07

Analyzed by Baycher

Lev Baycher

Checked by Sharon L...

Date 7/20/98

Chromatography by GLOBAL GEOCHEMISTRY CORPORATION

TODAY'S DATE...7/20/98 TIME.....1:43:07 PM
 RAW DATA FILE NAME..E:\DATA3\C10196.03R
 SAMPLE NAME.....B-11-10.5 (4483-2) 3.0 of 2000ul + (IS) .3ul inj.1
 DATE TAKEN..07-15-1998 15:43:10
 METHOD FILE.....E:\DATA3\C8196C.MET
 METHOD:...C8+ Analysis
 CALIBRATION FILE...E:\DATA3\C8_196B.CAL
 INSTRUMENT.....Carlo Erba--FID
 RUN TIME.....90
 AREA REJECT.....100
 HEADING 1..C8+ Analysis
 HEADING 2..
 FORMAT FILE..E:\DATA3\NORMAL.FMT

CAL. FILE VERSION....3
 OPERATOR....Lev Baycher
 COM PORT....3

PEAKS DETECTED IN THIS CHROMATOGRAM

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height	Component Amount
1	4.09		1401149	325703	
2	4.475		457734	154408	
3	4.693		295227	46971	
4	5.044	n-C8	808027	167392	
5	6.196		380708	152197	
6	6.445		1368673	296384	
7	7.059		461438	68269	
8	7.806	n-C9	76394	16138	
9	41.536	Internal Standard	1883333	214953	
10	49.337		101856	9917	

Group	Group Amount	Amount %
0	0.000	N/A

TOTAL AREA DETECTED = 7234540

Analyzed by Lev Baycher

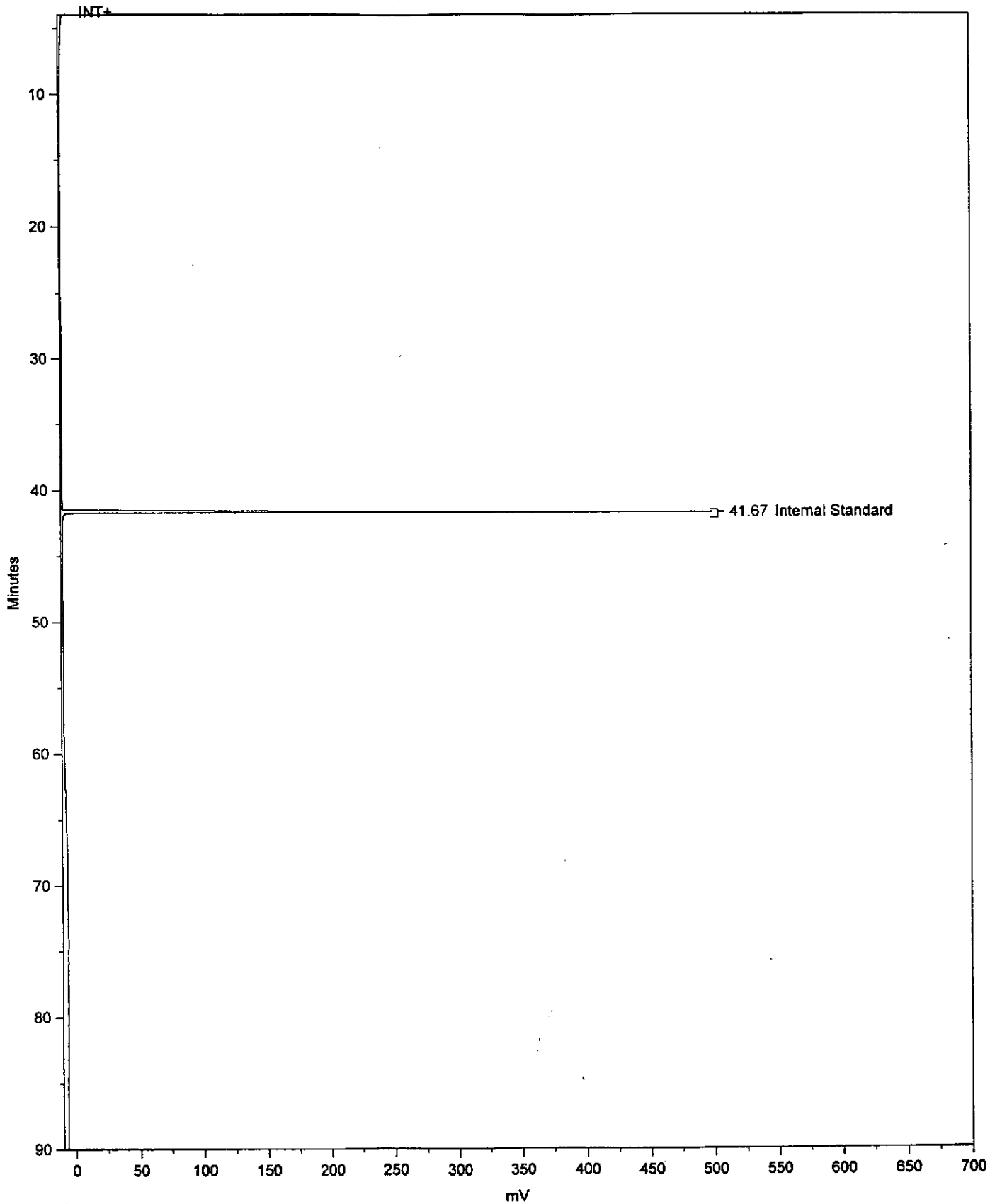
Lev Baycher

Checked by Sharon

Date 7/20/98

Method-Blank for W.O. #4483

E:\DATA3\10201.01R



Chromatography by GLOBAL GEOCHEMISTRY CORPORATION

TODAY'S DATE...7/20/98 TIME.....3:49:03 PM
 RAW DATA FILE NAME..E:\DATA3\C10201.01R
 SAMPLE NAME.....Method-Blank for W.O. #4483
 DATE TAKEN..07-20-1998 15:43:19
 METHOD FILE.....E:\DATA3\C8196B.MET
 METHOD:..C8+ Analysis
 CALIBRATION FILE...E:\DATA3\C8_196B.CAL
 INSTRUMENT.....Carlo Erba-FID
 RUN TIME.....90
 AREA REJECT.....100
 HEADING 1..C8+ Analysis
 HEADING 2..
 FORMAT FILE..E:\DATA3\NORMAL.FMT

