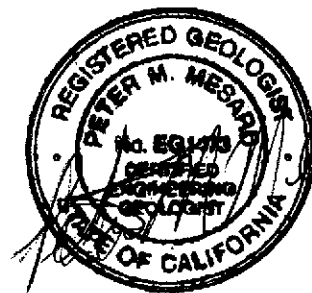


GROUNDWATER INVESTIGATION REPORT
OWENS-BROCKWAY GLASS CONTAINERS
3600 ALAMEDA AVENUE
OAKLAND, CALIFORNIA

22 April 1999

K/J 950007.20



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1 INTRODUCTION

Kennedy/Jenks Consultants (Kennedy/Jenks) prepared this Groundwater Investigation Report (Report) on behalf of Owens-Brockway Glass Containers (Owens-Brockway). The Owens-Brockway plant is located at 3600 Alameda Avenue, Oakland, California (the Site). The Site location is shown on Figure 1. This Report summarizes results of the subsurface investigation conducted by Kennedy/Jenks at the Site on 26 and 27 January 1999. The work was performed in accordance with the 18 November 1998 Groundwater Investigation Work Plan (Kennedy/Jenks 1998a) prepared by Kennedy/Jenks and approved by Alameda County Department of Environmental Health (ACDEH).

2 BACKGROUND

The Owens-Brockway Oakland plant was constructed in 1936 and occupies a city block, which is bounded by Alameda and Fruitvale Avenues, the Inner Harbor Channel, 37th Street and 8th Street. The plant includes a glass manufacturing operation, warehouses, and paved outdoor storage areas. The Site plan is shown on Figure 2.

2.1 Previous Investigation and Remedial Activities

Historically, fuel oil (or furnace fuel) used to operate the plant was stored in underground storage tanks (USTs) on the west side of the plant until the late 1980s. Soil containing petroleum hydrocarbons (PHCs) was encountered in July 1986 during construction of a fork lift ramp to the plant's basement.

As a result of this discovery, 16 exploratory soil borings were advanced by Exceltech, Inc. during July 1986 in the vicinity of the ramp, the USTs and the former maintenance building. Eighteen groundwater monitoring wells were subsequently installed at the Site from July 1986 through December 1986, the deepest of which was advanced to approximately 32 feet below ground surface (bgs). The well construction details are summarized in Table 1. The soil and groundwater samples collected in the vicinity of the USTs contained low boiling range (purgeable) PHCs and high boiling range (extractable) PHCs. In addition, benzene, toluene, ethylbenzene and total xylenes (BTEX) were detected in soil and groundwater samples. Several groundwater samples in the vicinity of the tanks and the maintenance shop contained detectable levels of halogenated volatile organic compounds (HVOCs). The results of these activities were documented in Exeltech's February 1987 report entitled *Soil and Groundwater Contamination Investigation*.

In September 1986, a 16,000-gallon fuel oil UST was removed and 148 cubic yards of petroleum-impacted soil was excavated and disposed at Chemical Waste Management's Kettleman Hills Class I facility. A 36-inch diameter recovery well was installed in the tank excavation and equipped with a product recovery device in 1987. The original recovery well (R-1) was upgraded and a second recovery well (R-2) was installed near Monitoring Well MW-2 in 1989. The two recovery wells were operated for several months without collecting any PHCs. They are now inoperable.

Owens-Brockway also operated four USTs (one 350-gallon, two 8,000-gallon and one 12,000-gallon) located east of the forming building. These four USTs were removed and replaced with two USTs (gasoline and diesel) during 1986. According to Exceltech, visual evidence of releases from these tanks was noted during the removal activities. Three of the monitoring wells (MW-16, 17 and 18) were installed in the vicinity of these tanks. The gas and diesel USTs, installed in 1986, were removed on 9 October 1998 under the oversight of the Oakland Fire Department.

The *September Quarterly Ground-Water Sampling Report*, prepared by Ensco Environmental Services in November 1988, reported that the monitoring well network at the Site was sampled six times between April 1987 and September 1988 (Table 2 summarizes the historical groundwater analytical data) The field measurements indicated that several wells contained separate-phase petroleum product.

Since the monitoring wells were initially installed, Wells MW-3 and MW-18 have been destroyed during construction activities at the plant.

Groundwater is tidally influenced and shallow groundwater is encountered between 9 and 13 feet bgs (Exceltech 1987). Flow is generally south and southwest toward the Harbor Channel. Historical depth-to-groundwater measurements are summarized in Table 3.

2.2 Recent Sampling Activities

2.2.1 1997 Sampling

In a letter to Owens-Brockway dated 28 April 1997, ACDEH requested that Owens-Brockway resume groundwater monitoring at the Site. ACDEH requested that Wells MW-1, 2, 5, 6, 7, 8, 9, 10, 13, 15, and 17 be sampled and analyzed for total petroleum hydrocarbons as gasoline (TPHg), diesel (TPHd) and motor oil (TPHmo); BTEX. In addition, ACDEH requested that all wells except MW-13, 15, and 17 be analyzed for HVOCs and polychlorinated biphenyls (PCBs).

Following the measurement of depth to groundwater and purging operations, groundwater samples were collected on 16 September 1997 from Wells MW-1, 5, 7, 8, 9, 10, 13, 15, and 17. Wells MW-2 and MW-6 contained separate-phase petroleum product; therefore, groundwater samples were not collected from them, although a product sample was obtained from Well MW-2 and analyzed by gas chromatography techniques in order to compare the product sample to hydrocarbon fuel standards ("fingerprinting").

Samples collected from Wells MW-1, 5, 7, 8, 9, 10, 13, 15, and 17 were analyzed for purgeable and extractable petroleum hydrocarbons by EPA Method 8015 Modified and for BTEX by EPA Method 8020. The groundwater samples collected from Wells MW-1, 5, 7, 8, 9, and 10 were also analyzed for HVOCs by EPA Method 8260 and for PCBs by EPA Method 8080.

✓ for MTB2
No HVOCs or PCBs were detected in the samples analyzed. Results of the groundwater analyses for PHCs and BTEX are summarized in Table 2. The chromatogram for the product sample collected from Well MW-2 contained hydrocarbons in the C10 to C22 range; however, the pattern did not match the laboratory's diesel standard. This is likely due to weathering of the PHCs. Extractable PHCs (TPHd and TPHmo) were detected in groundwater in all the monitoring wells sampled on 16 September 1997. Purgeable PHCs (TPHg) were detected in the groundwater samples collected from Wells MW-7, 9, and 17. The analytical results typically did not match the gasoline, diesel, and motor oil standards. This is likely due to weathering of the PHCs. The results of this sampling event and the product thickness monitoring were presented in the 19 November 1997 letter report prepared by Kennedy/Jenks (Kennedy/Jenks 1997).

2.2.2 1998 Sampling

A groundwater monitoring event was conducted on 2 November 1998. Groundwater samples were collected from Wells MW-1, MW-8, MW-10, MW-13, MW-15 and MW-17 following depth to groundwater measurements and purging operations. Five wells (MW-2, MW-5, MW-6, MW-7 and MW-9) were not sampled due to the presence of separate-phase

petroleum. The results of this monitoring event were presented in a separate document (Kennedy/Jenks 1998b).

3 INVESTIGATION OBJECTIVE AND SCOPE OF WORK

The objective of the January 1999 subsurface investigation was to further assess the extent of PHCs in shallow groundwater downgradient of the western portion of the Site. Based upon the results of the September 1997 and November 1998 groundwater sampling events, five shallow borings were advanced to collect reconnaissance groundwater samples to be analyzed for PHCs. The presence of deeply buried utilities, such as the Sausal Creek storm drain, may influence groundwater flow direction and migration of PHCs. Based upon a review of public utility drawings and Owens-Brockway plant utility drawings, only the Sausal Creek storm sewer extends to the groundwater table. Therefore, several of the proposed borings were located in close proximity to the storm drain to evaluate this potential preferential flow path.

The locations of the storm sewer and other area utilities, as well as the five borings, are shown on Figure 3.

4 FIELD AND ANALYTICAL PROCEDURES

As discussed in Section 3, five soil borings (KB-1 through KB-5) were advanced to collect reconnaissance groundwater samples to further delineate the presence of PHCs downgradient of the Site. The boring locations are shown on Figure 3.

Prior to drilling, Kennedy/Jenks contacted Underground Services Alert (USA) to mark the buried utilities in the vicinity of the five borings. In addition, a private locator was retained by Kennedy/Jenks to attempt to locate buried utilities and other subsurface obstructions in the vicinity of the borings. Kennedy/Jenks obtained drilling permits from Alameda County Public Works (ACPW). In addition, excavation permits from the City of Oakland were obtained.

On 26 and 27 January 1999, the soil borings were advanced by Precision, Inc. with a hydraulic push/drive sampling system. Borings KB-2 through KB-5 were cored to 19 feet bgs and Boring KB-1 was cored to a depth of 28 feet bgs. All borings were advanced until groundwater was present in the borehole. The borings were continuously cored and the soils were lithologically logged by a Kennedy/Jenks geologist using the Unified Soil Classification System (ASTM D 2488-93). In addition, at approximately five-foot intervals, the recovered core was placed in a container and allowed to equilibrate to ambient temperature. The concentration of the headspace was then measured with an organic vapor meter. These data are depicted on the boring logs presented in Appendix A.

Once each boring reached groundwater, a reconnaissance groundwater sample was collected by lowering a PVC screen and riser into the boring. The samples were delivered under chain-of-custody procedures to Entech Analytical Labs, Inc., a California-certified laboratory, for analysis.

The reconnaissance groundwater samples were analyzed for purgeable and extractable PHCs by EPA Method 8015 Modified and for BTEX by EPA Method 8020. A silica gel cleanup step was also performed on the groundwater samples collected from Borings KB-3, KB-4 and KB-5 prior to sample analysis for extractable PHCs to evaluate the ^{remove} presence of soluble biogenic materials that are measured indiscriminately by TPH analyses such as EPA Method 8015 Modified. The silica gel cleanup was conducted using EPA Method 3630 Modified. For comparison purposes, groundwater samples were also analyzed for extractable PHCs by Method 8015 Modified without the silica gel cleanup step.

A detailed description of the equipment and procedures used during drilling and groundwater sampling is included in Appendix B.

5 QUALITY ASSURANCE/QUALITY CONTROL AND DATA VALIDATION

In order to validate the groundwater sample results, a duplicate groundwater sample was collected and analyzed by EPA Method 8015 Modified for purgeable and extractable PHCs and for BTEX by EPA Method 8020. Duplicate samples measure consistency in sampling and analysis. A field blank was collected and analyzed for all compounds to verify that sampling equipment was decontaminated between boring locations. A trip blank accompanied the sample container and was analyzed for BTEX by EPA Method 8020.

As shown in Table 4, the groundwater sample and duplicate sample results for Boring KB-3 were within the same order of magnitude. The field blank contained 2.8 µg/l of toluene. This detection of toluene does not affect the validity of the data obtained during this investigation. The trip blank did not contain detectable concentrations of BTEX.

6 FINDINGS AND CONCLUSIONS

The findings of the field investigation and conclusions regarding these findings are presented below. The analytical results for the January 1999 subsurface investigation are summarized in Table 4. The laboratory reports, including the chromatograms, are included in Appendix C.

