Oakland
All-America City
1993

CITY OF OAKLAND

DALZIEL BUILDING • 250 FRANK H. OGAWA PLAZA, SUITE 5301 • OAKLAND, CALIFORNIA 94612-2034

Public Works Agency
Environmental Services

FAX (510) 238-7286
TDD (510) 238-7644

June 17, 2000

Mr. Barney Chan
Alameda County Environmental Health Services
1131 Harbor Bay Parkway
Alameda, California 94502-6577

Subject: **First Quarter 2000 Monitoring and Recommendation Report**
City of Oakland Municipal Service Center
7101 Edgewater Drive
Oakland, California

Dear Mr. Chan:

Enclosed is one copy of the First Quarter 2000 Monitoring and Recommendation Report, prepared by our consultant, Cambria Environmental Technology Inc., for the City of Oakland Municipal Service Center at 7101 Edgewater Drive.

We are finalizing a Work Plan for installation of additional borings and one additional well (MW-18) between MW-6 and MW-16. We will send you the Work Plan for your review and approval by July 15, 2000.

Please call me at 238-6259, if you have any questions or require additional information.

Sincerely,

Joseph A. Cotton
Environmental Program Specialist

cc: w/o encl.: Andrew Clark-Clough
David Elias, Cambria Environmental Technology
cc: w/encl.: Diane Heinz, Port of Oakland

CAMBRIA

May 16, 2000

Mr. Joseph Cotton
City of Oakland, Public Works Agency
Environmental Services Division
250 Frank H. Ogawa Plaza, Ste. 5301
Oakland, California 94612-2034

Re: **First Quarter 2000 Monitoring and Recommendations Report**
City of Oakland, Municipal Services Center
7101 Edgewater Drive
Oakland, California
Cambria Project #153-1247-019

Dear Mr. Cotton:

As required by the Alameda County Health Care Services Agency (ACHCSA), Cambria Environmental Technology, Inc. (Cambria) has prepared this first quarter 2000 groundwater monitoring report for the above-referenced site. Presented below are the first quarter 2000 activities and results, the anticipated second quarter 2000 activities, and recommendations for future work. The recommendations are based on the initial analytic results for groundwater samples collected from seven new monitoring wells installed in December 1999. Groundwater elevations and hydrocarbon concentrations are presented on Figure 1. We have also included isoconcentration contours as Figures 2 through 6 and cross sections, including the new lithologic data generated during the well installation, as Figures 7 and 8. Analytic results are tabulated in Table 1, and the laboratory analytical report including chromatograms is included as Attachment A. Well sampling forms, completed in the field, are included as Attachment B, and our standard field procedures for sampling monitoring wells are included as Attachment C.

FIRST QUARTER 2000 ACTIVITIES AND RESULTS

On January 18, 2000, Cambria gauged monitoring wells MW-1, MW-2 and MW-5 through MW-17 and backfill wells TBW-1, TBW-3, and TBW-6 (Figure 1), and inspected the site wells for separate phase hydrocarbons (SPH). Wells MW-3 and MW-4 were destroyed during the fourth quarter 1999. As per the ACHCSA approved schedule shown below, Cambria collected groundwater samples on January 18 and 19, 2000, from monitoring wells MW-1, MW-2 and MW-5 through MW-10, and initial groundwater samples from new wells MW-11 through MW-17. Select groundwater samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH as diesel (TPHd), TPH as kerosene (TPHk), TPH as motor oil (TPHmo), benzene, toluene, ethylbenzene and xylenes (BTEX), methyl tert-butyl ether (MTBE), and select bioparameters at Caltest Analytical of Napa, California, a California state-certified laboratory. The specific analytes for each well are presented below in Table A.

Need New Schedule

Oakland, CA
San Ramon, CA
Sonoma, CA
Portland, OR

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

Table A - Well Sampling Protocol

Well	Sampling Frequency	Proposed Analytes
MW-1	1st and 3rd Quarters	TPHd, TPHk, TPHmo, TPHg/BTEX/ MTBE*, bioparameters
MW-2	1st and 3rd Quarters	TPHd , TPHg/BTEX/MTBE*, bioparameters
MW-3		None - destroy well
MW-4		None - destroy well
MW-5	1st and 3rd Quarters	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE*, bioparameters
MW-6	1st and 3rd Quarters	TPHd, TPHg/BTEX/MTBE*, bioparameters
MW-7	1st and 3rd Quarters	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE*, bioparameters
MW-8	1st, 2nd, 3rd, and 4th Quarters	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE*, bioparameters
MW-9	1st, 2nd, 3rd, and 4th Quarters	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE*, bioparameters
MW-10	1st, 2nd, 3rd, and 4th Quarters	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE*, bioparameters
MW-11	1st, 2nd, 3rd, and 4th Quarters	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE*, bioparameters
MW-12	1st, 2nd, 3rd, and 4th Quarters	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE*, bioparameters
MW-13	1st, 2nd, 3rd, and 4th Quarters	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE*, bioparameters
MW-14	1st, 2nd, 3rd, and 4th Quarters	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE*, bioparameters
MW-15	1st, 2nd, 3rd, and 4th Quarters	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE*, bioparameters
MW-16	1st, 2nd, 3rd, and 4th Quarters	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE*, bioparameters
MW-17	1st, 2nd, 3rd, and 4th Quarters	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE*, bioparameters

*Any positive results for MTBE will be confirmed by re-analysis using EPA Method 8260, except in MW-5. Confirmation by EPA Method 8260 for MW-5 is not necessary due to positive confirmation results in the third quarter 1998.
Bioparameters = Ferrous iron, ORP, DO, total alkalinity, nitrate, and sulfate and conducted only during 1st and 3rd quarters.

Groundwater Flow Direction

Cambria gauged all monitoring wells on January 18, 2000, within a thirty-minute period, to minimize the effects of tidal fluctuation on the measurement of groundwater elevations. The measurements indicate a northern groundwater gradient of 0.007 ft/ft toward Damon Slough in the northern portion of the site and a southwestern-northwestern groundwater gradient of 0.003 ft/ft toward San Leandro Bay in the central and southern portion of the site (Figure 1). The flow directions are generally consistent with historical measurements. However, the groundwater elevation data from newly installed wells MW-11 and MW-14, located in the central/western portion of the site, revealed a northwest/southeast-trending groundwater ridge. This ridge was not evident during previous sampling events. The flow direction interpretation in the northern portion of the site was not effected substantially by the removal of groundwater elevation data from previously destroyed wells MW-3 and MW-4. The contours near these former wells appear similar to previous sampling events

with groundwater flowing north towards Damon Slough. Groundwater elevation data are presented in Table 1.

Hydrocarbon Distribution in Groundwater

Chromatogram Review: Analytic laboratories will usually report the hydrocarbons detected in the range of the requested analysis, regardless of the pattern of the chromatogram. They may note if the pattern is different from the typical pattern associated with the requested analysis. However, this practice can still result in false positive hydrocarbon detections and reporting due to the overlapping of the ranges of different types of hydrocarbons. For example: a laboratory may report a diesel concentration, when in fact, the hydrocarbon detected is the lighter end of motor oil.

The laboratory reported that the soil and groundwater samples analyzed from newly installed wells MW- 12 through 17 contained relatively high TPHmo concentrations compared to historical soil and groundwater samples analyzed from other locations. In addition, we noted that high motor oil concentrations were often associated with a lower diesel concentration for a number of the perimeter wells. Therefore, we requested that the analytic laboratory complete a review of the chromatograms generated for this quarter to assess whether the TPHd detected in groundwater samples from the wells located along the shoreline were actually the lighter end of TPHmo. **The results of this review indicated that most of the TPHd reported by the laboratory was actually motor oil** (Table 1, Figure 2, Attachment A). This result of the chromatogram review is significant for two reasons: 1) the TPHd-impacted soil and groundwater appears to be restricted to onsite, and is not detected in groundwater water samples collected from downgradient perimeter wells MW-8, 9, 10, 13, 14, 15, or 17, and 2) the City does not have a history of an onsite motor oil release, nor has elevated TPHmo been detected historically in onsite groundwater or soil samples. **Therefore, the TPHmo detected in the newly installed wells appears to originate from an offsite source located along the San Leandro** shoreline and is not related to fuel dispensing activities associated with the City's Municipal Service Center.

Isoconcentration Contours: Cambria generated isoconcentration contours for TPHg, TPHd, TPHmo, benzene, and MTBE for this quarters data to summarize and present the distribution of the different hydrocarbons detected at the site (Figures 2,3,4,5, and 6). The discussion below summarizes the general distribution of each analyte.

Diesel in Groundwater: As discussed above, the majority of the diesel detected in groundwater samples for this quarter were actually the lighter end of motor oil, and in wells MW-10 and MW-11, the heavier end of gasoline contributed to the diesel concentration, as well. Therefore, the maximum TPHd concentration detected in groundwater was 100 micrograms per liter (µg/l) in well MW-5, which is located about 450 ft from San Leandro Bay, adjacent to the active USTs and Building Number 5. As illustrated on Figure 2, none of the offsite perimeter wells contain diesel

concentrations above the San Francisco Airport Ecological Protection Zone Tier I Standard of 640 µg/l. Although the wells were not sampled for TPHd due to SPH, the SPH surrounding wells TBW-5, TBW-1, TBW-3, and MW-6 are likely a mix of gasoline and diesel. Based on this quarters sampling data, it appears that TPHd in groundwater has not migrated offsite to the San Leandro Bay.

Motor Oil in Groundwater: The maximum TPHmo concentration detected in groundwater was 120,000 µg/l in new offsite well MW-13. With the exception of well MW-12, located immediately adjacent to the fence and property line, the highest TPHmo concentration detected in onsite groundwater was 660 µg/l in well MW-2. The TPHmo detected in the sample from MW-12 may be the result of it's proximity to the property boundary and the apparent TPHmo offsite source. As illustrated on Figure 3, elevated TPHmo concentrations appear to be restricted to the areas offsite and to the west of the Municipal Service Center property line.

Gasoline in Groundwater: The maximum TPHg concentration detected was 3,000 µg/l in well MW-5. Up to 200 µg/l TPHg were detected in downgradient offsite wells MW-9, 10, 12, and 15, which is below the San Francisco Airport Ecological Protection Zone Tier I Standard acceptable threshold of 3,700 µg/l. TPHg concentrations appear to be defined in the downgradient and crossgradient directions to within acceptable ecological risk thresholds (Figure 4).

Benzene in Groundwater: A maximum benzene concentration of 66 µg/l was detected in well MW-5, located adjacent to the active USTs. This concentration, and the other low concentrations detected, is within the acceptable risk thresholds for both the San Francisco Airport Ecological Protection Zone Tier I Standards and the City of Oakland Risk-Based Tier I guidance thresholds for inhalation of indoor air vapors, of 71 and 110 µg/l, respectively (Figure 5).

MTBE in Groundwater: With the exception of the 1,300 µg/l MTBE detected in well MW-5, no MTBE was detected in any of the groundwater samples collected for this quarters monitoring. However, the downgradient extent of the MTBE is defined by the non-detect result for well MW-11, located about 150 downgradient of well MW-5 (Figure 6).

Separate-Phase Hydrocarbons: Separate-phase hydrocarbons (SPH) were detected in monitoring wells MW-6 and MW-16, and in backfill wells TBW-3 and TBW-5. However, the extent of SPH is defined in the downgradient direction for each of these areas by wells MW-13 and MW 17. It is unlikely that the SPH detected in well MW-16 is related to the SPH in well MW-6 because the hydrocarbon appears to be more viscous than the onsite diesel/gasoline SPHs. Cambria recently submitted a product sample from well MW-16 to verify this conclusion, and will report the results of the analysis under separate cover. Cambria is currently removing SPH from tank backfill well TBW-5 using a pneumatic skimmer. SPH in wells MW-6, MW-16, TBW-1 and TBW-3 are being removed with passive skimmers.

Bioparameter Analyses Results

Cambria analyzed groundwater samples for ferrous iron, total alkalinity, oxidation reduction potential (ORP), dissolved oxygen (DO), nitrate, and sulfate to assess the present level of intrinsic bioremediation. These bioparameters were quantified in all of the monitoring wells analyzed for hydrocarbons. Presented below in Table B is a summary of the chemical reactions and relationships that indicate whether hydrocarbon biodegradation is occurring. Following Table B we have summarized the analytical results for this quarters sampling. The analytical results in their entirety, including TPHg and TPHd concentrations for comparison, are presented in Table 2.

Table B - Bioparameter Analysis

Bio-parameter	Description of chemical processes and implications of relationship between hydrocarbon and bioparameter concentrations.	Relationship indicating active bio-degradation	Observed Relationship
ORP	The oxidation-reduction potential (ORP) of groundwater is a measure of electron activity and is an indicator of the relative tendency of a solute species to gain or lose electrons. The ORP of groundwater generally ranges from -400 millivolts (mV) to +800 mV. Under oxidizing conditions the ORP of groundwater is positive, while under reducing conditions the ORP is usually negative. Reducing conditions (negative ORP) suggests that anaerobic biodegradation is occurring. Generally, the ORP of groundwater inside a hydrocarbon plume should be somewhat less than that measured outside the plume.	inverse	direct
Nitrate	After DO has been depleted in the groundwater, nitrate may be used as an electron acceptor for anaerobic biodegradation. In this denitrification process, nitrate is reduced to nitrite. Reduced nitrate concentrations in the source area compared to the clean area suggests that anaerobic biodegradation is occurring.	inverse	inverse
Sulfate	After DO and nitrate have been depleted in the groundwater, sulfate may be used as an electron acceptor for anaerobic biodegradation. If sulfate concentrations vary inversely with hydrocarbon concentrations, anaerobic biodegradation of fuel hydrocarbons is probably occurring.	inverse	inverse
Ferrous Iron	In some cases ferric iron acts as an electron acceptor during anaerobic biodegradation of petroleum hydrocarbons. In this process, ferric iron is reduced to ferrous iron, which may be soluble in water. Therefore, if the ferrous iron concentrations vary directly with hydrocarbon concentration, anaerobic biodegradation may be occurring.	direct	direct

Alkalinity	The total alkalinity of groundwater indicates the groundwater's ability to neutralize acid. High alkalinity (high pH) conditions occur when groundwater contains elevated hydroxides, carbonates, and bicarbonates of elements such as calcium, magnesium, sodium, potassium, or ammonia. Since these chemical species are created by the respiration of microorganisms, high alkalinity is an indicator of biological activity. However, these chemical species may also result from the dissolution of rock (especially carbonates) and the transfer of carbon dioxide from the atmosphere. Alkalinity also buffers groundwater pH against acid generation by both aerobic and anaerobic biodegradation processes. Higher alkalinity in the source area as compared to clean areas suggests that aerobic biodegradation is occurring.	direct	direct
Dissolved Oxygen	During aerobic biodegradation, DO levels are reduced as aerobic respiration occurs. DO is the most thermodynamically favored electron acceptor used in aerobic biodegradation of petroleum hydrocarbons. Active aerobic biodegradation of BTEX compounds requires at least 1 ppm DO in groundwater and DO concentrations can be as high as 8 to 13 mg/L in oxygen-saturated groundwater that is free of hydrocarbons. Observed inverse relationships between DO and hydrocarbon concentrations indicate the occurrence of aerobic degradation, provided that at least 1 to 2 mg/L of DO is present in groundwater.	inverse	Inverse

Aerobic biodegradation: In general, nitrate, sulfate and DO concentrations appear to decrease as hydrocarbon concentrations increase, suggesting that aerobic biodegradation of hydrocarbons is occurring. Also, total alkalinity results show a general increasing trend as hydrocarbon concentrations increase, which also indicates aerobic biodegradation.

Anaerobic biodegradation: Ferrous iron concentrations exhibited a general increasing trend as hydrocarbons increased, suggesting that anaerobic biodegradation is occurring. ORP, however, appeared to increase as hydrocarbon concentrations increased, which is contraindicative of anaerobic biodegradation. The negative ORP values measured in wells MW-1, MW-5, MW-7, MW-11, MW-13 and TBW-6 indicate that reducing conditions may be present in the groundwater surrounding these wells.

In general, the bioparameter results indicate that natural biodegradation of hydrocarbons is occurring at the site.

Geologic Cross Sections

Cambria prepared two geologic cross sections to better understand the hydrogeology of the site, and to incorporate the new lithologic information generated during the installation of monitoring wells MW-11 through MW-17. Although the analytic results for groundwater from the downgradient perimeter wells indicate that the rate of contaminant transport is minimal at the site, the cross sections were also prepared to identify any high permeability sediments that may promote transport of hydrocarbons towards the San Leandro bay.

Cross Section A-A¹: The analytic results for groundwater indicate that hydrocarbon transport of TPHg and TPHd-related hydrocarbons is not occurring at a rapid rate. However, high permeability sediments do exist between wells MW-14 and MW-8, as shown on Figure 7. As discussed below, cross section B-B¹ shows that the high permeability sediments do not extend significantly to the east from well MW-16, and are not likely a concern in this area. However, there is less information regarding the sediments east of wells MW-14, MW-9, and MW-15. The shallow samples collected on the east side of the storage building during the piping removal were primarily low permeability clayey silts, with occasional sands and gravels, but the samples were not collected below about 7 ft depth. However, as mentioned above, the hydrocarbon concentrations detected in these wells are all below acceptable risk-based parameters for TPHg, TPHd, benzene, and MTBE, indicating that a high permeability conduit does not exist in the vicinity of the wells. High permeability units exist from about 12-18 ft depth in well MW-12 and in remediation well RW-1 from about 14 to 19 ft depth.

Cross Section B-B¹: As shown on Figure 8 , cross section B-B¹, high permeability sediments appear to exist adjacent to San Leandro Bay, and do not extend significantly onto the Municipal Service Center property in the southern portion of the site. Hydrocarbon transport from the former USTs located upgradient from MW-6 is likely impeded by the moderate and low permeability sediments that appear to exist from well MW-7 to at least well MW-6.

OTHER FIRST QUARTER 2000 ACTIVITIES

Cambria installed an active, mobile free-product skimmer, and began removal of free-product from tank backfill wells TBW-1 and TBW-5. As of April 18, 2000, the active skimmer had removed about 95 gallons of SPH from well TBW-5. In addition, Cambria installed passive skimmers in wells MW-6, MW-16, TBW-1, and TBW-3.

CONCLUSIONS AND RECOMMENDATIONS

As mentioned above, Cambria collected the initial groundwater samples from seven newly installed monitoring wells (five offsite, two onsite) during this sampling event. In summary, the analytic results for groundwater from the seven new monitoring wells indicate the following:

- The diesel concentrations detected in the offsite perimeter wells are from the light end of motor oil, and are not indicative of actual TPHd in groundwater.

- The offsite groundwater samples contained elevated TPHmo concentrations of up to 120,000 µg/l. These TPHmo concentrations are much higher than the concentrations detected in onsite wells where gasoline and diesel are the primary contaminants of concern. Since TPHmo appears to exist primarily offsite, there may be offsite TPHmo sources not associated with the historical operations at the Municipal Service Center. The site and the surrounding land is composed of large quantities of fill of unknown origin. Therefore, it is possible that motor oil was entrained in the material used to fill the offsite area. Although there is no historical documentation, a second potential source may have been a motor oil spill prior to the reclamation of the wetland.

- As discussed above, none of the groundwater samples analyzed this quarter from the perimeter wells contained hydrocarbon concentrations above acceptable risk thresholds, with the exception of TPHmo. However, the TPHmo detected in the samples is likely from a source not associated with the historical activities at the Municipal Service Center.

- The viscous SPH detected in well MW-16 did not appear to be the same hydrocarbon as the mixed gasoline and diesel SPH detected in onsite monitoring wells. Cambria compared the chromatograms from the soil samples collected from this well with the chromatograms from the product detected onsite. The results of the comparison supported that the hydrocarbons may be from different sources. We have also submitted a product sample to an analytic laboratory to verify this conclusion.

- The extent of hydrocarbons in groundwater downgradient of well MW-5 and the active USTs appears to attenuate significantly with distance. This conclusion is based on the moderate hydrocarbon concentrations detected in groundwater samples collected from the newly installed downgradient well MW-11, which define the downgradient extent of hydrocarbons from this source area.

- With the exception of the wells containing SPH, no groundwater samples collected this quarter contained benzene, MTBE, TPHg, or TPHd concentrations above the San Francisco Airport Ecological Protection Zone Tier I standards or the City of Oakland Risk-based Tier I guidance thresholds for inhalation of indoor air vapors.

As mentioned above, the relatively high TPHmo concentrations are interfering with the TPHd analyses and causing the laboratory to report falsely elevated TPHd concentrations. To better assess the source of the TPHmo, to keep the remedial process moving forward for the onsite TPHg and

TPHd-impacted soil and groundwater, and to better define the location of high permeability sediments, Cambria recommends the following:

- Completing borings, and perhaps a monitoring well in the vicinity of wells MW-16 and MW-17 to assess whether the source of the SPH detected in well MW-16 emanates from on or offsite. Cambria has also collected a SPH sample from well MW-16 for comparison to the SPH detected onsite;
- Installing one to two wells between the onsite hydrocarbon sources and the newly installed perimeter wells to better assess whether the TPHmo detected in groundwater at the perimeter of the site exists onsite, as well. Cambria will likely recommend locations at the property boundary, downgradient of well TBW-5 and MW-6. Cambria also recommends installing either a boring or a well downgradient of well MW-12, between the well and the San Leandro Bay, to assess the extent of the high permeability unit at 12 ft depth in well MW-12;
- Continuing to remove product from the subsurface using both active and passive skimmers. In addition, Cambria recommends moving forward with feasibility testing in remediation test well RW-1 to assess the viability of completing site remediation using dual-phase extraction, soil vapor extraction, or air sparging; and
- Completing a human health and ecological risk assessment to assist with the designation of site specific cleanup concentration thresholds. These thresholds will help to guide the remedial action decision-making process.

ANTICIPATED SECOND QUARTER 2000 ACTIVITIES

Cambria will gauge and measure any SPH detected in MW-1, MW-2 and MW-5 through MW-17, and collect groundwater samples from wells MW-8 through MW-17. Following field activities, Cambria will tabulate the analytic data, contour groundwater elevations, and write a quarterly monitoring report.

CLOSING

Please call Jacquelyn Jones at (510) 420-3315 or David Elias at (510) 420-3307, if you have any questions or comments regarding this report or anticipated site activities.

Sincerely,
Cambria Environmental Technology, Inc.

Jacquelyn Jones
Staff Geologist

David Elias, R.G.
Senior Geologist

Attachments: A - Laboratory Analytical Report
B - Well Sampling Forms
C - Standard Procedures for Monitoring Wells

H:\City of Oakland\Municipal Service Center\QM\1q00\CofO-1q00.wpd

05/15/00

Groundwater Elevation Contour Map and Hydrocarbon Concentrations

January 18 and 19, 2000

EXPLANATION

- Monitoring well location
- RW-1 — Remediation well location
- TBW-1 — Tank Backfill Well
- MW-3 — Abandoned Well
- NM — Not measured
- NS — Not sampled for TPHg/TPHd/benzene
- NSV — Well Not Surveyed
- SPH — Separate Phase Hydrocarbons detected in well
- * — Anomalous groundwater elevation, not used in contouring
- a — Extractable hydrocarbon concentrations indicative of motor oil
- b — Chromatogram pattern not indicative of diesel
- Well / ELEV / TPHg / TPHd / BENZ — Monitoring Well Designation; Groundwater elevation, feet above mean sea level (msl); TPHg, TPHd, and benzene concentrations in parts per billion (ppb)
- 0.004 — Approximate groundwater flow direction and gradient
- Fence

DAMON SLOUGH

EDGEWATER DRIVE

SAN LEANDRO BAY

MW-4

MW-3

MW-2 3.06 <50 60a 2.1

MW-10 2.82 100 120a <0.5

MW-1 4.64 660 50 43

TBW-6 5.66* 170 55b 0.6

TBW-5 NM SPH SPH SPH

RW-1

MW-12 2.32 200 1,800a,b <0.5

TBW-1 NSV SPH SPH SPH

TBW-2

MW-13 1.71 <50 8,800a <0.5

MW-14 2.68 120 1,700a <0.5

MW-9 2.14 160 200a 5.7

MW-15 1.80 110 12,000a 3.8

MW-16 3.35 SPH SPH SPH

MW-17 4.51* <50 850a <0.5

MW-8 3.91 <50 <50 <0.5

MW-5 4.55 3,000 100 66 E

MW-11 4.52 220 <50 <0.5

MW-7 4.20 54 <50 1.5

TBW-3 6.19* SPH SPH SPH

MW-6 2.90* SPH SPH SPH

TBW-4

3.0

4.0

2.0

0.007

0.003

0.009

911 Center

Admin.

Public Works Building

Crafts and Storage

Storage

Building No. 5

Active USTs

Former USTs

Former USTs

Former UST

Above Ground Storage Tanks
NGV Fueling Station

0 75 150 300

Scale (ft)

FIGURE

1

CAMBRIA

Municipal Service Center

7101 Edgewater Drive

Oakland, California

05/15/00

TPHd Isoconcentration Contour Map

January 18 and 19, 2000

CAMBRIA

Municipal Service Center
7101 Edgewater Drive
Oakland, California

EXPLANATION

- Monitoring well location
- RW-1 — Remediation well location
- TBW-1 — Tank Backfill Well
- MW-3 — Abandoned Well
- NM — Not measured
- NS — Not sampled for TPHd
- SPH — Separate Phase Hydrocarbons detected in well
- Well ID / TPHd — Monitoring Well Designation; TPHd concentrations in parts per billion (ppb)
- 100 — TPHd isoconcentration contour line, Dashed where inferred
- Fence
- * — Extractable hydrocarbon concentrations (TPHd analysis) indicative of motor oil
- ** — Chromatogram pattern not indicative of diesel

DAMON SLOUGH

EDGEWATER DRIVE

MW-4

MW-3

911 Center

Admin.

Public Works Building

Crafts and Storage

Storage

Building No. 5

Active USTs

Former USTs

Former UST

Above Ground Storage Tanks
NGV Fueling Station

MW-1 50
MW-2 60*
MW-3 SPH
MW-4 NS
MW-5 100
MW-6 SPH
MW-7 <50
MW-8 <50
MW-9 200*
MW-10 120*
MW-11 <50
MW-12 1,800*
MW-13 8,800*
MW-14 1,700*
MW-15 12,000*
MW-16 SPH
MW-17 850*
TBW-1 SPH
TBW-2 NS
TBW-3 SPH
TBW-4 NS
TBW-5 SPH
TBW-6 55**
RW-1
100

0 75 150 300
Scale (ft)

SAN LEANDRO BAY

FIGURE
2

04/18/00

EXPLANATION

- Monitoring well location
- RW-1 — Remediation well location
- TBW-1 — Tank Backfill Well
- MW-3 — Abandoned Well
- NM — Not measured
- NS — Not sampled for TPHmo
- SPH — Separate Phase Hydrocarbons detected in well
- Well ID / TPHmo — Monitoring Well Designation; TPHmo concentrations in parts per billion (ppb)
- 100 — TPHmo isoconcentration contour line, Dashed where inferred
- Fence

MW-4

MW-3

DAMON SLOUGH

EDGEWATER DRIVE

MW-2 660

Public Works Building

911 Center

Admin.