CAL. FILE VERSION....3
 OPERATOR....Lev Baycher
 COM PORT....3

PEAKS DETECTED IN THIS CHROMATOGRAM

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height	Component Amount
1	41.672	Internal Standard	3074563	508614	
Group	Group Amount	Amount %			
0	0.000	N/A			

TOTAL AREA DETECTED = 3074563

Analyzed by Baycher
 Checked by Shan-tu

Lev Baycher
 Date 7/20/98

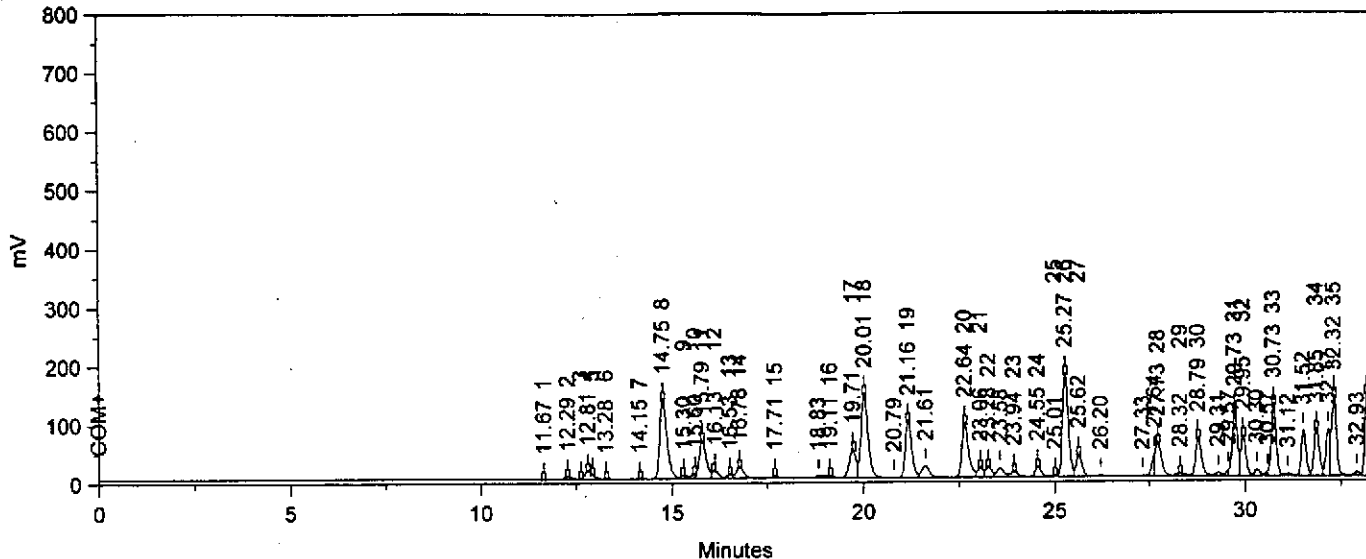
Chromatography by GLOBAL GEOCHEMISTRY CORPORATION

TODAY'S DATE....7/20/98 TIME.....12:58:25 PM
 RAW DATA FILE NAME..E:\DATA3\C10197.01R
 SAMPLE NAME.....Diesel Std 07/15/98
 DATE TAKEN..07-16-1998 16:22:05
 METHOD FILE.....IE:\DATA3\C8187B.MET
 METHOD:..C8+ Analysis
 CALIBRATION FILE...IE:\DATA3\C8_187B.CAL CAL. FILE VERSION....1
 INSTRUMENT.....Carlo Erba-FID OPERATOR....Lev Baycher
 RUN TIME.....90
 AREA REJECT.....100 COM PORT....3
 HEADING 1..C8+ Analysis
 HEADING 2..
 FORMAT FILE..E:\DATA3\NORMAL.FMT