- No PHCs were detected in the groundwater samples collected from Borings KB-1 and KB-2.
- Separate phase PHCs were not observed while advancing the borings and collecting groundwater samples.
- Based upon field observations of the continuous soil core taken, discoloration and petroleum odor were noted in Borings KB-3, KB-4 and KB-5. This discoloration was observed from approximately 13 feet to 18 feet bgs. This is likely due to the fluctuating water table caused by tidal action.
- The groundwater samples collected from Boring KB-3 had low levels (1.1 to 3.3 $\mu\text{g/l}$) of BTEX present and the sample collected from Boring KB-5 contained 0.88 $\mu\text{g/l}$ of total xylenes.
- PHCs were detected in the groundwater samples collected from Borings KB-3, KB-4 and KB-5. All three samples contained total purgeable petroleum hydrocarbons (TPPH) ranging from 110 $\mu\text{g/l}$ (160 $\mu\text{g/l}$ in the duplicate sample) in Boring KB-3 to 1,500 $\mu\text{g/l}$ in Boring KB-5. These three groundwater samples also contained total extractable petroleum hydrocarbons (TEPH) ranging from 360 $\mu\text{g/l}$ in Boring KB-4 to 1,400 $\mu\text{g/l}$ in Boring KB-5.
- The groundwater samples collected from Borings KB-3, KB-4 and KB-5 were also analyzed for TEPH following a silica gel cleanup step. The TEPH concentration in Borings KB-3 and KB-4 was reduced below the laboratory reporting limit (50 $\mu\text{g/l}$) and the TEPH concentration in Boring KB-5 was reduced from 1,400 $\mu\text{g/l}$ to 730 $\mu\text{g/l}$ following the silica gel cleanup. Silica gel cleanup separates the PHCs from other polar compounds such as alcohols and acids that may be present due to biological degradation of PHCs. It appears that the TEPH present in Boring KB-3 and KB-4 is due to biogenic material and not to PHCs.
- The lithology observed consisted of fine-grained materials above the water table. Sand and silty sand was encountered from 16 to 18 feet bgs in Boring KB-3 and KB-4. Boring KB-5 contained silty sand from 12 to 14 feet bgs and a poorly-graded sand from 14 to 19 feet bgs.
- Based upon the field observations and the groundwater sample analytical results from Boring KB-5, PHCs appear to have migrated in groundwater beneath Alameda Avenue from the Oakland plant.
- It does not appear that separate phase PHC, present in Wells MW-2, 5, 6, and 7, has migrated beneath Alameda Avenue. Also, it appears that the storm drain is not a significant conduit for PHCs.

- Although there are no state groundwater cleanup levels for PHCs, the San Francisco Bay Regional Water Quality Control Board (RWQCB) is working with tenants at the San Francisco International Airport to develop groundwater screening levels for these compounds. In a 16 July 1998 letter from the RWQCB to the tenant group, Tier 1 Saltwater Ecological Protection Zone (SEPZ) concentrations for TPH constituents were proposed (RWQCB 1998). The TPHg level was 3.7 mg/l and the TPHd concentration was 0.314 mg/l. These values may be revised again based upon additional toxicity tests being conducted. Only the sample from Boring KB-5 contained concentrations (after the silica gel cleanup step) above these proposed screening levels. It is important to note these screening levels were developed using fresh gasoline and diesel. The PHCs present at the site are highly weathered fuel oil.
- The BTEX concentrations detected in the groundwater samples are below the California maximum contaminant levels (MCLs) with the exception of the samples collected from Boring KB-3. The benzene concentrations were 1.4 µg/l and 1.5 µg/l for the sample and duplicate sample, respectively. The MCL for benzene is 1 µg/l.

7 RECOMMENDATIONS

- Prepare a risk management plan for the Site as requested by ACDEH.
- Hydrocarbon product removal options are being evaluated and recommendations regarding free-product removal will be addressed in the risk management plan.

8 REFERENCES

Ensco 1988. September Quarterly Groundwater Sampling and Analysis for O.I. Glass Container Division, S.T.S., 3600 Alameda Avenue, Oakland, California. Ensco Environmental Services, Inc., November 1988.

Exceltech 1987. Soil and Groundwater Contamination Investigation, Owens-Illinois Glass Container Division, 3600 Alameda Avenue, Oakland, California. Exceltech, Inc., February 1987.

Kennedy/Jenks 1997. Groundwater Monitoring, Owens-Brockway Oakland Plant, Kennedy/Jenks Consultants. 19 November 1997.

Kennedy/Jenks 1998a. Groundwater Investigation Work Plan, Owens-Brockway Glass Containers, 3600 Alameda Avenue, Oakland, California, Kennedy/Jenks Consultants, 18 November 1998.

Kennedy/Jenks 1998b. Groundwater Monitoring Event – 2 November 1998, Owens-Brockway Oakland Plant, 19 November 1998.

RWQCB 1998. Letter from San Francisco Bay RWQCB to SFIA Consolidated Tenant Group. Staff's Comments on the Proposed Task 3B and 3D Reports Submitted in Compliance with Board Order No. 95-136 Adopted for San Francisco International Airport, San Mateo County, California. 16 July 1998.

TABLES

TABLE 1

Summary of Well Construction Details
Owens-Brockway, Oakland, California
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Well Number	Date Installed	Measurement Elevation ^(a) (feet)	Top of Screen ^(b) (feet)	Screen Length (feet)	Well Depth ^(c) (feet)	Casing Diameter (inches)	Comments
MW-1	9/12/86	16.02	8	21	29	2	
MW-2	9/12/86	17.11	10	20	30	2	
MW-3	9/12/86	15.46	10	20	30	2	Destroyed
MW-4	9/29/86	16.02	8.5	20	28.5	2	TOCE=18.05 (Ensco 1998) ^(d)
MW-5	9/29/96	16.19	8.5	20	28.5	2	
MW-6	9/29/96	17.48	12.5	16	28.5	2	
MW-7	9/30/86	16.11	12.5	11	23.5	2	TOCE=15.76 (Ensco 1998)
MW-8	10/22/86	16.57	15	13.5	28.5	2	
MW-9	7/23/86	7.33 ^(e)	5	10	20	2	
MW-10	10/22/86	15.96	10	15	25	2	
MW-11	11/24/86	13.99	10	20	30	2	
MW-12	11/24/86	13.83	11	15	26	2	
MW-13	12/11/86	13.98	9.5	15	24.5	2	
MW-14	11/25/86	14.78	10	15	25	2	
MW-15	12/17/86	15.16	9.5	20	29.5	2	
MW-16	12/12/86	13.48	10	14.5	24.5	2	
MW-17	12/15/86	14.17	9.5	15	24.5	2	
MW-18	12/15/86	14.89	9	15	24	2	Destroyed
R-1	1987	NM ^(f)	NA ^(g)	NA	24	36	
R-2	1989	NM	NA	NA	NA	12	

Notes:

- (a) Top of casing elevation (TOCE) except where noted; measured in feet above US Coast and Geodetic Datum (mean sea level). Elevations measured by Exceltech in 1986.
- (b) Depth to top of screened interval (feet below top of casing).
- (c) Depth to bottom of screened interval (feet below top of casing).
- (d) TOCE remeasured for Wells MW-4 and MW-7. 1997 and 1998 groundwater elevations calculated using 1988 measurements.
- (e) Well casing elevation was not measured for this well; well is located beneath forklift ramp and this measurement is the ground surface elevation in feet MSL.
- (f) NM = not measured
- (g) NA = not available

TABLE 2

Summary of Groundwater Analytical Results
Owens-Brockway, Oakland, California
K/J 950007.20

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Well Number	Date Sampled	TPPH ^(a) (µg/l) ^(b)	TEPH ^(b) (µg/l)	O&G ^(c) (µg/l)	B ^(d) (µg/l)	T ^(e) (µg/l)	E ^(f) (µg/l)	X ^(g) (µg/l)
MW-1	9/23/86	<0.01 ⁽ⁱ⁾	NA ^(j)	25,000	<10	<10	NA	<10
	4/9/87	BDL ^(k)	NA	NA	BDL	BDL	NA	BDL
	9/16/87 ^(l)	-	-	-	-	-	-	-
	12/1/87 ^(l)	-	-	-	-	-	-	-
	3/7/88 ^(l)	-	-	-	-	-	-	-
	6/8/88 ^(l)	-	-	-	-	-	-	-
	9/14/88 ^(l)	-	-	-	-	-	-	-
	9/16/97	<50	190	<300	<0.5	<0.5	<0.5	<0.5
	11/2/98	<50	160	NA	<0.5	<0.5	<0.5	<0.5
	MW-2	4/9/87 ^(m)	-	-	-	-	-	-
9/16/87 ^(m)		-	-	-	-	-	-	-
12/1/87 ^(m)		-	-	-	-	-	-	-
3/7/88 ^(l)		-	-	-	-	-	-	-
6/8/88 ^(l)		-	-	-	-	-	-	-
9/14/88 ^(l)		-	-	-	-	-	-	-
9/16/97 ^(m)		-	-	-	-	-	-	-
11/2/98 ^(m)		-	-	-	-	-	-	-
MW-3 ⁽ⁿ⁾	9/23/86	<10	NA	18,000	<10	<10	NA	<10
	4/9/87	370	NA	NA	BDL	BDL	NA	BDL
	9/16/87 ^(m)	-	-	-	-	-	-	-
	12/1/87 ^(m)	-	-	-	-	-	-	-
	3/7/88	NA	190,000	NA	NA	NA	NA	NA
	6/9/88	NA	16,000	NA	NA	NA	NA	NA
	9/14/88 ^(m)	-	-	-	-	-	-	-
MW-4	10/3/86	20	NA	7,200	<5	<5	NA	<5
	4/9/87	BDL	NA	NA	BDL	BDL	NA	BDL
	9/16/87	1.3	66	NA	BDL	BDL	NA	BDL
	12/1/87	BDL	100	NA	BDL	BDL	NA	8.9
	3/7/88	BDL	BDL	NA	BDL	BDL	NA	BDL
	6/8/88	BDL	BDL	NA	BDL	BDL	NA	BDL
	9/14/88	BDL	100	NA	BDL	BDL	NA	BDL
	9/16/97	<50	7,500	4,100	<0.5	<0.5	<0.5	<0.5
MW-5	10/3/86	1,400	NA	24,000	<5	<5	NA	6.6
	4/9/87	54	NA	NA	BDL	BDL	NA	BDL
	9/16/87	NA	96,000	NA	NA	NA	NA	NA
	12/1/87	NA	2,000	NA	NA	NA	NA	NA
	3/9/88	NA	BDL	NA	NA	NA	NA	NA
	6/9/88	NA	12,000	NA	NA	NA	NA	NA
	9/14/88	NA	6,300	NA	NA	NA	NA	NA
	9/16/97	<50	7,500	4,100	<0.5	<0.5	<0.5	<0.5
	11/2/98 ^(m)	FP	-	-	-	-	-	-

TABLE 2

Summary of Groundwater Analytical Results
Owens-Brockway, Oakland, California
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Well Number	Date Sampled	TPPH ^(a) (µg/l) ^(b)	TEPH ^(b) (µg/l)	O&G ^(c) (µg/l)	B ^(d) (µg/l)	T ^(e) (µg/l)	E ^(f) (µg/l)	X ^(g) (µg/l)
MW-6	4/9/87 ^(m)	-	-	-	-	-	-	-
	9/16/87	NA	400,000	NA	NA	NA	NA	NA
	12/1/87	NA	30,000	NA	NA	NA	NA	NA
	3/9/88	NA	9,800	NA	NA	NA	NA	NA
	6/9/88	NA	63,000	NA	NA	NA	NA	NA
	9/14/88	NA	140,000	NA	NA	NA	NA	NA
	9/16/97 ^(m)	EP	-	-	-	-	-	-
	11/2/98 ^(m)	EP	-	-	-	-	-	-
MW-7	10/3/86	260	NA	8,000	<5	<5	NA	<5
	4/9/87 ^(m)	-	-	-	-	-	-	-
	9/16/87	NA	790,000	NA	NA	NA	NA	NA
	12/1/87	NA	5,300	NA	NA	NA	NA	NA
	3/9/88	NA	BDL	NA	NA	NA	NA	NA
	6/9/88	NA	12,000	NA	NA	NA	NA	NA
	9/14/88	NA	67,000	NA	NA	NA	NA	NA
	9/16/97	850	26,000	11,000	<0.5	<0.5	<0.5	<0.5
	11/2/98 ^(m)	EP	-	-	-	-	-	-
MW-8	10/23/86	1,300	NA	14,000	<0.2	<0.2	NA	<1
	4/9/87	73	NA	NA	BDL	BDL	NA	BDL
	9/16/87 ^(m)	-	-	-	-	-	-	-
	12/1/87	NA	630	NA	NA	NA	NA	NA
	3/9/88	NA	2,600	NA	NA	NA	NA	NA
	6/9/88	NA	1,700	NA	NA	NA	NA	NA
	9/14/88	NA	150	NA	NA	NA	NA	NA
	8/12/97 ^(m)	-	-	-	-	-	-	-
	9/16/97	<50	290	<300	<0.5	<0.5	<0.5	<0.5
	11/2/98	<50	1,300	NA	<0.5	<0.5	<0.5	<0.5
MW-9	4/9/87 ^(m)	-	-	-	-	-	-	-
	9/16/87	NA	1,300	NA	NA	NA	NA	NA
	12/1/87	NA	18,000	NA	NA	NA	NA	NA
	3/9/88	NA	47,000	NA	NA	NA	NA	NA
	6/8/88 ^(m)	-	-	-	-	-	-	-
	9/14/88 ^(m)	-	-	-	-	-	-	-
	9/16/97	6,000	19,000	9,000	<13	<13	<13	18
	11/2/98 ^(m)	EP	-	-	-	-	-	-
MW-10	10/23/86	380	NA	7,200	<0.2	<0.2	NA	<0.2
	4/9/87	300	NA	NA	BDL	BDL	NA	BDL
	9/16/87	NA	3,800	NA	NA	NA	NA	NA
	12/1/87	NA	590	NA	NA	NA	NA	NA
	3/8/88	NA	BDL	NA	NA	NA	NA	NA
	6/8/88	NA	3,800	NA	NA	NA	NA	NA
	9/14/88	NA	570	NA	NA	NA	NA	NA