Crafts and Storage

Storage

MW-5 320

Active USTs

Building No. 5

Former USTs

MW-7 <200

MW-10 1,200

MW-1 <200

TBW-6 <200

TBW-5 NS

RW-1

TBW-1 NS

Former USTs

TBW-2 NS

MW-12 11,000

MW-13 120,000

100,000

1,000

10,000

MW-14 22,000

MW-9 2,300

MW-15 69,000

MW-16 SPH

MW-8 <200

MW-17 21,000

MW-11 500

Former USTs

TBW-3 NS

Former UST

TBW-4 NS

MW-6 NS

Above Ground Storage Tanks
NGV Fueling Station

SAN LEANDRO BAY

0 75 150 300
Scale (ft)

FIGURE
3

TPHmo Isoconcentration Contour Map

January 18 and 19, 2000

CAMBRIA

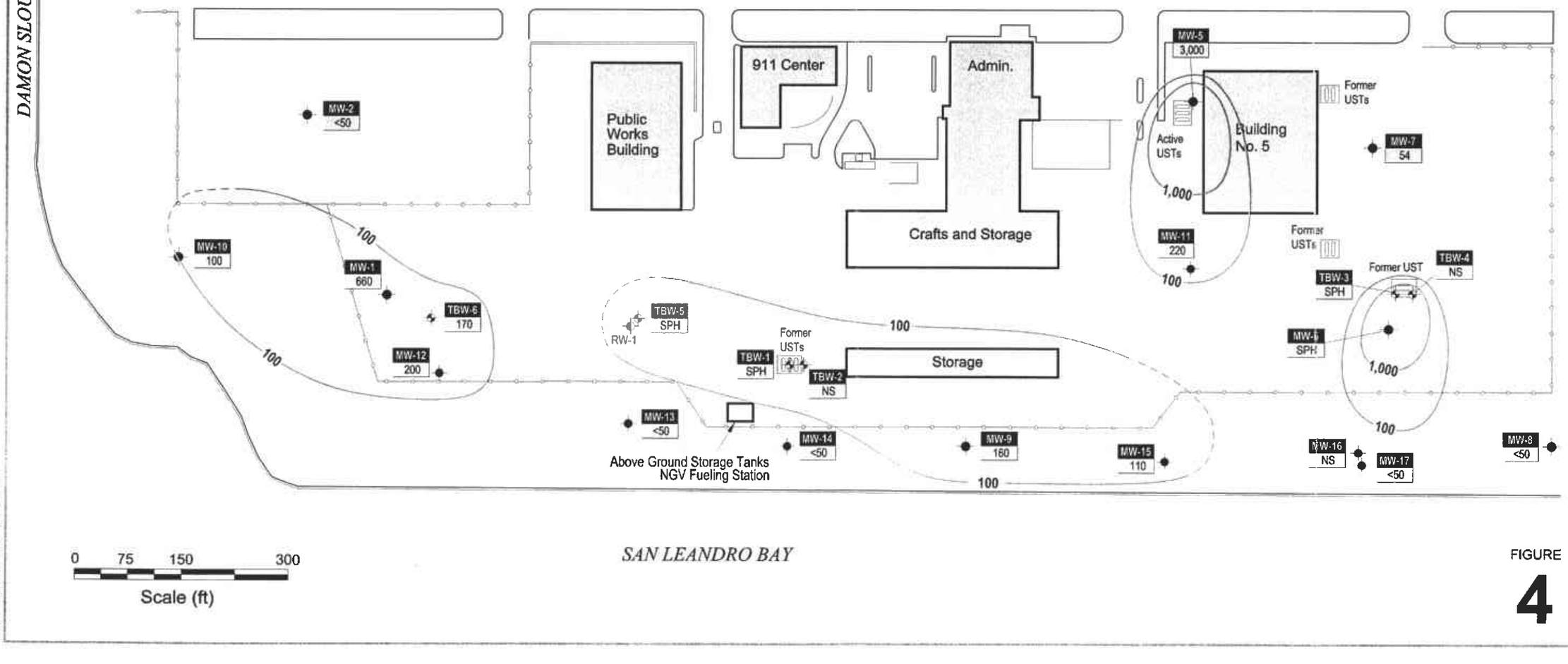
Municipal Service Center
7101 Edgewater Drive
Oakland, California

TPHg Isoconcentration Contour Map

January 18 and 19, 2000

EXPLANATION

- Monitoring well location
- RW-1 — Remediation well location
- TBW-1 — Tank Backfill Well
- MW-3 — Abandoned Well
- NM — Not measured
- NS — Not sampled for TPHg
- SPH — Separate Phase Hydrocarbons detected in well
- Well ID / TPHg — Monitoring Well Designation; TPHg concentrations in parts per billion (ppb)
- 100 — TPHg isoconcentration contour line, dashed where inferred
- Fence



FIGURE

4

Municipal Service Center

7101 Edgewater Drive

Oakland, California

CAMBRIA

Benzene Isoconcentration Contour Map

January 18 and 19, 2000

EXPLANATION

- Monitoring well location
- RW-1 — Remediation well location
- TBW-1 — Tank Backfill Well
- MW-3 — Abandoned Well
- NM — Not measured
- NS — Not sampled for Benzene
- SPH — Separate Phase Hydrocarbons detected in well
- Well ID / BENZ — Monitoring Well Designation; Benzene concentrations in parts per billion (ppb)
- 100 — Benzene isoconcentration contour line, Dashed where inferred
- Fence

MW-4

MW-3

DAMON SLOUGH

EDGEWATER DRIVE

MW-2 2.1

MW-1 43

MW-10 <0.5

TBW-6 0.6

MW-12 <0.5

MW-13 <0.5

MW-14 <0.5

MW-9 5.7

MW-15 3.8

MW-16 NS

MW-17 <0.5

MW-8 <0.5

MW-5 66

MW-7 1.5

MW-11 <0.5

TBW-5 SPH

TBW-1 SPH

TBW-2 NS

TBW-3 SPH

TBW-4 NS

MW-6 SPH

RW-1

Public Works Building

911 Center

Admin.

Crafts and Storage

Storage

Building No. 5

Active USTs

Former USTs

Former UST

Above Ground Storage Tanks
NGV Fueling Station

10

100

1.0

0 75 150 300

Scale (ft)

SAN LEANDRO BAY

FIGURE

5

Municipal Service Center

7101 Edgewater Drive

Oakland, California

CAMBRIA

05/15/00

EXPLANATION

- Monitoring well location
- RW-1 — Remediation well location
- TBW-1 — Tank Backfill Well
- MW-3 — Abandoned Well
- NM — Not measured
- NS — Not sampled for MTBE
- SPH — Separate Phase Hydrocarbons detected in well
- Well ID / MTBE — Monitoring Well Designation; MTBE concentrations in parts per billion (ppb)
- 100 — MTBE isoconcentration contour line. Dashed where inferred
- Fence

MW-4

MW-3

DAMON SLOUGH

EDGEWATER DRIVE

MW-2 <5.0

Public Works Building

911 Center

Admin.

Crafts and Storage

MW-5 1,300

1,000
100
10

Active USTs

Former USTs

Building No. 5

MW-7 <5.0

MW-1 <5.0

MW-10 <5.0

TBW-6 <5.0

RW-1

TBW-5 NS

MW-12 <5.0

Former USTs

TBW-1 NS

TBW-2 NS

Storage

MW-11 <5.0

Former USTs

Former UST

TBW-4 NS

TBW-3 NS

MW-8 NS

MW-13 <5.0

Above Ground Storage Tanks
NGV Fueling Station

MW-14 <5.0

MW-9 <5.0

MW-15 <5.0

MW-16 NS

MW-17 <5.0

MW-6 <5.0

0 75 150 300

Scale (ft)

SAN LEANDRO BAY

FIGURE

6

MTBE Isoconcentration Contour Map

January 18 and 19, 2000

CAMBRIA

Municipal Service Center

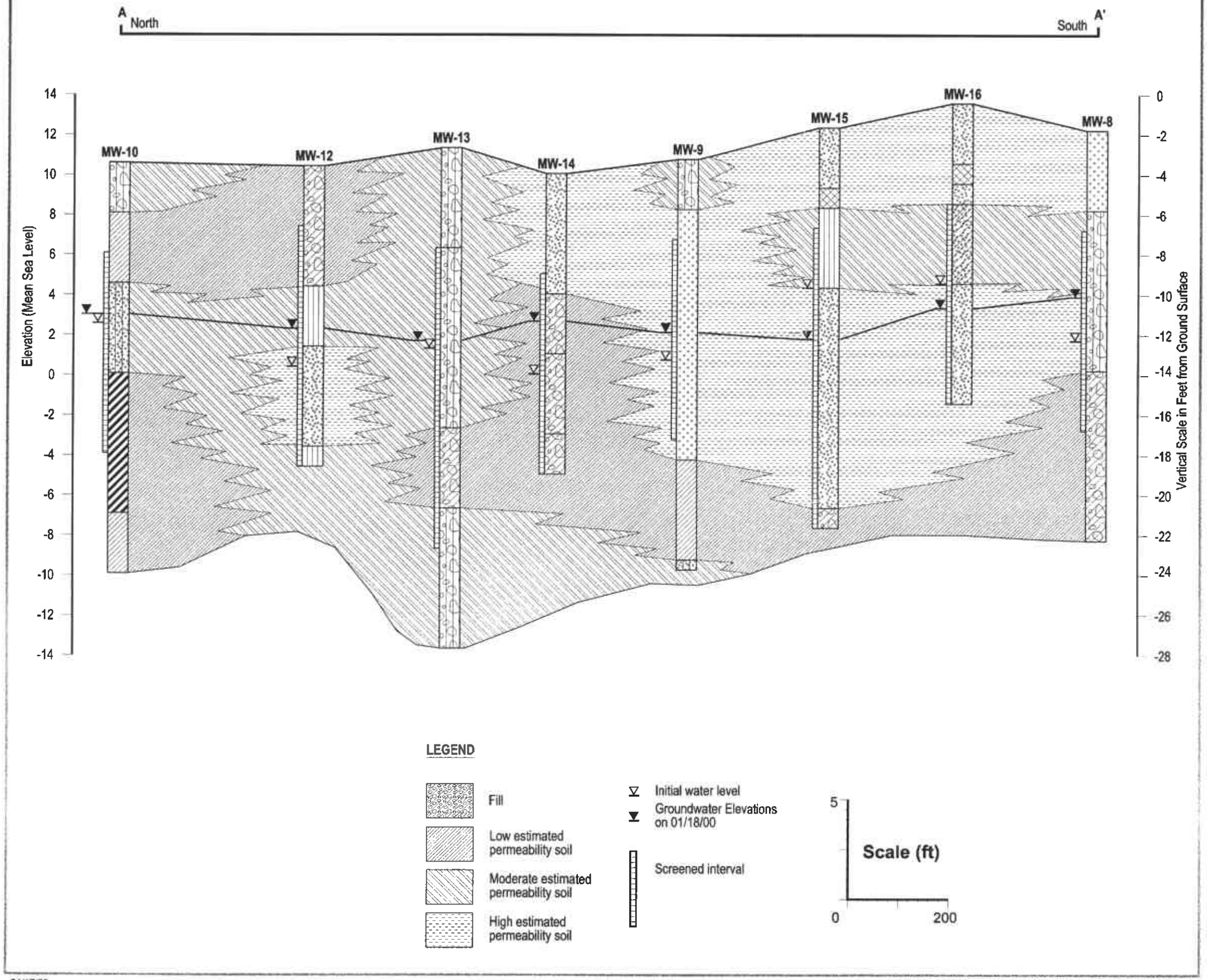
7101 Edgewater Drive

Oakland, California

City of Oakland MSC

7101 Edgewater Drive
Oakland, California

Geologic Cross Section A-A'



CAMBRIA

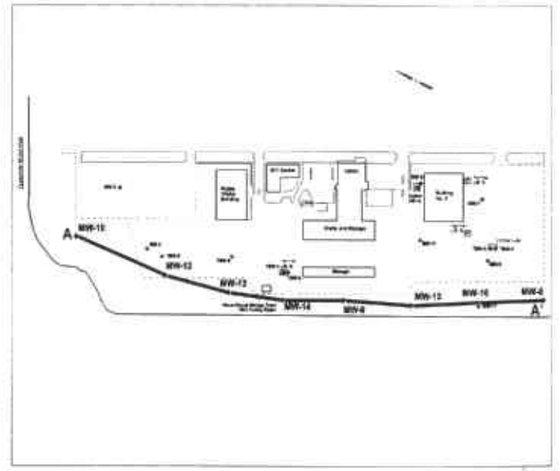
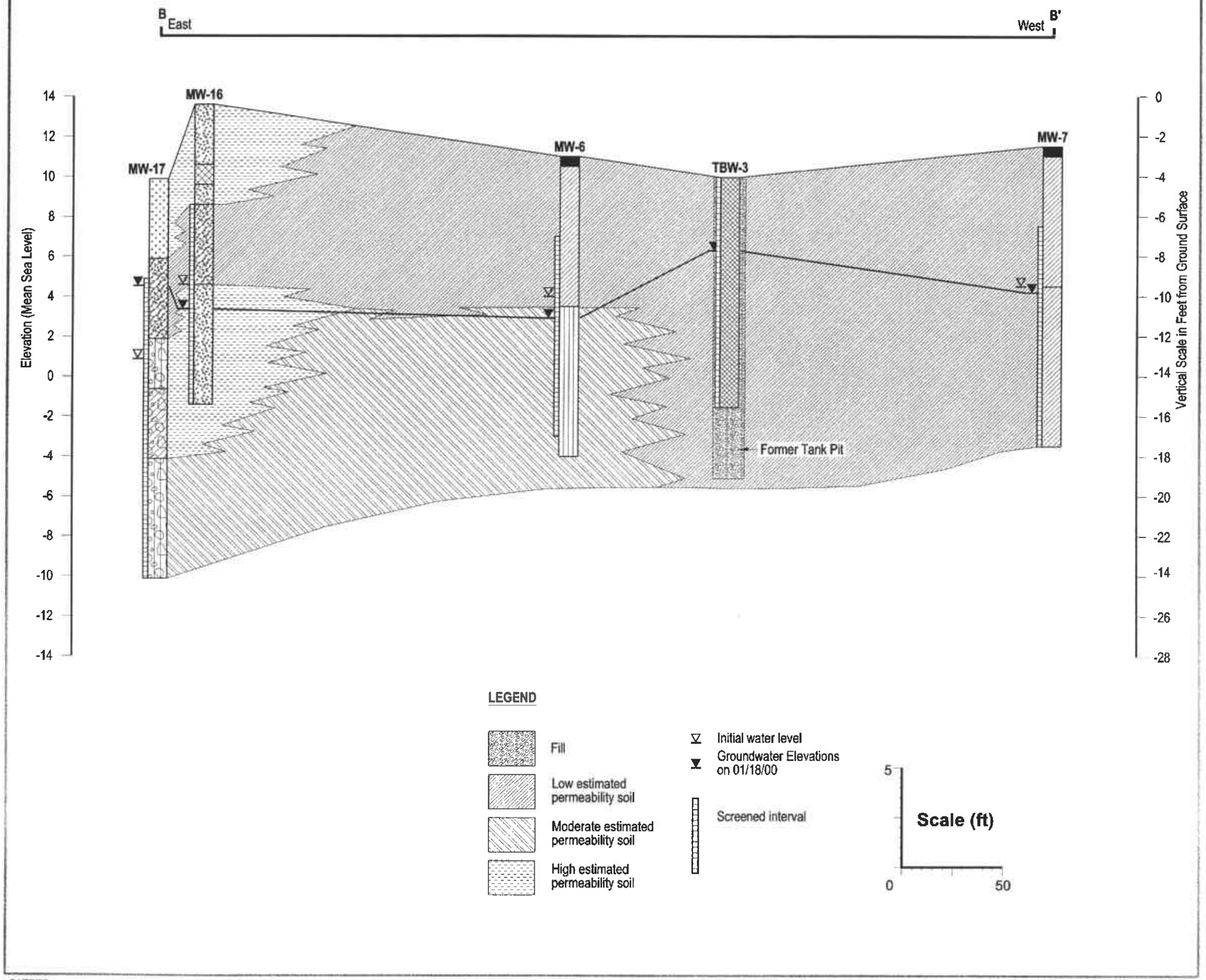


FIGURE 7

04/17/00

I:\CITY OF OAKLAND\MSC\FIGURES\SECTIONS\SECTION-A.DWG



04/27/00

I:\CITY OF OAKLAND\MSC\FIGURES\SECTIONS\SECTION-B.DWG

City of Oakland MSC

7101 Edgewater Drive
Oakland, California

Geologic Cross Section B-B'

CAMBRIA

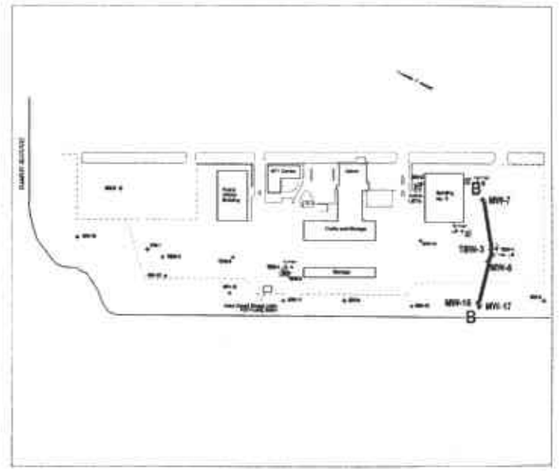
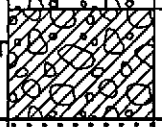
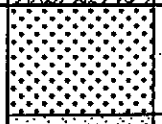
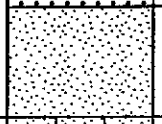
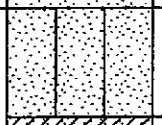
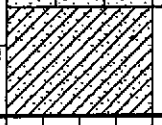
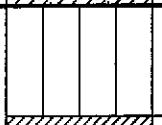
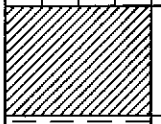
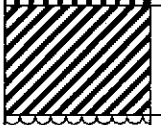
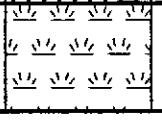


FIGURE 8

Cambria Environmental Technology, Inc.

BORING LOG LEGEND

MAJOR DIVISIONS			SYMBOLS: GRAPH	SYMBOLS: LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

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CAMBRIA

Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ----------									---------->
MW-1															
10/04/89	10.20	---	---	8020		---	---	---	540	65	26	14	22	---	---
10/04/89	10.20	---	---	8240		---	---	---	---	120	46	43	78	---	---
04/27/93	10.20	---	---	8020		---	---	---	<1,000	<1.0	<1.0	<1.0	<1.0	---	---
04/19/95	10.20	---	---	8020		---	---	---	3,200	880	15	23	21	---	---
07/27/95	10.20	4.62	5.58	8020		---	---	---	980	130	3.6	1.4	5.6	---	---
11/20/95	10.20	6.08	4.12	8020		---	---	---	400	99	2.8	1.1	4.6	---	---
02/21/96	10.20	4.62	5.58	8020		---	---	---	1,700	340	8.4	5.3	16	---	---
05/13/96	10.20	4.33	5.87	8020		---	---	---	7,300	2,000	30	42	38	---	---
08/27/96	10.20	5.25	4.95	8020		---	---	---	380	61	2.4	<0.5	4.2	---	---
02/23/98	10.20	1.75	8.45	8020		<50	<500	<50	820	160	4.9	3	9.7	---	---
08/19/98	10.20	4.78	5.42	8020 SGC		1,200	---	---	780	69	4.1	0.84	8.5	<5.0	---
11/11/98	10.20	5.64	4.56	---		---	---	---	---	---	---	---	---	---	---
02/23/99	10.20	3.41	6.79	8020 SGC		1,200	1,600	<50	1,100	190	5.0	3.0	12	<5.0	---
05/27/99	10.20	3.96	6.24	---		---	---	---	---	---	---	---	---	---	---
08/24/99	10.20	4.92	5.28	8020 SGC		640	1,900	<50	370	37	0.9	<0.5	1.9	<5.0	---
11/22/99	10.20	5.46	4.74	---		---	---	---	---	---	---	---	---	---	---
01/18/00	10.05	5.41	4.64	---		---	---	---	---	---	---	---	---	---	---
01/19/00	---	---	---	8020 SGC		50	<200	<50	660	43	2.3	1.1	6.0	<5.0	---
MW-2															
10/04/89	10.47	---	---	8020		---	---	---	<30	<0.3	<0.3	<0.3	<0.3	---	---
10/04/89	10.47	---	---	8240		---	---	---	---	2.0	<2.0	<2.0	<2.0	---	---
04/27/93	10.47	---	---	8020		---	---	---	<1,000	<1.0	<1.0	<1.0	<1.0	---	---
04/19/95	10.47	---	---	8020		---	---	---	<50	1.8	<0.5	<0.5	<0.5	---	---
07/27/95	10.47	6.22	4.25	8020		---	---	---	<50	2.3	<0.5	<0.5	<0.5	---	---
11/20/95	10.47	7.49	2.98	8020		---	---	---	<50	2.2	<0.5	<0.5	<0.5	---	---

Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ---------->									
MW-2															
02/21/96	10.47	6.68	3.79	8020		---	---	---	<50	1.7	<0.5	<0.5	0.5	---	---
05/13/96	10.47	6.32	4.15	8020		---	---	---	---	2.0	<0.5	<0.5	<0.5	---	---
08/27/96	10.47	6.84	3.63	8020		---	---	---	---	2.4	<0.5	<0.5	<0.5	---	---
02/24/98	10.47	5.44	5.03	8020		<50	<500	<50	---	1.6	<0.5	<0.5	<0.5	---	---
08/19/98	10.47	6.56	3.91	8020	SGC	330	---	---	<50	4.1	3.4	0.8	2.6	<5.0	<100
11/11/98	10.47	7.37	3.10	---		---	---	---	---	---	---	---	---	---	---
02/23/99	10.47	8.68	1.79	8020	SGC	200	900	<50	<50	3.5	0.6	0.6	1.2	<5.0	---
05/27/99	10.47	5.20	5.27	---		---	---	---	---	---	---	---	---	---	---
08/24/99	10.47	6.75	3.72	8020	SGC	140	700	<50	<50	2.6	<0.5	<0.5	<0.5	<5.0	---
11/22/99	10.47	7.58	2.89	---		---	---	---	---	---	---	---	---	---	---
01/18/00	10.47	7.41	3.06	8020	SGC	60 A	660	<50	<50	2.1	<0.5	<0.5	<0.5	<5.0	---
MW-3															
10/04/89	---	---	---	8020		---	---	---	<30	<0.3	<0.3	<0.3	<0.3	---	---
10/04/89	---	---	---	8240		---	---	---	---	<2.0	<2.0	<2.0	<2.0	---	---
02/23/98	---	---	---	---		<50	<500	<50	---	---	---	---	---	---	---
11/11/98	---	5.83	---	---		---	---	---	---	---	---	---	---	---	---
02/23/99	---	---	---	---	Submerged	---	---	---	---	---	---	---	---	---	---
05/27/99	---	1.68	---	---		---	---	---	---	---	---	---	---	---	---
08/24/99	---	4.76	---	---		---	---	---	---	---	---	---	---	---	---
11/22/99	---	6.46	---	---		---	---	---	---	---	---	---	---	---	---
11/22/99	---	---	---	---	Destroyed	---	---	---	---	---	---	---	---	---	---
MW-4															
10/04/89	7.89	---	---	8020		---	---	---	<30	<0.3	<0.3	<0.3	<0.3	---	---
10/04/89	7.89	---	---	8240		---	---	---	---	<2.0	<2.0	<2.0	<2.0	---	---

Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ----------									
MW-4															
11/11/98	7.89	6.25	1.64	---		---	---	---	---	---	---	---	---	---	---
02/23/99	7.89	3.10	4.79	---		---	---	---	---	---	---	---	---	---	---
05/27/99	7.89	4.03	3.86	---		---	---	---	---	---	---	---	---	---	---
08/24/99	7.89	5.07	2.82	---		---	---	---	---	---	---	---	---	---	---
11/22/99	7.89	6.32	1.57	---		---	---	---	---	---	---	---	---	---	---
11/22/99	---	---	---	---	Destroyed	---	---	---	---	---	---	---	---	---	---
MW-5															
12/13/91	11.15	---	---	8020		1,900	---	---	13,000	1,500	190	970	2,500	---	---
12/13/91	---	---	---	8020	Dup	---	---	---	16,000	1,400	180	870	2,500	---	---
12/13/91	11.15	---	---	8240		---	---	---	---	1,800	<250	1,000	3,800	---	---
12/13/91	---	---	---	8240	Dup	---	---	---	---	1,600	<250	980	3,500	---	---
04/27/93	11.15	---	---	8240		12,000	---	---	35,000	2,100	<1.0	1,800	2,700	---	---
04/19/95	11.15	---	---	8240		880	4,700	---	14,000	490	51	610	1,200	---	---
07/27/95	11.15	6.29	4.86	8240		590	5,000	---	22,000	1,300	54	1,500	2,400	---	---
11/20/95	11.15	6.98	4.17	8020		<50	<50	<50	8,900	430	31	610	880	---	---
02/21/96	11.15	5.97	5.18	8020		480	<50	<50	1,000	540	65	700	970	---	---
05/13/96	11.15	6.25	4.90	8020		<50	<50	<50	5,900	430	26	580	760	---	---
05/13/96	---	---	---	8020	Dup	<50	<50	<50	7,300	360	22	49	640	---	---
08/27/96	11.15	6.40	4.75	8020		2,000	<51	<51	6,600	430	27	600	650	---	---
08/27/96	---	---	---	8020	Dup	6,600	<51	<51	6,300	410	25	580	620	---	---
02/23/98	11.15	4.22	6.93	8020		<50	<500	<50	740	19	1.4	41	34	---	---
08/19/98	11.15	6.14	5.01	8020		1,400	<250	1,700	5,800	500	25	730	300	5,900	---
08/19/98	11.15	6.14	5.01	8260	SGC	---	---	---	---	---	---	---	---	6,700	---
11/11/98	11.15	6.51	4.64	---		---	---	---	---	---	---	---	---	---	---
02/23/99	11.15	3.59	7.56	8020	SGC	2,000	700	<50	6,700	300	26	800	690	1,600	---

Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ----------									
MW-5															
05/27/99	11.15	5.71	5.44	---		---	---	---	---	---	---	---	---	---	---
08/24/99	11.15	6.02	5.13	8020	SGC	220	2,000	<50	2,100 E	190 E	5.5	340 E	78	380 E	---
11/22/99	11.15	6.16	4.99	---		---	---	---	---	---	---	---	---	---	---
01/18/00	11.15	6.60	4.55	---		---	---	---	---	---	---	---	---	---	---
01/19/00	---	---	---	8020	SGC	100	320	<50	3,000	66 E	6.3	400 E	90	300 E (1,300)	---
MW-6															
12/13/91	10.98	---	---	8020		520	---	---	780	110	2.7	<2.5	5.5	---	---
12/13/91	10.98	---	---	8240		---	---	---	---	95	5	<5	<5	---	---
04/27/93	10.98	---	---	8020		<1,000	---	---	<1,000	430	4	5	10	---	---
04/19/95	10.98	---	---	8020		6,700	---	---	5,700	40	<0.8	3.9	29	---	---
04/19/95	---	---	---	8020	Dup	3,700	---	---	3,000	310	3.1	2.7	100	---	---
07/27/95	10.98	7.09	3.89	8020		3,900	---	---	6,100	430	15	200	600	---	---
07/27/95	---	---	---	8020	Dup	2,600	---	---	6,300	420	15	200	600	---	---
11/20/95	10.98	7.89	3.09	8020		850	---	---	6,800	160	4.6	8.0	240	---	---
11/20/95	---	---	---	8020	Dup	---	---	---	3,600	130	11	4.4	200	---	---
02/21/96	10.98	7.40	3.58	8020		1,700	---	---	2,800	230	2.8	3.8	44	---	---
02/21/96	---	---	---	8020	Dup	2,500	---	---	2,200	280	3.0	4.0	4.6	---	---
05/13/96	10.98	7.10	3.88	8020		400	<50	<50	3,100	430	12	5.2	67	---	---
08/27/96	10.98	7.42	3.56	8020		3,100	---	---	4,200	300	9.3	110	110	---	---
08/19/98	10.98	---	---	---	SPH: 0.125 ft	---	---	---	---	---	---	---	---	---	---
11/11/98	10.98	7.09	3.89	---	SPH: 0.05 ft	---	---	---	---	---	---	---	---	---	---
02/23/99	10.98	7.31	3.67	---	SPH: NM	---	---	---	---	---	---	---	---	---	---
05/27/99	10.98	6.91	4.07	---	SPH: 0.20 ft	---	---	---	---	---	---	---	---	---	---
08/24/99	10.98	7.46	3.52	---	SPH: 0.03 ft	---	---	---	---	---	---	---	---	---	---

Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ---------->									
MW-6															
11/22/99	10.98	7.96	3.02	---	SPH: 0.16 ft	---	---	---	---	---	---	---	---	---	---
01/18/00	10.98	8.08	2.90	---	SPH: 0.019 ft	---	---	---	---	---	---	---	---	---	---
MW-7															
12/13/91	11.51	---	---	8020		<50	---	---	<50	<0.5	<0.5	<0.5	<0.5	---	---
12/13/91	11.51	---	---	8240		---	---	---	---	<5	<5	<5	<5	---	---
04/27/93	11.51	---	---	8240		<1,000	---	---	<1,000	<1.0	<1.0	<1.0	<1.0	---	---
04/19/95	11.51	---	---	8240		<50	<1,000	---	<50	<2.0	<2.0	<2.0	<2.0	---	---
07/27/95	11.51	6.87	4.64	8240		<50	<1,000	---	<50	<2.0	<2.0	<2.0	<2.0	---	---
11/20/95	11.51	8.48	3.03	8020		<50	---	---	<50	<0.5	<0.5	<0.5	1.5	---	---
02/21/96	11.51	6.29	5.22	8020		<50	---	---	<50	<0.5	<0.5	<0.5	<0.5	---	---
05/13/96	11.51	6.95	4.56	8020		<50	---	---	---	<0.5	<0.5	<0.5	<0.5	---	---
08/27/96	11.51	6.80	4.71	8020		---	---	---	---	<0.5	<0.5	<0.5	<0.5	---	---
08/19/98	11.51	6.88	4.63	---		---	---	---	---	---	---	---	---	---	---
11/11/98	11.51	7.40	4.11	---		---	---	---	---	---	---	---	---	---	---
02/23/99	11.51	5.57	5.94	8020		<50	<200	<50	80	<0.5	<0.5	<0.5	1.0	<5.0	---
05/27/99	11.51	6.56	4.95	---		---	---	---	---	---	---	---	---	---	---
08/24/99	11.51	6.29	5.22	8020	SGC	<50	<200	<50	<50	<0.5	<0.5	<0.5	<0.5	5.0	---
11/22/99	11.51	6.80	4.71	---		---	---	---	---	---	---	---	---	---	---
01/18/00	11.51	7.31	4.20	---		---	---	---	---	---	---	---	---	---	---
01/19/00	---	---	---	8020	SGC	<50	<200	<50	54	1.5	1.5	2.4	3.8	<5.0	---
MW-8															
11/20/96	12.22	---	---	8020		880	---	---	<50	0.66	<0.5	<0.5	<0.5	---	---
11/20/97	12.22	9.59	2.63	8020		200	---	---	<50	<0.5	<0.5	<0.5	<0.5	2.0	---
02/24/98	12.22	8.42	3.80	8020		<50	<500	<50	<50	<0.5	<0.5	<0.5	<0.5	---	---