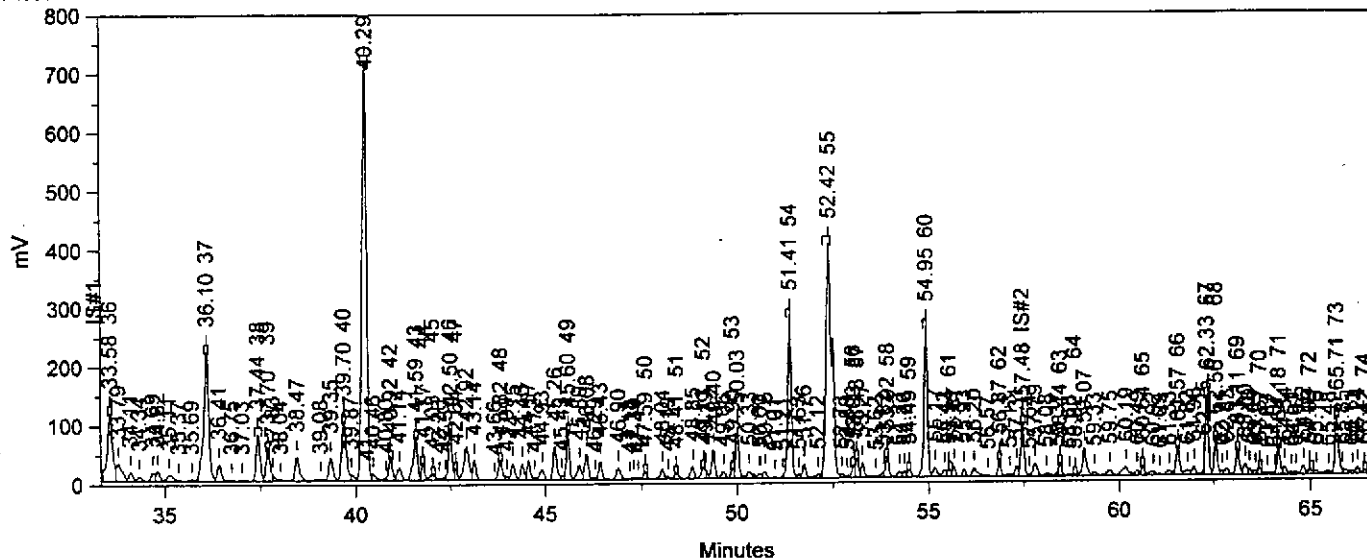
PEAKS DETECTED IN THIS CHROMATOGRAM

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height	Component Amount
1	4.951	n-C8	12826	5240	
2	7.79	n-C9	60935	15600	
3	9.914		89455	11397	
4	10.437		116147	11302	
5	11.28	n-C10	157844	35696	
6	12.145		75490	19281	
7	13.673		61408	10779	
8	15.	n-C11	478054	105469	
9	15.696		82039	10701	
10	16.032		354097	29755	
11	16.807		39072	7686	
12	17.388		237314	17098	
13	18.29		170139	18416	
14	18.666	n-C12	456447	123248	
15	19.2	i-C13	313765	56585	
16	20.016		153832	26818	
17	20.5		175420	17019	
18	20.873		171584	30996	
19	21.272	i-C14	186941	43041	
20	21.93		134401	28981	
21	22.128	n-C13	629658	139057	
22	22.725		224415	25872	
23	23.904		109655	12714	
24	24.226		274325	31389	
25	24.705	i-C15	363723	71146	
26	25.392	n-C14	583051	154771	
27	26.105		91421	17481	
28	26.654		172301	21520	
29	27.056		366326	24019	
30	27.403	i-C16	383928	91288	
31	27.586		117850	27609	
32	28.164		158042	15195	
33	28.492	n-C15	892302	180809	
34	29.431		321214	17466	
35	29.806		414257	31016	
36	30.468		442007	31076	
37	31.183		187823	31105	
38	31.423	n-C16	1155819	239568	
39	32.85	i-C18	788571	95738	
40	33.039		249789	26851	
41	33.37		135944	26287	

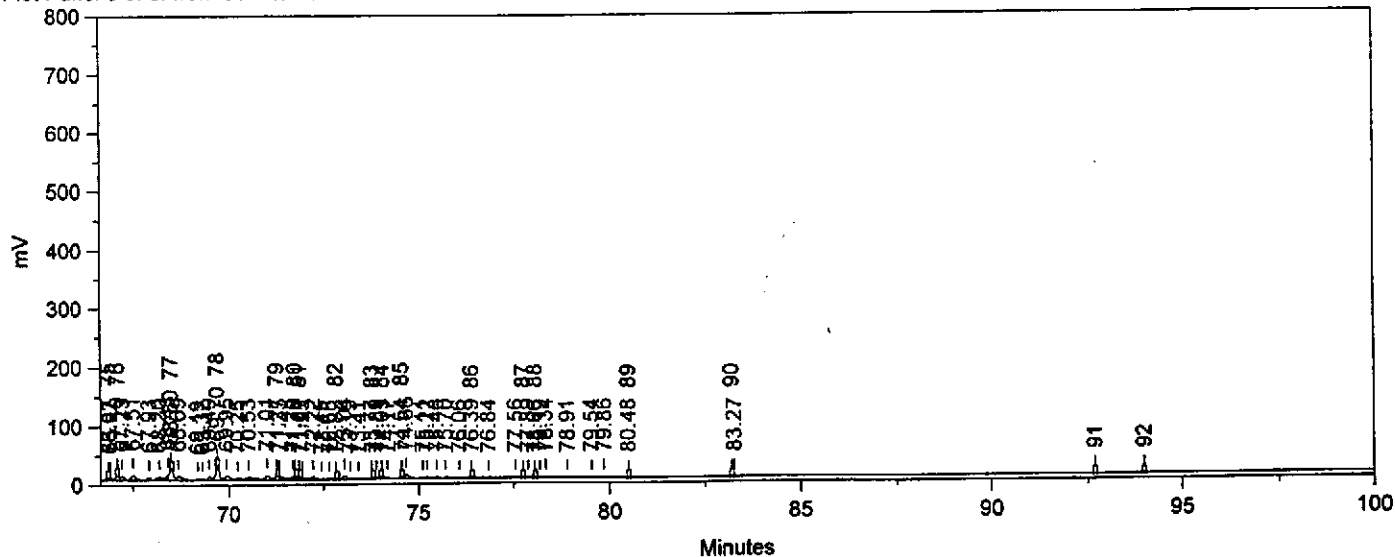
Plot Panel 1 of 3: from 0.0 to 33.3Minutes



Plot Panel 2 of 3: from 33.3 to 66.7Minutes



Plot Panel 3 of 3: from 66.7 to 100.0Minutes



C3 to C10 ANALYSIS by GLOBAL GEOCHEMISTRY CORPORATION

TODAY'S DATE: 7/15/98 TIME: 8:14:48 AM
 RAW DATA FILE NAME: E:\DATA6\C310191.03R
 SAMPLE NAME.....4483-1 (1g sample/5mL water) + 3uL IS-007
 DATE TAKEN: 07-10-1998 19:48:16
 METHOD FILE: !E:\DATA6\C310191C.MET
 METHOD: C3-C10 Analysis
 CALIBRATION FILE: !E:\DATA6\C310191C.CAL
 INSTRUMENT: HP5890/ALS-FID OPERATOR: R.deLeon
 RUN TIME: 110min
 COM PORT: 6
 HEADING 1: HP5890/Autosampler purge&trap
 HEADING 2: GC range=2^1
 FORMAT FILE: E:\DATA6\C3C10.FMT

PEAKS DETECTED IN THIS CHROMATOGRAM:

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height
1	11.67	1	4148	324
2	12.29	2	73480	5452
3	12.81	4	211718	14576
4	13.28	6	11825	857
5	14.15	7	16192	1153
6	14.75	8	1781157	135400
7	15.30	9	80128	6435
8	15.60	10	57382	9126
9	15.79	11	857428	65274
10	16.13	12	183265	14315
11	16.53	13	78602	7157
12	16.78	14	271164	19695
13	17.71	15	58077	4413
14	18.83		39511	3663
15	19.11	16	80569	4748
16	19.71	17	611185	48659
17	20.01	18	1807313	144449
18	20.79		7003	605
19	21.16	19	1115795	96697
20	21.61		280151	19650
21	22.64	20	1138466	92155
22	23.06	21	184027	17541
23	23.28	22	202809	18564
24	23.58		199895	15468
25	23.94	23	143295	10364
26	24.55	24	195919	18080
27	25.01	25	28593	3615
28	25.27	26	1885928	177172
29	25.62	27	412993	38545
30	26.20		38846	3106
31	27.33		17223	2037
32	27.64		193900	38394
33	27.73	28	658426	57517
34	28.32	29	93285	5543
35	28.79	30	704254	65699
36	29.31		63518	6055
37	29.57		50673	10772
38	29.73	31	1031275	108592
39	29.95	32	618781	69007
40	30.30		108654	11447
41	30.57		34898	8566
42	30.73	33	1113549	122928
43	31.12		40657	4192
44	31.52		673572	76177
45	31.85	34	776586	79233
46	32.17		599791	78703
47	32.32	35	1198725	136333
48	32.93		58586	7009
49	33.19	IS#1	1281479	141863
50	33.58	36	1102200	114769
51	33.79		307853	29067
52	34.11		115259	14961
53	34.34		69268	8264
54	34.69		99170	14713