TABLE 2

Summary of Groundwater Analytical Results
Owens-Brockway, Oakland, California
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Well Number	Date Sampled	TPPH ^(a) (µg/l) ^(h)	TEPH ^(b) (µg/l)	O&G ^(c) (µg/l)	B ^(d) (µg/l)	T ^(e) (µg/l)	E ^(f) (µg/l)	X ^(g) (µg/l)
MW-10 (cont'd)	9/16/97	<50	1,300	<300	<0.5	<0.5	<0.5	<0.5
	11/2/98	<50	1,400	NA	<0.5	<0.5	<0.5	<0.5
MW-11	12/5/86	<8	NA	1,200	<0.4	<0.4	NA	1.4
	4/9/87	BDL	NA	NA	BDL	BDL	NA	BDL
	9/16/87	BDL	NA	NA	BDL	BDL	NA	BDL
	12/1/87	BDL	NA	NA	0.8	BDL	NA	10
	3/7/88	BDL	BDL	NA	BDL	BDL	NA	BDL
	6/8/88	BDL	BDL	NA	BDL	BDL	NA	BDL
	9/14/88	BDL	100	NA	BDL	BDL	NA	BDL
MW-12	12/5/86	100	NA	2,500	0.49	1	NA	1.3
	4/9/87	BDL	NA	NA	BDL	BDL	NA	BDL
	9/16/87	BDL	NA	NA	BDL	BDL	NA	BDL
	12/1/87	BDL	NA	NA	BDL	BDL	NA	13
	3/7/88	BDL	BDL	NA	BDL	BDL	NA	BDL
	6/8/88	BDL	BDL	NA	BDL	BDL	NA	BDL
	9/14/88	BDL	120	NA	BDL	BDL	NA	BDL
MW-13	12/24/86	<10	NA	57,000	<0.2	<0.9	NA	<0.9
	4/9/87	BDL	NA	NA	BDL	BDL	NA	BDL
	9/16/87	BDL	NA	NA	BDL	BDL	NA	BDL
	12/1/87	BDL	NA	NA	1.6	BDL	NA	12
	3/8/88	7.7	BDL	NA	BDL	BDL	NA	BDL
	6/8/88	BDL	BDL	NA	BDL	BDL	NA	BDL
	9/14/88	BDL	130	NA	BDL	BDL	NA	BDL
	9/16/97	<50	120	<300	<0.5	<0.5	<0.5	<0.5
11/2/98	<50	120	NA	<0.5	<0.5	<0.5	<0.5	
MW-14	12/5/86 ^(o)	<8	NA	3,200	<0.4	<0.2	NA	<0.2
	4/9/87	BDL	NA	NA	BDL	BDL	NA	BDL
	9/16/87	1.7	56	NA	BDL	BDL	NA	BDL
	12/1/87	BDL	66	NA	1.2	4	NA	10
	3/7/88	20	BDL	NA	BDL	BDL	NA	BDL
	6/8/88 ^(l)	-	-	-	-	-	-	-
	9/14/88 ^(l)	-	-	-	-	-	-	-
MW-15	12/24/86	120	NA	1,600	<0.2	<0.9	NA	9.2
	4/9/87	BDL	NA	NA	BDL	BDL	NA	BDL
	9/16/87	8.4	BDL	NA	BDL	BDL	NA	BDL
	12/1/87	BDL	NA	NA	3.3	0.84	NA	14
	3/8/88	90	BDL	NA	0.8	BDL	NA	BDL
	6/9/88	53	BDL	NA	BDL	BDL	NA	BDL
	9/14/88	NA	100	NA	NA	NA	NA	NA
	9/16/97	<50	890	380	<0.5	<0.5	<0.5	<0.5
11/2/98	<50	340	NA	<0.5	<0.5	<0.5	<0.5	

TABLE 2

Summary of Groundwater Analytical Results
Owens-Brockway, Oakland, California
K/J 950007.20

Page 4 of 4

Well Number	Date Sampled	TPPH ^(a) (µg/l) ^(h)	TEPH ^(b) (µg/l)	O&G ^(c) (µg/l)	B ^(d) (µg/l)	T ^(e) (µg/l)	E ^(f) (µg/l)	X ^(g) (µg/l)
MW-16	12/24/86	<10	NA	1,200	<0.2	<0.9	NA	<0.9
	4/9/87	BDL	NA	NA	BDL	BDL	NA	BDL
	9/16/87	BDL	64	NA	BDL	BDL	NA	BDL
	12/1/87	120	150	NA	1	0.37	NA	9.1
	3/7/88	10	BDL	NA	0.5	BDL	NA	BDL
	6/8/88	BDL	BDL	NA	BDL	BDL	NA	BDL
	9/14/88	BDL	190	NA	BDL	BDL	NA	BDL
? →	9/16/97 ^(m)	PP	-	-	-	-	-	-
MW-17	12/24/86	240	NA	2,400	5	1.2	NA	14
	4/9/87	BDL	NA	NA	BDL	BDL	NA	BDL
	9/16/87	44	680	NA	BDL	BDL	NA	0.55
	12/1/87	540	1,300	NA	7.8	2.4	NA	28
	3/8/88	4,300	3,800	NA	83	BDL	NA	46
	6/8/88 ^(l)	-	-	-	-	-	-	-
	9/14/88	54,000	64,000	NA	BDL	BDL	NA	BDL
	9/16/97	1,900	110,000	9,600	<0.5	<0.5	<0.5	<0.5
11/2/98	<50	16,000	NA	<0.5	<0.5	<0.5	0.6	
MW-18 ⁽ⁿ⁾	12/24/86	<20	NA	1,600	<0.3	<0.3	NA	0.99
	4/9/87	BDL	NA	NA	BDL	BDL	NA	BDL
	9/16/87	BDL	480	NA	BDL	BDL	NA	BDL
	12/1/87	BDL	18	NA	BDL	BDL	NA	6.6
	3/7/88	BDL	BDL	NA	BDL	BDL	NA	BDL
	6/8/88	BDL	BDL	NA	BDL	BDL	NA	BDL
	9/14/88	BDL	190	NA	BDL	BDL	NA	BDL

Notes:

- (a) TPPH = total purgeable petroleum hydrocarbons using EPA Method 8015 modified
(b) TEPH = total extractable petroleum hydrocarbons using EPA Method 8015 modified
(c) O&G = total oil and grease
(d) B = benzene using EPA Method 8020
(e) T = toluene using EPA Method 8020
(f) E = ethylbenzene using EPA Method 8020
(g) X = total xylenes using EPA Method 8020
(h) (µg/l) = micrograms per liter
(i) < = analyte not present in the sample at or above the indicated detection limit
(j) NA = not analyzed
(k) BDL = below detection limit; actual limit not available for compilation of this table
(l) Not sampled; well inaccessible.
(m) Not sampled; separate-phase petroleum product present.
(n) Well destroyed.

TABLE 3

Summary of Groundwater Depths and Elevations
Owens-Brockway, Oakland, California
K/J 950007.20

Page 1 of 5

Well Number	Date Sampled	Depth to Water ^(a) (feet)	Groundwater Elevation ^(b) (feet)
MW-1	9/23/86	NM	-
	4/9/87	8.98	7.04
	9/16/87	NM	-
	12/1/87	NM	-
	3/7/88	NM	-
	6/8/88	NM	-
	9/14/88	NM	-
	9/16/97	9.35	6.67
	11/2/98	9.16	6.86
MW-2	4/9/87	NM	-
	9/16/87	NM	-
	12/1/87	20.19	-3.08
	3/7/88	NM	-
	6/8/88	NM	-
	9/14/88	NM	-
	8/12/97	15.15	1.96
	8/14/97	12.58	4.53
	8/26/97	11.58	5.53
	9/2/97	11.29	5.82
	9/9/97	11.50	5.61
	9/16/97	11.83	5.28
	11/2/98	12.10	5.01
MW-3 ^(c)	9/23/86	NM	-
	4/9/87	10.53	4.93
	9/16/87	11.44	4.02
	12/1/87	12.73	2.73
	3/7/88	15.22	0.24
	6/9/88	14.78	0.68
	9/14/88	NM	-
MW-4	10/3/86	NM	-
	4/9/87	8.73	7.29
	9/16/87	10.53	5.49
	12/1/87	9.08	6.94
	3/7/88	9.05	6.97
	6/8/88	9.25	6.77
	9/14/88	10.47	5.55
	11/2/98	NM	-
MW-5	10/3/86	NM	-
	4/9/87	12.02	4.17
	9/16/87	11.77	4.42
	12/1/87	11.37	4.82

TABLE 3
Summary of Groundwater Depths and Elevations
 Owens-Brockway, Oakland, California
 K/J 950007.20

Well Number	Date Sampled	Depth to Water ^(a) (feet)	Groundwater Elevation ^(b) (feet)
MW-5 (cont'd)	3/9/88	13.06	3.13
	6/9/88	12.74	3.45
	9/14/88	13.38	2.81
	8/12/97	11.81	4.38
	8/14/97	11.91	4.28
	8/26/97	11.42	4.77
	9/2/97	10.50	5.69
	9/9/97	11.25	4.94
	9/16/97	12.30	3.89
	11/2/98	11.48	4.71
MW-6	4/9/87	13.28	4.20
	9/16/87	13.40	4.08
	12/1/87	13.04	4.44
	3/9/88	15.00	2.48
	6/9/88	14.56	2.92
	9/14/88	14.90	2.58
	8/12/97	13.96	3.52
	8/14/97	13.91	3.57
	8/26/97	13.58	3.90
	9/2/97	8.91	8.57
	9/9/97	10.91	6.57
	9/16/97	11.96	5.52
11/2/98	13.20	4.28	
MW-7	10/3/86	NM	-
	4/9/87	12.13	3.98
	9/16/87	12.29	3.82
	12/1/87	11.24	4.87
	3/9/88	11.85	4.26
	6/9/88	12.46	3.65
	9/14/88	12.97	3.14
	8/12/97	11.91	4.20
	8/14/97	11.83	4.28
	8/26/97	11.00	5.11
	9/2/97	10.83	5.28
	9/9/97	11.58	4.53
	9/16/97	12.15	3.96
11/2/98	12.24	3.87	
MW-8	10/23/86	NM	-
	4/9/87	10.35	6.22
	9/16/87	10.71	5.86
	12/1/87	9.89	6.68

TABLE 3

Summary of Groundwater Depths and Elevations
Owens-Brockway, Oakland, California
K/J 950007.20