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Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ----------									---------->
MW-8															
06/08/98	12.22	9.57	2.65	8020		1,200	1,000	<50	<50	<0.5	<0.5	<0.5	<0.5	---	---
08/19/98	12.22	9.49	2.73	8020 SGC		<50	<250	<50	<50	1.6	3.4	1.0	2.8	<5.0	---
11/11/98	12.22	9.64	2.58	8020 SGC		<50	<200	<50	<50	0.9	0.8	0.6	2.3	<5.0	---
02/23/99	12.22	11.53	0.69	8020		700	1,500	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	---
05/27/99	12.22	9.65	2.57	8020		<50	<200	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	---
08/24/99	12.22	9.62	2.60	8020 SGC		70	<200	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	---
11/22/99	12.22	9.64	2.58	8020 SGC		57	<200	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	---
01/18/00	12.22	8.31	3.91	8020 SGC		<50	<200	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	---
MW-9															
11/20/96	10.77	---	---	8020		1,900	---	---	240	21	0.81	1.8	2.2	---	---
11/20/97	10.77	7.91	2.86	8020		---	---	---	300	20	<0.5	<0.5	1.8	<1.0	---
02/24/98	10.77	6.11	4.66	8020		<50	<500	<50	2,200	540	5.6	1.6	4.9	---	---
06/08/98	10.77	7.14	3.63	8020		1,800	890	<50	840	450	6.1	3.3	5.3	---	---
08/19/98	10.77	7.88	2.89	8020 SGC		190	<250	160	740	370	8.6	0.99	7.3	<5.0	---
11/11/98	10.77	8.23	2.54	8020 SGC		<50	230	<50	700	130	4.3	<0.5	3.9	<5.0	---
02/23/99	10.77	6.65	4.12	8020		1,100	3,700	<50	1,100	620	9.7	1.5	7.7	<5.0	---
05/27/99	10.77	7.70	3.07	8020 SGC		70	300	<50	950	470	11	1.5	9.2	<5.0	---
08/24/99	10.77	8.12	2.65	8020 SGC		890	1,700	<50	290	45	2.8	<0.5	3.0	<5.0	---
11/22/99	10.77	8.33	2.44	8020 SGC		1,000	6,000	<50	170	12	1.8	<0.5	2.0	<5.0	---
01/18/00	10.77	8.63	2.14	8020 SGC		200 A	2,300	<50	160	5.7	1.9	0.6	4.2	<5.0	---
MW-10															
11/20/96	10.59	---	---	8020		940	---	---	<50	49	0.59	0.54	1.2	---	---
11/20/97	10.59	7.70	2.89	8020		---	---	---	<50	<0.5	<0.5	<0.5	<0.5	---	---
02/24/98	10.59	4.39	6.20	8020		<50	<500	<50	<50	<0.5	<0.5	<0.5	<0.5	---	---

Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ---------->									
MW-10															
06/08/98	10.59	6.94	3.65	8020		500	<500	<50	<50	7.3	<0.5	<0.5	<0.5	---	---
08/19/98	10.59	6.99	3.60	8020 SGC		240	520	110	<50	<0.5	<0.5	<0.5	<0.5	<5.0	---
11/11/98	10.59	7.57	3.02	8020 SGC		<50	<200	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	---
02/23/99	10.59	5.51	5.08	8020		170	1,200	<50	<50	1.3	<0.5	<0.5	<0.5	<5.0	---
05/27/99	10.59	6.72	3.87	8020 SGC		<50	<200	<50	350	170	1.5	0.5	2.3	<5.0	---
08/24/99	10.59	7.27	3.32	8020 SGC		140	300	<50	380	160 E	<0.5	<0.5	2.6	<5.0	---
11/22/99	10.59	7.71	2.88	8020 SGC		570	3,400	<50	110	5.1	<0.5	<0.5	0.72	<5.0	---
01/18/00	10.59	7.77	2.82	---		---	---	---	---	---	---	---	---	---	---
01/19/00	---	---	---	8020 SGC		120 A,B	1,200	<50	100	<0.5	<0.5	0.8	<0.5	<5.0	---
MW-11															
01/18/00	11.60	7.08	4.52	---		---	---	---	---	---	---	---	---	---	---
01/19/00	---	---	---	8020 SGC		<50	500	<50	220	<0.5	<0.5	<0.5	<0.5	<5.0	---
MW-12															
01/18/00	10.43	8.11	2.32	---		---	---	---	---	---	---	---	---	---	---
01/19/00	---	---	---	8020 SGC		1,800 A	11,000	<50	200	<0.5	3.4	1.5	8.4	<5.0	---
MW-13															
01/18/00	11.34	9.63	1.71	8020 SGC		8,800 A	120,000	<50	<50	<0.5	0.8	<0.5	<0.5	<5.0	---
MW-14															
01/18/00	10.05	7.37	2.68	8020 SGC		1,700 A	22,000	<50	120	<0.5	<0.5	<0.5	<0.5	<5.0	---
MW-15															
01/18/00	12.36	10.56	1.80	8020 SGC		12,000 A	89,000	<50	110	3.8	2.1	1.0	4.6	<5.0	---
MW-16															
01/18/00	13.57	10.22	3.35	---	SPH: 0.1 ft	---	---	---	---	---	---	---	---	---	---

Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ---------->									
MW-16															
MW-17															
01/18/00	9.86	5.35	4.51	8020	SGC	850 A	21,000	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	---
TBW-1															
02/23/99	---	6.25	---	---	SPH: 0.10 ft	---	---	---	---	---	---	---	---	---	---
05/27/99	---	5.29	---	---	SPH: 0.01 ft	---	---	---	---	---	---	---	---	---	---
08/24/99	---	6.99	---	---	SPH: 0.18 ft	---	---	---	---	---	---	---	---	---	---
11/22/99	---	---	---	---	Inaccessible	---	---	---	---	---	---	---	---	---	---
01/18/00	---	---	---	---	Inaccessible	---	---	---	---	---	---	---	---	---	---
TBW-3															
08/19/98	---	2.67	---	8020	SGC	810,000	---	---	920	3.2	<0.5	<0.5	0.77	<10	---
08/19/98	---	2.67	---	8260		---	---	---	---	---	---	---	---	<5.0	---
02/23/99	---	1.25	---	8020		3,800	3,000	<50	110	1.6	<0.5	<0.5	<0.5	<5.0	---
05/27/99	---	---	---	---	DTW: NM	---	---	---	---	---	---	---	---	---	---
08/24/99	---	3.25	---	---	SPH globules	---	---	---	---	---	---	---	---	---	---
11/22/99	---	3.68	---	---		---	---	---	---	---	---	---	---	---	---
01/18/00	9.92	3.73	6.19	---	SPH globules	---	---	---	---	---	---	---	---	---	---
TBW-5															
02/23/99	---	9.72	---	---	SPH: 1.45 ft	---	---	---	---	---	---	---	---	---	---
05/27/99	---	7.03	---	---	SPH: 1.13 ft	---	---	---	---	---	---	---	---	---	---
08/24/99	---	6.52	---	---	SPH: 1.33 ft	---	---	---	---	---	---	---	---	---	---
11/22/99	---	8.31	---	---	SPH: 1.29 ft	---	---	---	---	---	---	---	---	---	---
01/18/00	10.22	6.20	4.02	---	SPH: 0.9 ft	---	---	---	---	---	---	---	---	---	---

Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ---------->									
TBW-6															
02/23/99	---	2.09	---	8020		160	600	<50	60	<0.5	<0.5	<0.5	<0.5	<5.0	---
05/27/99	---	3.31	---	---		---	---	---	---	---	---	---	---	---	---
08/24/99	---	7.29	---	8020 SGC		180	400	<50	130	<0.5	<0.5	<0.5	<0.5	<5.0	---
11/22/99	---	4.37	---	---		---	---	---	---	---	---	---	---	---	---
01/18/00	9.49	3.83	5.66	---		---	---	---	---	---	---	---	---	---	---
01/19/00	---	---	---	8020 SGC		55 C	<200	<50	170	0.6	<0.5	<0.5	<0.5	<5.0	---
Trip Blank															
08/19/98	---	---	---	8020		---	---	---	<50	<0.5	<0.5	<0.5	<0.5	<5.0	---
11/22/99	---	---	---	8020		---	---	---	<50	<0.5	<0.5	<0.5	<0.5	<5.0	---

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Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ----------									---------->

Notes

All concentrations in micrograms per liter (µg/l)
--- = not measured/analyzed
TOC = Top of casing
DTW = Depth to water
GW = Ground water
BTEX = Benzene, toluene, ethylbenzene, and xylenes - analyzed by EPA Method 8020 or 8240/8260
TPHd = Total petroleum hydrocarbons as diesel - analyzed by Modified EPA method 8015
TPHmo = Total petroleum hydrocarbons as motor oil - analyzed by Modified EPA method 8015
TPHk = Total petroleum hydrocarbons as kerosene - analyzed by EPA method 8015
TPHg= Total petroleum hydrocarbons as gasoline - analyzed by Modified EPA method 8015
MTBE = Methyl tert-butyl ether - analyzed by EPA Method 8020 or 8260. Confirmation 8260 results shown in parentheses.
DUP = Duplicate sample
SPH = Separate-phase hydrocarbons; measured thickness
SGC = Silica gel cleanup prior to TPHd, TPHk, or TPHmo analysis
NM = Not measured
TBW = Tank backfill well
A = The analytical laboratory reviewed the data and noted that all petroleum hydrocarbons quantified in the diesel range are actually the front end of the motor oil pattern
B = The analytical laboratory reviewed the data and noted that the quantitiation in the diesel range show no diesel pattern; the response looks like lower carbon chain compounds close to the gasoline range
C = The analytical laboratory reviewed the data and noted that there is no pattern relating to diesel range; the peaks are small and random
E = Results are estimated due to concentrations exceeding the calibration ranged

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Table 2. Groundwater Analytical Results for Bioparameters, Sodium, and Chloride

City of Oakland Municipal Service Center, Oakland, California

Sample ID / Date	TPHg (µg/l)	TPHd (µg/l)	ORP (mV)	Ferrous Iron	DO-B	DO-A	Nitrate	Sulfate	Total Alkalinity	Sodium	Chloride
					<---------- ug/l ----------						---------->
Damon Slough											
08/19/98	---	---	---	---	---	---	---	---	---	5,900,000	14,400,000
MW-1											
08/19/98	780	1,200	60	>5,000	9,800	8,470	<1,000	<1,000	1,270,000	1,600,000	3,750,000
02/23/99	1,100	1,200	---	>5,000	---	1,600	<100	<500	1,400,000	---	---
08/24/99	370	640	-64	3,500	---	880	<100	<500	1,300,000	---	---
01/19/00	660	50	-165	2,700	---	590	7,600	<500	1,300,000	---	---
MW-2											
08/19/98	<50	330	120	>5,000	8,630	8,560	<1,000	5,000	215,000	4,700,000	8,000,000
02/23/99	<50	200	50	>5,000	---	1,500	<100	<500	140,000	---	---
08/24/99	<50	140	-34	<5,000	---	140	<100	<500	120,000	---	---
01/18/00	<50	60	78	2,000	---	620	16,000	600	120,000	---	---
MW-3											
08/19/98	---	---	-170	900	9,330	9,210	<1,000	400,000	3,260,000	14,000,000	23,750,000
MW-4											
08/19/98	---	---	-178	2,600	9,410	8,000	<1,000	280,000	1,700,000	3,600,000	7,000,000
MW-5											
08/19/98	5,800	1,400	75	>5,000	9,430	9,180	<1,000	10,000	820,000	970,000	2,520,000
02/23/99	6,700	2,000	-55	2,100	---	1,800	<100	14,000	400,000	---	---
08/24/99	2,100	220	-54	2,900	---	320	<100	<500	660,000	---	---

Table 2. Groundwater Analytical Results for Bioparameters, Sodium, and Chloride

City of Oakland Municipal Service Center, Oakland, California

Sample ID / Date	TPHg (µg/l)	TPHd (µg/l)	ORP (mV)	Ferrous Iron	DO-B	DO-A	Nitrate	Sulfate	Total Alkalinity	Sodium	Chloride
	<---------- ug/l ---------->										
MW-5											
01/19/00	3,000	100	-171	4,100	---	420	1,900	21,000	680,000	---	---
MW-6											
02/23/99 SPH: NM	---	---	115	3,200	---	6,400	<100	<500	1,300,000	---	---
08/24/99 SPH: 0.03 ft	---	---	---	---	---	---	NA	NA	1,100,000	---	---
MW-7											
08/19/98	---	---	110	>5,000	8,600	7,860	<1,000	300,000	970,000	920,000	1,800,000
02/23/99	80	<50	75	4,900	---	3,900	<100	190,000	870,000	---	---
08/24/99	<50	<50	-19	4,400	---	450	<100	300,000	760,000	---	---
01/19/00	54	<50	-170	3,100	---	310	6,600	820,000	840,000	---	---
MW-8											
11/20/96	<50	880	50	<100 a	500	---	<500	478,000	---	---	7,490,000
11/20/97	<50	200	262	<1,000 a	4,000	---	<50	1,200,000	380,000	---	---
08/19/98	<50	<50	220	3,400	10,180	9,820	<1,000	610,000	490,000	4,300,000	7,500,000
02/23/99	<50	700	75	5,000	---	5,300	<100	150,000	630,000	---	---
08/24/99	<50	70	87	200	---	320	<100	<5,000	320,000	---	---
01/18/00	<50	<50	149	<500	---	223	16,000	1,900,000	270,000	---	---
MW-9											
11/20/96	240	1,900	-73	240 a	---	---	<500	<3,000	---	---	2,230,000
11/20/97	300	1,000	202	<1,000	<1,000	---	<50	1,000	1,300,000	---	---
08/19/98	740	190	275	>5,000	10,150	9,670	<1,000	1,000	1,180,000	820,000	1,400,000

Table 2. Groundwater Analytical Results for Bioparameters, Sodium, and Chloride

City of Oakland Municipal Service Center, Oakland, California

Sample ID / Date	TPHg (µg/l)	TPHd (µg/l)	ORP (mV)	Ferrous Iron	DO-B	DO-A	Nitrate	Sulfate	Total Alkalinity	Sodium	Chloride
					<---------- ug/l ---------->						
MW-9											
02/23/99	1,100	1,100	-40	4,900	---	1,100	<100	1,200	1,000,000	---	---
08/24/99	290	890	-65	3,300	---	330	<100	<500	950,000	---	---
01/18/00	160	200	48	2,100	---	300	7,600	4,400	980,000	---	---
MW-10											
11/20/96	<50	940	-54	<100 a	---	---	<500	52,000	---	---	1,940,000
11/20/97	<50	370	226	<1,000 a	<1,000	---	<50	<100	870,000	---	---
08/19/98	<50	240	68	4,200	10,210	9,840	<1,000	10,000	900,000	330,000	350,000
02/23/99	<50	170	-10	3,000	---	1,900	3,000	71,000	690,000	---	---
08/24/99	380	140	75	1,700	---	760	<100	<500	910,000	---	---
01/19/00	100	120	-161	800	---	650	1,900	<500	940,000	---	---
MW-11											
01/19/00	220	<50	-120	2,600	---	330	<100	26,000	1,800,000	---	---
MW-12											
01/19/00	200	1,800	170	8,000	---	---	2,400	2,800	920,000	---	---
MW-13											
01/18/00	<50	8,800	-81	2,300	---	210	300	320,000	850,000	---	---
MW-14											
01/18/00	120	1,700	90	1,100	---	250	700	3,100	1,100,000	---	---

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Table 2. Groundwater Analytical Results for Bioparameters, Sodium, and Chloride

City of Oakland Municipal Service Center, Oakland, California

Sample ID / Date	TPHg (µg/l)	TPHd (µg/l)	ORP (mV)	Ferrous Iron	DO-B	DO-A	Nitrate	Sulfate	Total Alkalinity	Sodium	Chloride
					<---------- ug/l ---------->						
MW-15											
01/18/00	110	12,000	93	3,100	---	270	9,000	3,900	920,000	---	---
MW-17											
01/18/00	<50	850	102	<500	---	230	25,000	1,600	960,000	---	---
San Leandro Bay											
08/19/98	---	---	---	---	---	---	---	---	---	5,700,000	14,400,000
TBW-1											
02/23/99 SPH: 0.10 ft	---	---	---	---	---	---	<100	34,000	420,000	---	---
08/24/99 SPH: 0.18 ft	---	---	---	---	---	---	---	---	550,000	---	---
TBW-3											
08/19/98	920	810,000	135	1,800	6,860	7,000	<1,000	45,000	410,000	91,000	175,000
02/23/99	110	3,800	---	1,900	---	2,400	2,000	49,000	410,000	---	---
08/24/99 SPH globules	---	---	---	---	---	---	2,600	<500	430,000	---	---
TBW-5											
02/23/99 SPH: 1.45 ft	---	---	---	---	---	---	13,000	1,000	690,000	---	---
08/24/99 SPH: 1.33 ft	---	---	---	---	---	---	NA	NA	600,000	---	---
TBW-6											
02/23/99	60	160	---	<100	---	1,100	<100	58,000	180,000	---	---
08/24/99	130	180	42	<500	---	490	<100	39,000	340,000	---	---
01/19/00	170	55	-161	<500	---	400	1,000	60,000	200,000	---	---

Table 2. Groundwater Analytical Results for Bioparameters, Sodium, and Chloride

City of Oakland Municipal Service Center, Oakland, California

Sample ID / Date	TPHg (µg/l)	TPHd (µg/l)	ORP (mV)	Ferrous Iron	DO-B	DO-A	Nitrate	Sulfate	Total Alkalinity	Sodium	Chloride
					<---------- ug/l ---------->						
Ideal Relationship with Hydrocarbon Concentrations:			Inverse	Direct	Inverse	Inverse	Inverse	Inverse	Direct		
Most Recent Observed Relationship with Hydrocarbon Concentrations:			Direct	Direct	---	Inverse	Inverse	Inverse	Direct		

Legend

ORP = Oxidation/reduction potential
DO = Dissolved Oxygen (B = before purging, A = After purging)
Inc. = Inconclusive

Notes

All concentrations in milligrams per liter (ug/l), unless otherwise noted
--- = Not measured/analyzed
NA = Not analyzed due to oily content of sample
a = Results for Soluble Iron

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ATTACHMENT A

Laboratory Analytical Report

Caltest
ANALYTICAL LABORATORY
ENVIRONMENTAL ANALYSES

May 11, 2000

David Elias
Cambria
1144 65th Street Suite C
Oakland, CA 94608

Dear David,

Calest has reviewed the extractable petroleum hydrocarbon data on project 153-1247-020/City of Oakland. The following information should be considered on reviewing the final data.
For samples:

Caltest ID	Project ID
A010438-1	MW2
A010438-3	MW9
A010438-4	MW13
A010438-5	MW14
A010438-6	MW15
A010438-7	MW17
A010469-4	MW10

All petroleum hydrocarbons quantified in the diesel range are actually the front end of the motor oil pattern. As you know, we are limited by methodology and the fact that different sources of petroleum products are not identical. The method is limited by quantifying over a static carbon range. Motor oil is quantified from C24 to C32, when infact the the pattern begins before C24. Our standards are measured under the same conditions, so we are able to quantify the motor oil with confidence. Any front end motor oil that is quantified in the diesel range, will be reported as TPH and not as diesel.

For samples:

Caltest ID	Project ID
A010469-4	MW10

Quantitation in the diesel range show no diesel pattern, the response looks like lower carbon chain compounds close to the gasoline range.

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ENVIRONMENTAL ANALYSES

For sample:

Caltest ID	Project ID
A010469-7	TBW6

There is no pattern relating to diesel or front end motor oil in the diesel range, the peaks are small and random.

For sample:

Caltest ID	Project ID
A0I0469-6	MW12

Petroleum hydrocarbons quantified in the diesel range includes the front end of the motor oil pattern and unidentifiable peaks earlier in the diesel range.

I hope this further clarifies your data. Please call if you have any questions.

Sincerely
Caltest Analytical Laboratory

CHHorn

Christine Horn
Laboratory Director

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010438

REPORT of ANALYTICAL RESULTS

Report Date: 03 FEB 2000
Received Date: 19 JAN 2000

Client: David Elias
Cambria
1144 65th Street, Suite C
Oakland, CA 94608

Purchase Order: 153-1247-020

Project: 153-1247-020/CITY OF OAKLAND

Sampled by: J.JONES

Lab Number	Sample Identification	Matrix	Sampled Date/Time
A010438-1	MW2	AQUEOUS	18 JAN 00 11:23
A010438-2	MW8	AQUEOUS	18 JAN 00 12:55
A010438-3	MW9	AQUEOUS	18 JAN 00 14:55
A010438-4	MW13	AQUEOUS	18 JAN 00 17:15
A010438-5	MW14	AQUEOUS	18 JAN 00 15:30
A010438-6	MW15	AQUEOUS	18 JAN 00 14:20
A010438-7	MW17	AQUEOUS	18 JAN 00 13:35

Todd M. Albertson
Project Manager

CAHorn
Christine Horn
Laboratory Director

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Results are specific to the sample as submitted and only to the parameters reported.
All analyses performed by EPA Methods or Standard Methods (SM) 18th Ed. except where noted.
Results of 'ND' mean not detected at or above the listed Reporting Limit (R.L.).
'D.F.' means Dilution Factor and has been used to adjust the listed Reporting Limit (R.L.).
Acceptance Criteria for all Surrogate recoveries are defined in the QC Spike Data Reports.

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010438

INORGANIC ANALYTICAL RESULTS

ANALYTE	RESULT	R.L.	UNITS	D.F.	METHOD	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010438-1								
SAMPLE ID: MW2								
SAMPLED: 18 JAN 00 11:23								
ALKALINITY				1	310.1	01.25.00	I000005ALK	
Bicarbonate as CaCO3	120.	10.	mg/L					
Hydroxide as CaCO3	ND	10.	mg/L					
Carbonate as CaCO3	ND	10.	mg/L					
Total Alkalinity as CaCO3	120.	10.	mg/L					
Nitrate as N	16.	1.	mg/L	10	300.0	01.20.00	I000009IC	
Sulfate	0.6	0.5	mg/L	1	300.0	01.20.00	I000009IC	
LAB NUMBER: A010438-2								
SAMPLE ID: MW8								
SAMPLED: 18 JAN 00 12:55								
ALKALINITY				1	310.1	01.25.00	I000005ALK	
Bicarbonate as CaCO3	270.	10.	mg/L					
Hydroxide as CaCO3	ND	10.	mg/L					
Carbonate as CaCO3	ND	10.	mg/L					
Total Alkalinity as CaCO3	270.	10.	mg/L					
Nitrate as N	16.	1.	mg/L	10	300.0	01.20.00	I000009IC	
Sulfate	1900.	50.	mg/L	100	300.0	01.27.00	I000014IC	
LAB NUMBER: A010438-3								
SAMPLE ID: MW9								
SAMPLED: 18 JAN 00 14:55								
ALKALINITY				1	310.1	01.25.00	I000005ALK	
Bicarbonate as CaCO3	980.	10.	mg/L					
Hydroxide as CaCO3	ND	10.	mg/L					
Carbonate as CaCO3	ND	10.	mg/L					
Total Alkalinity as CaCO3	980.	10.	mg/L					
Nitrate as N	7.6	0.1	mg/L	1	300.0	01.20.00	I000009IC	
Sulfate	4.4	0.5	mg/L	1	300.0	01.20.00	I000009IC	

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010438

INORGANIC ANALYTICAL RESULTS

ANALYTE	RESULT	R.L.	UNITS	D.F.	METHOD	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010438-4								
SAMPLE ID: MW13								
SAMPLED: 18 JAN 00 17:15								
ALKALINITY				1	310.1	01.25.00	I000005ALK	
Bicarbonate as CaCO3	850.	10.	mg/L					
Hydroxide as CaCO3	ND	10.	mg/L					
Carbonate as CaCO3	ND	10.	mg/L					
Total Alkalinity as CaCO3	850.	10.	mg/L					
Nitrate as N	0.3	0.1	mg/L	1	300.0	01.20.00	I000009IC	
Sulfate	320.	5.	mg/L	10	300.0	01.20.00	I000009IC	
LAB NUMBER: A010438-5								
SAMPLE ID: MW14								
SAMPLED: 18 JAN 00 15:30								
ALKALINITY				1	310.1	01.25.00	I000005ALK	
Bicarbonate as CaCO3	1100.	10.	mg/L					
Hydroxide as CaCO3	ND	10.	mg/L					
Carbonate as CaCO3	ND	10.	mg/L					
Total Alkalinity as CaCO3	1100.	10.	mg/L					
Nitrate as N	0.7	0.1	mg/L	1	300.0	01.20.00	I000009IC	
Sulfate	3.1	0.5	mg/L	1	300.0	01.20.00	I000009IC	
LAB NUMBER: A010438-6								
SAMPLE ID: MW15								
SAMPLED: 18 JAN 00 14:20								
ALKALINITY				1	310.1	02.02.00	I000006ALK	
Bicarbonate as CaCO3	920.	10.	mg/L					
Hydroxide as CaCO3	ND	10.	mg/L					
Carbonate as CaCO3	ND	10.	mg/L					
Total Alkalinity as CaCO3	920.	10.	mg/L					
Nitrate as N	9.0	0.1	mg/L	1	300.0	01.20.00	I000009IC	
Sulfate	3.9	0.5	mg/L	1	300.0	01.20.00	I000009IC	

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LAB ORDER No.: A010438

INORGANIC ANALYTICAL RESULTS

ANALYTE	RESULT	R.L.	UNITS	D.F.	METHOD	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010438-7								
SAMPLE ID: MW17								
SAMPLED: 18 JAN 00 13:35								
ALKALINITY				1	310.1	02.02.00	I000006ALK	
Bicarbonate as CaCO3	960.	10.	mg/L					
Hydroxide as CaCO3	ND	10.	mg/L					
Carbonate as CaCO3	ND	10.	mg/L					
Total Alkalinity as CaCO3	960.	10.	mg/L					
Nitrate as N	25.	1.	mg/L	10	300.0	01.20.00	I000009IC	
Sulfate	1600.	50.	mg/L	100	300.0	01.27.00	I000014IC	

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CALIFORNIA ELAP #1664

ORGANIC ANALYTICAL RESULTS

LAB ORDER No.: A010438

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010438-1							
SAMPLE ID: MW2							
SAMPLED: 18 JAN 00 11:23							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS				1	02.01.00	T000027TPH	1,2,3,4
TPH-Extractable, quantitated as diesel	60.	50.	ug/L				
TPH-Extractable, quantitated as Motor Oil	660.	200.	ug/L				
Surrogate o-Terphenyl	82.		%				
Kerosene	ND						
LAB NUMBER: A010438-1 (continued)							
SAMPLE ID: MW2							
SAMPLED: 18 JAN 00 11:23							
METHOD: EPA 8015/8020A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS				1		V000005G9A	5
TPH-Purgeable, quantitated as gasoline	ND	50.	ug/L		01.25.00		
Benzene	2.1	0.5	ug/L		01.25.00		
Toluene	ND	0.5	ug/L		01.25.00		
Ethylbenzene	ND	0.5	ug/L		01.25.00		
Xylenes (Total)	ND	0.5	ug/L		01.25.00		
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L		01.26.00		
Surrogate 4-Bromofluorobenzene [FID]	97.		%		01.25.00		
Surrogate 4-Bromofluorobenzene [PID]	93.		%		01.25.00		
LAB NUMBER: A010438-2							
SAMPLE ID: MW8							
SAMPLED: 18 JAN 00 12:55							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS				1	02.01.00	T000027TPH	1,2
TPH-Extractable, quantitated as diesel	ND	50.	ug/L				

1) Sample Preparation on 01-28-00 using EPA 3510
2) This sample was analyzed following Silica Gel Cleanup.
3) An unidentified petroleum hydrocarbon was present in the sample. An approximate concentration has been calculated based on Diesel #2 standards.
4) An unidentified petroleum hydrocarbon mixture was present in the sample. An approximate concentration has been calculated based on motor oil standards.
5) Sample Preparation on 01-25-00 using EPA 5030

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LAB ORDER No.: A010438

ORGANIC ANALYTICAL RESULTS

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010438-2 (continued)							
SAMPLE ID: MW8							
SAMPLED: 18 JAN 00 12:55							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS (continued)				1	02.01.00	T000027TPH	
TPH-Extractable, quantitated as Motor Oil	ND	200.	ug/L				
Surrogate o-Terphenyl	83.		%				
Kerosene	ND						
LAB NUMBER: A010438-2 (continued)							
SAMPLE ID: MW8							
SAMPLED: 18 JAN 00 12:55							
METHOD: EPA 8015/8020A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS				1		V000005G9A	1
TPH-Purgeable, quantitated as gasoline	ND	50.	ug/L		01.25.00		
Benzene	ND	0.5	ug/L		01.25.00		
Toluene	ND	0.5	ug/L		01.25.00		
Ethylbenzene	ND	0.5	ug/L		01.25.00		
Xylenes (Total)	ND	0.5	ug/L		01.25.00		
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L		01.26.00		
Surrogate 4-Bromofluorobenzene [FID]	97.		%		01.25.00		
Surrogate 4-Bromofluorobenzene [PID]	92.		%		01.25.00		
LAB NUMBER: A010438-3							
SAMPLE ID: MW9							
SAMPLED: 18 JAN 00 14:55							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS				1	02.01.00	T000027TPH	2,3,4,5
TPH-Extractable, quantitated as diesel	200.	50.	ug/L				

1) Sample Preparation on 01-25-00 using EPA 5030
2) Sample Preparation on 01-28-00 using EPA 3510
3) This sample was analyzed following Silica Gel Cleanup.
4) An unidentified petroleum hydrocarbon was present in the sample. An approximate concentration has been calculated based on Diesel #2 standards.
5) An unidentified petroleum hydrocarbon mixture was present in the sample. An approximate concentration has been calculated based on motor oil standards.