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height
55	34.82		130653	16075
56	35.11		114073	9841
57	35.37		17494	2201
58	35.69		24654	2828
59	36.10	37	2031223	219392
60	36.41		213229	27940
61	36.75		17393	2086
62	37.03		13342	1681
63	37.44	38	576237	78872
64	37.70	39	404694	53291
65	37.83		45074	10221
66	38.04		17229	2269
67	38.47		326404	40131
68	39.08		39129	3553
69	39.35		305668	37891
70	39.70	40	879858	100942
71	39.87		67198	9821
72	40.29	41	6008502	712914
73	40.46		104388	10963
74	40.80		18197	4484
75	40.92	42	260100	39374
76	41.14		179975	20396
77	41.59	43	579351	73329
78	41.77	44	183953	29521
79	42.03	45	102315	10974
80	42.20		18544	3372
81	42.37		24872	6024
82	42.50	46	535685	82597
83	42.64	47	103389	19084
84	42.92		543113	56661
85	43.14		211739	33520
86	43.66		6032	1040
87	43.82	48	250624	33067
88	43.99		35439	6336
89	44.15		194669	27585
90	44.40		165672	26970
91	44.57		201471	32712
92	44.72		25266	4770
93	44.93		146002	17459
94	45.26		397351	57136
95	45.43		35921	7328
96	45.60	49	452623	80781
97	45.89		193259	24960
98	46.08		303340	43529
99	46.29		23504	4292
100	46.43		182181	30397
101	46.90		153395	19268
102	47.18		7566	1311
103	47.30		24872	3868
104	47.41		12967	2567
105	47.59	50	89130	13209
106	48.04		125446	17857
107	48.19		28125	4937
108	48.41	51	84472	10429
109	48.85		156292	21151
110	49.13	52	140555	19667
111	49.19		63527	14993
112	49.40		314068	49066
113	49.66		95994	12096
114	49.90	53	85472	17139
115	50.03		519161	84685
116	50.33		91777	12443
117	50.60		53118	8727
118	50.75		90650	11894
119	51.01		22118	2917
120	51.21		15645	4701
121	51.41	54	1804699	276610
122	51.63		34860	5741
123	51.76		148144	23641
124	52.12		59073	6218
125	52.42	55	4357595	399734

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height
126	52.73		42643	6770
127	52.88		23802	4125
128	53.03	56	115930	21799
129	53.13	57	184225	33863
130	53.27		144558	25512
131	53.62		19828	3434
132	53.82		57304	10152
133	53.92	58	223741	36327
134	54.23		81636	10485
135	54.36		65238	11310
136	54.49	59	97787	13222
137	54.95	60	1648423	255541
138	55.17		130484	16724
139	55.42		88415	12314
140	55.54	61	86679	13384
141	55.67		106351	18164
142	55.93		83869	13766
143	56.20		151364	14617
144	56.57		21124	3302
145	56.87	62	156266	29947
146	57.13		42580	5260
147	57.31		104717	17951
148	57.48	IS#2	555120	92676
149	57.64		18192	4123
150	57.79		183836	21762
151	58.08		33442	5770
152	58.37		23874	7804
153	58.44	63	131019	22539
154	58.68		22095	3363
155	58.82	64	14945	2705
156	59.07		352082	47120
157	59.33		55214	6997
158	59.75		114973	10478
159	60.19		201033	15024
160	60.49		62049	9922
161	60.64	65	99333	17665
162	60.92		76393	7098
163	61.09		20978	3665
164	61.33		90327	8195
165	61.57	66	318164	48662
166	61.82		85037	9405
167	61.98		97996	14213
168	62.25		44390	25601
169	62.33	67	770386	135952
170	62.56	68	342295	60877
171	62.71		38699	7087
172	62.83		83997	11451
173	63.11	69	269200	43058
174	63.30		121885	19160
175	63.40		56058	10859
176	63.55		39595	6920
177	63.67	70	77928	12104
178	63.87		29171	2947
179	64.07		14127	3716
180	64.18	71	276198	46734
181	64.34		91892	13904
182	64.51		26301	4469
183	64.62		35234	5094
184	64.82		101590	15145
185	64.99	72	65609	9987
186	65.16		48990	6713
187	65.48		69396	5070
188	65.71	73	660679	99345
189	65.85		65785	7499
190	66.11		39961	5709
191	66.24		75792	11649
192	66.42	74	52918	6995
193	66.55		5356	2505
194	66.63		19112	2846
195	66.87	75	38910	4479
196	66.92		21165	4111