Page 3 of 5

Well Number	Date Sampled	Depth to Water ^(a) (feet)	Groundwater Elevation ^(b) (feet)
MW-8 (cont'd)	3/9/88	9.61	6.96
	6/9/88	9.96	6.61
	9/14/88	10.71	5.86
	8/12/97	10.04	6.53
	9/16/97	9.90	6.67
	11/2/98	9.80	6.77
MW-9 ^(d)	4/9/87	NM	-
	9/16/87	NM	-
	12/1/87	6.83	-
	3/9/88	6.44	-
	6/8/88	NM	-
	9/14/88	7.70	-
	8/12/97	6.83	-
	8/14/97	6.46	-
	8/26/97	6.29	-
	9/2/97	6.33	-
	9/9/97	6.58	-
	9/16/97	6.62	-
	11/2/98	6.90	-
MW-10	10/23/86	NM	-
	4/9/87	10.29	5.67
	9/16/87	11.19	4.77
	12/1/87	10.08	5.88
	3/8/88	10.36	5.60
	6/8/88	10.89	5.07
	9/14/88	11.34	4.62
	9/16/97	10.27	5.69
	11/2/98	10.30	5.66
MW-11	12/5/86	-	-
	4/9/87	9.02	4.97
	9/16/87	9.96	4.03
	12/1/87	9.44	4.55
	3/7/88	9.31	4.68
	6/8/88	9.42	4.57
	9/14/88	9.10	4.89
	11/2/98	NM	-
MW-12	12/5/86	NM	-
	4/9/87	6.83	7.00
	9/16/87	7.80	6.03
	12/1/87	7.59	6.24
	3/7/88	7.02	6.81

TABLE 3

Summary of Groundwater Depths and Elevations
Owens-Brockway, Oakland, California
K/J 950007.20

Page 4 of 5

Well Number	Date Sampled	Depth to Water ^(a) (feet)	Groundwater Elevation ^(b) (feet)
MW-12 (cont'd)	6/8/88	7.38	6.45
	9/14/88	8.14	5.69
	11/2/98	NM	-
MW-13	12/24/86	NM	-
	4/9/87	10.79	3.19
	9/16/87	10.98	3.00
	12/1/87	10.21	3.77
	3/8/88	10.51	3.47
	6/8/88	10.85	3.13
	9/14/88	10.93	3.05
	9/16/97	10.55	3.43
	11/2/98	10.98	3.00
	MW-14	12/5/86	NM
4/9/87		7.17	7.61
9/16/87		8.78	6.00
12/1/87		8.26	6.52
3/7/88		7.26	7.52
6/8/88		NM	-
9/14/88		NM	-
11/2/98		NM	-
MW-15	12/24/86	NM	-
	4/9/87	11.88	3.28
	9/16/87	11.77	3.39
	12/1/87	11.25	3.91
	3/8/88	11.24	3.92
	6/9/88	12.15	3.01
	9/14/88	12.34	2.82
	9/16/97	11.92	3.24
	11/2/98	11.60	3.56
MW-16	12/24/86	NM	-
	4/9/87	9.47	4.01
	9/16/87	10.07	3.41
	12/1/87	9.23	4.25
	3/7/88	9.46	4.02
	6/8/88	9.56	3.92
	9/14/88	9.99	3.49
	9/16/97	7.32	6.16
	11/2/98	NM	-

TABLE 3

Summary of Groundwater Depths and Elevations

Owens-Brockway, Oakland, California

K/J 950007.20

Page 5 of 5

Well Number	Date Sampled	Depth to Water ^(a) (feet)	Groundwater Elevation ^(b) (feet)
MW-17	12/24/86	NM	-
	4/9/87	9.95	4.22
	9/16/87	10.59	3.58
	12/1/87	9.87	4.30
	3/8/88	10.10	4.07
	6/8/88	NM	-
	9/14/88	10.58	3.59
	8/12/97	9.54	4.63
	8/14/97	9.58	4.59
	8/26/97	9.25	4.92
	9/2/97	9.50	4.67
	9/9/97	9.58	4.59
	9/16/97	9.74	4.43
11/2/98	9.96	4.21	
MW-18 ^(c)	12/24/86	NM	-
	4/9/87	9.91	4.98
	9/16/87	10.37	4.52
	12/1/87	10.19	4.7
	3/7/88	9.60	5.29
	6/8/88	10.01	4.88
	9/14/88	10.82	4.07

Notes:

- (a) Depth to water measured from the top of the well casing. Not corrected for product thickness.
- (b) Groundwater elevations are reported in feet above mean sea level.
- (c) Well destroyed.
- (d) Casing elevation not measured.
- (e) NM = Not measured

TABLE 4

Groundwater Analytical Results – 27 January 1999 Reconnaissance Samples

Owens-Brockway, Oakland, California
K/J 950007.20

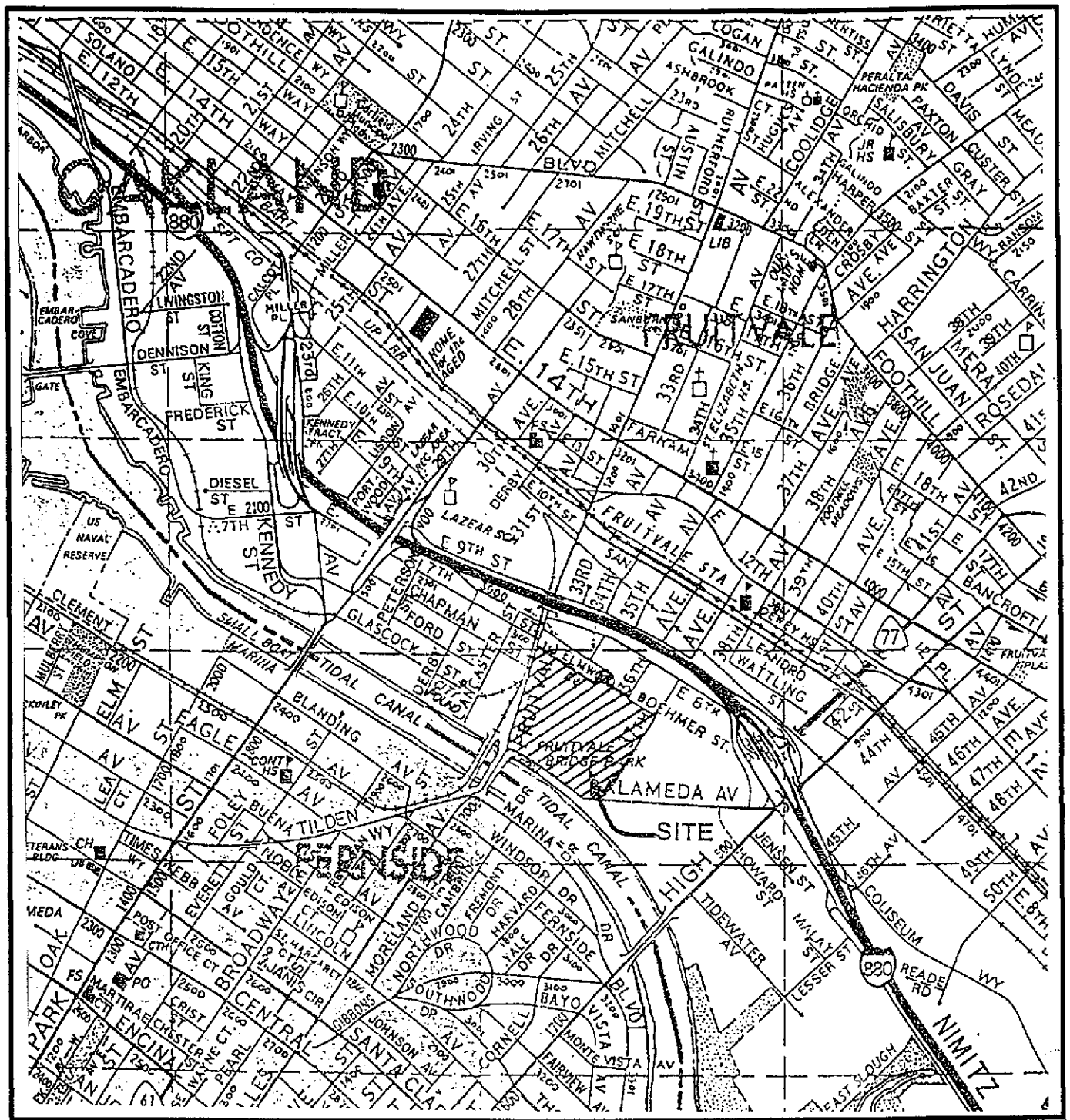
Page 1 of 1

Boring Number	TPPH ^(a) (µg/l) ^(g)	TEPH ^(b) (µg/l)	TEPH (w/ silica gel) (µg/l)	B ^(c) (µg/l)	T ^(d) (µg/l)	E ^(e) (µg/l)	X ^(f) (µg/l)
KB-1	<50 ^(h)	<50	NA ⁽ⁱ⁾	<0.5	<0.5	<0.5	<0.5
KB-2	<50	<50	NA	<0.5	<0.5	<0.5	<0.5
KB-3	110 (160) ^(j)	420 (490)	<50 (NA)	1.4 (1.5)	<0.5 (1.1)	<0.5 (<0.5)	3.3 (2.9)
KB-4	590	360	<50	<0.5	<0.5	<0.5	<0.5
KB-5	1,500	1,400	730	<0.5	<0.5	<0.5	0.88

Notes:

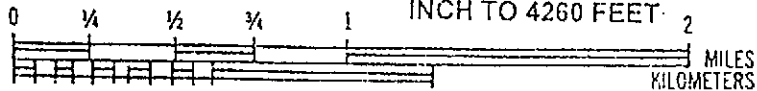
- (a) TPPH = total purgeable petroleum hydrocarbons using EPA Method 8015 modified
 (b) TEPH = total extractable petroleum hydrocarbons using EPA Method 8015 modified. The laboratory identified the TEPHs as within the quantification range (C6-C10) for stoddard solvent. The chromatographic pattern was not typical of fuel. This is likely due to weathering effects.
 (c) B = benzene using EPA Method 8020
 (d) T = toluene using EPA Method 8020
 (e) E = ethylbenzene using EPA Method 8020
 (f) X = total xylenes using EPA Method 8020
 (g) (µg/l) = micrograms per liter
 (h) < = analyte not present in the sample at or above the indicated detection limit
 (i) NA = Not analyzed
 (j) Duplicate sample results indicated in parentheses.

FIGURES

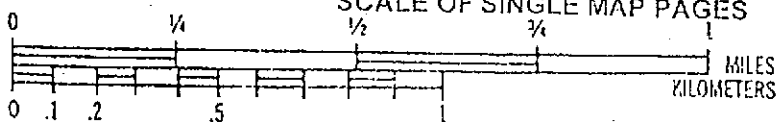


SCALE OF MULTIPLE MAP PAGES

INCH TO 4260 FEET



SCALE OF SINGLE MAP PAGES



SOURCE

The Thomas Guide: San Francisco, Alameda, and Contra Costa Counties Street Guide and Directory, Thomas Bros. Maps, 1991.