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

ORGANIC ANALYTICAL RESULTS

LAB ORDER No.: A010438

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010438-3 (continued)							
SAMPLE ID: MW9							
SAMPLED: 18 JAN 00 14:55							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS (continued)				1	02.01.00	T000027TPH	
TPH-Extractable, quantitated as Motor Oil	2300.	200.	ug/L				
Surrogate o-Terphenyl	81.		%				
Kerosene	ND						
LAB NUMBER: A010438-3 (continued)							
SAMPLE ID: MW9							
SAMPLED: 18 JAN 00 14:55							
METHOD: EPA 8015/8020A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS				1		V000005G9A	1,2
TPH-Purgeable, quantitated as gasoline	160.	50.	ug/L		01.25.00		
Benzene	5.7	0.5	ug/L		01.25.00		
Toluene	1.9	0.5	ug/L		01.25.00		
Ethylbenzene	0.6	0.5	ug/L		01.25.00		
Xylenes (Total)	4.2	0.5	ug/L		01.25.00		
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L		01.26.00		
Surrogate 4-Bromofluorobenzene [FID]	98.		%		01.25.00		
Surrogate 4-Bromofluorobenzene [PID]	92.		%		01.25.00		

1) Sample Preparation on 01-25-00 using EPA 5030
2) A fuel pattern and it's constituents were found that did not identically match our standard.

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

ORGANIC ANALYTICAL RESULTS

LAB ORDER No.: A010438

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010438-4							
SAMPLE ID: MW13							
SAMPLED: 18 JAN 00 17:15							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS					02.01.00	T000027TPH	3-8
TPH-Extractable, quantitated as diesel	8800.	50.	ug/L	1			
TPH-Extractable, quantitated as Motor Oil	120000.	2000.	ug/L	10			
Surrogate o-Terphenyl	81.		%	1			
Kerosene	ND						
LAB NUMBER: A010438-4 (continued)							
SAMPLE ID: MW13							
SAMPLED: 18 JAN 00 17:15							
METHOD: EPA 8015/8020A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS				1		V000005G9A	1
TPH-Purgeable, quantitated as gasoline	ND	50.	ug/L		01.25.00		
Benzene	ND	0.5	ug/L		01.25.00		
Toluene	0.8	0.5	ug/L		01.25.00		
Ethylbenzene	ND	0.5	ug/L		01.25.00		
Xylenes (Total)	ND	0.5	ug/L		01.25.00		
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L		01.26.00		
Surrogate 4-Bromofluorobenzene [FID]	99.		%		01.25.00		
Surrogate 4-Bromofluorobenzene [PID]	95.		%		01.25.00		

3) Sample Preparation on 01-28-00 using EPA 3510
4) This sample was analyzed following Silica Gel Cleanup.
5) The final volume of the sample extract was higher than the nominal amount, resulting in (a) higher reporting limit(s).
6) Sample diluted to bring concentration of target analyte(s) within the working range of the instrument, resulting in increased reporting limits.
7) An unidentified petroleum hydrocarbon was present in the sample. An approximate concentration has been calculated based on Diesel #2 standards.
8) An unidentified petroleum hydrocarbon mixture was present in the sample. An approximate concentration has been calculated based on motor oil standards.
1) Sample Preparation on 01-25-00 using EPA 5030

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

ORGANIC ANALYTICAL RESULTS

LAB ORDER No.: A010438

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010438-5							
SAMPLE ID: MW14							
SAMPLED: 18 JAN 00 15:30							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS				1	02.01.00	T000027TPH	1-6
TPH-Extractable, quantitated as diesel	1700.	250.	ug/L				
TPH-Extractable, quantitated as Motor Oil	22000.	1000.	ug/L				
Surrogate o-Terphenyl	38.		%				
Kerosene	ND						
LAB NUMBER: A010438-5 (continued)							
SAMPLE ID: MW14							
SAMPLED: 18 JAN 00 15:30							
METHOD: EPA 8015/8020A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS				1		V000005G9A	7,8
TPH-Purgeable, quantitated as gasoline	120.	50.	ug/L		01.25.00		
Benzene	ND	0.5	ug/L		01.25.00		
Toluene	ND	0.5	ug/L		01.25.00		
Ethylbenzene	ND	0.5	ug/L		01.25.00		
Xylenes (Total)	ND	0.5	ug/L		01.25.00		
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L		01.26.00		
Surrogate 4-Bromofluorobenzene [FID]	100.		%		01.25.00		
Surrogate 4-Bromofluorobenzene [PID]	94.		%		01.25.00		

1) Sample Preparation on 01-28-00 using EPA 3510
2) This sample was analyzed following Silica Gel Cleanup.
3) The final volume of the sample extract was higher than the nominal amount, resulting in (a) higher reporting limit(s).
4) An unidentified petroleum hydrocarbon was present in the sample. An approximate concentration has been calculated based on Diesel #2 standards.
5) An unidentified petroleum hydrocarbon mixture was present in the sample. An approximate concentration has been calculated based on motor oil standards.
6) Due to matrix interferences present in the sample, surrogate recoveries failed to meet the QA/QC acceptance criteria.
7) Sample Preparation on 01-25-00 using EPA 5030
8) An unidentified petroleum hydrocarbon was present in the sample. An approximate concentration has been calculated based on gasoline standards.

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010438

ORGANIC ANALYTICAL RESULTS

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010438-6							
SAMPLE ID: MW15							
SAMPLED: 18 JAN 00 14:20							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS					02.01.00	T000027TPH	1-6
TPH-Extractable, quantitated as diesel	12000.	250.	ug/L	1			
TPH-Extractable, quantitated as Motor Oil	89000.	2000.	ug/L	10			
Surrogate o-Terphenyl	69.		%	1			
Kerosene	ND						
LAB NUMBER: A010438-6 (continued)							
SAMPLE ID: MW15							
SAMPLED: 18 JAN 00 14:20							
METHOD: EPA 8015/8020A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS				1		V000005G9A	7,8
TPH-Purgeable, quantitated as gasoline	110.	50.	ug/L		01.25.00		
Benzene	3.8	0.5	ug/L		01.25.00		
Toluene	2.1	0.5	ug/L		01.25.00		
Ethylbenzene	1.	0.5	ug/L		01.25.00		
Xylenes (Total)	4.6	0.5	ug/L		01.25.00		
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L		01.26.00		
Surrogate 4-Bromofluorobenzene [FID]	102.		%		01.25.00		
Surrogate 4-Bromofluorobenzene [PID]	95.		%		01.25.00		

1) Sample Preparation on 01-28-00 using EPA 3510
2) This sample was analyzed following Silica Gel Cleanup.
3) The final volume of the sample extract was higher than the nominal amount, resulting in (a) higher reporting limit(s).
4) Sample diluted to bring concentration of target analyte(s) within the working range of the instrument, resulting in increased reporting limits.
5) An unidentified petroleum hydrocarbon was present in the sample. An approximate concentration has been calculated based on Diesel #2 standards.
6) An unidentified petroleum hydrocarbon mixture was present in the sample. An approximate concentration has been calculated based on motor oil standards.
7) Sample Preparation on 01-25-00 using EPA 5030
8) A fuel pattern and it's constituents were found that did not identically match our standard.

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

ORGANIC ANALYTICAL RESULTS

LAB ORDER No.: A010438

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010438-7							
SAMPLE ID: MW17							
SAMPLED: 18 JAN 00 13:35							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS				1	02.01.00	T000027TPH	1-5
TPH-Extractable, quantitated as diesel	850.	250.	ug/L				
TPH-Extractable, quantitated as Motor Oil	21000.	1000.	ug/L				
Surrogate o-Terphenyl	83.		%				
Kerosene	ND						
LAB NUMBER: A010438-7 (continued)							
SAMPLE ID: MW17							
SAMPLED: 18 JAN 00 13:35							
METHOD: EPA 8015/8020A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS				1		V000005G9A	6
TPH-Purgeable, quantitated as gasoline	ND	50.	ug/L		01.25.00		
Benzene	ND	0.5	ug/L		01.25.00		
Toluene	ND	0.5	ug/L		01.25.00		
Ethylbenzene	ND	0.5	ug/L		01.25.00		
Xylenes (Total)	ND	0.5	ug/L		01.25.00		
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L		01.26.00		
Surrogate 4-Bromofluorobenzene [FID]	94.		%		01.25.00		
Surrogate 4-Bromofluorobenzene [PID]	90.		%		01.25.00		

1) Sample Preparation on 01-28-00 using EPA 3510
2) This sample was analyzed following Silica Gel Cleanup.
3) The final volume of the sample extract was higher than the nominal amount, resulting in (a) higher reporting limit(s).
4) An unidentified petroleum hydrocarbon was present in the sample. An approximate concentration has been calculated based on Diesel #2 standards.
5) An unidentified petroleum hydrocarbon mixture was present in the sample. An approximate concentration has been calculated based on motor oil standards.
6) Sample Preparation on 01-25-00 using EPA 5030

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010438

SUPPLEMENTAL QUALITY CONTROL (QC) DATA REPORT

Report Date: 03 FEB 2000
Received Date: 19 JAN 2000

Client: David Elias
Cambria
1144 65th Street, Suite C
Oakland, CA 94608

Project: 153-1247-020/CITY OF OAKLAND

QC Batch ID	Method	Matrix
I000005ALK	310.1	AQUEOUS
I000006ALK	310.1	AQUEOUS
I000009IC	300.0	AQUEOUS
I000014IC	300.0	AQUEOUS
T000027TPH	8015M	AQUEOUS
V000005G9A	8015/8020A	AQUEOUS

Todd M. Albertson
Project Manager

Christine Horn
Laboratory Director

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Results are specific to the sample as submitted and only to the parameters reported.
All analyses performed by EPA Methods or Standard Methods (SM) 18th Ed. except where noted.
Results of 'ND' mean not detected at or above the listed Reporting Limit (R.L.).
Analyte Spike Amounts reported as 'NS' mean not spiked and will not have recoveries reported.
'RPD' means Relative Percent Difference and RPD Acceptance Criteria is stated as a maximum.
'NC' means not calculated for RPD or Spike Recoveries.

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010438

METHOD BLANK ANALYTICAL RESULTS

ANALYTE	RESULT	R.L.	UNITS	ANALYZED	NOTES
QC BATCH: I000005ALK					
ALKALINITY				01.25.00	
Bicarbonate as CaCO3	ND	10.	mg/L		
Hydroxide as CaCO3	ND	10.	mg/L		
Carbonate as CaCO3	ND	10.	mg/L		
Total Alkalinity as CaCO3	ND	10.	mg/L		
QC BATCH: I000006ALK					
ALKALINITY				02.02.00	
Bicarbonate as CaCO3	ND	10.	mg/L		
Hydroxide as CaCO3	ND	10.	mg/L		
Carbonate as CaCO3	ND	10.	mg/L		
Total Alkalinity as CaCO3	ND	10.	mg/L		
QC BATCH: I000009IC					
Nitrate as N	ND	0.1	mg/L	01.20.00	
Sulfate	ND	0.5	mg/L	01.20.00	
QC BATCH: I000014IC					
Sulfate	ND	0.5	mg/L	01.27.00	
QC BATCH: T000027TPH					
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS				01.31.00	1
Diesel Fuel	ND	50.	ug/L		
TPH-Extractable, quantitated as diesel	ND	50.	ug/L		
Motor Oil	ND	200.	ug/L		
TPH-Extractable, quantitated as Motor Oil	ND	200.	ug/L		
Surrogate o-Terphenyl	87.		%		
Kerosene	ND				
QC BATCH: V000005G9A					
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS					
Total Petroleum Hydrocarbons - Gasoline	ND	50.	ug/L	01.26.00	
TPH-Purgeable, quantitated as gasoline	ND	50.	ug/L	01.25.00	
Benzene	ND	0.5	ug/L	01.25.00	

1) This sample was analyzed following Silica Gel Cleanup.

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

METHOD BLANK ANALYTICAL RESULTS

LAB ORDER No.: A010438

ANALYTE	RESULT	R.L.	UNITS	ANALYZED	NOTES
QC BATCH: V000005G9A (continued)					
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS (continued)					
Toluene	ND	0.5	ug/L	01.25.00	
Ethylbenzene	ND	0.5	ug/L	01.25.00	
Xylenes (Total)	ND	0.5	ug/L	01.25.00	
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L	01.26.00	
Surrogate 4-Bromofluorobenzene [FID]	96.		%	01.25.00	
Surrogate 4-Bromofluorobenzene [PID]	92.		%	01.25.00	

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010438

LABORATORY CONTROL SAMPLE ANALYTICAL RESULTS

ANALYTE	SPIKE AMOUNT	SPIKE\DUP RESULT	SPK\DUP %REC	ACCEPTANCE %REC \RPD	REL% DIFF	ANALYZED	NOTES
QC BATCH: I000005ALK							
ALKALINITY						01.25.00	
Bicarbonate as CaCO3	100.	99.\	99\	80-120\20			
Total Alkalinity as CaCO3	100.	99.\	99\	80-120\20			
QC BATCH: I000006ALK							
ALKALINITY						02.02.00	
Bicarbonate as CaCO3	100.	89.\	89\	80-120\20			
Total Alkalinity as CaCO3	100.	89.\	89\	80-120\20			
QC BATCH: I000009IC							
Nitrate as N	6.25	6.26\	100\	80-120\20		01.20.00	
Sulfate	20.0	20.6\	103\	80-120\20		01.20.00	
QC BATCH: I000014IC							
Sulfate	20.0	20.9\	104\	80-120\20		01.27.00	
QC BATCH: T000027TPH							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS						01.31.00	1
Diesel Fuel	1000	844.\	84\	36-102\			
Surrogate o-Terphenyl	100	76.2\	76\	40-140\			
QC BATCH: V000005G9A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS							
Total Petroleum Hydrocarbons - Gasoline	550.	500.\	91\	50-130\		01.26.00	
Benzene	6.69	6.26\	94\	50-130\		01.25.00	
Toluene	39.0	34.4\	88\	50-130\		01.25.00	
Surrogate 4-Bromofluorobenzene [FID]	20.0	19.5\	98\	50-130\		01.25.00	
Surrogate 4-Bromofluorobenzene [PID]	20.0	18.0\	90\	50-130\		01.25.00	

1) This sample was analyzed following Silica Gel Cleanup.

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CERTIFIED ENVIRONMENTAL SERVICES
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DUPLICATE SAMPLES ANALYTICAL RESULTS

LAB ORDER No.: A010438

ANALYTE	R.L.	ORIGINAL RESULT	DUPLICATE RESULT	REL% DIFF	ACCEPT LIMIT	ANALYZED	NOTES
QC BATCH: I000005ALK							
QC SAMPLE LAB NUMBER: A010432-1							
ALKALINITY						01.25.00	
Bicarbonate as CaCO3	10.	216.	220.	1.8	20		
Hydroxide as CaCO3	10.	ND	ND	NC	20		
Carbonate as CaCO3	10.	ND	ND	NC	20		
Total Alkalinity as CaCO3	10.	216.	220.	1.8	20		
QC BATCH: I000006ALK							
QC SAMPLE LAB NUMBER: A010469-7							
ALKALINITY						02.02.00	
Bicarbonate as CaCO3	10.	200.	210.	4.9	20		
Hydroxide as CaCO3	10.	ND	ND	NC	20		
Carbonate as CaCO3	10.	ND	ND	NC	20		
Total Alkalinity as CaCO3	10.	200.	210.	4.9	20		

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010438

MATRIX SPIKE ANALYTICAL RESULTS

ANALYTE	ORIGINAL RESULT	SPIKE AMOUNT	SPIKE\DUP RESULT	SPK\DUP %REC	ACCEPTANCE %REC \RPD	REL% DIFF	ANALYZED	NOTES
QC BATCH: I000009IC								
QC SAMPLE LAB NUMBER: A010452-1								
Nitrate as N	2.63	50.	52.0\52.5	99\100	80-120\20	1	01.20.00	
QC BATCH: I000009IC (continued)								
QC SAMPLE LAB NUMBER: A010452-1								
Sulfate	33.8	160.	185.\188.	94\96	80-120\20	1.6	01.20.00	
QC BATCH: I000014IC								
QC SAMPLE LAB NUMBER: A010655-4								
Sulfate	32.1	160.	191.\184.	99\95	80-120\20	3.7	01.27.00	
QC BATCH: V000005G9A								
QC SAMPLE LAB NUMBER: A010438-1								
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS							01.26.00	
Total Petroleum Hydrocarbons - Gasoline	ND	550.	440.\401.	80\73	50-130\25	9.3		
Benzene	2.14	6.69	9.66\8.98	112\102	50-130\25	7.3		
Toluene	ND	39.0	35.8\32.8	92\84	50-130\25	8.7		
Surrogate 4-Bromofluorobenzene [FID]	97.%	20.0	18.8\18.4	94\92	50-130\25			
Surrogate 4-Bromofluorobenzene [PID]	93.%	20.0	19.4\19.0	97\95	50-130\25			

CALTEST ANALYTICAL LABORATORY

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SAMPLE CHAIN OF CUSTODY

PAGE 1 OF 1

LAB ORDER #: A010438

PROJECT # / PROJECT NAME: 153-1247-020 / City of Oakland

P.O. #: 153-1247-020

CLIENT: Cambria Environmental

CONTACT NAME: Jacquelyn Jones

ADDRESS: 1144 65th Street, Ste B CITY: Oakland STATE: CA ZIP: 94608

BILLING ADDRESS: Same

PHONE #: 5104203315 FAX PHONE: 5104209170 SAMPLER (PRINT & SIGN NAME): Jacquelyn Jones / [signature]

ANALYSES REQUESTED: TPHg, BTEX, MTBE 8020 / Confirm MTBE hits by 8260 / TPHd, K, mo w/ silica gel cleanup / nitrate, sulfate, alkalinity

TURN-AROUND TIME: ☒ STANDARD ☐ RUSH

DUE DATE:

CALTEST #	DATE SAMPLED	TIME SAMPLED	MATRIX	CONTAINER AMOUNT/TYPE	PRESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB #	COMP. or GRAB	TPHg, BTEX, MTBE 8020	Confirm MTBE hits by 8260		TPHd, K, mo w/ silica gel cleanup		nitrate, sulfate, alkalinity	REMARKS
-1	1/18/00	1123	Wtr	*	*	MW2			X	X		X		X	NOTE:
-2	↓	1255	↓	↓	↓	MW8			↓	↓		↓		↓	More
-3	↓	255	↓	↓	↓	MW9			↓	↓		↓		↓	samples for
-4	↓	515	↓	↓	↓	MW13			↓	↓		↓		↓	this site
-5	↓	330	↓	↓	↓	MW14			↓	↓		↓		↓	will be
-6	↓	220	↓	↓	↓	MW15			↓	↓		↓		↓	coming tomorrow
-7	↓	135	↓	↓	↓	MW17			↓	↓		↓		↓	to you.

* containers: 4 HCl pres VOAs; 2 L ambers non-pres; 2-½ L plastic, non pres

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	RELINQUISHED BY	DATE/TIME	RECEIVED BY
[signature]	1/18/00 1430	Michael E. [signature]	Michael E. [signature]	1/19/00 1625	[signature]

FOR LAB USE ONLY: Samples: WG ___ MICRO ___ BIO ___ TEMP ___ SEALED Y/N INTACT Y/N

BD: BIO ___ WG ___

CC: AA ___ SV ___ VO ___

SIL: HP ___ PT ___ QT ___ VOA ___

W/HNO₃ ___ H₂SO₄ ___ NaOH ___

PIL: HNO₃ ___ H₂SO₄ ___ NaOH ___

MATRIX: AQ = Aqueous Nondrinking Water, Digested Metals; FE = Low R.L.s, Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water; SL = Soil, Sludge, Solid; FP = Free Product

CONTAINER TYPES: AL = Amber Liter; AQL = 250 mL Amber; PT = Pint (Plastic); QT=Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL.VOA; OTC = Other Type Container

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010469

REPORT of ANALYTICAL RESULTS

Report Date: 23 FEB 2000
Received Date: 20 JAN 2000

Client: David Elias
Cambria
1144 65th Street, Suite C
Oakland, CA 94608

Purchase Order: 153-1247-20

Project: 153-1247-20/CITY OF OAKLAND

Sampled by: J.JONES

Lab Number	Sample Identification	Matrix	Sampled Date/Time
A010469-1	MW1	AQUEOUS	19 JAN 00 14:00
A010469-2	MW5	AQUEOUS	19 JAN 00 15:35
A010469-3	MW7	AQUEOUS	19 JAN 00 15:50
A010469-4	MW10	AQUEOUS	19 JAN 00 13:15
A010469-5	MW11	AQUEOUS	19 JAN 00 14:50
A010469-6	MW12	AQUEOUS	19 JAN 00 10:30
A010469-7	TBW6	AQUEOUS	19 JAN 00 11:15
A010469-15	MW5	AQUEOUS	19 JAN 00 15:35

Todd M. Albertson
Project Manager

Christine Horn
Laboratory Director

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All analyses performed by EPA Methods or Standard Methods (SM) 18th Ed. except where noted.
Results of 'ND' mean not detected at or above the listed Reporting Limit (R.L.).
'D.F.' means Dilution Factor and has been used to adjust the listed Reporting Limit (R.L.).
Acceptance Criteria for all Surrogate recoveries are defined in the QC Spike Data Reports.

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010469

INORGANIC ANALYTICAL RESULTS

ANALYTE	RESULT	R.L.	UNITS	D.F.	METHOD	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010469-1								
SAMPLE ID: MW1								
SAMPLED: 19 JAN 00 14:00								
ALKALINITY				1	310.1	02.02.00	I000006ALK	
Bicarbonate as CaCO3	1300.	10.	mg/L					
Hydroxide as CaCO3	ND	10.	mg/L					
Carbonate as CaCO3	ND	10.	mg/L					
Total Alkalinity as CaCO3	1300.	10.	mg/L					
Nitrate as N	7.6	0.1	mg/L	1	300.0	01.20.00	I000009IC	
Sulfate	ND	0.5	mg/L	1	300.0	01.20.00	I000009IC	
LAB NUMBER: A010469-2								
SAMPLE ID: MW5								
SAMPLED: 19 JAN 00 15:35								
ALKALINITY				1	310.1	02.02.00	I000006ALK	
Bicarbonate as CaCO3	680.	10.	mg/L					
Hydroxide as CaCO3	ND	10.	mg/L					
Carbonate as CaCO3	ND	10.	mg/L					
Total Alkalinity as CaCO3	680.	10.	mg/L					
Nitrate as N	1.9	0.1	mg/L	1	300.0	01.20.00	I000009IC	
Sulfate	21.	0.5	mg/L	1	300.0	01.20.00	I000009IC	
LAB NUMBER: A010469-3								
SAMPLE ID: MW7								
SAMPLED: 19 JAN 00 15:50								
ALKALINITY				1	310.1	02.02.00	I000006ALK	
Bicarbonate as CaCO3	840.	10.	mg/L					
Hydroxide as CaCO3	ND	10.	mg/L					
Carbonate as CaCO3	ND	10.	mg/L					
Total Alkalinity as CaCO3	840.	10.	mg/L					
Nitrate as N	6.6	0.1	mg/L	1	300.0	01.20.00	I000009IC	
Sulfate	820.	50.	mg/L	100	300.0	01.27.00	I000014IC	

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010469

INORGANIC ANALYTICAL RESULTS

ANALYTE	RESULT	R.L.	UNITS	D.F.	METHOD	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010469-4								
SAMPLE ID: MW10								
SAMPLED: 19 JAN 00 13:15								
ALKALINITY				1	310.1	02.02.00	I000006ALK	
Bicarbonate as CaCO3	940.	10.	mg/L					
Hydroxide as CaCO3	ND	10.	mg/L					
Carbonate as CaCO3	ND	10.	mg/L					
Total Alkalinity as CaCO3	940.	10.	mg/L					
Nitrate as N	1.9	0.1	mg/L	1	300.0	01.20.00	I000009IC	
Sulfate	ND	0.5	mg/L	1	300.0	01.20.00	I000009IC	
LAB NUMBER: A010469-5								
SAMPLE ID: MW11								
SAMPLED: 19 JAN 00 14:50								
ALKALINITY				1	310.1	02.02.00	I000006ALK	
Bicarbonate as CaCO3	1800.	10.	mg/L					
Hydroxide as CaCO3	ND	10.	mg/L					
Carbonate as CaCO3	ND	10.	mg/L					
Total Alkalinity as CaCO3	1800.	10.	mg/L					
Nitrate as N	ND	0.1	mg/L	1	300.0	01.20.00	I000009IC	
Sulfate	26.	0.5	mg/L	1	300.0	01.20.00	I000009IC	
LAB NUMBER: A010469-6								
SAMPLE ID: MW12								
SAMPLED: 19 JAN 00 10:30								
ALKALINITY				1	310.1	02.02.00	I000006ALK	
Bicarbonate as CaCO3	920.	10.	mg/L					
Hydroxide as CaCO3	ND	10.	mg/L					
Carbonate as CaCO3	ND	10.	mg/L					
Total Alkalinity as CaCO3	920.	10.	mg/L					
Nitrate as N	2.4	0.1	mg/L	1	300.0	01.20.00	I000009IC	
Sulfate	2.8	0.5	mg/L	1	300.0	01.20.00	I000009IC	

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010469

INORGANIC ANALYTICAL RESULTS

ANALYTE	RESULT	R.L.	UNITS	D.F.	METHOD	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010469-7								
SAMPLE ID: TBW6								
SAMPLED: 19 JAN 00 11:15								
ALKALINITY				1	310.1	02.02.00	I000006ALK	
Bicarbonate as CaCO3	200.	10.	mg/L					
Hydroxide as CaCO3	ND	10.	mg/L					
Carbonate as CaCO3	ND	10.	mg/L					
Total Alkalinity as CaCO3	200.	10.	mg/L					
Nitrate as N	1.0	0.1	mg/L	1	300.0	01.20.00	I000009IC	
Sulfate	60.	5.	mg/L	10	300.0	01.27.00	I000014IC	

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010469

ORGANIC ANALYTICAL RESULTS

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010469-1							
SAMPLE ID: MW1							
SAMPLED: 19 JAN 00 14:00							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS				1	02.01.00	T000027TPH	1,2,3
TPH-Extractable, quantitated as diesel	50.	50.	ug/L				
TPH-Extractable, quantitated as Motor Oil	ND	200.	ug/L				
Surrogate o-Terphenyl	81.		%				
Kerosene	ND	50.					
LAB NUMBER: A010469-1 (continued)							
SAMPLE ID: MW1							
SAMPLED: 19 JAN 00 14:00							
METHOD: EPA 8015/8020A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS				1	01.25.00	V000005G9A	4,5
Total Petroleum Hydrocarbons - Gasoline	660.	50.	ug/L				
Benzene	43.	0.5	ug/L				
Toluene	2.3	0.5	ug/L				
Ethylbenzene	1.1	0.5	ug/L				
Xylenes (Total)	6.0	0.5	ug/L				
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L				
Surrogate 4-Bromofluorobenzene [FID]	99.		%				
Surrogate 4-Bromofluorobenzene [PID]	95.		%				
LAB NUMBER: A010469-2							
SAMPLE ID: MW5							
SAMPLED: 19 JAN 00 15:35							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS				1	02.01.00	T000027TPH	1,2,3,6

1) Sample Preparation on 01-28-00 using EPA 3510
2) This sample was analyzed following Silica Gel Cleanup.
3) An unidentified petroleum hydrocarbon was present in the sample. An approximate concentration has been calculated based on Diesel #2 standards.
4) Sample Preparation on 01-25-00 using EPA 5030
5) A fuel pattern and it's constituents were found that did not identically match our standard.
6) An unidentified petroleum hydrocarbon mixture was present in the sample. An approximate concentration has been calculated based on motor oil standards.