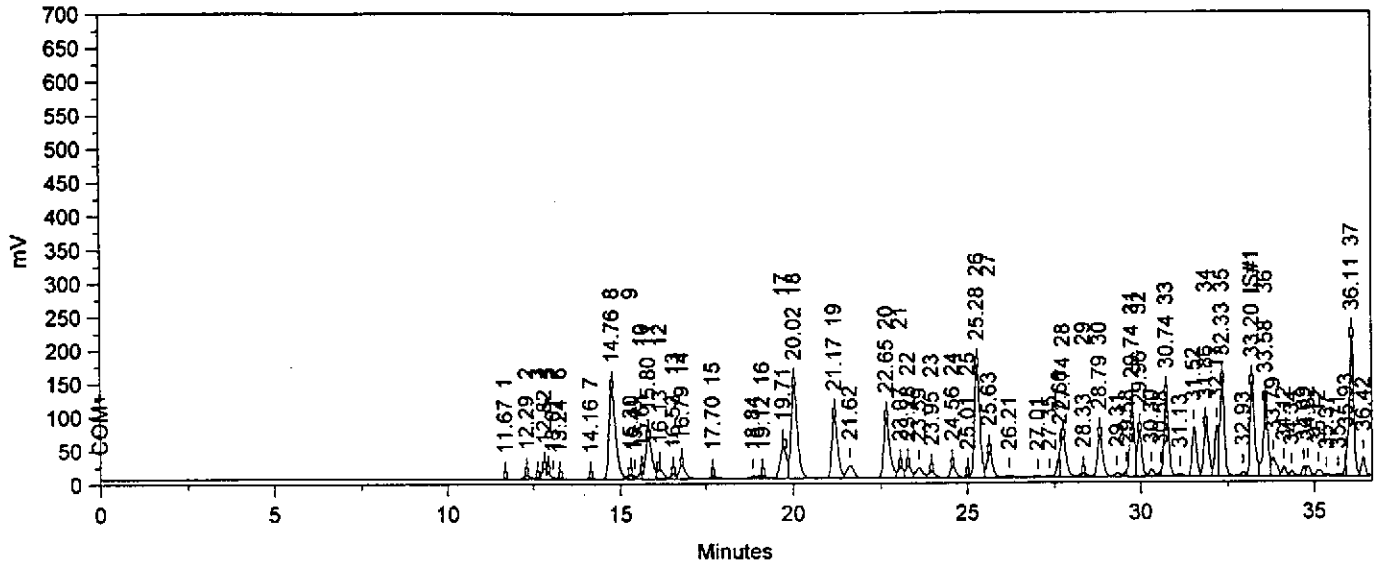
Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height
197	67.10	76	53974	9346
198	67.23		54236	7548
199	67.51		89312	9747
200	67.93		42396	5703
201	68.20		66435	6281
202	68.43		46903	10643
203	68.50	77	148847	20639
204	68.69		74336	7366
205	69.19		28767	2953
206	69.32		22635	3314
207	69.49		42514	7129
208	69.70	78	175022	25924
209	69.95		82175	7767
210	70.25		40400	3860
211	70.53		88060	5288
212	71.01		77483	7909
213	71.27	79	60771	7263
214	71.35		48085	5350
215	71.70		36608	5445
216	71.76	80	36589	5669
217	71.87	81	36470	5421
218	71.95		19453	3729
219	72.22		59420	5666
220	72.45		13401	1852
221	72.65		22371	2597
222	72.82	82	19222	2583
223	73.04		56699	7044
224	73.19		26940	2710
225	73.41		30668	2140
226	73.77	83	23442	3187
227	73.89		28779	3854
228	74.03	84	26366	3827
229	74.17		26426	3135
230	74.54	85	17569	3370
231	74.66		81349	7058
232	75.11		26087	2643
233	75.22		22286	3031
234	75.46		23815	3169
235	75.70		22425	2991
236	76.06		22490	1641
237	76.39	86	19311	1837
238	76.84		13552	1604
239	77.56		17791	1832
240	77.89		14975	1343
241	78.06	88	2155	461
242	78.19		3149	645
243	78.34		17608	2320
244	78.91		3505	665
245	79.54		9572	989
246	79.86		26346	1924
247	80.48	89	33976	961
248	83.27		3916	537

TOTAL AREA DETECTED = 6.026092E+07

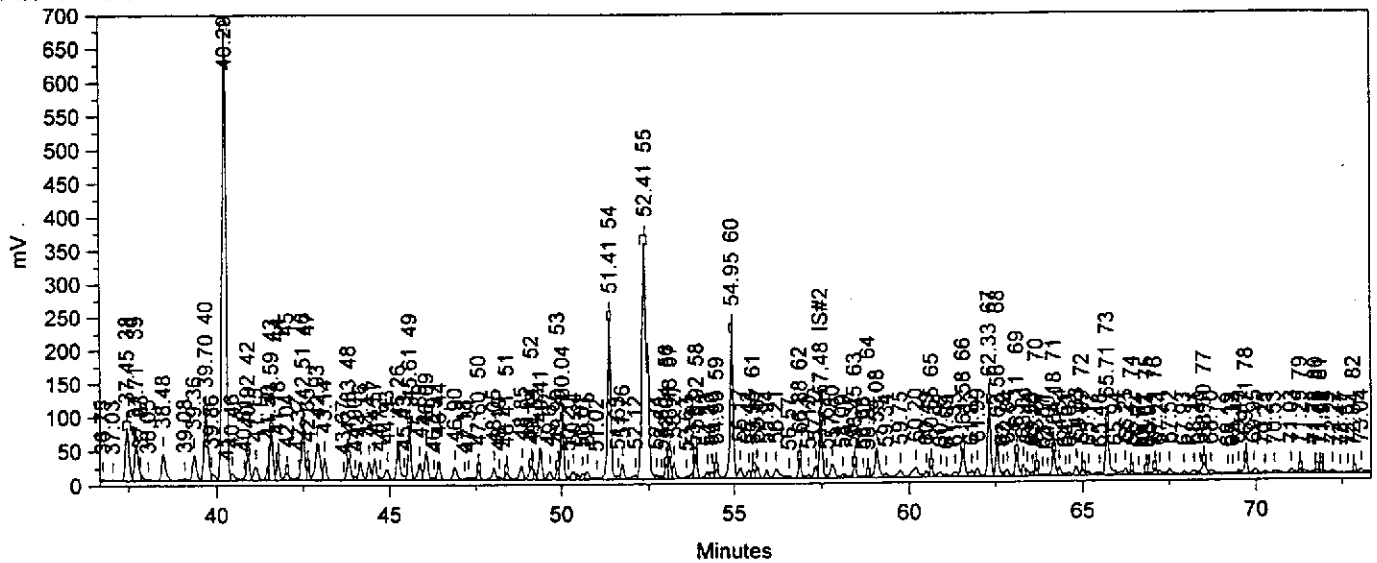
Processed by: rjd

Date: 7-15-98

Plot Panel 1 of 3: from 0.0 to 36.7Minutes



Plot Panel 2 of 3: from 36.7 to 73.3Minutes



C3 to C10 ANALYSIS by GLOBAL GEOCHEMISTRY CORPORATION

TODAY'S DATE: 7/15/98 TIME: 8:10:36 AM
 RAW DATA FILE NAME: E:\DATA6\C310191.04R
 SAMPLE NAME.....4483-1D (1g sample/5mL water) + 3uL IS-007
 DATE TAKEN: 07-10-1998 21:56:45
 METHOD FILE: IE:\DATA6\C310191D.MET
 METHOD: C3-C10 Analysis
 CALIBRATION FILE: IE:\DATA6\C310191D.CAL
 INSTRUMENT: HP5890/ALS-FID OPERATOR: R.deLeon
 RUN TIME: 110min
 COM PORT: 6
 HEADING 1: HP5890/Autosampler purge&trap
 HEADING 2: GC range=2^1
 FORMAT FILE: E:\DATA6\C3C10.FMT