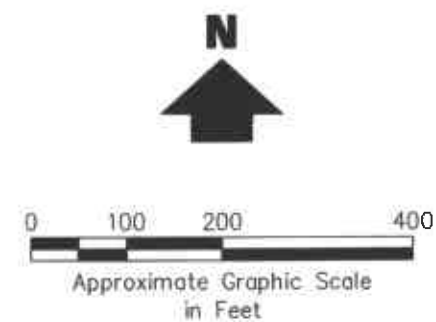
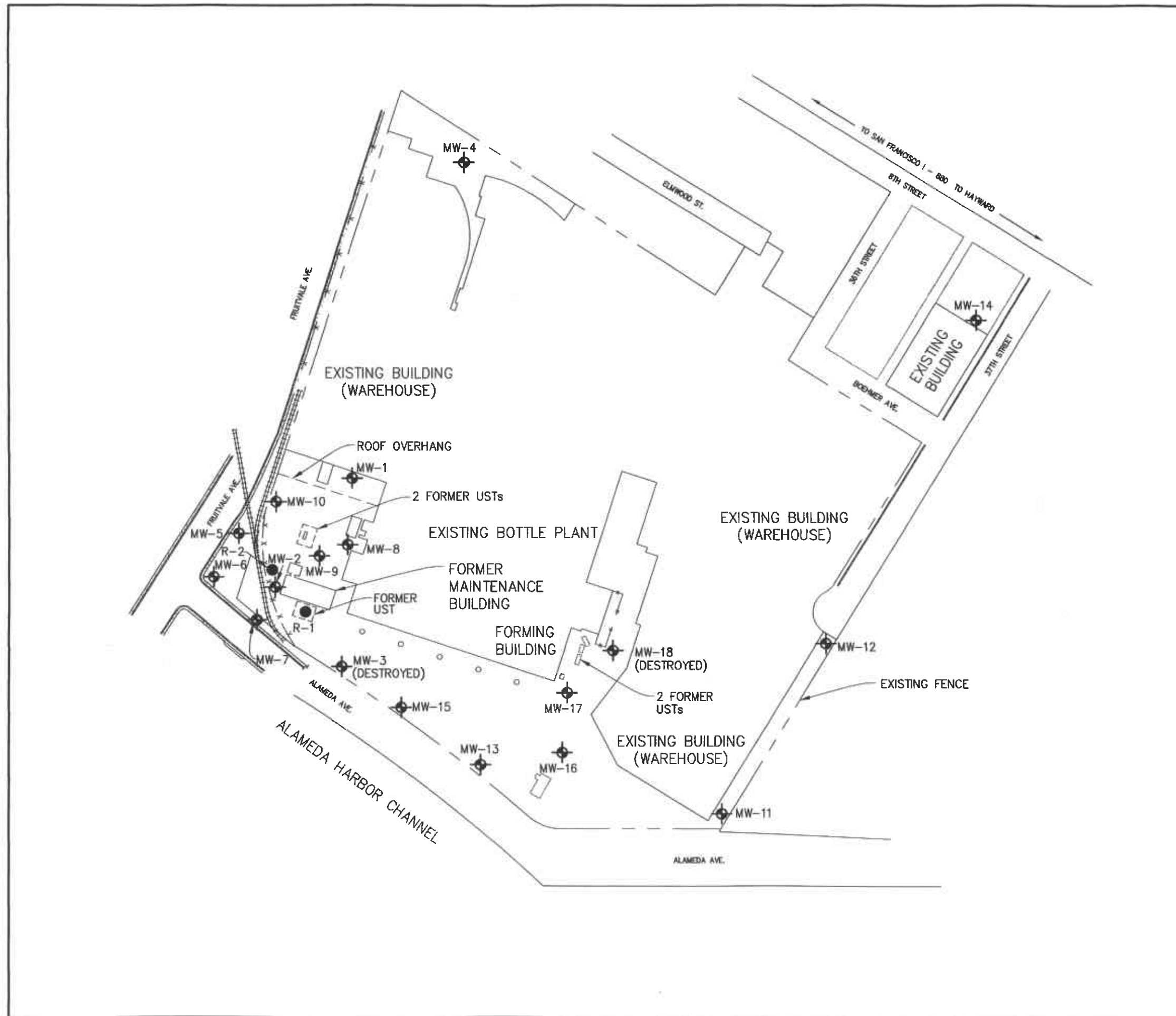
Kennedy/Jenks Consultants

Owens Brockway
Oakland, California

Site Location

K/J 950007.20
March 1999

Figure 1



LEGEND

- ⊕ MW-2 GROUNDWATER MONITORING WELL
- R-1 PRODUCT RECOVERY WELL

SOURCE

Site Plan for Soil and Groundwater Investigation, Exceltech, February 1987.

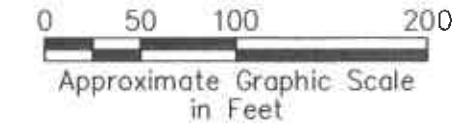
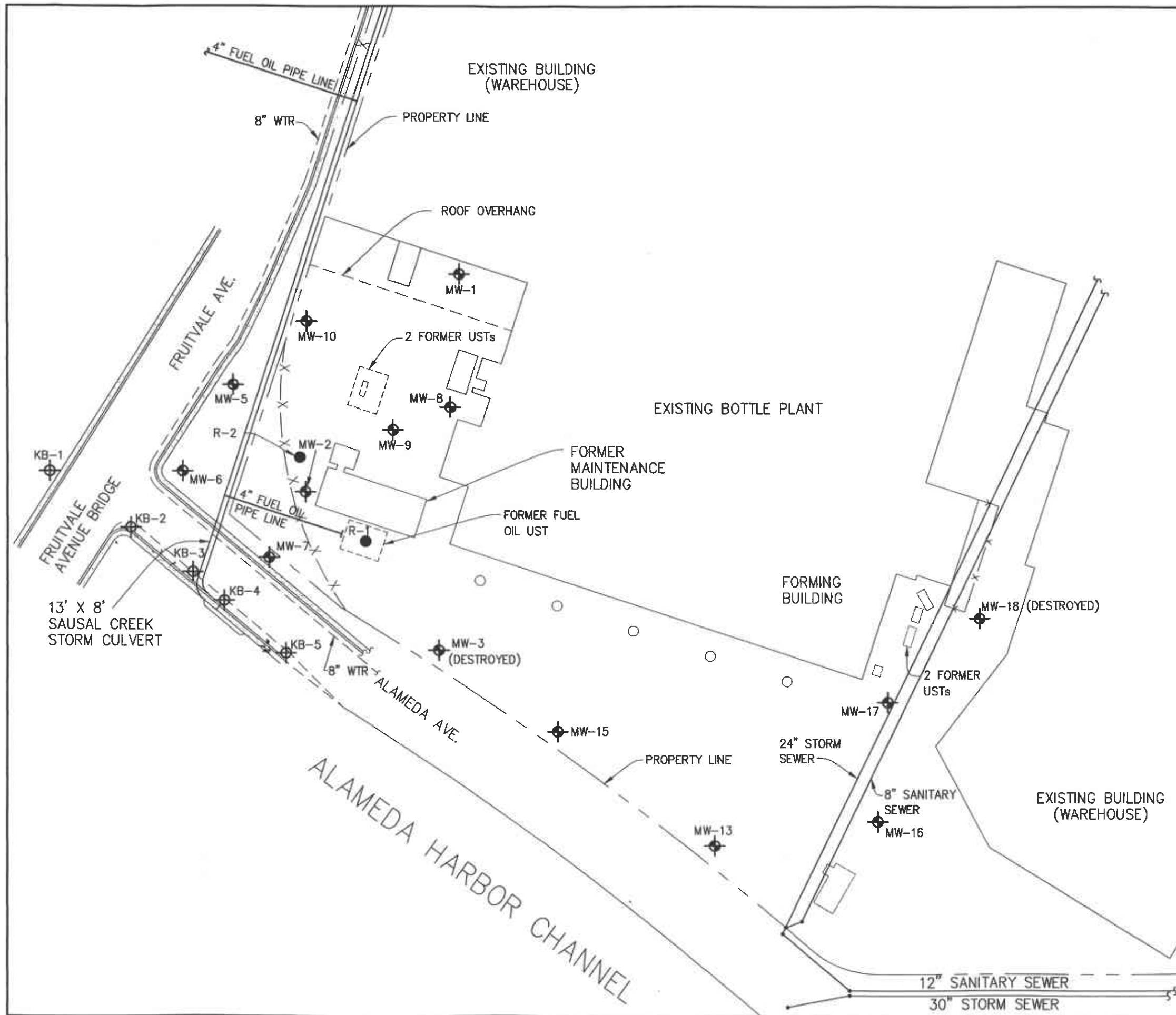
Kennedy/Jenks Consultants

Owens Brockway
Oakland, California

Site Plan

K/J 950007.20
March 1999

Figure 2



LEGEND

- ⊕ MW-2 GROUNDWATER MONITORING WELL
- R-1 PRODUCT RECOVERY WELL
- ⊕ KB-1 SOIL BORING - JANUARY 1999

SOURCE

Site Plan for Soil and Groundwater Investigation, Exceltech, February 1987.

Kennedy/Jenks Consultants
Owens Brockway
Oakland, California

Soil Boring Locations

K/J 950007.20
March 1999

Figure 3

APPENDIX A

BORING LOGS

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION Fruitvale Avenue, Oakland, CA		Boring/Well Name KB-1	
DRILLING COMPANY Precision Sampling, Inc.		DRILLER S. Navarro	
DRILLING METHOD(S) Percussion - XD-1 (Direct Push)		DRILL BIT(S) SIZE 3.5 inch	
ISOLATION CASING n/a		FROM n/a TO n/a FT.	
BLANK CASING 1-in. PVC (temporary)		FROM 0 TO 18 FT.	
SLOTTED CASING 1-in. PVC 0.010-in. (temporary)		FROM 18 TO 28 FT.	
SIZE AND TYPE OF FILTER PACK n/a		FROM n/a TO n/a FT.	
SEAL n/a		FROM n/a TO n/a FT.	
GROUT Bentonite Cement		FROM 0 TO 28 FT.	
ELEVATION AND DATUM n/a		TOTAL DEPTH 28 ft. BGS	
DATE STARTED 1/27/99		DATE COMPLETED 1/27/99	
STATIC WATER ELEVATION 16.25 ft. BGS (1/27/99)		LOGGED BY M. McLeod	
SAMPLING METHODS Continuous		WELL COMPLETION <input type="checkbox"/> SURFACE HOUSING <input type="checkbox"/> STAND PIPE _____ FT.	

SAMPLES			Drill Depth (Feet)	WELL CONSTRUCTION	USCS Log	Lithology	Color	SAMPLE DESCRIPTION and DRILLING REMARKS
Type & No.	Recovery (Feet)	Penetr. Resist. Blows/6"						
								0 - 1 FT. ASPHALT AND BASE ROCK, NOT SAMPLED
	2.0			OVM = 0 PPM	ML	10YR 5/4-5/6		SANDY SILT WITH GRAVEL (ML) YELLOWISH BROWN, 5-10% GRAVEL, ~25%-40% FINE-GRAINED SAND TO COARSE-GRAINED SAND, UP TO ~60% SILT, DENSE, DRY, NO ODOR, NO STAINS
	1.0		5					
	2.0			OVM = 0 PPM	CL	10YR 2/1		CLAY (CL) BLACK OVERALL, SCATTERED COARSE-GRAINED SAND, MEDIUM STIFF TO STIFF (PP = 2.0 TSF), MEDIUM PLASTICITY, DRY, NO ODOR, NO STAINS
			10					
	3.0			OVM = 0 PPM	CL	2.5Y 6/3-6/4		GRADES TO CLAY TO SILTY CLAY (CL) LIGHT YELLOWISH BROWN OVERALL, SOFT (PP = 1 TSF), MEDIUM TO LOW PLASTICITY, DRY TO MOIST, NO ODOR, NO STAINS
			15					
	3.0							15 FT. COLOR GRADES TO MOTTLED LIGHT YELLOWISH BROWN AND WHITE
						2.5Y 6/3		
						10YR 8/1		

Project Name		Owens Brockway		Project Number		950007.20		Boring/Well Name		KB-1	
SAMPLES			Drill Depth (Feet)	WELL CONSTRUCTION		USCS Log	Lithology	Color	SAMPLE DESCRIPTION and DRILLING REMARKS		
Type & No.	Recovery (Feet)	Penetr. Resist. Blows/6"									
	3.0					CL					
					OVM = 0 PPM			5Y 6/2			GRADES TO CLAYEY SAND (SC) LIGHT OLIVE GRAY, ~60% FINE-GRAINED SAND, ~40% SILT AND CLAY, VERY STIFF (PP = 4.5 TSF), LOW PLASTICITY, MOIST TO WET, NO ODOR, NO STAINS
	1.5		20			SC					
					OVM = 0 PPM			2.5Y 6/3			SAND WITH SILT (SM) LIGHT YELLOWISH BROWN OVERALL, ~90% FINE-GRAINED SAND, ~10% SILT, MOIST TO WET, NO ODOR, NO STAINS
	2.0					SM					22 - 25 FT. DARK YELLOWISH BROWN (10YR 4/6) STREAKING; SCATTERED THIN LAYERS OF POORLY GRADED SAND (SP)
			25								
	3.0					CL		10YR 5/4			CLAY (CL) MOTTLED YELLOWISH BROWN AND LIGHT GRAY, SOFT TO MEDIUM STIFF (PP = 1-1.5 TSF), MEDIUM PLASTICITY, MOIST
								10YR 7/2			

28 FT. TERMINATE BORING. INSTALL TEMPORARY 1-INCH PVC CASING WITH 0.010-INCH SLOTTED SCREEN FROM 18 TO 28 FT. AND COLLECT RECONNAISSANCE GROUNDWATER SAMPLE ON 1/27/99.