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

ORGANIC ANALYTICAL RESULTS

LAB ORDER No.: A010469

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010469-2 (continued)							
SAMPLE ID: MW5							
SAMPLED: 19 JAN 00 15:35							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS (continued)				1	02.01.00	T000027TPH	
TPH-Extractable, quantitated as diesel	100.	50.	ug/L				
TPH-Extractable, quantitated as Motor Oil	320.	200.	ug/L				
Surrogate o-Terphenyl	84.		%				
Kerosene	ND	50.					
LAB NUMBER: A010469-2 (continued)							
SAMPLE ID: MW5							
SAMPLED: 19 JAN 00 15:35							
METHOD: EPA 8015/8020A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS				1	01.25.00	V000005G9A	1,2,3
Total Petroleum Hydrocarbons - Gasoline	3000.	50.	ug/L				
Benzene	66.E	0.5	ug/L				
Toluene	6.3	0.5	ug/L				
Ethylbenzene	400.E	0.5	ug/L				
Xylenes (Total)	90.	0.5	ug/L				
Methyl tert-Butyl Ether (MTBE)	300.E	5.	ug/L				
Surrogate 4-Bromofluorobenzene [FID]	168.		%				
Surrogate 4-Bromofluorobenzene [PID]	92.		%				
LAB NUMBER: A010469-3							
SAMPLE ID: MW7							
SAMPLED: 19 JAN 00 15:50							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS				1	02.01.00	T000027TPH	4,5
TPH-Extractable, quantitated as diesel	ND	50.	ug/L				

1) Sample Preparation on 01-25-00 using EPA 5030
2) "E" flagged results are estimated due to concentrations exceeding the calibration range.
3) Due to matrix interferences present in the sample, surrogate recoveries failed to meet the QA/QC acceptance criteria.
4) Sample Preparation on 01-28-00 using EPA 3510
5) This sample was analyzed following Silica Gel Cleanup.

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CALIFORNIA ELAP #1664

ORGANIC ANALYTICAL RESULTS

LAB ORDER No.: A010469

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010469-3 (continued)							
SAMPLE ID: MW7							
SAMPLED: 19 JAN 00 15:50							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS (continued)				1	02.01.00	T000027TPH	
TPH-Extractable, quantitated as Motor Oil	ND	200.	ug/L				
Surrogate o-Terphenyl	78.		%				
Kerosene	ND	50.					
LAB NUMBER: A010469-3 (continued)							
SAMPLE ID: MW7							
SAMPLED: 19 JAN 00 15:50							
METHOD: EPA 8015/8020A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS				1	01.25.00	V000005G9A	1,2
Total Petroleum Hydrocarbons - Gasoline	54.	50.	ug/L				
Benzene	1.5	0.5	ug/L				
Toluene	1.5	0.5	ug/L				
Ethylbenzene	2.4	0.5	ug/L				
Xylenes (Total)	3.8	0.5	ug/L				
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L				
Surrogate 4-Bromofluorobenzene [FID]	95.		%				
Surrogate 4-Bromofluorobenzene [PID]	93.		%				
LAB NUMBER: A010469-4							
SAMPLE ID: MW10							
SAMPLED: 19 JAN 00 13:15							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS				1	02.01.00	T000027TPH	3,4,5,6
TPH-Extractable, quantitated as diesel	120.	50.	ug/L				

1) Sample Preparation on 01-25-00 using EPA 5030
2) A fuel pattern and it's constituents were found that did not identically match our standard.
3) Sample Preparation on 01-28-00 using EPA 3510
4) This sample was analyzed following Silica Gel Cleanup.
5) An unidentified petroleum hydrocarbon was present in the sample. An approximate concentration has been calculated based on Diesel #2 standards.
6) An unidentified petroleum hydrocarbon mixture was present in the sample. An approximate concentration has been calculated based on motor oil standards.

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CALIFORNIA ELAP #1664

ORGANIC ANALYTICAL RESULTS

LAB ORDER No.: A010469

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010469-4 (continued)							
SAMPLE ID: MW10							
SAMPLED: 19 JAN 00 13:15							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS (continued)				1	02.01.00	T000027TPH	
TPH-Extractable, quantitated as Motor Oil	1200.	200.	ug/L				
Surrogate o-Terphenyl	90.		%				
Kerosene	ND	50.					
LAB NUMBER: A010469-4 (continued)							
SAMPLE ID: MW10							
SAMPLED: 19 JAN 00 13:15							
METHOD: EPA 8015/8020A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS				1	01.25.00	V000005G9A	1,2
Total Petroleum Hydrocarbons - Gasoline	100.	50.	ug/L				
Benzene	ND	0.5	ug/L				
Toluene	ND	0.5	ug/L				
Ethylbenzene	0.8	0.5	ug/L				
Xylenes (Total)	ND	0.5	ug/L				
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L				
Surrogate 4-Bromofluorobenzene [FID]	97.		%				
Surrogate 4-Bromofluorobenzene [PID]	95.		%				
LAB NUMBER: A010469-5							
SAMPLE ID: MW11							
SAMPLED: 19 JAN 00 14:50							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS				1	02.01.00	T000027TPH	3,4,5
TPH-Extractable, quantitated as diesel	ND	50.	ug/L				
TPH-Extractable, quantitated as Motor Oil	500.	200.	ug/L				

1) Sample Preparation on 01-25-00 using EPA 5030
2) A fuel pattern and it's constituents were found that did not identically match our standard.
3) Sample Preparation on 01-28-00 using EPA 3510
4) This sample was analyzed following Silica Gel Cleanup.
5) An unidentified petroleum hydrocarbon mixture was present in the sample. An approximate concentration has been calculated based on motor oil standards.

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ORGANIC ANALYTICAL RESULTS

LAB ORDER No.: A010469

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010469-5 (continued)							
SAMPLE ID: MW11							
SAMPLED: 19 JAN 00 14:50							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS (continued)				1	02.01.00	T000027TPH	
Surrogate o-Terphenyl	86.		%				
Kerosene	ND	50.					
LAB NUMBER: A010469-5 (continued)							
SAMPLE ID: MW11							
SAMPLED: 19 JAN 00 14:50							
METHOD: EPA 8015/8020A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS				1	01.26.00	V000005G9A	1,2
Total Petroleum Hydrocarbons - Gasoline	220.	50.	ug/L				
Benzene	ND	0.5	ug/L				
Toluene	ND	0.5	ug/L				
Ethylbenzene	ND	0.5	ug/L				
Xylenes (Total)	ND	0.5	ug/L				
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L				
Surrogate 4-Bromofluorobenzene [FID]	99.		%				
Surrogate 4-Bromofluorobenzene [PID]	94.		%				
LAB NUMBER: A010469-6							
SAMPLE ID: MW12							
SAMPLED: 19 JAN 00 10:30							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS					02.01.00	T000027TPH	3-8

1) Sample Preparation on 01-25-00 using EPA 5030
2) A fuel pattern and it's constituents were found that did not identically match our standard.
3) Sample Preparation on 01-28-00 using EPA 3510
4) This sample was analyzed following Silica Gel Cleanup.
5) The final volume of the sample extract was higher than the nominal amount, resulting in (a) higher reporting limit(s).
6) Sample diluted to bring concentration of target analyte(s) within the working range of the instrument, resulting in increased reporting limits.
7) An unidentified petroleum hydrocarbon was present in the sample. An approximate concentration has been calculated based on Diesel #2 standards.
8) An unidentified petroleum hydrocarbon mixture was present in the sample. An approximate concentration has been calculated based on motor oil standards.

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ORGANIC ANALYTICAL RESULTS

LAB ORDER No.: A010469

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010469-6 (continued)							
SAMPLE ID: MW12							
SAMPLED: 19 JAN 00 10:30							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS (continued)					02.01.00	T000027TPH	
TPH-Extractable, quantitated as diesel	1800.	100.	ug/L	2			
TPH-Extractable, quantitated as Motor Oil	11000.	400.	ug/L	2			
Surrogate o-Terphenyl	70.		%	1			
Kerosene	ND	50.					
LAB NUMBER: A010469-6 (continued)							
SAMPLE ID: MW12							
SAMPLED: 19 JAN 00 10:30							
METHOD: EPA 8015/8020A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS				1	01.26.00	V000005G9A	1,2
Total Petroleum Hydrocarbons - Gasoline	200.	50.	ug/L				
Benzene	ND	0.5	ug/L				
Toluene	3.4	0.5	ug/L				
Ethylbenzene	1.5	0.5	ug/L				
Xylenes (Total)	8.4	0.5	ug/L				
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L				
Surrogate 4-Bromofluorobenzene [FID]	111.		%				
Surrogate 4-Bromofluorobenzene [PID]	99.		%				
LAB NUMBER: A010469-7							
SAMPLE ID: TBW6							
SAMPLED: 19 JAN 00 11:15							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS				1	02.01.00	T000027TPH	3,4,5
TPH-Extractable, quantitated as diesel	55.	50.	ug/L				

1) Sample Preparation on 01-25-00 using EPA 5030
2) A fuel pattern and it's constituents were found that did not identically match our standard.
3) Sample Preparation on 01-28-00 using EPA 3510
4) This sample was analyzed following Silica Gel Cleanup.
5) An unidentified petroleum hydrocarbon was present in the sample. An approximate concentration has been calculated based on Diesel #2 standards.

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ORGANIC ANALYTICAL RESULTS

LAB ORDER No.: A010469

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010469-7 (continued)							
SAMPLE ID: TBW6							
SAMPLED: 19 JAN 00 11:15							
METHOD: EPA 8015M							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS (continued)				1	02.01.00	T000027TPH	
TPH-Extractable, quantitated as Motor Oil	ND	200.	ug/L				
Surrogate o-Terphenyl	67.		%				
Kerosene	ND	50.					
LAB NUMBER: A010469-7 (continued)							
SAMPLE ID: TBW6							
SAMPLED: 19 JAN 00 11:15							
METHOD: EPA 8015/8020A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS				1	01.26.00	V000005G9A	1,2
TPH-Purgeable, quantitated as gasoline	170.	50.	ug/L				
Benzene	0.6	0.5	ug/L				
Toluene	ND	0.5	ug/L				
Ethylbenzene	ND	0.5	ug/L				
Xylenes (Total)	ND	0.5	ug/L				
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L				
Surrogate 4-Bromofluorobenzene [FID]	97.		%				
Surrogate 4-Bromofluorobenzene [PID]	94.		%				
LAB NUMBER: A010469-15							
SAMPLE ID: MW5							
SAMPLED: 19 JAN 00 15:35							
METHOD: EPA 8260A							
MTBE BY GC/MS				100	02.08.00	V000020MSA	3,4
Methyl tert-Butyl Ether (MTBE)	1300.	100.	ug/L				
Surrogate Dibromofluoromethane	110.		%				
Surrogate 1,2-DCA-d4	130.		%				
Surrogate Toluene-d8	99.		%				

1) Sample Preparation on 01-25-00 using EPA 5030
2) An unidentified petroleum hydrocarbon was present in the sample. An approximate concentration has been calculated based on gasoline standards.
3) Sample Preparation on 02-08-00 using EPA 5030
4) Sample diluted to bring concentration of target analyte(s) within the working range of the instrument, resulting in increased reporting limits.

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LAB ORDER No.: A010469

ORGANIC ANALYTICAL RESULTS

ANALYTE	RESULT	R.L.	UNITS	D.F.	ANALYZED	QC BATCH	NOTES
LAB NUMBER: A010469-15 (continued)							
SAMPLE ID: MW5							
SAMPLED: 19 JAN 00 15:35							
METHOD: EPA 8260A							
MTBE BY GC/MS				100	02.08.00	V000020MSA	
(continued)							
Surrogate 4-BFB	100.		%				

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CERTIFIED ENVIRONMENTAL SERVICES
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LAB ORDER No.: A010469

SUPPLEMENTAL QUALITY CONTROL (QC) DATA REPORT

Report Date: 23 FEB 2000
Received Date: 20 JAN 2000

Client: David Elias
Cambria
1144 65th Street, Suite C
Oakland, CA 94608

Project: 153-1247-20/CITY OF OAKLAND

QC Batch ID	Method	Matrix
I000006ALK	310.1	AQUEOUS
I000009IC	300.0	AQUEOUS
I000014IC	300.0	AQUEOUS
T000027TPH	8015M	AQUEOUS
V000005G9A	8015/8020A	AQUEOUS
V000020MSA	8260A	AQUEOUS

Todd M. Albertson
Project Manager

CAHorn
Christine Horn
Laboratory Director

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Results are specific to the sample as submitted and only to the parameters reported.
All analyses performed by EPA Methods or Standard Methods (SM) 18th Ed. except where noted.
Results of 'ND' mean not detected at or above the listed Reporting Limit (R.L.).
Analyte Spike Amounts reported as 'NS' mean not spiked and will not have recoveries reported.
'RPD' means Relative Percent Difference and RPD Acceptance Criteria is stated as a maximum.
'NC' means not calculated for RPD or Spike Recoveries.

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LAB ORDER No.: A010469

METHOD BLANK ANALYTICAL RESULTS

ANALYTE	RESULT	R.L.	UNITS	ANALYZED	NOTES
QC BATCH: I000006ALK					
ALKALINITY				02.02.00	
Bicarbonate as CaCO3	ND	10.	mg/L		
Hydroxide as CaCO3	ND	10.	mg/L		
Carbonate as CaCO3	ND	10.	mg/L		
Total Alkalinity as CaCO3	ND	10.	mg/L		
QC BATCH: I000009IC					
Nitrate as N	ND	0.1	mg/L	01.20.00	
Sulfate	ND	0.5	mg/L	01.20.00	
QC BATCH: I000014IC					
Sulfate	ND	0.5	mg/L	01.27.00	
QC BATCH: T000027TPH					
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS				01.31.00	1
Diesel Fuel	ND	50.	ug/L		
TPH-Extractable, quantitated as diesel	ND	50.	ug/L		
Motor Oil	ND	200.	ug/L		
TPH-Extractable, quantitated as Motor Oil	ND	200.	ug/L		
Surrogate o-Terphenyl	87.		%		
Kerosene	ND				
QC BATCH: V000005G9A					
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS					
Total Petroleum Hydrocarbons - Gasoline	ND	50.	ug/L	01.26.00	
TPH-Purgeable, quantitated as gasoline	ND	50.	ug/L	01.25.00	
Benzene	ND	0.5	ug/L	01.25.00	
Toluene	ND	0.5	ug/L	01.25.00	
Ethylbenzene	ND	0.5	ug/L	01.25.00	
Xylenes (Total)	ND	0.5	ug/L	01.25.00	
Methyl tert-Butyl Ether (MTBE)	ND	5.	ug/L	01.26.00	
Surrogate 4-Bromofluorobenzene [FID]	96.		%	01.25.00	
Surrogate 4-Bromofluorobenzene [PID]	92.		%	01.25.00	

1) This sample was analyzed following Silica Gel Cleanup.

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LAB ORDER No.: A010469

METHOD BLANK ANALYTICAL RESULTS

QC BATCH: V000020MSA

ANALYTE	RESULT	R.L.	UNITS	ANALYZED	NOTES
VOLATILE ORGANIC COMPOUNDS				02.08.00	
Benzene	ND	1.	ug/L		
Bromodichloromethane	ND	1.	ug/L		
Bromoform	ND	1.	ug/L		
Bromomethane (Methyl Bromide)	ND	1.	ug/L		
Carbon Tetrachloride	ND	1.	ug/L		
Chlorobenzene	ND	1.	ug/L		
Chloroethane (Ethyl Chloride)	ND	1.	ug/L		
2-Chloroethylvinyl ether	ND	1.	ug/L		
Chloroform	ND	1.	ug/L		
Chloromethane (Methyl Chloride)	ND	1.	ug/L		
Dibromochloromethane	ND	1.	ug/L		
1,2-Dichlorobenzene	ND	1.	ug/L		
1,3-Dichlorobenzene	ND	1.	ug/L		
1,4-Dichlorobenzene	ND	1.	ug/L		
Dichlorodifluoromethane (F-12)	ND	1.	ug/L		
1,1-Dichloroethane	ND	1.	ug/L		
1,2-Dichloroethane (EDC)	ND	1.	ug/L		
1,1-Dichloroethene	ND	1.	ug/L		
cis-1,2-Dichloroethene	ND	1.	ug/L		
trans-1,2-Dichloroethene	ND	1.	ug/L		
1,2-Dichloropropane	ND	1.	ug/L		
cis-1,3-Dichloropropene	ND	0.5	ug/L		
trans-1,3-Dichloropropene	ND	0.5	ug/L		
Dichlorotrifluoroethane (F-123)	ND	1.	ug/L		
Ethylbenzene	ND	1.	ug/L		
Methylene Chloride	ND	3.	ug/L		
Methyl tert-Butyl Ether (MTBE)	ND	1.	ug/L		
1,1,2,2-Tetrachloroethane	ND	1.	ug/L		
Tetrachloroethene (PCE)	ND	1.	ug/L		
Toluene	ND	1.	ug/L		
1,1,1-Trichloroethane (TCA)	ND	1.	ug/L		
1,1,2-Trichloroethane	ND	1.	ug/L		
Trichloroethene (TCE)	ND	1.	ug/L		
Trichlorofluoromethane (F-11)	ND	1.	ug/L		
Trichlorotrifluoroethane (F-113)	ND	1.	ug/L		
Vinyl Chloride	ND	1.	ug/L		
Xylenes (Total)	ND	1.	ug/L		
Surrogate Dibromofluoromethane	110.		%		
Surrogate 1,2-DCA-d4	148.		%		
Surrogate Toluene-d8	109.		%		
Surrogate 4-BFB	105.		%		

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CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010469

LABORATORY CONTROL SAMPLE ANALYTICAL RESULTS

ANALYTE	SPIKE AMOUNT	SPIKE\DUP RESULT	SPK\DUP %REC	ACCEPTANCE %REC \RPD	REL% DIFF	ANALYZED	NOTES
QC BATCH: I000006ALK							
ALKALINITY						02.02.00	
Bicarbonate as CaCO3	100.	89.\	89\	80-120\20			
Total Alkalinity as CaCO3	100.	89.\	89\	80-120\20			
QC BATCH: I000009IC							
Nitrate as N	6.25	6.26\	100\	80-120\20		01.20.00	
Sulfate	20.0	20.6\	103\	80-120\20		01.20.00	
QC BATCH: I000014IC							
Sulfate	20.0	20.9\	104\	80-120\20		01.27.00	
QC BATCH: T000027TPH							
TOTAL SEMI-VOLATILE PETROLEUM HYDROCARBONS						01.31.00	1
Diesel Fuel	1000	844.\	84\	36-102\			
Surrogate o-Terphenyl	100	76.2\	76\	40-140\			
QC BATCH: V000005G9A							
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS							
Total Petroleum Hydrocarbons - Gasoline	550.	500.\	91\	50-130\		01.26.00	
Benzene	6.69	6.26\	94\	50-130\		01.25.00	
Toluene	39.0	34.4\	88\	50-130\		01.25.00	
Surrogate 4-Bromofluorobenzene [FID]	20.0	19.5\	98\	50-130\		01.25.00	
Surrogate 4-Bromofluorobenzene [PID]	20.0	18.0\	90\	50-130\		01.25.00	
QC BATCH: V000020MSA							
VOLATILE ORGANIC COMPOUNDS						02.08.00	
Benzene	20.0	16.2\	81\	70-130\			
Chlorobenzene	20.0	15.2\	76\	70-130\			
1,1-Dichloroethene	20.0	15.3\	76\	70-130\			
Toluene	20.0	16.5\	82\	70-130\			
Trichloroethene (TCE)	20.0	14.8\	74\	70-130\			
Surrogate Dibromofluoromethane	20.0	23.6\	118\	70-130\			

1) This sample was analyzed following Silica Gel Cleanup.

CALTEST ANALYTICAL LABORATORY
1885 N. Kelly Rd. • Napa, California 94558
(707) 258-4000 • Fax: (707) 226-1001

CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LABORATORY CONTROL SAMPLE ANALYTICAL RESULTS

LAB ORDER No.: A010469

ANALYTE	SPIKE AMOUNT	SPIKE\DUP RESULT	SPK\DUP %REC	ACCEPTANCE %REC \RPD	REL% DIFF	ANALYZED	NOTES
QC BATCH: V000020MSA (continued)							
VOLATILE ORGANIC COMPOUNDS (continued)						02.08.00	
Surrogate 1,2-DCA-d4	20.0	27.3\	136\	70-130\			
Surrogate Toluene-d8	20.0	21.1\	106\	70-130\			
Surrogate 4-BFB	20.0	19.2\	96\	50-130\			

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(707) 258-4000 • Fax: (707) 226-1001

CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

LAB ORDER No.: A010469

DUPLICATE SAMPLES ANALYTICAL RESULTS

ANALYTE	R.L.	ORIGINAL RESULT	DUPLICATE RESULT	REL% DIFF	ACCEPT LIMIT	ANALYZED	NOTES
QC BATCH: I000006ALK							
QC SAMPLE LAB NUMBER: A010469-7							
ALKALINITY						02.02.00	
Bicarbonate as CaCO3	10.	200.	210.	4.9	20		
Hydroxide as CaCO3	10.	ND	ND	NC	20		
Carbonate as CaCO3	10.	ND	ND	NC	20		
Total Alkalinity as CaCO3	10.	200.	210.	4.9	20		

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(707) 258-4000 • Fax: (707) 226-1001

CERTIFIED ENVIRONMENTAL SERVICES
CALIFORNIA ELAP #1664

MATRIX SPIKE ANALYTICAL RESULTS

LAB ORDER No.: A010469

ANALYTE	ORIGINAL RESULT	SPIKE AMOUNT	SPIKE\DUP RESULT	SPK\DUP %REC	ACCEPTANCE %REC \RPD	REL% DIFF	ANALYZED	NOTES
QC BATCH: I000009IC								
QC SAMPLE LAB NUMBER: A010452-1								
Nitrate as N	2.63	50.	52.0\52.5	99\100	80-120\20	1	01.20.00	
QC BATCH: I000009IC (continued)								
QC SAMPLE LAB NUMBER: A010452-1								
Sulfate	33.8	160.	185.\188.	94\96	80-120\20	1.6	01.20.00	
QC BATCH: I000014IC								
QC SAMPLE LAB NUMBER: A010655-4								
Sulfate	32.1	160.	191.\184.	99\95	80-120\20	3.7	01.27.00	
QC BATCH: V000005G9A								
QC SAMPLE LAB NUMBER: A010438-1								
AROMATIC HYDROCARBONS AND TOTAL PURGEABLE PETROLEUM HYDROCARBONS							01.26.00	
Total Petroleum Hydrocarbons - Gasoline	ND	550.	440.\401.	80\73	50-130\25	9.3		
Benzene	2.14	6.69	9.66\8.98	112\102	50-130\25	7.3		
Toluene	ND	39.0	35.8\32.8	92\84	50-130\25	8.7		
Surrogate 4-Bromofluorobenzene [FID]	97.%	20.0	18.8\18.4	94\92	50-130\25			
Surrogate 4-Bromofluorobenzene [PID]	93.%	20.0	19.4\19.0	97\95	50-130\25			

[redacted] 1885 N. KELLY ROAD • NAPA, CA 94558 • (707) 258-4000 • Fax (707) 226-1001

CALTEST ANALYTICAL LABORATORY

SAMPLE CHAIN OF CUSTODY

PAGE ______ OF ______

LAB ORDER #: AD10469

PROJECT # / PROJECT NAME: 153-1247-20 / City of Oakland

P.O. #: 153-1247-20 Jk

CLIENT: Cambria Environmental

CONTACT NAME: Jacquelyn Jones

ADDRESS: 1144 65th Street, Ste B. CITY: Oakland STATE: CA ZIP: 94608

BILLING ADDRESS: Same

PHONE #: 510 420 3335

FAX PHONE: 510 420 9170

SAMPLER (PRINT & SIGN NAME): Jacquelyn Jones [signature]

ANALYSES REQUESTED: TPHg BTEX MTBE 8020 / Confirm all MTBE hits by 8260 / TPHd, Kmo w/ silica gel cleanup / nitrate sulfate alkalinity

TURN-AROUND TIME: ☐ STANDARD ☐ RUSH

DUE DATE:

CALTEST #	DATE SAMPLED	TIME SAMPLED	MATRIX	CONTAINER AMOUNT/TYPE	PRESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB #	COMP. or GRAB	TPHg BTEX MTBE 8020	Confirm all MTBE hits by 8260	TPHd, Kmo w/ silica gel cleanup	nitrate sulfate alkalinity	REMARKS
-1	4/19/00	200	wtr	4 VOAs / 2 L Ambers / 1 L plastic	HCL / non / non	MW1			X	X	X	X	
-2	↓	325	↓	↓	↓	MW5			↓	↓	↓	↓	
-3	↓	350	↓	↓	↓	MW7			↓	↓	↓	↓	
-4	↓	115	↓	↓	↓	MW10			↓	↓	↓	↓	
-5	↓	250	↓	↓	↓	MW11			↓	↓	↓	↓	
-6	↓	1030	↓	↓	↓	MW12			↓	↓	↓	↓	
-7	↓	1115	↓	↓	↓	TBW6			↓	↓	↓	↓	

NOTE: Please report these samples w/ samples from 4/18/00

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	RELINQUISHED BY	DATE/TIME	RECEIVED BY
[signature]	4/19/00 1355	[signature] Michael E. [illegible]	[signature] Michael E. [illegible]	4/20/00 1525	[signature]

FOR LAB USE ONLY: Samples: WC ___ MICRO ___ BIO ___ TEMP ___ SEALED Y/N ___ INTACT Y/N
BO: BIO ___ WC ___
CC: ___ VOA
SIL: HP ___ PT ___ VOA
W/RNO₃ ___ H₂SO₄ ___ NaOH
PIL: HNO₃ ___ H₂SO₄ ___ NaOH

MATRIX: AQ = Aqueous Nondrinking Water, Digested Metals; FE = Low R.L.s, Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water; SL = Soil, Sludge, Solid; FP = Free Product

CONTAINER TYPES: AL = Amber Liter; AQL = 250 mL. Amber; PT = Pint (Plastic); QT=Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA 40 mL.VOA; OTC = Other Type Container

R ___ PR ___ N ___ F ___

[redacted] 8015M Diesel Standard [redacted]

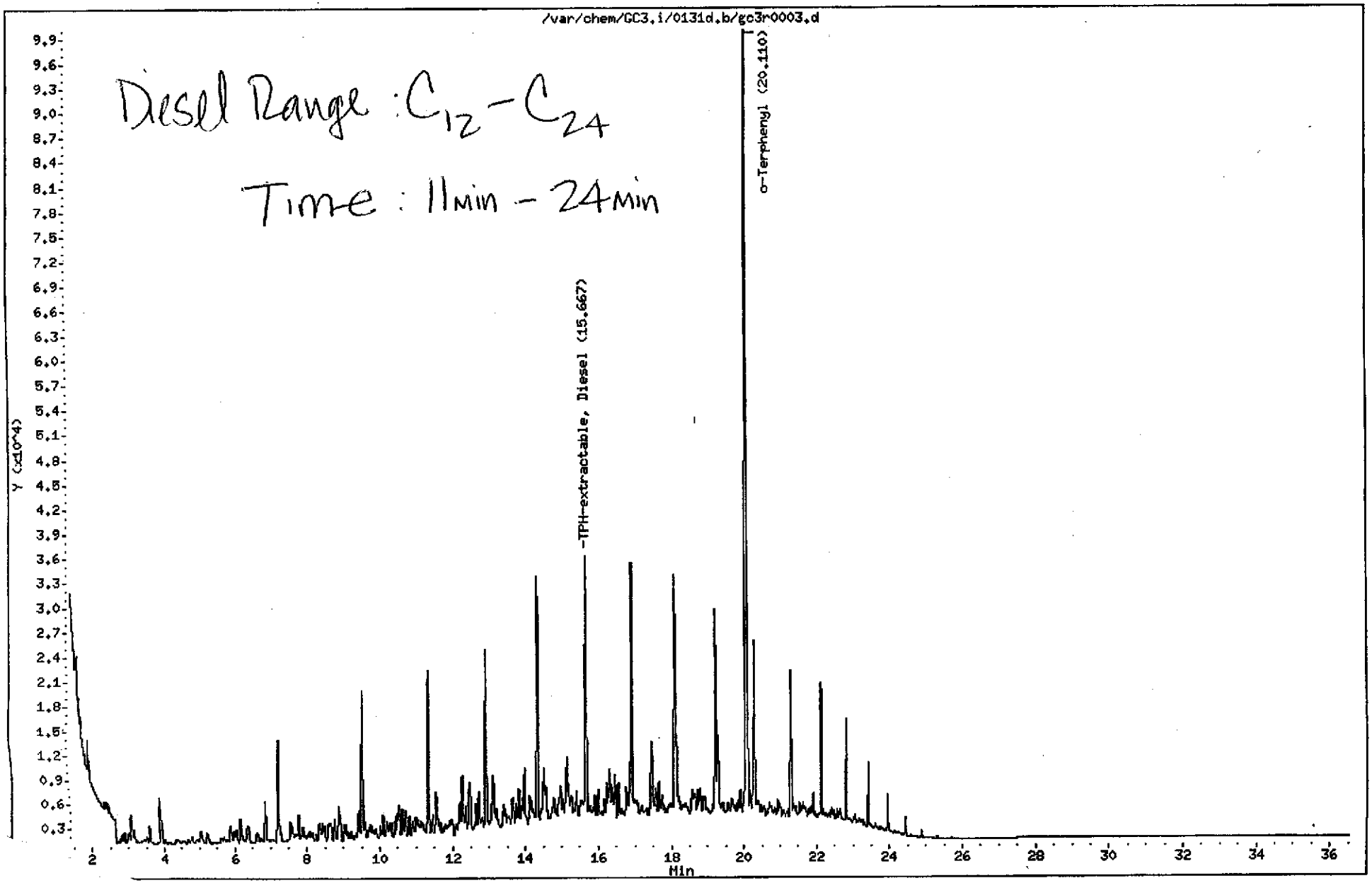
EPA 8015M DIESEL STANDARD

Data File: /var/chem/GC3.i/0131d.b/gc3r0003.d
Date : 31-JAN-2000 17:16
Client ID:
Sample Info: DIESEL 1000/100