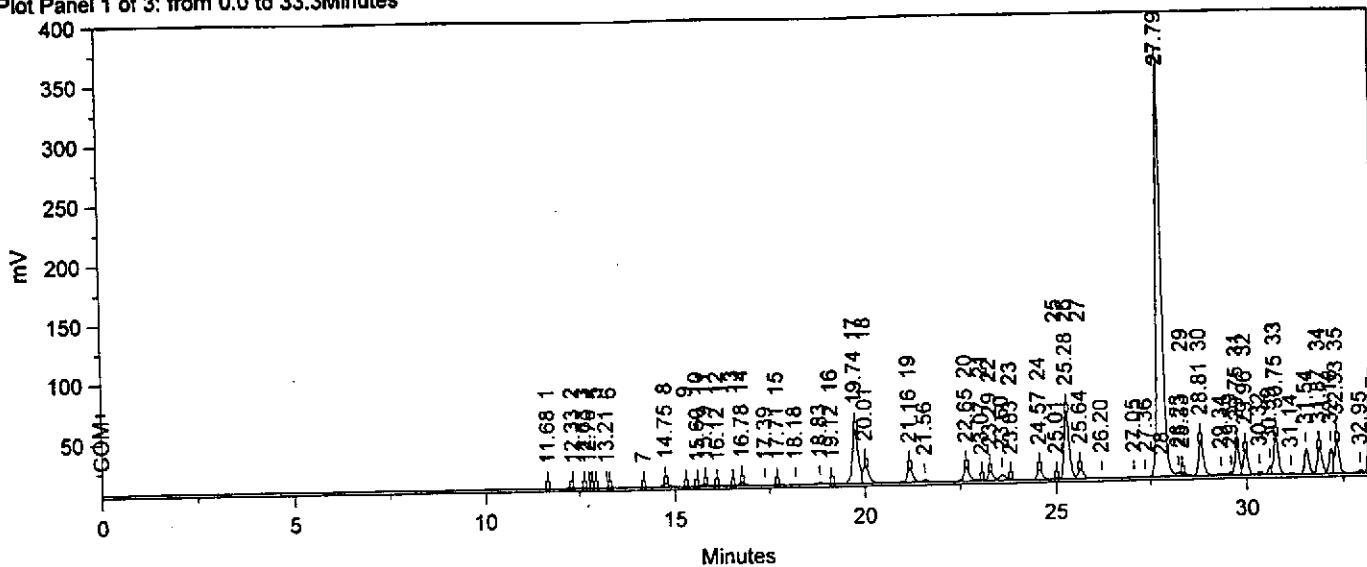
PEAKS DETECTED IN THIS CHROMATOGRAM:

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height
1	11.67	1	4376	387
2	12.29	2	77543	5757
3	12.82	4	215706	15300
4	13.07		10376	2305
5	13.24	6	12385	907
6	14.16	7	15422	1222
7	14.76	8	1801995	134896
8	15.30	9	72557	6551
9	15.41		14157	3941
10	15.61	10	58497	9497
11	15.80	11	834157	62936
12	16.13	12	187175	14374
13	16.53	13	77101	7109
14	16.79	14	272468	19852
15	17.70	15	52151	4227
16	18.84		41347	3787
17	19.12	16	75670	4565
18	19.71	17	593849	46985
19	20.02	18	1750406	138174
20	21.17	19	1074660	91860
21	21.62		267780	18757
22	22.65	20	1095594	88033
23	23.07	21	176862	16651
24	23.28	22	195921	17749
25	23.59		198451	14818
26	23.95	23	128895	9812
27	24.56	24	186947	17161
28	25.01	25	27819	3522
29	25.28	26	1788287	166193
30	25.63	27	414547	38037
31	26.21		37053	3007
32	27.01		18353	1115
33	27.35		17101	1895
34	27.66		204528	39586
35	27.74	28	659057	59464
36	28.33	29	88168	5419
37	28.79	30	659256	61364
38	29.31		61967	5600
39	29.58		51747	10756
40	29.74	31	1014062	107351
41	29.96	32	617775	67868
42	30.30		103187	10925
43	30.58		37765	8913
44	30.74	33	1100816	121569
45	31.13		38523	3891
46	31.52		647665	72935
47	31.86	34	746035	75677
48	32.17		565657	75001
49	32.33	35	1230681	139559
50	32.93		53889	6461
51	33.20	IS#1	1240731	137377
52	33.58	36	1077078	113269
53	33.79		281545	26942
54	34.12		106904	13758