NOTES

1. ALL CONTACTS ARE APPROXIMATE
2. VERTICAL SCALE IS 1-INCH = 2.5 FEET
3. SOIL CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, ASTM D-2488-93
4. COLOR DESIGNATION IN ACCORDANCE WITH THE MUNSELL SOIL COLOR CHARTS (KOLLMORGEN INSTRUMENTS CORPORATION, 1990)
5. BGS = BELOW GROUND SURFACE
6. OVM = ORGANIC VAPOR METER; READINGS OF HEADSPACE OBTAINED FROM SOIL PLACED IN AIRTIGHT PLASTIC BAG
7. PPM = PARTS PER MILLION
8. PP = POCKET PENETROMETER; TSF=TONS PER SQUARE FOOT
9. FIRST ENCOUNTERED WATER DEPTH: APPROXIMATELY 18 FEET BGS
10. FINAL GROUNDWATER DEPTH: 16.25 FEET BGS

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION Alameda Avenue at Fruitvale Ave., Oakland, CA		Boring/Well Name KB-2	
DRILLING COMPANY Precision Sampling, Inc.		DRILLER S. Novarro	
DRILLING METHOD(S) Percussion - XD-1 (Direct Push)		Project Name Owens Brockway	
ISOLATION CASING n/a		Project Number 950007.20	
BLANK CASING 1-in. PVC (temporary)		ELEVATION AND DATUM n/a	
SLOTTED CASING 1-in. PVC 0.010-in. (temporary)		TOTAL DEPTH 19 ft. BGS	
SIZE AND TYPE OF FILTER PACK n/a		DATE STARTED 1/26/99	
SEAL n/a		DATE COMPLETED 1/26/99	
GROUT Bentonite Cement		STATIC WATER ELEVATION 15.4 ft. BGS (1/27/99)	
		LOGGED BY M. McLeod	
		SAMPLING METHODS Continuous	
		WELL COMPLETION <input type="checkbox"/> SURFACE HOUSING <input type="checkbox"/> STAND PIPE _____ FT.	

SAMPLES			Drill Depth (Feet)	WELL CONSTRUCTION	USCS Log	Lithology	Color	SAMPLE DESCRIPTION and DRILLING REMARKS
Type & No.	Recovery (Feet)	Penetr. Resist. Blows/6"						
								0 - 1 FT. ASPHALT AND BASE ROCK, NOT SAMPLED
	2.4							SANDY SILT WITH GRAVEL (ML) DARK BROWN OVERALL WITH MULTICOLORED GRAINS, 5-10% GRAVEL, ~15% COARSE-GRAINED SAND, UP TO ~85% SILT, VERY DENSE, MOIST, NO ODOR, NO STAINS 7.5YR 4/4
	0.5		5		ML		5 FT. SHORT RUN DUE TO BLOCKAGE OF TUBE	
	1.0							7 - 10 FT. NOTE LOW RECOVERY
	1.0							CLAYEY SILT TO SILT (ML) MOTTLED BLACK AND PALE YELLOW WITH WHITE SPECKS, VERY STIFF, LOW PLASTICITY, DRY, NO ODOR, NO STAINS 2.5Y 7/3-2/0 5Y 8/2
	3.0			OVM = 0 PPM				SCATTERED FINE WOOD (?) FRAGMENTS, SCATTERED WHITE ZONES (0.1 FT. DIAMETER) 11 FT. COLOR GRADES TO LIGHT GRAY OVERALL 2.5Y 7/2
	3.0			OVM = 0 PPM				GRADES TO CLAY TO SANDY CLAY (CL) LIGHT GRAY OVERALL, SOFT TO MEDIUM STIFF (PP = 1.5 TSF), MEDIUM PLASTICITY, NO ODOR, NO STAINS 2.5Y 7/2
			15	OVM = 0 PPM				GRADES TO SAND WITH SILT (SM) LIGHT 2.5Y 6/4

Project Name			Owens Brockway			Project Number			950007.20			Boring/Well Name			KB-2		
SAMPLES			Drill Depth (Feet)	WELL CONSTRUCTION			USCS Log	Lithology	Color	SAMPLE DESCRIPTION and DRILLING REMARKS							
Type & No.	Recovery (Feet)	Penetr. Resist. Blows/B*															
	2.5						SM		2.5Y 6/4	YELLOWISH BROWN OVERALL, ~90% FINE-GRAINED SAND, ~10% SILT, LOOSE, NO PLASTICITY, WET, NO ODOR, NO STAINS							
<p>19.0 FT. TERMINATE BORING. INSTALL TEMPORARY 1-INCH PVC CASING WITH 0.010-INCH SLOTTED SCREEN FROM 14 TO 19 FT. AND COLLECT RECONNAISSANCE GROUNDWATER SAMPLE. SAMPLE COLLECTED AND BORING GROUTED 1/27/99.</p> <p>NOTES</p> <ol style="list-style-type: none"> 1. ALL CONTACTS ARE APPROXIMATE 2. VERTICAL SCALE IS 1-INCH = 2.5 FEET 3. SOIL CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, ASTM D-2488-93 4. COLOR DESIGNATION IN ACCORDANCE WITH THE MUNSELL SOIL COLOR CHARTS (KOLLMORGEN INSTRUMENTS CORPORATION, 1990) 5. BGS = BELOW GROUND SURFACE 6. OVM = ORGANIC VAPOR METER; READINGS OF HEADSPACE OBTAINED FROM SOIL PLACED IN AIRTIGHT PLASTIC BAG 7. PPM = PARTS PER MILLION 8. PP = POCKET PENETROMETER; TSF=TONS PER SQUARE FOOT 9. FIRST ENCOUNTERED WATER DEPTH: APPROXIMATELY 17 FEET BGS 10. FINAL GROUNDWATER DEPTH: 15.4 FEET BGS (1/27/99) 																	

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION Alameda Avenue - North side of Sausal Creek, Oakland, CA		Boring/Well Name KB-3	
DRILLING COMPANY Precision Sampling, Inc.		DRILLER S. Navarro	
DRILLING METHOD(S) Percussion - XD-1 (Direct Push)		Project Name Owens Brockway	
ISOLATION CASING n/a		Project Number 950007.20	
BLANK CASING 1-in. PVC (temporary)		FROM n/a TO n/a FT.	ELEVATION AND DATUM n/a
SLOTTED CASING 1-in. PVC 0.010-in. (temporary)		FROM 0 TO 14 FT.	TOTAL DEPTH 19 ft. BGS
SIZE AND TYPE OF FILTER PACK n/a		FROM 14 TO 19 FT.	DATE STARTED 1/26/99
SEAL n/a		FROM n/a TO n/a FT.	DATE COMPLETED 1/26/99
GROUT Bentonite Cement		FROM 0 TO 28 FT.	STATIC WATER ELEVATION Appx. 12 ft. BGS (1/27/99)
			LOGGED BY M. McLeod
			SAMPLING METHODS Continuous
			WELL COMPLETION <input type="checkbox"/> SURFACE HOUSING <input type="checkbox"/> STAND PIPE _____ FT.

SAMPLES			Drill Depth (Feet)	WELL CONSTRUCTION	USCS Log	Lithology	Color	SAMPLE DESCRIPTION and DRILLING REMARKS
Type & No.	Recovery (Feet)	Penetr. Resist. Blows/6"						
								0 - 1 FT. ASPHALT AND BASE ROCK, NOT SAMPLED
	1.0			OVM = 0 PPM	CL	7.5YR 4/6		SANDY CLAY WITH GRAVEL (CL) STRONG BROWN OVERALL, 5-10% ANGULAR GRAVEL, ~25-30% COARSE-GRAINED SAND, ~60-70% CLAY, VERY STIFF, DRY, NO ODOR, NO STAINS
	2.0		5		ML	10YR 4/3		SANDY SILT (ML) BROWN OVERALL, 5-10% SCATTERED COARSE-GRAINED SAND, ~20% FINE-GRAINED SAND, ~80% SILT, DRY, NO ODOR, NO STAINS
	2.0					10YR 5/4		7 FT. COLOR GRADES TO YELLOWISH BROWN, TRACE SCATTERED GRAVEL, DENSITY DECREASES
	2.1		10			2.5Y 7/3		9.5 FT. COLOR GRADES TO PALE YELLOW
					CL	2.5Y 7/4		SILTY CLAY TO CLAY (CL) PALE YELLOW OVERALL WITH SCATTERED, FINE BLACK AND WHITE ZONES, VERY STIFF (PP > 4.5 TSF), LOW TO MEDIUM PLASTICITY, NO ODOR, NO STAINS
	2.5		15		CL	5Y 7/2-8/2		GRADES TO SANDY CLAY (CL) MOTTLED LIGHT GRAY AND WHITE, MEDIUM STIFF (PP ≈ 1.5 TSF), MEDIUM PLASTICITY, NO ODOR, NO STAINS
					SM	5GY 5/1		SAND TO SILTY SAND (SM) GREENISH GRAY TO 18 FT. ~75% FINE-GRAINED SAND, ~25% SILT, LOW DENSITY, NO PLASTICITY, MOIST, SLIGHT

Project Name			Owens Brockway			Project Number			950007.20			Boring/Well Name			KB-3		
SAMPLES			Drill Depth (Feet)	WELL CONSTRUCTION			USCS Log	Lithology	Color	SAMPLE DESCRIPTION and DRILLING REMARKS							
Type & No.	Recovery (Feet)	Penetr. Resist. Blows/ft															
	2.5						SM	5GY 5/1 10YR 5/4 10YR 7/1 10YR 2/2	HYDROCARBON ODOR AT 18 FT. 18 FT. COLOR CHANGES TO MOTTLED YELLOWISH BROWN, LIGHT GRAY, AND VERY DARK BROWN								
<p>19.0 FT. TERMINATE BORING. INSTALL TEMPORARY 1-INCH PVC CASING WITH 0.010-INCH SLOTTED SCREEN FROM 14 TO 19 FT. AND COLLECT RECONNAISSANCE GROUNDWATER SAMPLE. SAMPLE COLLECTED AND BORING GROUTED 1/27/99.</p> <p>NOTES</p> <ol style="list-style-type: none"> 1. ALL CONTACTS ARE APPROXIMATE 2. VERTICAL SCALE IS 1-INCH = 2.5 FEET 3. SOIL CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, ASTM D-2488-93 4. COLOR DESIGNATION IN ACCORDANCE WITH THE MUNSELL SOIL COLOR CHARTS (KOLLMORGEN INSTRUMENTS CORPORATION, 1990) 5. BGS = BELOW GROUND SURFACE 6. OVM = ORGANIC VAPOR METER; READINGS OF HEADSPACE OBTAINED FROM SOIL PLACED IN AIRTIGHT PLASTIC BAG 7. PPM = PARTS PER MILLION 8. PP = POCKET PENETROMETER; TSF=TONS PER SQUARE FOOT 9. FIRST ENCOUNTERED WATER DEPTH: APPROXIMATELY 17 FEET BGS 10. FINAL GROUNDWATER DEPTH: APPROXIMATELY 12 FEET BGS (1/27/99) 																	

BORING LOCATION Alameda Avenue - South side of Sausal Creek, Oakland, CA		Boring/Well Name KB-4	
DRILLING COMPANY Precision Sampling, Inc.		DRILLER S. Navarro	
DRILLING METHOD(S) Percussion - XD-1 (Direct Push)		DRILL BIT(S) SIZE 3.5 inch	
ISOLATION CASING n/a		FROM n/a TO n/a FT.	
BLANK CASING 1-in. PVC (temporary)		FROM 0 TO 14 FT.	
SLOTTED CASING 1-in. PVC 0.010-in. (temporary)		FROM 14 TO 19 FT.	
SIZE AND TYPE OF FILTER PACK n/a		FROM n/a TO n/a FT.	
SEAL n/a		FROM n/a TO n/a FT.	
GROUT Bentonite Cement		FROM 0 TO 28 FT.	
		ELEVATION AND DATUM n/a	TOTAL DEPTH 19 ft. BGS
		DATE STARTED 1/26/99	DATE COMPLETED 1/26/99
		STATIC WATER ELEVATION 12.16 ft. BGS (1/27/99)	
		LOGGED BY M. McLeod	
		SAMPLING METHODS Continuous	WELL COMPLETION <input type="checkbox"/> SURFACE HOUSING <input type="checkbox"/> STAND PIPE _____ FT.