Column phase: MXT-1

Instrument: GC3.i

Operator: NTA
Column diameter: 0.53



EPA 8015M Motor oil Standard

EPA 8015M MOTOR OIL STANDARD

Data File: /var/chem/GC3.i/0131d.b/gc3r0006.d
Date : 31-JAN-2000 19:28
Client ID:
Sample Info: MOTOR OIL 2000

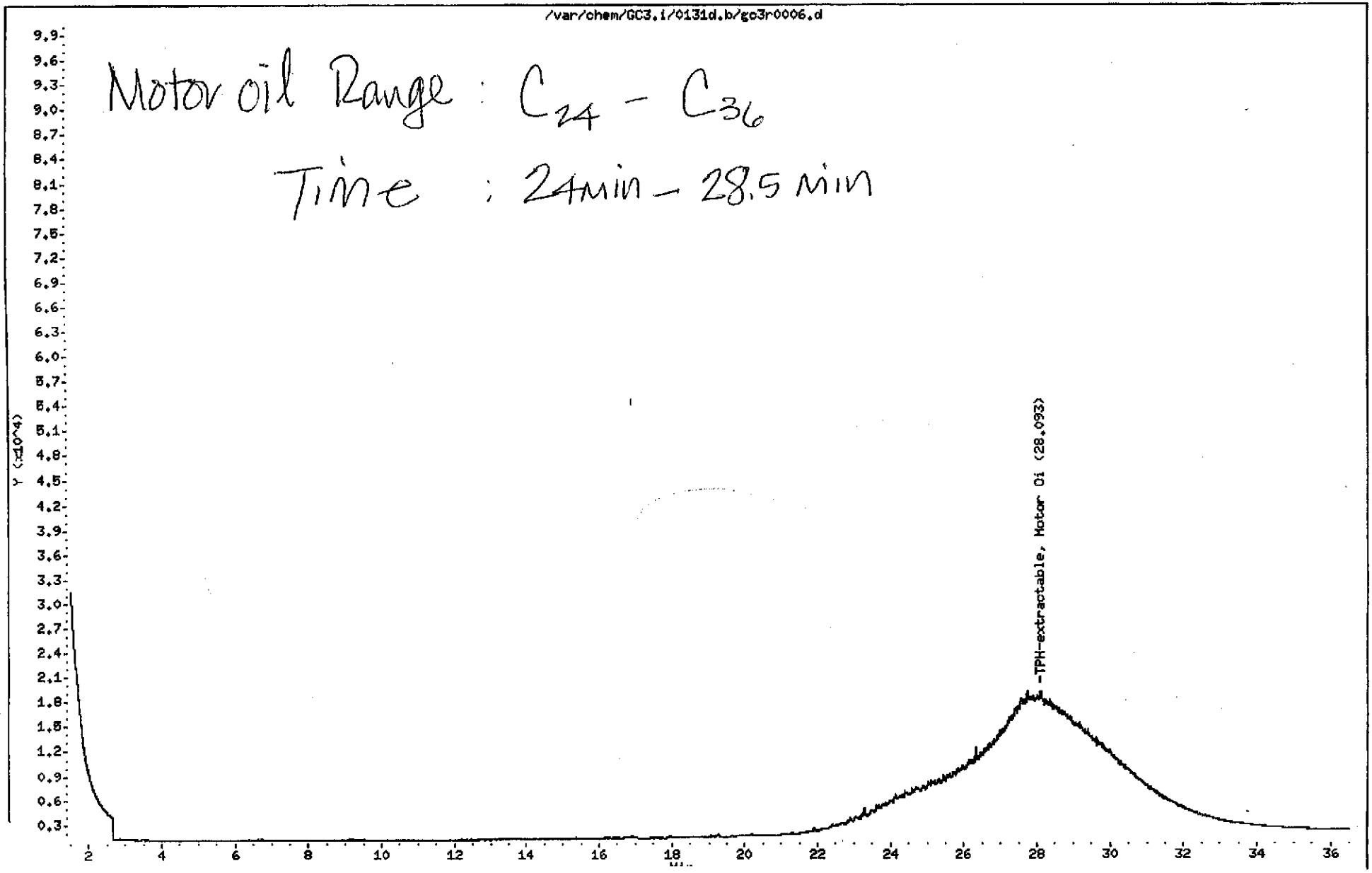
Instrument: GC3.i
Operator: NTA
Column diameter: 0.53

Column phase: HXT-1

/var/chem/GC3.i/0131d.b/gc3r0006.d

Motor oil Range : $C_{24} - C_{36}$

Time : 24min - 28.5 min

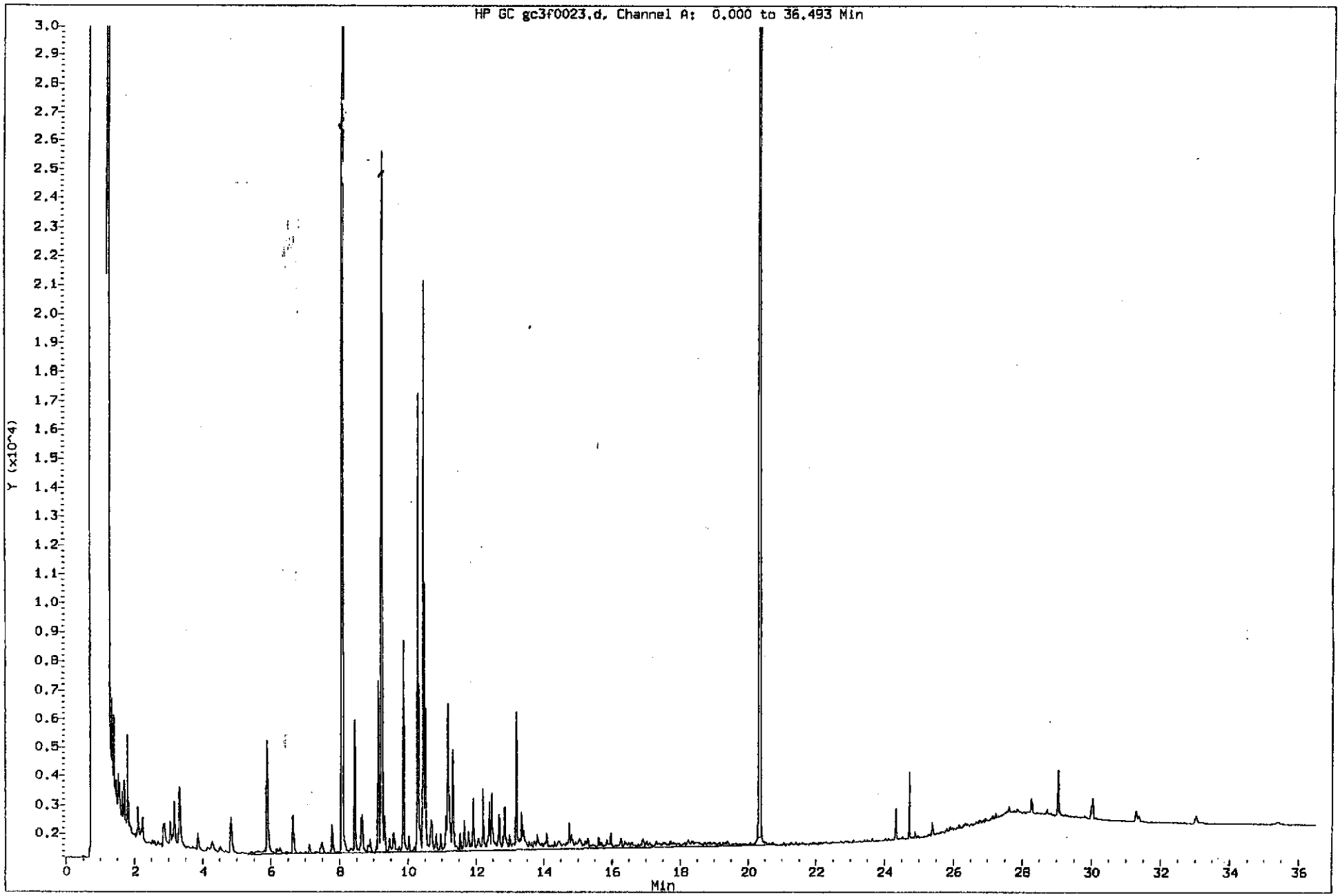


[redacted]

EPA 8015M - DIESEL/MOTOR OIL/KEROSENE

CALTEST ANALYTICAL
A010469-1
CLIENT: CAMBRIA
ID: MW1/AQ
SAMPLED: 01-19 @ 1400

Data File: /var/chem/GC3.i/0131d.b/gc3f0023.d
Injection Date: 01-FEB-2000 08:24
Instrument: GC3.i
Client Sample ID:

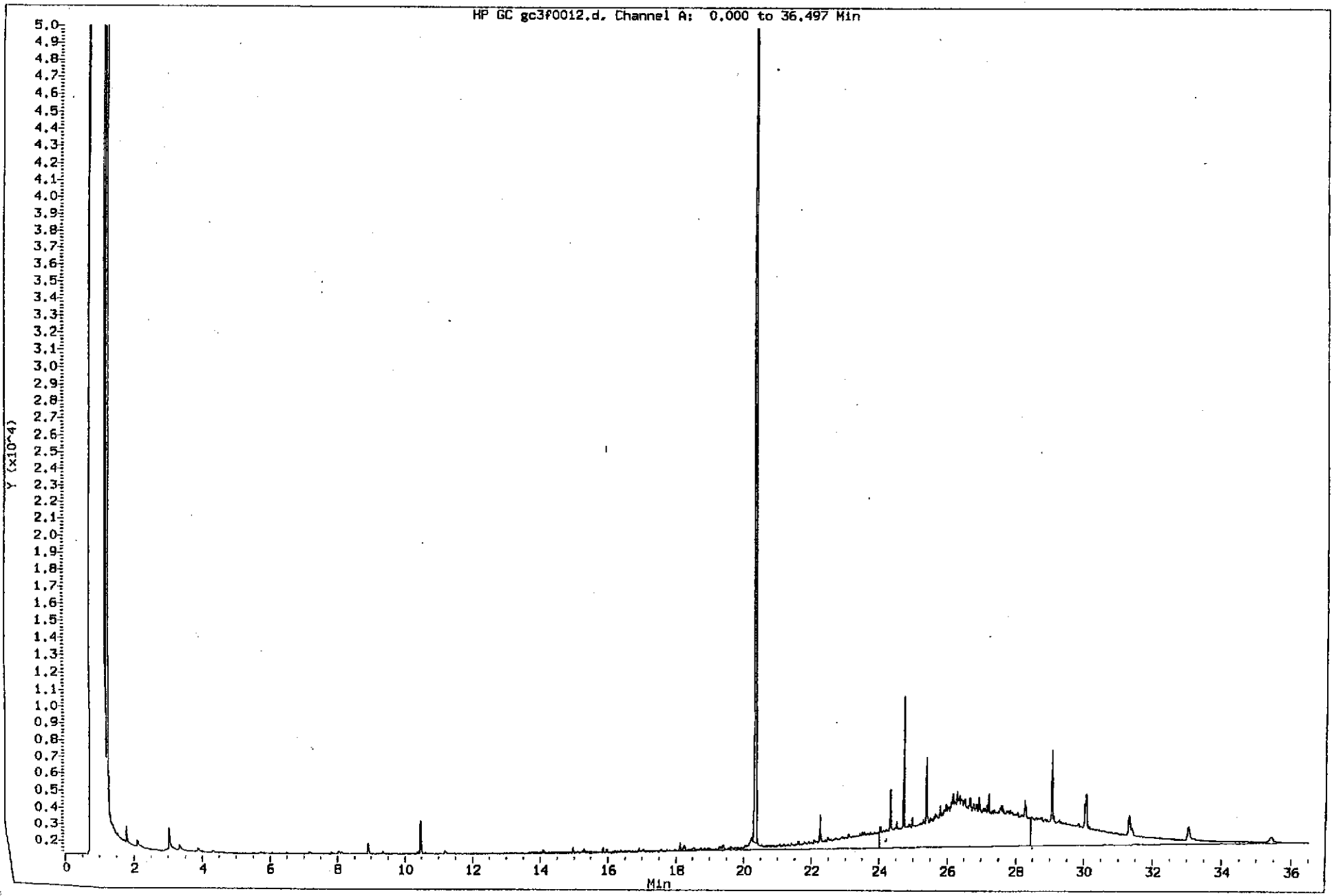


EPA 8015M - Diesel/Motoroil/Kerosene

EPA 8015M DIESEL/MOTOR OIL/KEROSENE

Data File: /var/chem/GC3.1/0131d.b/gc3f0012.d
Injection Date: 01-FEB-2000 00:02
Instrument: GC3.1
Client Sample ID:

CALTEST ANALYTICAL
A010438-1
CLIENT:CAMBRIA
ID:MW2/AQ
SAMPLED:01-18 @ 1123

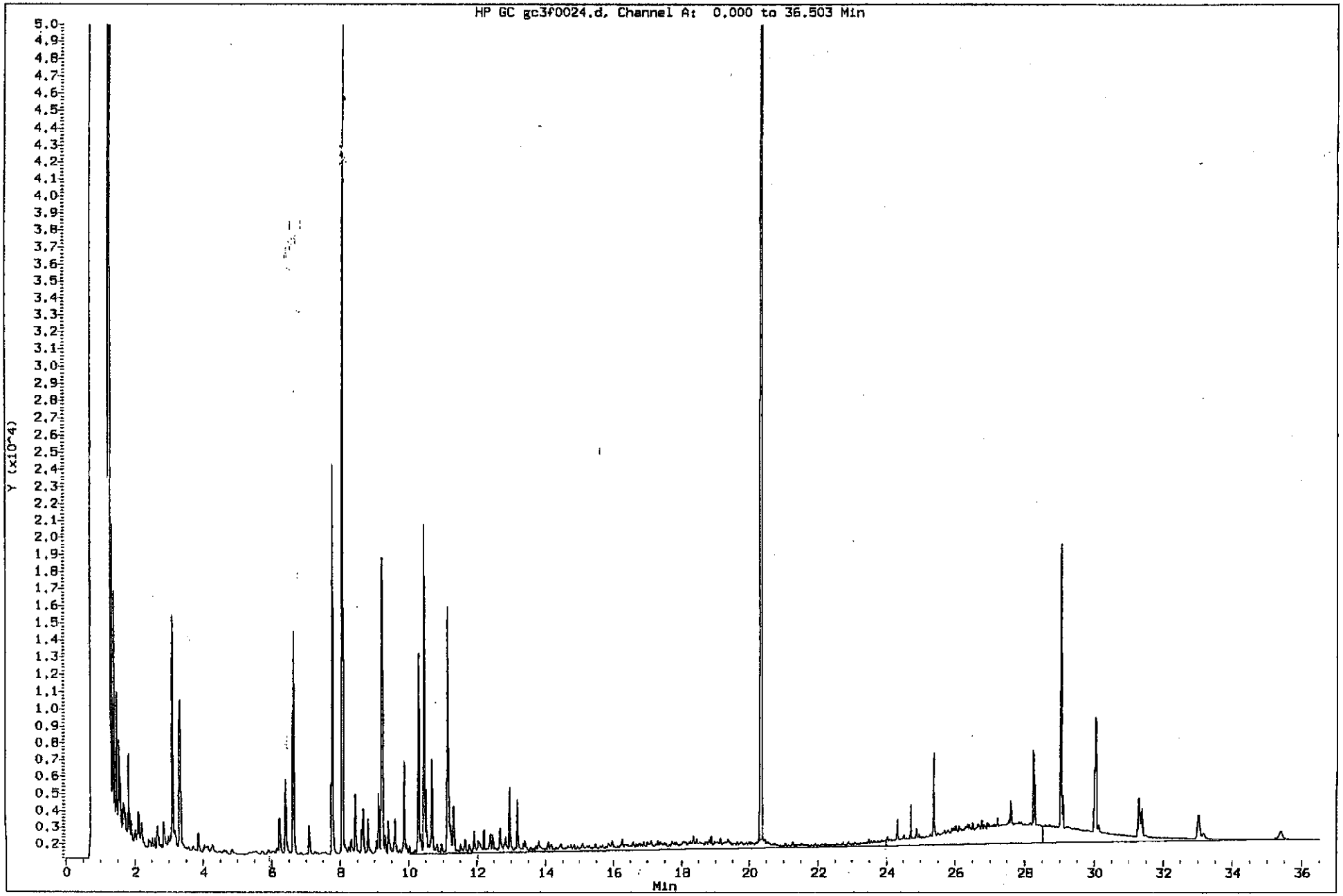


EPA 8015M - Diesel/Motor oil/Kerosene

EPA 8015M - DIESEL/MOTOR OIL/KEROSENE

CALTEST ANALYTICAL
A010469-2
CLIENT: CAMBRIA
ID: MW5/AQ
SAMPLED: 01-19 @ 1535

Data File: /var/chem/GC3.i/0131d.b/gc3f0024.d
Injection Date: 01-FEB-2000 09:10
Instrument: GC3.i
Client Sample ID:

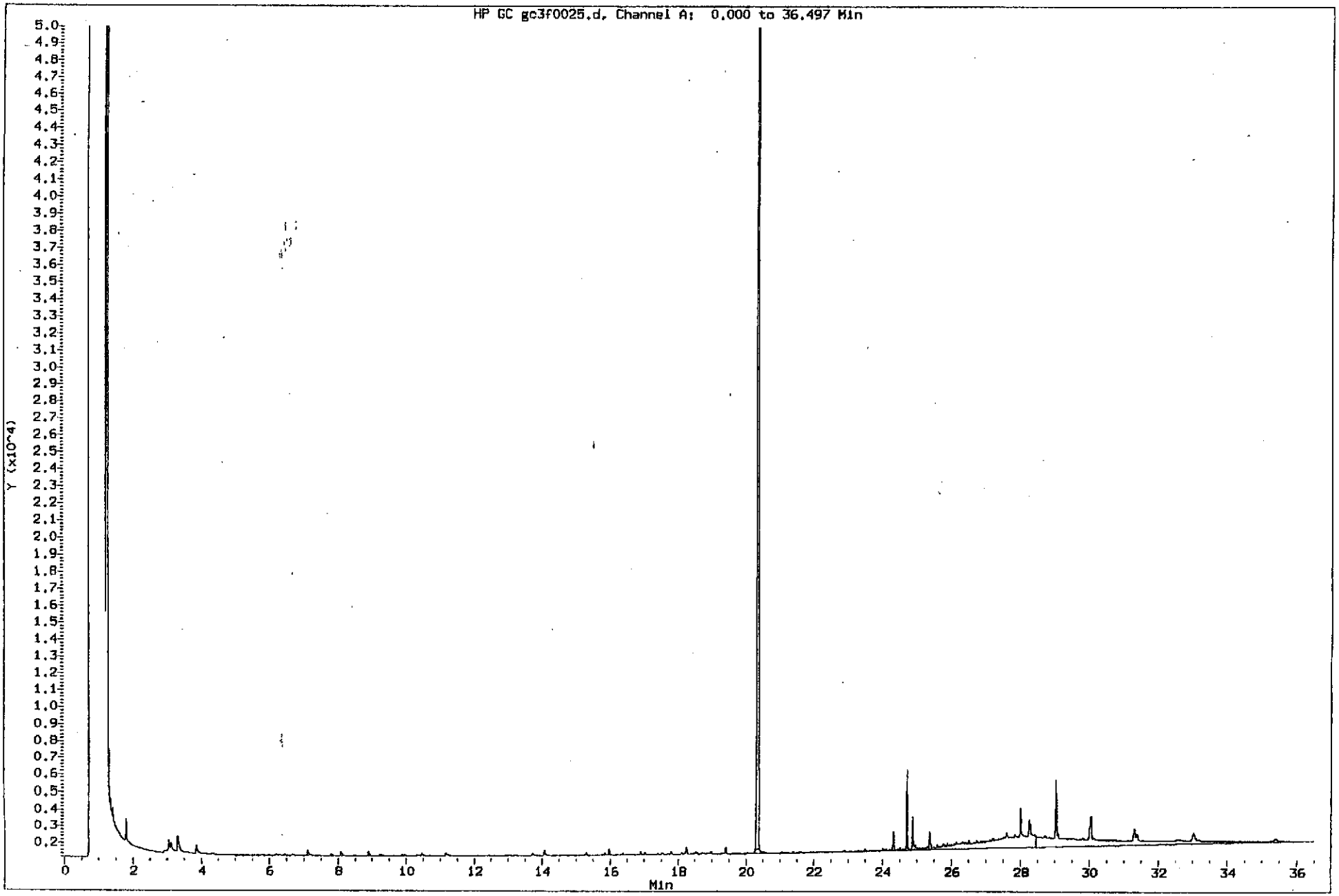


EPA 8015M - Diesel/Motor Oil/Kerosene

CALTEST ANALYTICAL
A010469-3
CLIENT:CAMBRIA
ID:MW7/AQ
SAMPLED:01-19 @ 1550

EPA 8015 M - DIESEL/MOTOR OIL/KEROSENE

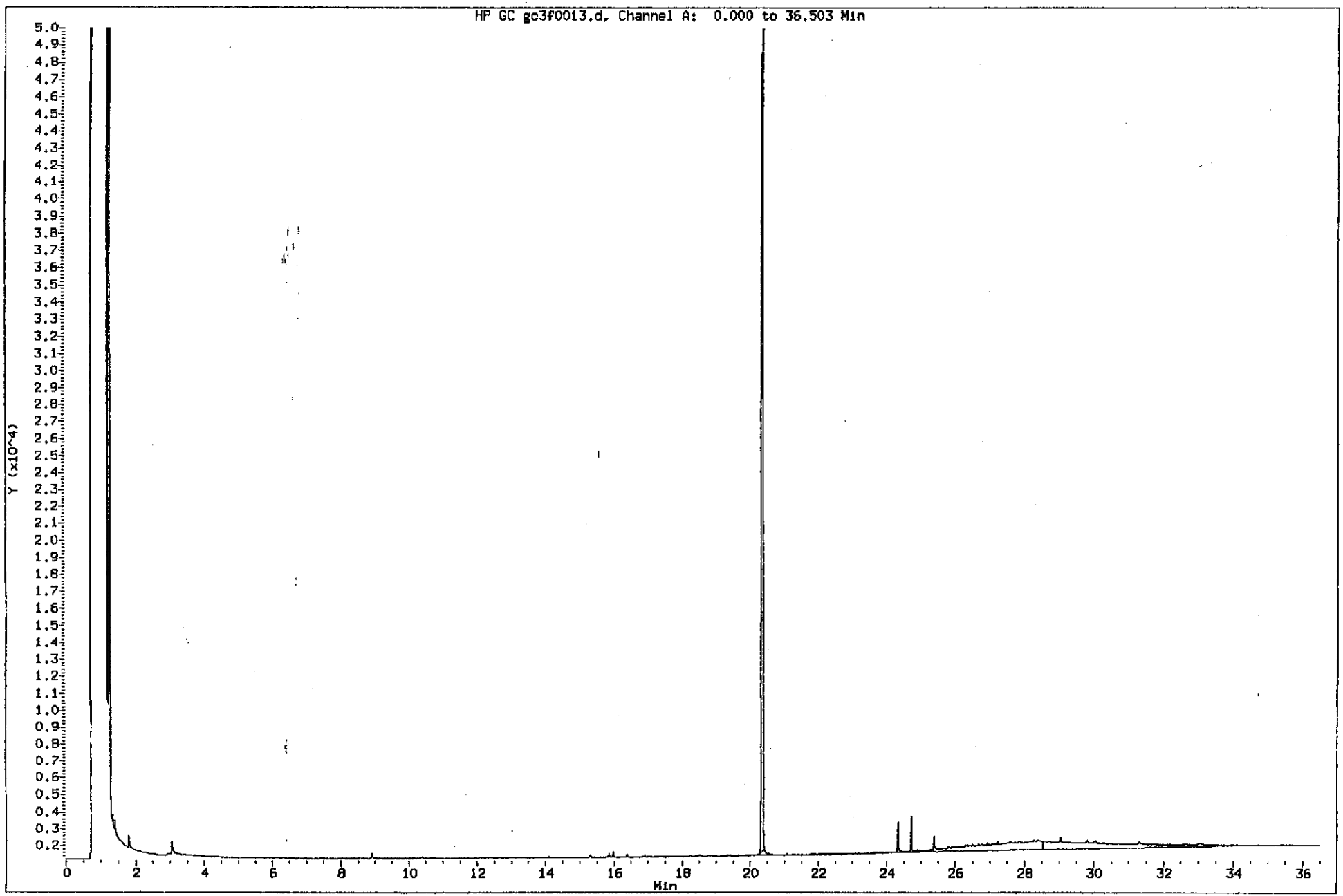
Data File: /var/chem/GC3.i/0131d.b/gc3f0025.d
Injection Date: 01-FEB-2000 09:57
Instrument: GC3.i
Client Sample ID:



EPA 8015M - DIESEL/MOTOR OIL/KEROSENE

CALTEST ANALYTICAL
A010438-2
CLIENT: CAMBRIA
ID: MW8/AQ
SAMPLED: 01-18 @ 1255

Data File: /var/chem/GC3.1/0131d.b/gc3f0013.d
Injection Date: 01-FEB-2000 00:47
Instrument: GC3.1
Client Sample ID:

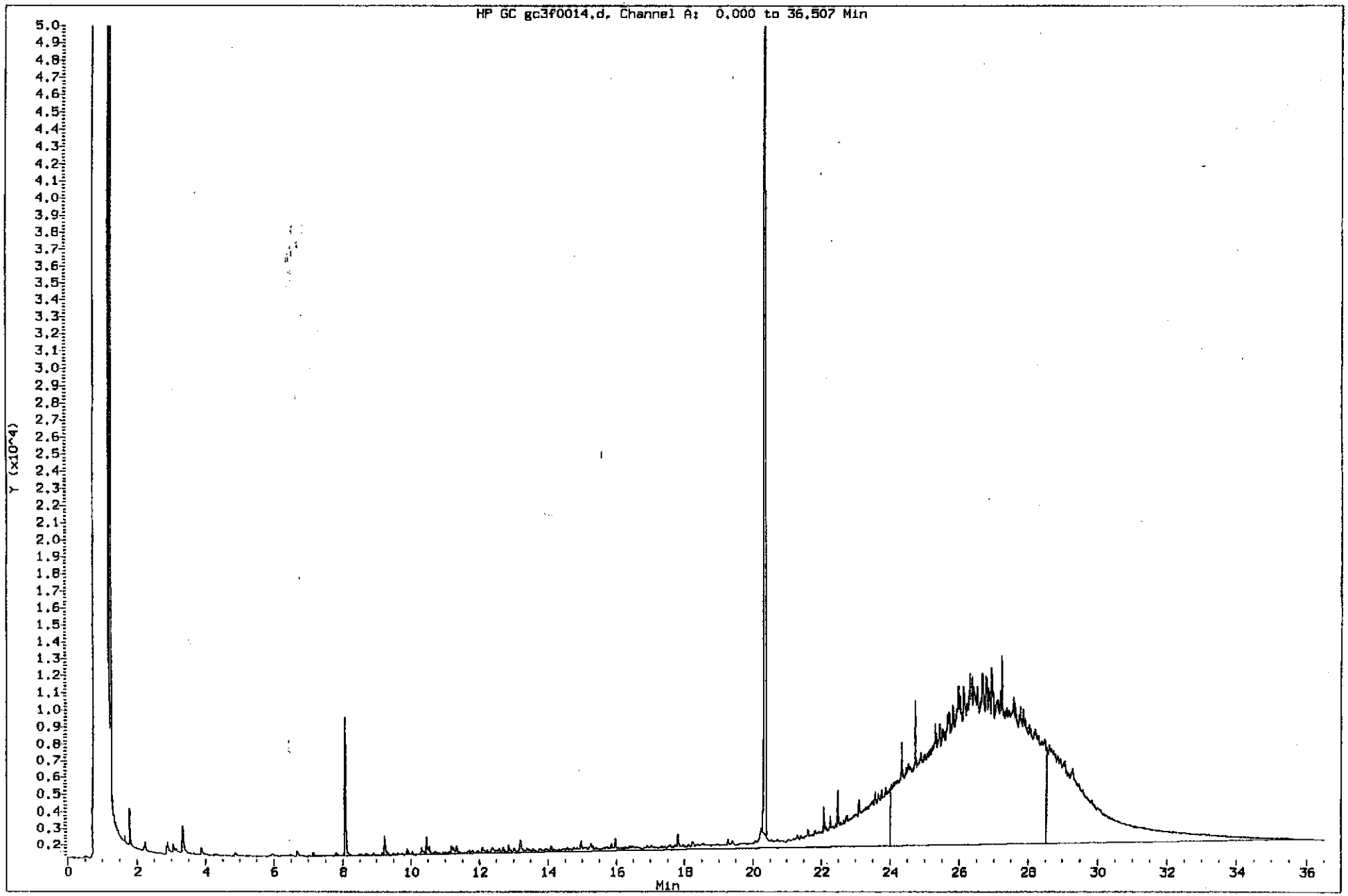


EPA 8015M Diesel/Motoroil/Kerosene

CALTEST ANALYTICAL
A010438-3
CLIENT: CAMBRIA
ID: MW9/AQ
SAMPLED: 01-18 @ 1455

EPA 8015M - DIESEL/MOTOR OIL/KEROSENE

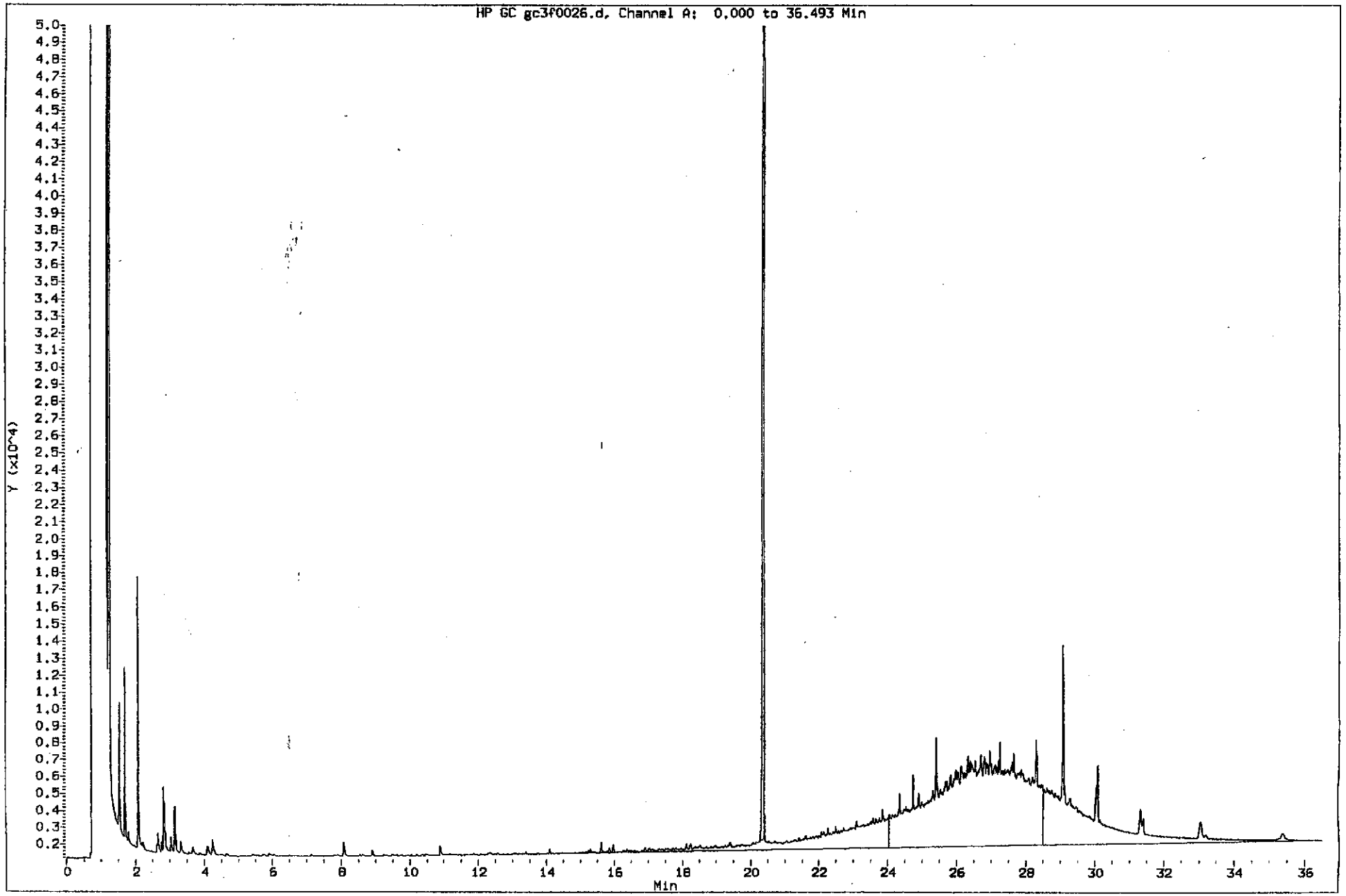
Data File: /var/chem/GC3.i/0131d.b/gc3f0014.d
Injection Date: 01-FEB-2000 01:33
Instrument: GC3.i
Client Sample ID:



EPA 8015M - DIESEL/MOTOR OIL/KEROSENE

CALTEST ANALYTICAL
A010469-4
CLIENT:CAMBRIA
ID:MW10/AQ
SAMPLED:01-19 @ 1315

Data File: /var/chem/GC3.i/0131d.b/gc3f0026.d
Injection Date: 01-FEB-2000 10:43
Instrument: GC3.i
Client Sample ID:

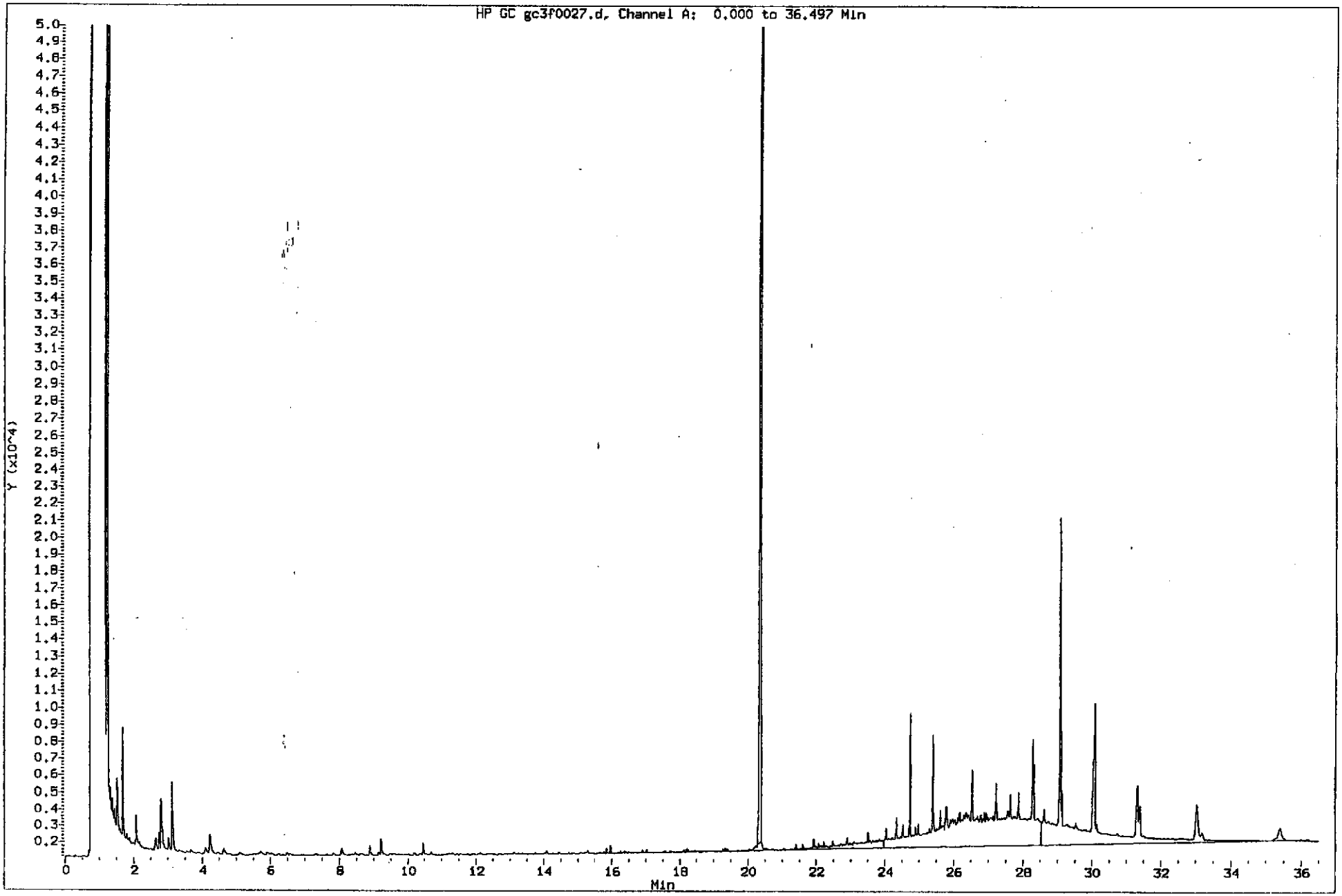


[redacted] EPA 8015M Diesel/Motor Oil/Kerosene [redacted]

EPA 8015M - DIESEL/MOTOR OIL/KEROSENE

Data File: /var/chem/GC3.i/0131d.b/gc3f0027.d
Injection Date: 01-FEB-2000 11:29
Instrument: GC3.i
Client Sample ID:

CALTEST ANALYTICAL
A010469-5
CLIENT:CAMBRIA
ID:MW11/AQ
SAMPLED:01-19 @ 1450

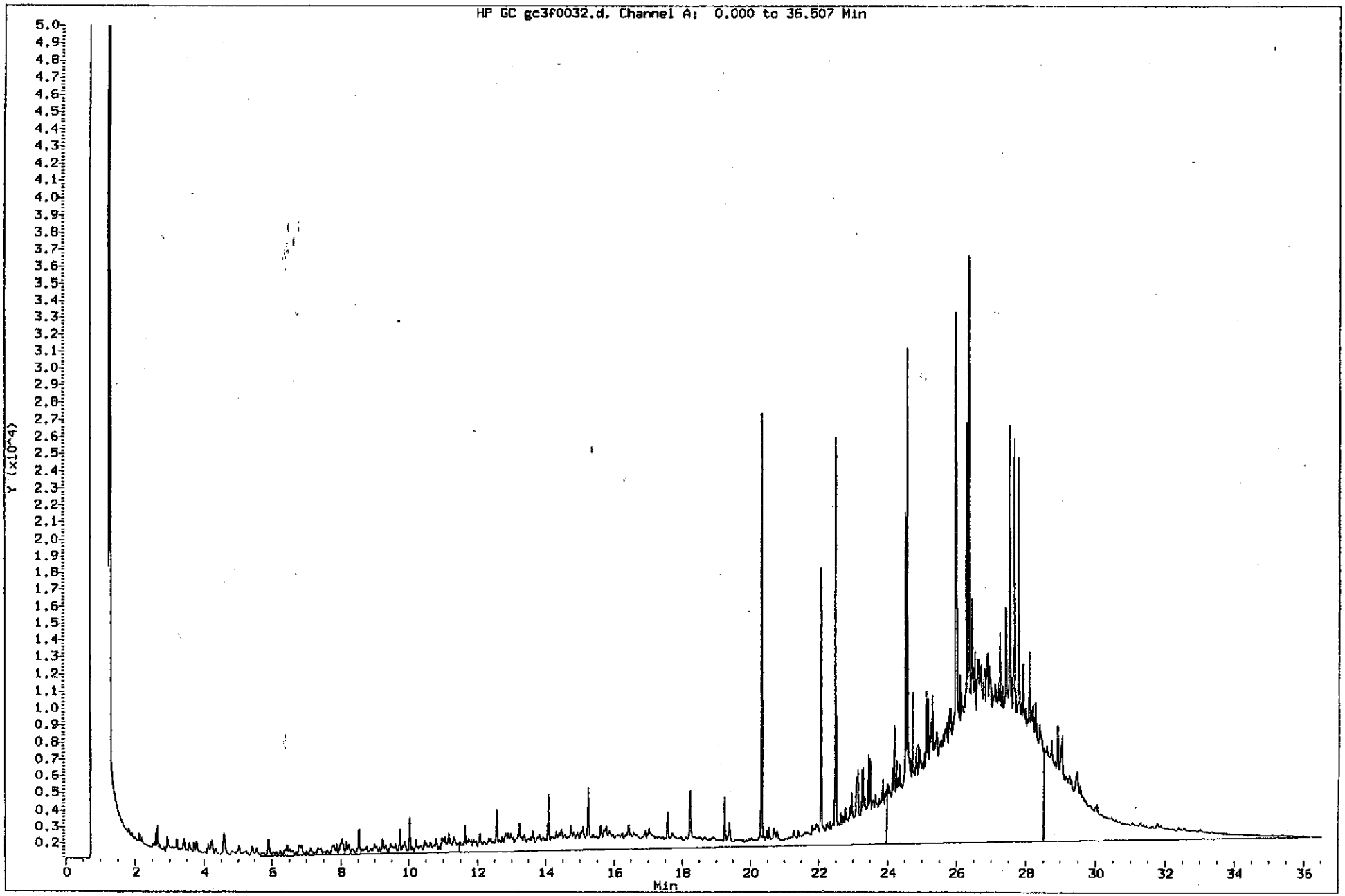


EPA 8015M - Diesel/Motor oil/Kerosene

EPA 8015M - DIESEL/MOTOR OIL/KEROSENE

Data File: /var/chem/GC3.1/0131d.b/gc3f0032.d
Injection Date: 01-FEB-2000 15:23
Instrument: GC3.1
Client Sample ID:

CALTEST ANALYTICAL
A010469-6
CLIENT:CAMBRIA
ID:MW12/AQ
SAMPLED:01-19 @ 1030

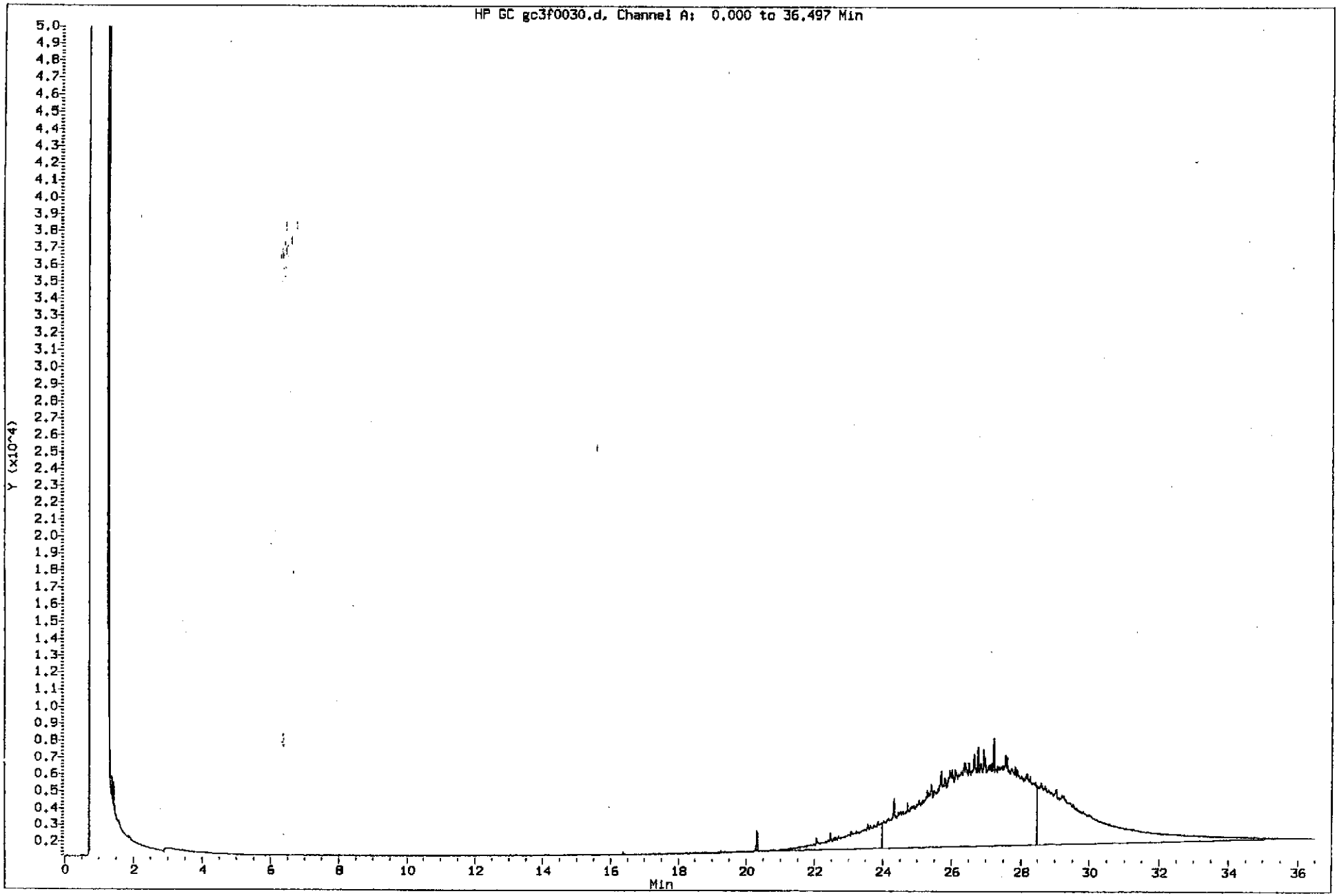


EPA 8015 - Diesel/Motor oil/Kerosene

EPA 8015M - DIESEL/MOTOR OIL/KEROSENE

CALTEST ANALYTICAL
A010438-4
CLIENT:CAMBRIA
ID:MW13/AQ
SAMPLED:01-18 @ 1715

Data File: /var/chem/GC3,i/0131d,b/gc3f0030.d
Injection Date: 01-FEB-2000 13:49
Instrument: GC3,i
Client Sample ID:

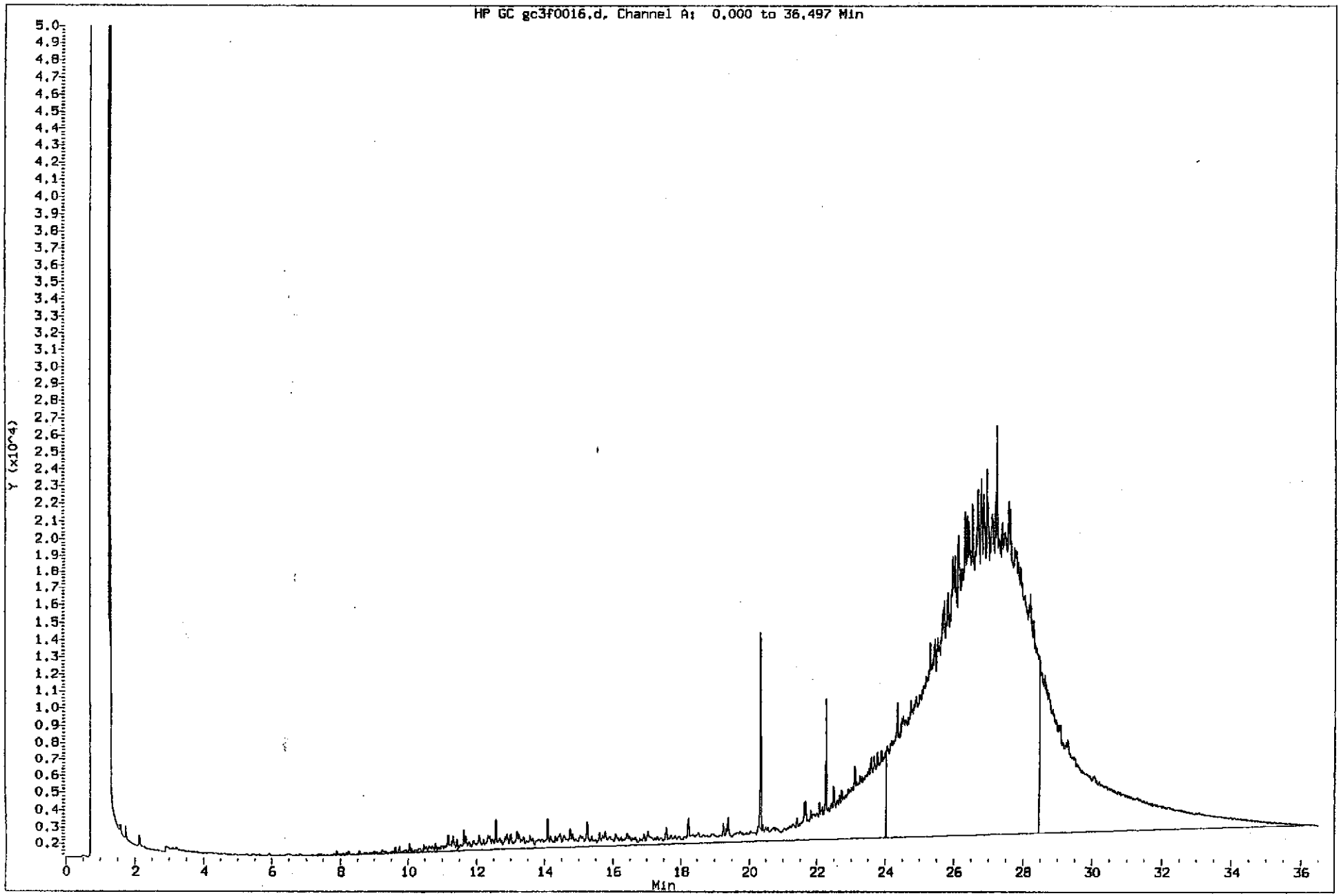


EPA 8015M - Diesel/Motor oil/Kerosene

EPA 8015M - DIESEL/MOTOR OIL/KEROSENE

CALTEST ANALYTICAL
A010438-5
CLIENT:CAMBRIA
ID:MW14/AQ
SAMPLED:01-18 @ 1530

Data File: /var/chem/GC3.i/0131d.b/gc3f0016.d
Injection Date: 01-FEB-2000 03:03
Instrument: GC3.i
Client Sample ID:

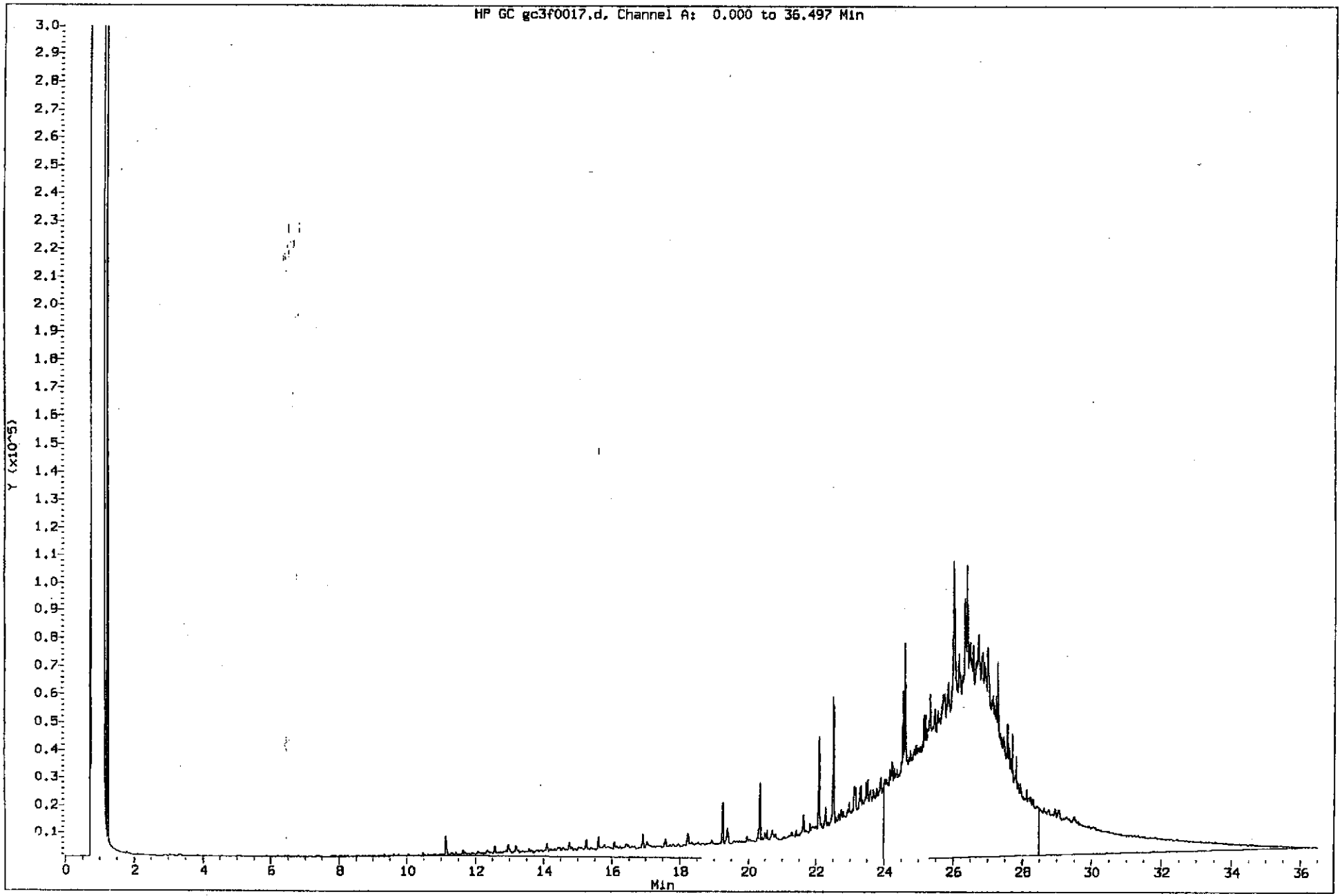


EPA 8015M Diesel/Motor oil/Kerosene

EPA 8015M - DIESEL/MOTOR OIL/KEROSENE

CALTEST ANALYTICAL
A010438-6
CLIENT:CAMBRIA
ID:MW15/AQ
SAMPLED:01-18 @ 1420

Data File: /var/chem/GC3.i/0131d.b/gc3f0017.d
Injection Date: 01-FEB-2000 03:49
Instrument: GC3.i
Client Sample ID:

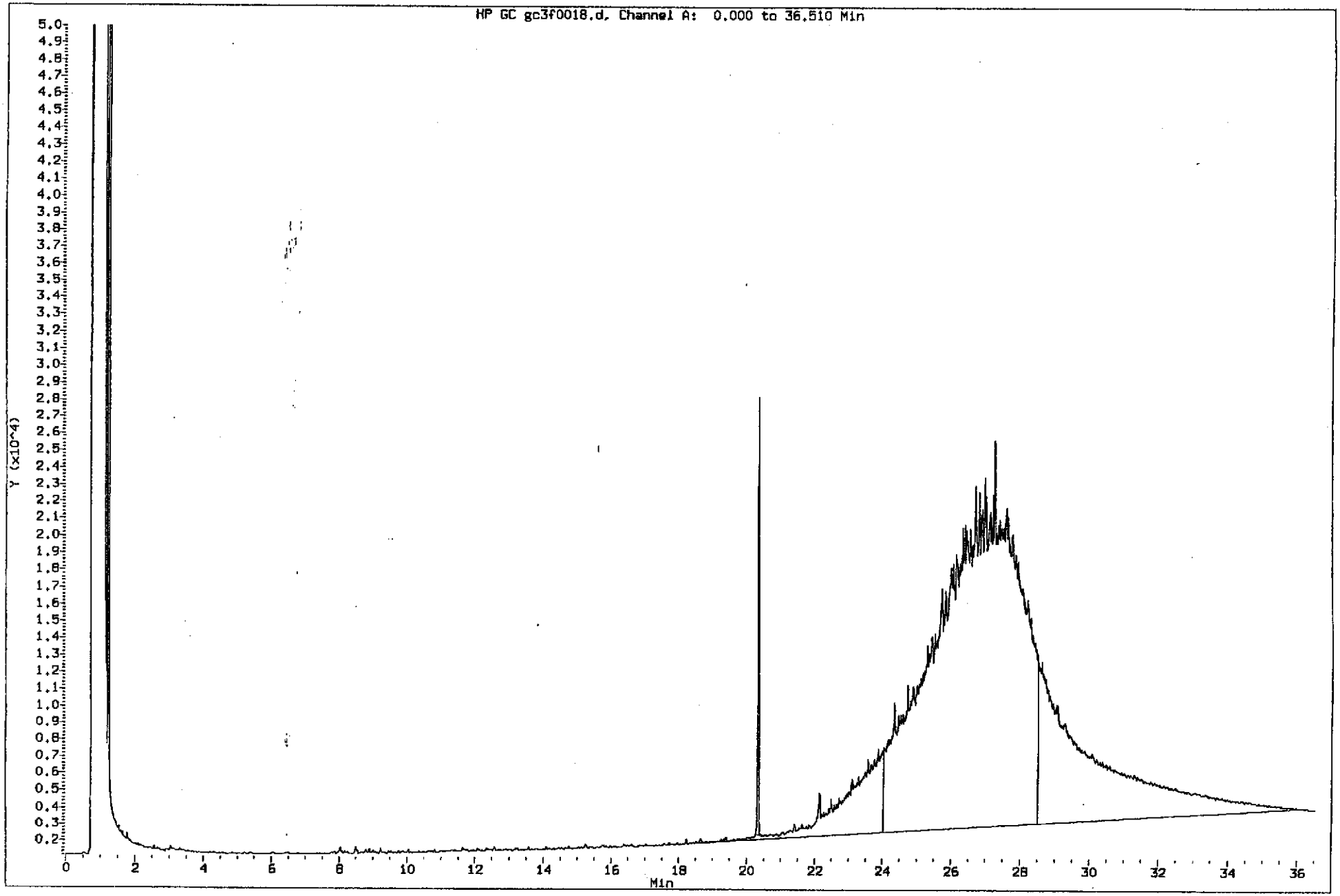


EPA 8015M - Diesel/Motoroil/Kerosene

EPA 8015M - DIESEL/MOTOR OIL/KEROSENE

CALTEST ANALYTICAL
A010438-7
CLIENT: CAMBRIA
ID: MW17/AQ
SAMPLED: 01-18 @ 1335

Data File: /var/chem/GC3.i/0131d.b/gc3f0018.d
Injection Date: 01-FEB-2000 04:35
Instrument: GC3.i
Client Sample ID:

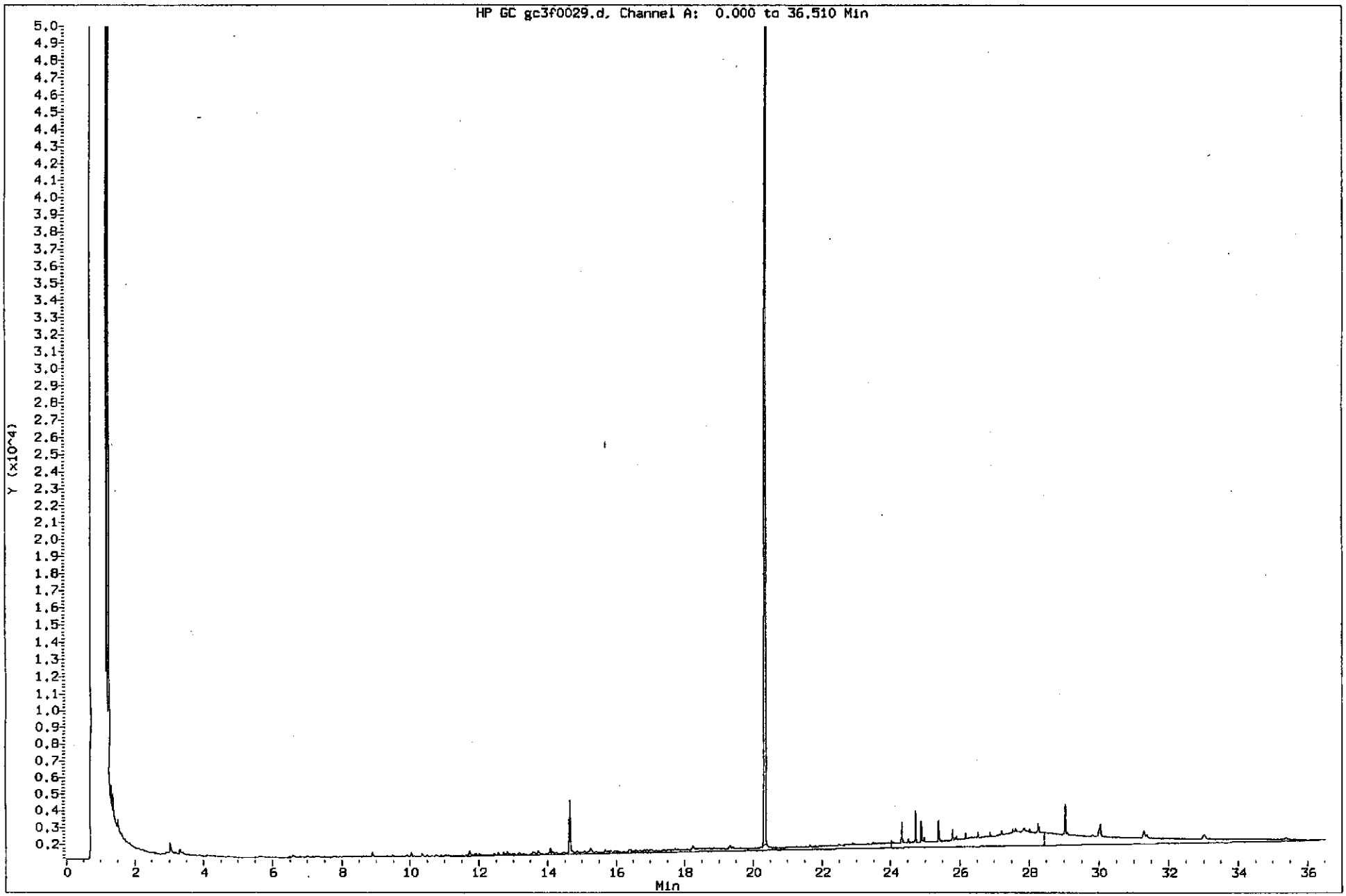


EPA 8015M - Diesel/Motor oil/Kerosene

EPA 8015M - DIESEL/MOTOR OIL/KEROSENE

Data File: /var/chem/GC3.i/0131d.b/gc3f0029.d
Injection Date: 01-FEB-2000 13:02
Instrument: GC3.i
Client Sample ID:

CALTEST ANALYTICAL
A010469-7
CLIENT:CAMBRIA
ID:TBW6/AQ
SAMPLED:01-19 @ 1115



CAMBRIA

ATTACHMENT B

Well Sampling Forms

CAMBRIA

WELL DEPTH MEASUREMENTS

Well ID	Time	Product Depth	Water Depth	Product Thickness	Well Depth	Comments
MW-8	9:40	—	8.31	—	15.15'	
MW-17	9:45	—	5.35	—	19.18	
MW-16	9:50	9.00	10.22	1.22	—	Very dirty! Bailed product
MW-15	10:05	—	10.56	—	20.65	
MW-9	10:10	—	8.63	—	17.25'	
MW-14	10:15	—	7.37	—	15.12	
MW-13	10:19	—	9.63	—	20-21	
MW-12	10:25	—	7.77	—	15.20'	
MW-2	10:17	—	7.41	—	15.89	
MW-1	9:56	—	5.41	—	15.79	
MW-10	10:11	—	9.11	—	15.08	
TDW-6	10:12	—	3.83	—	12.42'	
TDW-5	10:25	—	7.20	—	—	product skimmer installed
MW-11	9:55	—	7.08	—	19.58'	
MW-5	9:45	—	6.60	—	14.45	

Project Name: City of Dublin

Project Number: 153-1247

Measured By: JTE

Date: 1/8/99

F:\TEMPLATE\FORMS\FIELD\GW-DEPTH.WPD

CAMBRIA

WELL DEPTH MEASUREMENTS

page 2 of 2

Well ID	Time	Product Depth	Water Depth	Product Thickness	Well Depth	Comments
MW-7	9:40	-	7.31	-	14.35	
MW-11	9:55	-	7.08	-		
MW-3	9:50	-	3.73	-	-	high sheen, product globules
MW-6	9:37	7.89	8.08	0.19	-	
TBW1/2	covered by dumpster					

Project Name: City of O

Project Number: 153-1247

Measured By: JS/PE/DG

Date: 4/18/99

F:\TEMPLATE\FORMS\FIELD\GW-DEPTH.WPD

CAMBRIA

WELL SAMPLING FORM

Project Name: **City of Oakland**	Cambria Mgr: **DCE**	Well ID: MW1
Project Number: **153-1247**	Date: 1/19/00	Well Yield: —
Site Address: **7101 Edgewater Drive Oakland, California**	Sampling Method: **Disposable bailer**	Well Diameter: 2 " pvc
		Technician(s):
Initial Depth to Water: 5.40'	Total Well Depth: 15.69'	Water Column Height: 10.29'
Volume/ft: 0.16	1 Casing Volume: 1.64 gal	3 Casing Volumes: 4.93 gal
Purging Device: **sub pump**	Did Well Dewater?: no	Total Gallons Purged: 5 gal
Start Purge Time: 136	Stop Purge Time: 139	Total Time: 3 min

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments
136	1	12.0	7.0	1140	
138	2	12.7	6.9	1004	
139	3	12.5	7.0	1106	

Post-purge DO= 0.59 **mg/L** ppb

Post-purge ORP= -165 **mV**

Ferrous Iron= 2.7 **~~mg/L~~** ppb

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW1	1/19/00	2CD	**4 voa's**	**HCL**	**TPHg, BTEX, MTBE**	**8020 8015, confirm MTBE by 8260**
✓	✓	✓	~~1 liter~~ **2 ~~half-liter~~ plastic**	**none**	**nitrate, sulfate, alkalinity**	
			2 ambers	**none**	**TPHd/TPHk/TPHmo**	**NOTE: silica gel clean up**

CAMBRIA

WELL SAMPLING FORM

Project Name: **City of Oakland**	Cambria Mgr: **DCE**	Well ID: MW2
Project Number: **153-1247**	Date: 1/18/00	Well Yield: —
Site Address: **7101 Edgewater Drive Oakland, California**	Sampling Method: **Disposable bailer**	Well Diameter: 2 " **pvc**
		Technician(s): B/EG
Initial Depth to Water: 7.41'	Total Well Depth: 15.69'	Water Column Height: 8.28'
Volume/ft: 0.16	1 Casing Volume: 1.32 gal	3 Casing Volumes: 3.97 gal
Purging Device: **sub pump**	Did Well Dewater?: NO	Total Gallons Purged: 4 gal
Start Purge Time: 10:59	Stop Purge Time: 1103	Total Time: 4 min

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C°	pH	Cond. µS	Comments
10:59	1	17.9	7.2	1461 µS	
11:01	2	19.1	6.6	1786	
1103	3	19.1	6.4	1879	

Post-purge DO= 0.62 **mg/L** ppb

Post-purge ORP= 78 **mV**

Ferrous Iron= 2.0 **mg/L** ppb

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW2	1/18/00	1123	**4 voa's**	**HCL**	**TPHg, BTEX, MTBE**	**8020 8015, confirm MTBE by 8260**
↓	↓	↓	**2 half-liter plastic**	**none**	**nitrate, sulfate, alkalinity**	
			2 ambers	**none**	**TPHd/TPHk/TPHmo**	**NOTE: silica gel clean up**

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WELL SAMPLING FORM

Project Name: **City of Oakland**	Cambria Mgr: **DCE**	Well ID: MW5
Project Number: **153-1247**	Date: 1/19/00	Well Yield:
Site Address: **7101 Edgewater Drive Oakland, California**	Sampling Method: **Disposable bailer**	Well Diameter: 2" pvc
		Technician(s):
Initial Depth to Water: 6.49'	Total Well Depth: 14.45'	Water Column Height: 7.96'
Volume/ft: 0.16	1 Casing Volume: 1.27 gal	3 Casing Volumes: 3.82 gal
Purging Device: **sub pump**	Did Well Dewater?: no	Total Gallons Purged: 4 gal
Start Purge Time: 1307	Stop Purge Time: 3:10	Total Time: 4 gal

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments
1307	1	17.9	[illegible]	1415	
1312	2	[illegible]	[illegible]	[illegible]	
1310	3	17.6	7.1	1720	

Post-purge DO= 0.42 **mg/L** ppb ← ppm

Post-purge ORP= -171 **mV**

Ferrous Iron= 4.1 **mg/L** ppb ← ppm

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW5	1/19/00	325	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015, confirm MTBE by 8260
↓	↓	↓	2 half-liter plastic	none	nitrate, sulfate, alkalinity	
			2 ambers	none	TPHd/TPHk/TPHmo	NOTE: silica gel clean up

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WELL SAMPLING FORM

Project Name: **City of Oakland**	Cambria Mgr: **DCE**	Well ID: MW7
Project Number: **153-1247**	Date: 1/19/00	Well Yield:
Site Address: **7101 Edgewater Drive Oakland, California**	Sampling Method: **Disposable bailer**	Well Diameter: 2 " pvc
		Technician(s): ~~AD~~ BS
Initial Depth to Water: 7.20'	Total Well Depth: 14.35'	Water Column Height: 7.15'
Volume/ft: 0.16	1 Casing Volume: 1.14 gal	3 Casing Volumes: 3.43 gal
Purging Device: **sub pump**	Did Well Dewater?: no	Total Gallons Purged: 41.0 gals
Start Purge Time: 3:40 pm	Stop Purge Time: 3:46	Total Time: 6 min.

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments
3:42	1	18.1	7.0	1802	
3:44	2	18.4	7.0	1210	
3:46	3	18.5	7.1	1223	

Post-purge DO= 0.30 ~~mg/L~~ ppm Note: well threads are stripped

Post-purge ORP= −170 **mV**

Ferrous Iron= 3.1 **mg/L** ppm

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW7	1/19	3:50	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015, confirm MTBE by 8260
			~~2 half-liter~~ 1 liter plastic	none	nitrate, sulfate, alkalinity	
			2 ambers	none	TPHd/TPHk/TPHmo	NOTE: silica gel clean up

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WELL SAMPLING FORM

Project Name: **City of Oakland**	Cambria Mgr: **DCE**	Well ID: MW8
Project Number: **153-1247**	Date: 1/18/00	Well Yield: —
Site Address: **7101 Edgewater Drive Oakland, California**	Sampling Method: **Disposable bailer**	Well Diameter: 2 " **pvc**
		Technician(s): RS / EG
Initial Depth to Water: 8.31'	Total Well Depth: 15.15'	Water Column Height: 6.84'
Volume/ft: 0.16	1 Casing Volume: 1.09 gal	3 Casing Volumes: 3.28 gal
Purging Device: **sub pump**	Did Well Dewater?:	Total Gallons Purged: 12.0 gal
Start Purge Time: 12:31	Stop Purge Time: 12:34	Total Time: 3½ min

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C°	pH	Cond. µS	Comments
12:31	1	17.1	7.1	1770	
12:32	2	17.0	7.1	>2000	
12:33	3	18.0	6.8	>2000	

Post-purge DO= 2.23 ~~mg/L~~ ppb

Post-purge ORP= 149 **mV**

Ferrous Iron= < 0.5 ~~mg/L~~ ppb

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW8	1/18/00	1255	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015, confirm MTBE by 8260
↓	↓	↓	2 half-liter plastic	none	nitrate, sulfate, alkalinity	
			2 ambers	none	TPHd/TPHk/TPHmo	NOTE: silica gel clean up

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WELL SAMPLING FORM

Project Name: **City of Oakland**	Cambria Mgr: **DCE**	Well ID: MW9
Project Number: **153-1247**	Date: 1/18/00	Well Yield: —
Site Address: **7101 Edgewater Drive Oakland, California**	Sampling Method: **Disposable bailer**	Well Diameter: 2 " pvc
		Technician(s): DD/ET
Initial Depth to Water: 8.63	Total Well Depth: 17.25'	Water Column Height: 8.62'
Volume/ft: 0.16	1 Casing Volume: 1.38 gal	3 Casing Volumes: 4.14 gal
Purging Device: **sub pump**	Did Well Dewater?: no	Total Gallons Purged: 4.5
Start Purge Time: 2:31	Stop Purge Time: 236	Total Time: ~~236~~ 5 min

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C°	pH	Cond. µS	Comments
2:31	1	19.3	7.1	1373	
2:32	2	18.2	7.1	1396	
2:36	3	18.2	6.7	1431	

Post-purge DO= 0.30 ~~mg/L~~ ppb

Post-purge ORP= 48 **mV**

Ferrous Iron= 2.1 ~~mg/L~~ ppb

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW9	1/18/00	255	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015, confirm MTBE by 8260
✓	✓	✓	2 half-liter plastic	none	nitrate, sulfate, alkalinity	
			2 ambers	none	TPHd/TPHk/TPHmo	NOTE: silica gel clean up

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WELL SAMPLING FORM

Project Name: **City of Oakland**	Cambria Mgr: **DCE**	Well ID: MW10
Project Number: **153-1247**	Date: 1/19/00	Well Yield: —
Site Address: **7101 Edgewater Drive Oakland, California**	Sampling Method: **Disposable bailer**	Well Diameter: 2 " **pvc**
		Technician(s): JD
Initial Depth to Water: 7.77'	Total Well Depth: 15.20'	Water Column Height: 7.43'
Volume/ft: 0.16	1 Casing Volume: 1.19 gal	3 Casing Volumes: 3.57 gal
Purging Device: **sub pump**	Did Well Dewater?:	Total Gallons Purged: 4 gal
Start Purge Time: 1249	Stop Purge Time: 1251	Total Time: 2 min

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments
1249	1	18.2	7.3	1059	
1250	2	17.9	7.1	1052	
1251	3	18.2	7.1	1081	

Post-purge DO= 0.65 **mg/L** ppb

Post-purge ORP= −161 **mV**

Ferrous Iron= 0.8 **mg/L** ppb

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW10	1/19/00	115	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015, confirm MTBE by 8260
✓	✓	✓	2 half-liter plastic	none	nitrate, sulfate, alkalinity	
			2 ambers	none	TPHd/TPHk/TPHmo	NOTE: silica gel clean up

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WELL SAMPLING FORM

Project Name: **City of Oakland**	Cambria Mgr: **DCE**	Well ID: MW11
Project Number: **153-1247**	Date: 1/19/00	Well Yield: —
Site Address: **7101 Edgewater Drive Oakland, California**	Sampling Method: **Disposable bailer**	Well Diameter: 2 " pvc
		Technician(s): CS
Initial Depth to Water: 7.08'	Total Well Depth: 19.58'	Water Column Height: 12.5'
Volume/ft: 0.16	1 Casing Volume: 2gal	3 Casing Volumes: 6gal
Purging Device: **sub pump**	Did Well Dewater?: no	Total Gallons Purged: 6 gal
Start Purge Time: 224	Stop Purge Time: 227	Total Time: 3min

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments
224	1	19.0	7.0	909	
225	2	19.4	7.0	1130	
227	3	19.3	7.0	1271	

Post-purge DO= 0.33 **mg/L ppb**

Post-purge ORP= -120 **mV**

Ferrous Iron= 2.6 **mg/L ppb**

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW11	1/19/00	250	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015, confirm MTBE by 8260
✓	✓	✓	~~2 half-liter~~ plastic	none	nitrate, sulfate, alkalinity	
			2 ambers	none	TPHd/TPHk/TPHmo	NOTE: silica gel clean up

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WELL SAMPLING FORM

Project Name: **City of Oakland**	Cambria Mgr: **DCE**	Well ID: MW12
Project Number: **153-1247**	Date: 1/19/00	Well Yield: —
Site Address: **7101 Edgewater Drive Oakland, California**	Sampling Method: **Disposable bailer**	Well Diameter: 2 " pvc
		Technician(s): [illegible]
Initial Depth to Water: 8.10'	Total Well Depth: 15.08'	Water Column Height: 6.98'
Volume/ft: 0.16	1 Casing Volume: 1.12 gal	3 Casing Volumes: 3.35 gal
Purging Device: **sub pump**	Did Well Dewater?: no	Total Gallons Purged: 4 gal
Start Purge Time: 11:02	Stop Purge Time: 11:05	Total Time: 3 min

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments
11:02	1	18.2	7.5	1192	Water [illegible]
11:04	2	18.3	7.4	1212	[illegible]
11:05	3	18.2	7.3	1198	water

Post-purge DO= _____ **mg/L ppb**

Post-purge ORP= 170 **mV**

Ferrous Iron= 0.8 **mg/L ppb**

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW12	1/19/00		4 voa's + 1 liter	HCL	TPHg, BTEX, MTBE	8020 8015, confirm MTBE by 8260
			2 ~~half-liter~~ plastic	none	nitrate, sulfate, alkalinity	
			2 ambers	none	TPHd/TPHk/TPHmo	NOTE: silica gel clean up

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WELL SAMPLING FORM

Project Name: **City of Oakland**	Cambria Mgr: **DCE**	Well ID: MW13
Project Number: **153-1247**	Date: 1/18/09	Well Yield: —
Site Address: **201 Edgewater Drive Oakland, California**	Sampling Method: **Disposable bailer**	Well Diameter: 2 **" pvc**
		Technician(s): AS/EG
Initial Depth to Water: 9.63'	Total Well Depth: 20.21'	Water Column Height: 10.58'
Volume/ft: 0.16	1 Casing Volume: 1.69 gal	3 Casing Volumes: 5.08 gal
Purging Device: **sub pump**	Did Well Dewater?: yes	Total Gallons Purged: 2.0
Start Purge Time: 406	Stop Purge Time: 4:09	Total Time: 3 min

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments
406	1	19.2	7.7	1377	
408	2	19.3	7.6	1509	

Post-purge DO= 0.21 **mg/L** ppb

Post-purge ORP= −81 **mV**

Ferrous Iron= 2.3 **mg/L** ppb

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW13	1/18/09	415	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015, confirm MTBE by 8260
"	"	"	2 half-liter plastic	none	nitrate, sulfate, alkalinity	
"	"	"	2 ambers	none	TPHd/TPHk/TPHmo	NOTE: silica gel clean up

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WELL SAMPLING FORM

Project Name: **City of Oakland**	Cambria Mgr: **DCE**	Well ID: MW14
Project Number: **153-1247**	Date: 1/18/00	Well Yield: —
Site Address: **7101 Edgewater Drive Oakland, California**	Sampling Method: **Disposable bailer**	Well Diameter: 2 " pvc
		Technician(s): V/EG
Initial Depth to Water: 7.37'	Total Well Depth: 15.12'	Water Column Height: 7.75'
Volume/ft: 0.16	1 Casing Volume: 1.24 gal	3 Casing Volumes: 3.72 gal
Purging Device: **sub pump**	Did Well Dewater?: NO	Total Gallons Purged: 4.0
Start Purge Time: 3:15	Stop Purge Time: 3:19	Total Time: 4 min

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C°	pH	Cond. µs	Comments
3:15	1	18.4	7.4	1418 µs	
3:17	2	18.3	7.5	1441	
3:19	3	18.5	7.4	1460	

Post-purge DO= .25 ~~mg/L~~ ppb

Post-purge ORP= 060 **mV**

Ferrous Iron= 1.1 ~~mg/L~~ ppb

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW14	1/18/00	330	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015, confirm MTBE by 8260
↓	↓	↓	2 half-liter plastic	none	nitrate, sulfate, alkalinity	
↓	↓	↓	2 ambers	none	TPHd/TPHk/TPHmo	NOTE: silica gel clean up

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WELL SAMPLING FORM

Project Name: **City of Oakland**	Cambria Mgr: **DCE**	Well ID: MW15
Project Number: **153-1247**	Date: 1/18/00	Well Yield: —
Site Address: **7101 Edgewater Drive Oakland, California**	Sampling Method: **Disposable bailer**	Well Diameter: 2 " pvc
		Technician(s): AS/EG
Initial Depth to Water: 10.56'	Total Well Depth: 20.65'	Water Column Height: 10.09'
Volume/ft: 0.16	1 Casing Volume: 1.61 gal	3 Casing Volumes: 4.84 gal
Purging Device: **sub pump**	Did Well Dewater?: NO	Total Gallons Purged: 5 gal
Start Purge Time: 1:56	Stop Purge Time: 1:59	Total Time: 3 min

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C°	pH	Cond. µs	Comments
1:56	1	19.3	7.6	1690	
1:58	2	19.4	7.3	1537	
1:59	3	19.6	7.1	1503	

Post-purge DO= 0.27 ~~mg/L~~ ppb

Post-purge ORP= 93 mV

Ferrous Iron= 3.1 ~~mg/L~~ ppb

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW15	1/18/00	220	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015, confirm MTBE by 8260
✓	✓	✓	2 half-liter plastic	none	nitrate, sulfate, alkalinity	
			2 ambers	none	TPHd/TPHk/TPHmo	NOTE: silica gel clean up

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WELL SAMPLING FORM

Project Name: **City of Oakland**	Cambria Mgr: **DCE**	Well ID: MW 17
Project Number: **153-1247**	Date: 1/18/00	Well Yield: —
Site Address: **7101 Edgewater Drive Oakland, California**	Sampling Method: **Disposable bailer**	Well Diameter: 2 " pvc
		Technician(s): [illegible]
Initial Depth to Water: 5.35'	Total Well Depth: 19.18'	Water Column Height: 13.83'
Volume/ft: 0.16	1 Casing Volume: 2.21 gal	3 Casing Volumes: 6.64 gal
Purging Device: **sub pump**	Did Well Dewater?: NO	Total Gallons Purged: 6.8 gal
Start Purge Time: 1:12	Stop Purge Time: 118	Total Time: 6 min

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C°	pH	Cond. µS	Comments
1:12	1	17.3	7.4	1920	
1:15	2	17.4	7.0	1947	
1:17	3	17.5	7.1	1939	

Post-purge DO= 0.23 ~~mg/L~~ ppb

Post-purge ORP= 102 **mV**

Ferrous Iron= ~~X~~ 0.5 ~~mg/L~~ ppb

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-17	1/18/00	1:35	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015, confirm MTBE by 8260
"	"	"	2 half-liter plastic	none	nitrate, sulfate, alkalinity	
			2 ambers	none	TPHd/TPHk/TPHmo	NOTE: silica gel clean up

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WELL SAMPLING FORM

Project Name: **City of Oakland**	Cambria Mgr: **DCE**	Well ID: TBW4
Project Number: **153-1247**	Date: 1/19/00	Well Yield: —
Site Address: **7101 Edgewater Drive Oakland, California**	Sampling Method: **Disposable bailer**	Well Diameter: 6 " pvc
		Technician(s): RR
Initial Depth to Water: 4.01'	Total Well Depth: 12.42'	Water Column Height: 8.41'
Volume/ft: 1.47	1 Casing Volume: 12.37gal	3 Casing Volumes: ——
Purging Device: **sub pump**	Did Well Dewater?: NO	Total Gallons Purged: 14 gal
Start Purge Time: 1051	Stop Purge Time: 1058	Total Time: 7min

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments
1051	1	19.0	7.5	2m	
1054	2	18.0	7.5	5.6m	
1058	1	17.5	7.4	4.4m	

Post-purge DO= [illegible] ~~mg/L~~ ppb

Post-purge ORP= −161 **mV**

Ferrous Iron= 20.5 ~~mg/L~~ ppb

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
TBW4	1/19/00	1115	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015, confirm MTBE by 8260
↓	↓	↓	2 half-liter plastic	none	nitrate, sulfate, alkalinity	
			2 ambers	none	TPHd/TPHk/TPHmo	NOTE: silica gel clean up

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ATTACHMENT C

Standard Field Procedures for Monitoring Wells

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STANDARD FIELD PROCEDURES FOR MONITORING WELLS

This document describes Cambria Environmental Technology's standard field methods for drilling, installing, developing and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Well Construction and Surveying

Groundwater monitoring wells are installed in soil borings to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three feet thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two ft above the well screen. A two feet thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I,II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security. The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. After about ten minutes of surging, groundwater is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of groundwater are extracted and the sediment volume in the groundwater is negligible. This process usually occurs prior to installing the sanitary surface seal to ensure sand pack stabilization. If development occurs after surface seal installation, then development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.