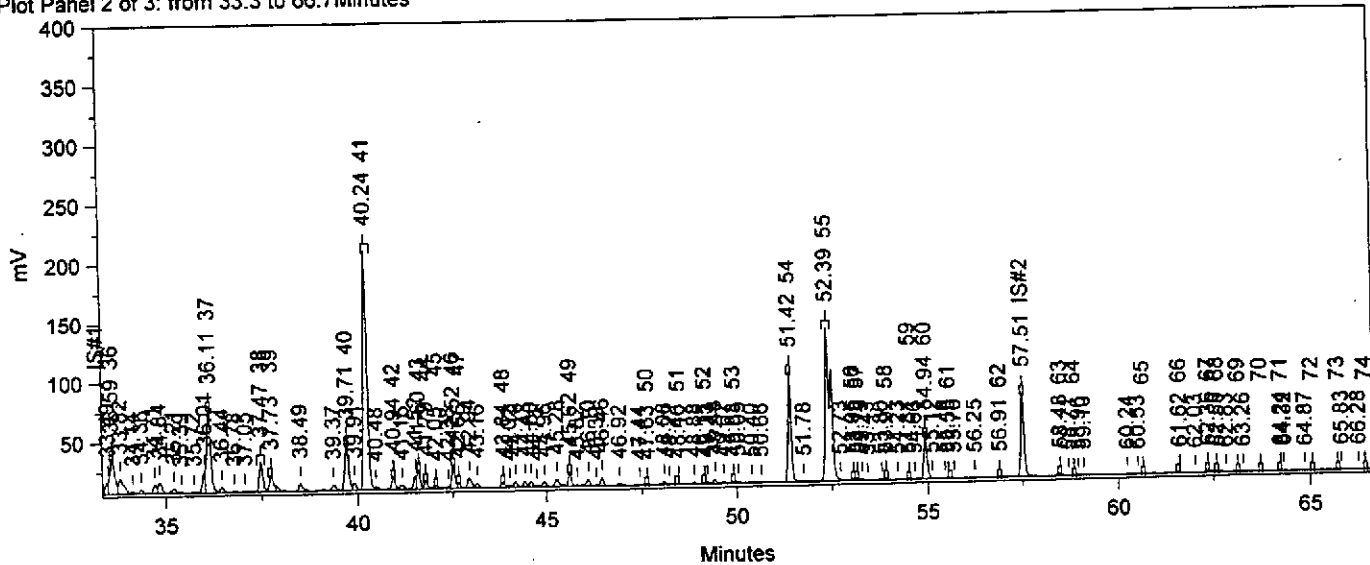
Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height
55	34.34		63208	7604
56	34.69		90308	13525
57	34.82		120431	14762
58	35.12		104556	8996
59	35.37		14754	1955
60	35.71		23663	2503
61	35.93		84378	33104
62	36.11	37	1845074	207494
63	36.42		209278	27475
64	36.75		15350	1902
65	37.03		11604	1520
66	37.45	38	560984	76993
67	37.71	39	406155	53806
68	37.83		41507	9689
69	38.05		15354	2029
70	38.48		319814	39357
71	39.08		35045	3274
72	39.36		296737	37204
73	39.70	40	847232	99985
74	39.86		67820	9298
75	40.29	41	5582789	672871
76	40.46		95173	10248
77	40.81		19191	4492
78	40.92	42	254418	38929
79	41.15		174217	19791
80	41.50		86545	24436
81	41.59	43	483248	73717
82	41.78	44	183821	29701
83	42.04	45	99900	10865
84	42.37		23795	5568
85	42.51	46	531937	82596
86	42.65	47	101518	18997
87	42.93		521164	54112
88	43.14		198576	31611
89	43.67		5052	951
90	43.83	48	241801	32304
91	44.00		33537	5816
92	44.16		185382	26553
93	44.41		156451	25801
94	44.57		193165	31393
95	44.72		22781	4445
96	44.93		133528	15804
97	45.26		369846	53921
98	45.43		34989	6710
99	45.61	49	449074	80107
100	45.89		184466	24375
101	46.09		290276	41621
102	46.29		20923	3879
103	46.44		162634	27183
104	46.90		145579	18444
105	47.18		6017	1154
106	47.31		24507	3607
107	47.60	50	85095	12950
108	48.05		117128	16584
109	48.19		24038	4426
110	48.41	51	79100	10132
111	48.85		147917	19936
112	49.14	52	128810	19192
113	49.18		67243	14538
114	49.41		295908	46473
115	49.67		88142	11132
116	49.90	53	82618	16845
117	50.04		500009	81639
118	50.20		15877	3540
119	50.34		87400	11776
120	50.61		50015	8377
121	50.75		86986	11528
122	51.02		20375	2701
123	51.41	54	1560904	240004
124	51.63		32901	5520
125	51.76		141767	22600

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height
126	52.12		54808	5962
127	52.41	55	3694040	353399
128	52.74		39593	6273
129	52.88		24761	3876
130	53.04	56	105577	20819
131	53.13	57	174950	32044
132	53.27		134866	23521
133	53.63		18309	3203
134	53.82		52462	9506
135	53.92	58	213613	34420
136	54.23		75019	9597
137	54.36		61842	10666
138	54.50	59	92159	12608
139	54.95	60	1393075	220111
140	55.17		124879	15679
141	55.42		83635	11608
142	55.55	61	78570	12517
143	55.67		101918	17081
144	55.94		77110	12897
145	56.21		143262	13668
146	56.57		19950	3100
147	56.88	62	145995	27976
148	57.13		39207	4887
149	57.32		97310	16546
150	57.48	IS#2	507924	85362
151	57.64		18533	3840
152	57.80		171786	20292
153	58.09		30456	5404
154	58.37		18585	6139
155	58.45	63	112370	18543
156	58.68		19120	3102
157	58.82	64	13228	2430
158	59.08		326276	43481
159	59.34		49552	6421
160	59.75		105557	9681
161	60.20		185384	14063
162	60.49		56862	9280
163	60.65	65	89803	15976
164	60.92		69661	6471
165	61.09		19067	3406
166	61.33		70839	7523
167	61.58	66	284506	39664
168	61.82		71001	8640
169	61.99		89717	13094
170	62.33	67	668920	111649
171	62.56	68	296610	49080
172	62.72		23722	6545
173	62.84		72854	10492
174	63.11	69	237433	34320
175	63.31		101601	18111
176	63.41		51291	9916
177	63.56		39841	6463
178	63.67	70	69072	11172
179	63.87		26322	2788
180	64.00		1649	1760
181	64.18	71	241167	37471
182	64.34		81527	12973
183	64.51		25689	4207
184	64.63		32675	4791
185	64.83		95025	14212
186	64.99	72	62812	9393
187	65.17		43665	6264
188	65.48		63854	4748
189	65.71	73	574400	77570
190	65.94		65371	6581
191	66.25		69400	10719
192	66.42	74	52814	6473
193	66.64		21135	2679
194	66.87	75	38010	4194
195	66.94		16826	3718
196	67.11	76	51022	8753

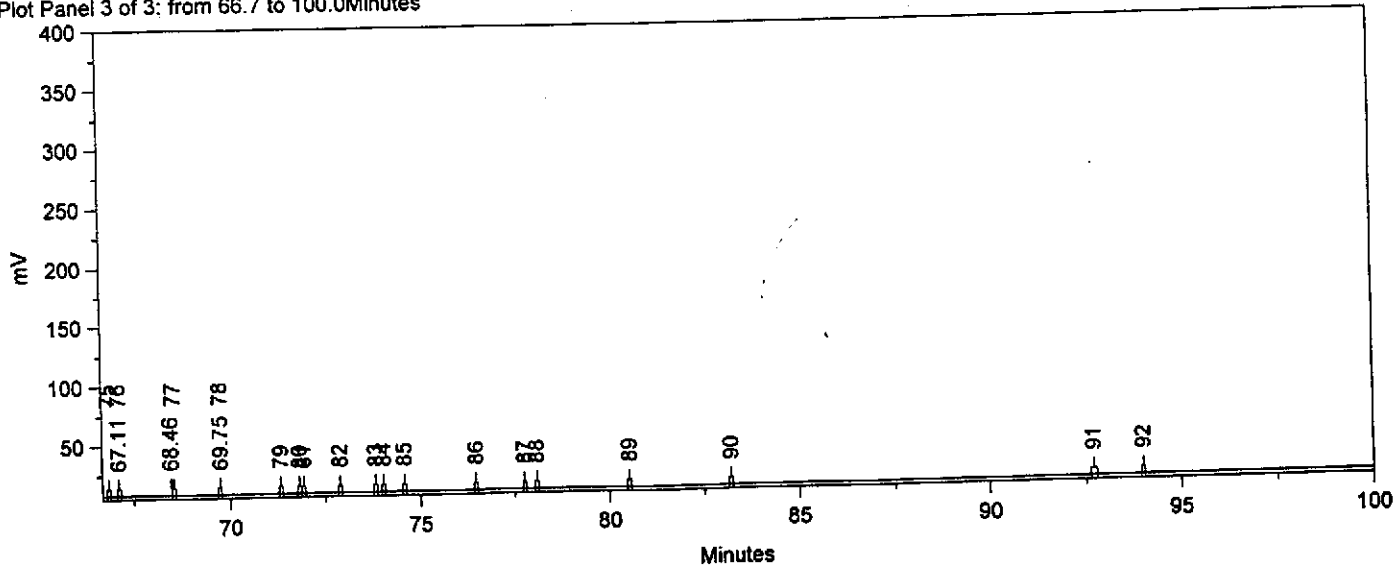
Plot Panel 1 of 3: from 0.0 to 33.3Minutes