SAMPLES			Drill Depth (Feet)	WELL CONSTRUCTION	USCS Log	Lithology	Color	SAMPLE DESCRIPTION and DRILLING REMARKS
Type & No.	Recovery (Feet)	Penetr. Resist. Blows/8"						
								0 - 1 FT. ASPHALT AND BASE ROCK, NOT SAMPLED
	2.0				SW	7.5YR 5/4 10YR 5/3		WELL GRADED SILTY SAND (SW) BROWN OVERALL, 5-10% GRAVEL, ~50% MEDIUM-GRAINED SAND, ~40% SILT, DENSE, DRY, NO ODOR, NO STAINS
			5		CL	2.5Y N2/0		GRADES TO CLAY (CL) BLACK, VERY STIFF (PP = 4.5 TSF), MEDIUM PLASTICITY, DRY, NO ODOR, NO STAINS, ABUNDANT ROOTS, TRACE SCATTERED COARSE-GRAINED SAND
	3.0							
					ML	10YR 7/2 10YR 6/6		SILT TO SANDY SILT (ML) LIGHT GRAY TO BROWNISH YELLOW WITH SCATTERED DARK BROWN (7.5YR 3/2) SPECKS, ~10-15% FINE-GRAINED SAND, ~85% SILT, LOW DENSITY, NO PLASTICITY, DRY, NO ODOR, NO STAINS
			10					
	2.5							
					CL	2.5Y 7/2		CLAY (CL) LIGHT GRAY OVERALL, VERY STIFF TO STIFF (PP = 3.5 TSF), LOW PLASTICITY, NO ODOR TO 12.8
	3.0							12.8 FT. SHARP COLOR CHANGE TO DARK GREENISH GRAY, STRONG HYDROCARBON ODOR
					SC	5G 4/1		CLAYEY SAND (SC) DARK GREENISH GRAY, ~50-60% FINE-GRAINED SAND, MEDIUM PLASTICITY, MOIST, STRONG HYDROCARBON ODOR
	2.6							
			15		SM	10YR 5/6		GRADES TO SILTY SAND (SM) YELLOWISH BROWN OVERALL, ~70%-80% FINE-GRAINED SAND, ~20-30%

Project Name			Owens Brockway			Project Number			950007.20			Boring/Well Name			KB-4		
SAMPLES			Drill Depth (Feet)	WELL CONSTRUCTION			USCS Log	Lithology	Color	SAMPLE DESCRIPTION and DRILLING REMARKS							
Type & No.	Recovery (Feet)	Penetr. Resisi. Blows/6"															
	2.5						SM		10YR 5/6	SILT, NO PLASTICITY, NO ODOR, NO STAINS, WET							
							CL		10YR 7/2-5/6	CLAY (CL) MOTTLED LIGHT GRAY AND YELLOWISH BROWN, MEDIUM STIFF (PP = 1.5 TSF), MEDIUM PLASTICITY, NO ODOR, NO STAINS							
<p>19.0 FT. TERMINATE BORING. INSTALL TEMPORARY 1-INCH PVC CASING WITH 0.010-INCH SLOTTED SCREEN FROM 14 TO 19 FT. AND COLLECT RECONNAISSANCE GROUNDWATER SAMPLE. SAMPLE COLLECTED AND BORING GROUTED 1/27/99.</p> <p>NOTES</p> <ol style="list-style-type: none"> 1. ALL CONTACTS ARE APPROXIMATE 2. VERTICAL SCALE IS 1-INCH = 2.5 FEET 3. SOIL CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, ASTM D-2488-93 4. COLOR DESIGNATION IN ACCORDANCE WITH THE MUNSELL SOIL COLOR CHARTS (KOLLMORGEN INSTRUMENTS CORPORATION, 1990) 5. BGS = BELOW GROUND SURFACE 6. OVM = ORGANIC VAPOR METER; READINGS OF HEADSPACE OBTAINED FROM SOIL PLACED IN AIRTIGHT PLASTIC BAG 7. PPM = PARTS PER MILLION 8. PP = POCKET PENETROMETER; TSF=TONS PER SQUARE FOOT 9. FIRST ENCOUNTERED WATER DEPTH: APPROXIMATELY 116.5 FEET BGS 10. FINAL GROUNDWATER DEPTH: 12.15 FEET BGS (1/27/99) 																	

BORING LOCATION Alameda Avenue, Oakland, CA		Boring/Well Name KB-5	
DRILLING COMPANY Precision Sampling, Inc.		DRILLER S. Novarro	
DRILLING METHOD(S) Percussion - XD-1 (Direct Push)		DRILL BIT(S) SIZE 3.5 inch	
ISOLATION CASING n/a		FROM n/a TO n/a FT.	
BLANK CASING 1-in. PVC (temporary)		FROM 0 TO 14 FT.	
SLOTTED CASING 1-in. PVC 0.010-in. (temporary)		FROM 14 TO 19 FT.	
SIZE AND TYPE OF FILTER PACK n/a		FROM n/a TO n/a FT.	
SEAL n/a		FROM n/a TO n/a FT.	
GROUT Bentonite Cement		FROM 0 TO 28 FT.	
		ELEVATION AND DATUM n/a	
		TOTAL DEPTH 19 ft. BGS	
		DATE STARTED 1/26/99	
		DATE COMPLETED 1/26/99	
		STATIC WATER ELEVATION 12.3 ft. BGS (1/27/99)	
		LOGGED BY M. McLeod	
		SAMPLING METHODS Continuous	
		WELL COMPLETION <input type="checkbox"/> SURFACE HOUSING <input type="checkbox"/> STAND PIPE _____ FT.	

SAMPLES			Drill Depth (Feet)	WELL CONSTRUCTION	USCS Log	Lithology	Color	SAMPLE DESCRIPTION and DRILLING REMARKS
Type & No.	Recovery (Feet)	Penetr. Resist. Blows/6"						
								0 - 1 FT. ASPHALT AND BASE ROCK, NOT SAMPLED
	2.0				ML	10YR 4/4		SANDY SILT WITH GRAVEL (ML) DARK YELLOWISH BROWN OVERALL, ~15% GRAVEL ~5% COARSE-GRAINED SAND, ~25% FINE-GRAINED SAND, ~55% SILT, DENSE, NO PLASTICITY, NO ODOR, NO STAINS
	2.5		5		CL	2.5Y N2/0		CLAY (CL) BLACK, VERY STIFF (PP = 3.5 TSF) LOW TO MEDIUM PLASTICITY, DRY, NO ODOR, SCATTERED ROOTS
	2.2				CL	2.5Y N2/0		CLAY TO SILTY CLAY (CL) LIGHT YELLOWISH BROWN OVERALL WITH WHITE, BLACK, AND YELLOWISH BROWN SPECKS, MEDIUM STIFF (PP = 2.0 TSF), MEDIUM TO LOW PLASTICITY, DRY, NO ODOR, NO STAINS 8 FT. STIFFNESS DECREASES TO PP = 1.5 TSF, PLASTICITY DECREASES TO LOW
	3.0		10	OVM = 0 PPM	CL	10YR 8/1 5/6 2.5Y 8/2		SANDY CLAY (CL) WHITE OVERALL, ~20% FINE-GRAINED SAND, SOFT (PP = 1.0 TSF), MEDIUM PLASTICITY, MOIST, NO ODOR
	3.0			OVM = 0 PPM	SM	5Y 6/2		GRADES TO SILTY SAND (SM) LIGHT OLIVE GRAY, ~80% FINE-GRAINED SAND, ~20% SILT, LOOSE, LOW PLASTICITY, MOIST, NO ODOR TO 13 FT. 12.5 FT. COLOR GRADES TO GREENISH GRAY, LIGHT HYDROCARBON ODOR
	3.0		15	OVM = 0 PPM	SP	5G 5/1		GRADES TO POORLY GRADED SAND (SP) GREENISH GRAY, ~90-95% FINE-GRAINED SAND, ~10-5% SILT, WET, LIGHT HYDROCARBON ODOR TO 14 FT.

Project Name			Owens Brockway			Project Number			950007.20			Boring/Well Name			KB-5		
SAMPLES			Drill Depth (Feet)	WELL CONSTRUCTION			USCS Log	Lithology	Color	SAMPLE DESCRIPTION and DRILLING REMARKS							
Type & No.	Recovery (Feet)	Penetr. Resist. Blows/8"															
	3.0						SP		5G 5/1	<p><u>POORLY GRADED SAND (SP) CONTINUED</u></p>							
<p>19.0 FT. TERMINATE BORING. INSTALL TEMPORARY 1-INCH PVC CASING WITH 0.010-INCH SLOTTED SCREEN FROM 14 TO 19 FT. AND COLLECT RECONNAISSANCE GROUNDWATER SAMPLE. SAMPLE COLLECTED AND BORING GROUTED 1/27/99.</p> <p>NOTES</p> <ol style="list-style-type: none"> 1. ALL CONTACTS ARE APPROXIMATE 2. VERTICAL SCALE IS 1-INCH = 2.5 FEET 3. SOIL CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, ASTM D-2488-93 4. COLOR DESIGNATION IN ACCORDANCE WITH THE MUNSELL SOIL COLOR CHARTS (KOLLMORGEN INSTRUMENTS CORPORATION, 1990) 5. BGS = BELOW GROUND SURFACE 6. OVM = ORGANIC VAPOR METER; READINGS OF HEADSPACE OBTAINED FROM SOIL PLACED IN AIRTIGHT PLASTIC BAG 7. PPM = PARTS PER MILLION 8. PP = POCKET PENETROMETER; TSF=TONS PER SQUARE FOOT 9. FIRST ENCOUNTERED WATER DEPTH: APPROXIMATELY 14 FEET BGS 10. FINAL GROUNDWATER DEPTH: 12.3 FEET BGS (1/27/99) 																	

APPENDIX B

TYPICAL HYDRAULIC PUSH/DRIVE SAMPLING PROCEDURES

APPENDIX B
TYPICAL HYDRAULIC PUSH/DRIVE SAMPLING PROCEDURES
Standard Operating Guideline

INTRODUCTION

This guideline describes the equipment and procedures typically used by Kennedy/Jenks Consultants personnel for collecting soil and reconnaissance groundwater samples with a hydraulic push/drive system.