Plot Panel 2 of 3: from 33.3 to 66.7Minutes



Plot Panel 3 of 3: from 66.7 to 100.0Minutes



C3 to C10 ANALYSIS by GLOBAL GEOCHEMISTRY CORPORATION

TODAY'S DATE: 7/15/98 TIME: 8:07:46 AM
 RAW DATA FILE NAME: E:\DATA6\310191.06R
 SAMPLE NAME.....4483-2 (0.1182g sample/5mL water) + 3uL IS-007
 DATE TAKEN: 07-11-1998 02:15:14
 METHOD FILE: IE:\DATA6\310191F.MET
 METHOD: C3-C10 Analysis
 CALIBRATION FILE: IE:\DATA6\310191F.CAL
 INSTRUMENT: HP5890/ALS-FID OPERATOR: R.deLeon
 RUN TIME: 110min
 COM PORT: 6
 HEADING 1: HP5890/Autosampler purge&trap
 HEADING 2: GC range=2^1
 FORMAT FILE: E:\DATA6\3C10.FMT

PEAKS DETECTED IN THIS CHROMATOGRAM:

Peak #	Ret Time (min)	Peak Name	Peak Area	Peak Height
1	11.68	1	5673	317
2	12.33	2	5931	435
3	12.63	3	4795	454
4	12.76		4173	396
5	13.21		5007	156
6	14.75	8	40652	3361
7	15.60	10	2600	288
8	15.79	11	20795	1856
9	16.12	12	3249	284
10	16.78	14	33832	2747
11	17.39		513	97
12	17.71	15	6320	570
13	18.18		681	110
14	18.83		17952	1577
15	19.12	16	1757	275
16	19.74	17	491358	45709
17	20.01	18	165778	14921
18	21.16	19	124081	12250
19	21.56		18137	1586
20	22.65	20	124078	11658
21	23.07	21	7615	1000
22	23.29	22	75255	7851
23	23.60		54097	5059
24	23.83	23	12575	1084
25	24.57	24	80411	8582
26	25.01	25	5514	731
27	25.28	26	536315	57627
28	25.64	27	82033	8260
29	26.20		5553	486
30	27.05		3883	363
31	27.36		3648	493
32	27.79	28	3383672	348478
33	28.23		30351	3260
34	28.33	29	24991	2775
35	28.81	30	271645	30197
36	29.34		14692	1599
37	29.59		16139	2827
38	29.75	31	202797	25229
39	29.96	32	176197	21586
40	30.32		24185	2955
41	30.59		41752	7347
42	30.75	33	278785	34285
43	31.14		10164	1283
44	31.54		162961	21152
45	31.87	34	192606	22100
46	32.18		156485	21256
47	32.33	35	222325	28767
48	32.95		22563	2999
49	33.21	IS#1	549124	73934
50	33.49		52095	10106
51	33.59	36	268422	30025
52	33.82		128868	12712
53	34.14		15586	2120
54	34.36		26056	3526

Date 10/19/98
Time 16:06:04

FORWARD. INC.

MATERIAL ANALYSIS REPORT BY ACCOUNT

For the period / / - 10/18/98

Detailed report for sites 00 - 99

Accounts 722623 - 722623 Customer Types - Z Materials - ZZZZZZZZZZ Material Types - Z

Date	Material	Type	Customer	Type	Tickets	Count	Est. vol.	Act. Vol.	Est. Wt.	Actual Wt.
08/21/98	CII SOIL T	C	722623	B	01-097685	0	18	18	17.34	17.34
09/01/98	CII SOIL T	C	722623	B	01-098809	0	18	18	12.57	12.57
TOSCO MARKETING (T.BERRY)					2	0	36	36	29.91	29.91
Average						0	18	18	15.00	15.00
Report Total					2	0	36	36	29.91	29.91
Report Average						0	18	18	15.00	15.00



FORWARD
INCORPORATED

P.O. Box 6336
1145 W. Charter Way • Stockton, CA 95206
(209) 466-4482 • (800) 204-4242 • FAX (209) 466-1067

July 10, 1998

RECEIVED

OCT 22 1998

GETTLER-RYAN INC.
GENERAL CONTRACTORS

Gettler-Ryan, Inc.
6747 Sierra Court, Suite J
Dublin, CA 94568

Attention: Clyde Galantine

RE: **FORWARD, INC.** Approval No. 722623
Contaminated Soil w/Hydrocarbon from Unocal S/S# 7376 - 4191 First Street

Dear Mr. Galantine:

FORWARD, INC. is pleased to confirm the disposal of 29.91 of material from the referenced site. The material was received at our Manteca, California facility on 8/21/98 and 9/1/98. The waste was placed in a Class II waste management unit.

Approval for this material was based on the information provided in the waste profile and associated materials submitted by Gettler-Ryan, dated July 10, 1998 on behalf of the Tosco Marketing Company. Acceptance of the waste is subject to the "Terms and Conditions" agreed to and signed by Gettler-Ryan in the waste profile.

Thank you for the opportunity to be of service. Should you have any questions regarding this matter, please do not hesitate to contact me or our Customer Service at (800) 204-4242.

Sincerely,

FORWARD, INC.

Brad Bonner / sr

Brad Bonner
Sales Manager

BB/sr

F:\FORWARD\MERGE FORMS\CONSULTANT CONFIRMATION OF DISPOSAL