EQUIPMENT

1. Portable, hydraulic push/drive sampling system
2. 6-inch long, 1.75-inch O.D. stainless steel or brass liners and liner sealing materials (Teflon sheets, plastic end caps, Ziploc plastic bags)
3. Type II Portland cement
4. 1-inch O.D. Schedule 40 PVC screen (0.010-inch slot size)
5. 1-inch O.D. Schedule 40 PVC blank casing
6. 0.75-inch diameter stainless steel or Teflon bailer
7. PID organic vapor analyzer
8. Water level indicator
9. Temperature, specific conductivity and pH meters
10. Equipment cleaning materials
 - a. Steam cleaner
 - b. Generator
 - c. Stiff-bristle brushes
 - d. Buckets
 - e. High-purity phosphate-free liquid soap
 - f. Deionized water
 - g. Rinsate collection system
11. Personal protective equipment
12. Appropriate groundwater sample containers
13. Chain-of-custody forms
14. Insulated sample storage container and ice substitute

TYPICAL PROCEDURES

1. Applicable drilling permits will be obtained prior to mobilization.
2. Sample locations will be cleared for underground utilities.
3. All downhole equipment will be steam cleaned prior to use at each location.
4. Soil borings will be advanced using a portable, hydraulic push/drive sampling system that simultaneously drives two nested, steel sampling rods into the ground to collect continuous soil cores.
5. As the sampling rods are advanced, the soil core will be collected in a 1-7/8-inch diameter, 3-foot long sample barrel, which is attached to the end of the inner rods. After being advanced 3 feet, the inner rods will be removed from the borehole with a hydraulic winch. The sampler (containing new liners) and inner rods will then be lowered back into the borehole to the previous depth and the rods are driven another 3 feet. This process will be repeated until the desired depth is reached.
6. The soil samples will be retained for lithologic logging and chemical analyses as described in the Work Plan. Headspace screening will be conducted by placing soil not selected for chemical analysis in an airtight container and allowing it to equilibrate for a minimum of 10 minutes. The headspace will be monitored in the container using a PID meter. The headspace concentration will be recorded on the boring log.
7. The soils will be classified in the field in approximate accordance with the visual-manual procedure of the Unified Soil Classification System (ASTM D-2488-93), and the Munsell Color Classification.
8. If required, soil samples will be collected at selected intervals for laboratory analysis. At these intervals, the ends of one or more of the soil sample liners will be covered with Teflon end sheets and plastic end caps, and labeled. Labels will document the sample designation, type, date and time of collection, collector(s), location, and any additional information.
9. If groundwater samples will not be collected, the soil borings will be grouted to the ground surface with a neat cement grout (Type II Portland cement) using the tremie method.
10. If groundwater samples will be collected, upon penetrating the uppermost groundwater surface during sampling, the sample barrel and inner rods will be removed and PVC well screen and casing will be installed within the outer drive casing to facilitate collection of a groundwater sample. The drive casing will be pulled up approximately 3 feet to expose the slotted PVC casing. Groundwater samples will then be collected from within the PVC casing with a 0.75-inch diameter Teflon or stainless steel bailer.
11. The depth to groundwater will be measured prior to groundwater sampling.
12. The sample will be drained directly from the bailer into sample containers. The containers will be labeled to document the sample designation, type, date and time of collection, collector(s), location, and any additional information.
13. After collecting the reconnaissance groundwater sample, decant groundwater into a clean container and record the following field parameters/observations:
 - a. Temperature (°C)
 - b. pH

- c. Specific conductivity ($\mu\text{mhos/cm}$)
 - d. Visual turbidity
 - e. Depth to water
 - f. Color
 - g. Other observations (odors, free-phase product)
1. After sample collection, the boring will be grouted to ground surface with a neat cement grout (Type II Portland cement) using the tremie method.

EQUIPMENT CLEANING

1. Downhole equipment (rods, sampler) will be steam cleaned prior to each borehole.
2. Sampling equipment (sampler) will be steam cleaned or washed with a brush in a solution of high-purity phosphate-free soap and potable water, then rinsed with potable water followed by double rinsing with deionized water prior to each sampling run.
3. Downhole equipment and vehicles which warrant it, will be steam cleaned prior to leaving the Site at completion of sampling.

INVESTIGATION-DERIVED RESIDUALS

Soil cuttings will be placed in labeled 5-gallon DOT-approved pails with bolt-on covers. Decontamination water and groundwater residuals will be contained in labeled 55-gallon DOT-approved drums with bolt-on covers. All residuals generated during sampling activities will be stored at the Site pending receipt of laboratory analyses and proper disposal.

APPENDIX C

LABORATORY ANALYTICAL REPORTS

Entech Analytical Labs, Inc.

CA ELAP# 2224

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

February 4, 1999

Stephani Stehling
Kennedy/Jenks Consultants
622 Folsom Street
San Francisco, CA 94107

R E C E I V E D
FEB 17 1999

KENNEDY/JENKS CONSULTANTS

Subject: 8 Water Samples
Lab #'s: G2742-G2750
Project Name: 3600 Alameda
Project Number: 950007.20
P.O. Number:
Method(s): EPA 8015M/8020

Dear Stephani Stehling,

Chemical analysis on the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. USEPA protocols for sample storage and preservation were followed.

Entech Analytical Labs, Inc. is certified by the State of California (#2224). If you have any questions regarding procedures or results, please call me at 408-735-1550.

Sincerely,



Michelle L. Anderson
Lab Director

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

NARRATIVE

Method(s): EPA 8015M/8020

SUMMARY:

Eight water samples were received from Kennedy/Jenks Consultants on January 27, 1999. Samples were received cool and intact at time of sample receipt.

FINDINGS:

For lab # G2748, the sample was run three times to confirm the Toluene result in the sample.

All Quality Control parameters are within established limits.

Entech Analytical Labs, Inc.

CA ELAP# 2224

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Kennedy/Jenks Consultants
622 Folsom Street
San Francisco, CA 94107
Attn: Stephani Stehling

Date: 2/4/99
 Date Received: 1/27/99
 Project: 950007.20
 PO #:
 Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	KB-2-Recon			KB-5-Recon			KB-3-Recon				
Sample Date	1/27/99			1/27/99			1/27/99				
Sample Time	8:25			8:50			9:20				
Lab #	G2742			G2743			G2744				
	Result	DF	DLR	Result	DF	DLR	Result	DF	DLR	PQL	Method
Results in µg/Liter:											
Analysis Date	1/29/99			1/29/99			1/29/99				
Total TPH-Extractable	ND			1,400			420				8015M
Individual TPH Results:											
TPH-Diesel	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Motor Oil	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Bunker Oil	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Jet Fuel (JP-5)	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Stoddard	ND	1.0	50	1,400 ^x	1.0	50	420 ^x	1.0	50	50	8015M
TPH-Hydraulic Oil	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Fuel Oil	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
Results in µg/Liter:											
Analysis Date	1/28/99			1/29/99			1/28/99				
Total TPH-Purgeable	ND			1,500			110				8015M
Individual TPH Results:											
TPH-Gas	ND	1.0	50	1,500 ^x	1.0	50	110	1.0	50	50	8015M
TPH-Aviation Gas	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Mineral Spirits	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
Analysis Date	1/28/99			1/29/99			1/28/99				
Benzene	ND	1.0	0.50	ND	1.0	0.50	1.4	1.0	0.50	0.50	8020
Toluene	ND	1.0	0.50	ND	1.0	0.50	ND	1.0	0.50	0.50	8020
Ethyl Benzene	ND	1.0	0.50	ND	1.0	0.50	ND	1.0	0.50	0.50	8020
Xylenes	ND	1.0	0.50	0.88	1.0	0.50	3.3	1.0	0.50	0.50	8020

DF=Dilution Factor

ND=None detected above DLR

PQL=Practical Quantitation Limit

DLR=Detection Reporting Limit

Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #2224)


 Michelle L. Anderson, Lab Director

Environmental Analysis Since 1983

Entech Analytical Labs, Inc.

CA ELAP# 2224

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Kennedy/Jenks Consultants
 622 Folsom Street
 San Francisco, CA 94107
 Attn: Stephani Stehling

Date: 2/4/99
 Date Received: 1/27/99
 Project: 950007.20
 PO #:
 Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	1/27 Dup			KB-4-Recon			KB-1-Recon				
Sample Date	1/27/99			1/27/99			1/27/99				
Sample Time	9:25			10:40			15:10				
Lab #	G2745			G2746			G2747				
	Result	DF	DLR	Result	DF	DLR	Result	DF	DLR	PQL	Method
Results in µg/Liter:											
Analysis Date	1/29/99			1/29/99			1/29/99				
Total TPH-Extractable	490			360			ND				8015M
Individual TPH Results:											
TPH-Diesel	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Motor Oil	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Bunker Oil	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Jet Fuel (JP-5)	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Stoddard	490 ^x	1.0	50	360 ^x	1.0	50	ND	1.0	50	50	8015M
TPH-Hydraulic Oil	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Fuel Oil	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
Results in µg/Liter:											
Analysis Date	1/28/99			1/29/99			1/28/99				
Total TPH-Purgeable	160			590			ND				8015M
Individual TPH Results:											
TPH-Gas	160	1.0	50	590 ^x	1.0	50	ND	1.0	50	50	8015M
TPH-Aviation Gas	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Mineral Spirits	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
Analysis Date	1/28/99			1/29/99			1/28/99				
Benzene	1.5	1.0	0.50	ND	1.0	0.50	ND	1.0	0.50	0.50	8020
Toluene	1.1	1.0	0.50	ND	1.0	0.50	ND	1.0	0.50	0.50	8020
Ethyl Benzene	ND	1.0	0.50	ND	1.0	0.50	ND	1.0	0.50	0.50	8020
Xylenes	2.9	1.0	0.50	ND	1.0	0.50	ND	1.0	0.50	0.50	8020

DF=Dilution Factor

ND=None detected above DLR

PQL=Practical Quantitation Limit

DLR=Detection Reporting Limit

Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #2224)


 Michelle L. Anderson, Lab Director

Entech Analytical Labs, Inc.

CA ELAP# 2224

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Kennedy/Jenks Consultants
622 Folsom Street
San Francisco, CA 94107
Attn: Stephani Stehling

Date: 2/4/99
 Date Received: 1/27/99
 Project: 950007.20
 PO #:
 Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	1/27 FB			Trip Blank						
Sample Date	1/27/99			1/27/99						
Sample Time	14:10			15:45						
Lab #	G2748			G2750						
	Result	DF	DLR	Result	DF	DLR			PQL	Method
Results in µg/Liter:										
Analysis Date	1/29/99									
Total TPH-Extractable	ND			na						8015M
Individual TPH Results:										
TPH-Diesel	ND	1.0	50	na					50	8015M
TPH-Motor Oil	ND	1.0	50	na					50	8015M
TPH-Bunker Oil	ND	1.0	50	na					50	8015M
TPH-Jet Fuel (JP-5)	ND	1.0	50	na					50	8015M
TPH-Stoddard	ND	1.0	50	na					50	8015M
TPH-Hydraulic Oil	ND	1.0	50	na					50	8015M
TPH-Fuel Oil	ND	1.0	50	na					50	8015M
Results in µg/Liter:										
Analysis Date	2/4/99									
Total TPH-Purgeable	ND			na						8015M
Individual TPH Results:										
TPH-Gas	ND	1.0	50	na					50	8015M
TPH-Aviation Gas	ND	1.0	50	na					50	8015M
TPH-Mineral Spirits	ND	1.0	50	na					50	8015M
Analysis Date	2/4/99			2/3/99						
Benzene	ND	1.0	0.50	ND	1.0	0.50			0.50	8020
Toluene	2.8	1.0	0.50	ND	1.0	0.50			0.50	8020
Ethyl Benzene	ND	1.0	0.50	ND	1.0	0.50			0.50	8020
Xylenes	ND	1.0	0.50	ND	1.0	0.50			0.50	8020

DF=Dilution Factor ND=None detected above DLR PQL=Practical Quantitation Limit DLR=Detection Reporting Limit
 na = not analyzed

Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #2224)


 Michelle L. Anderson, Lab Director

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

STANDARD LAB QUALIFIERS

July, 1998

All Entech lab reports now reference standard lab qualifiers. These qualifiers are noted in the adjacent column to the analytical result and are adapted from the U.S. EPA CLP program. The current qualifier list is as follows:

Qualifier	Description
U	Compound was analyzed for but not detected
J	Estimated valued for tentatively identified compounds or if result is below PQL but above MDL
N	Presumptive evidence of a compound (for Tentatively Identified Compounds)
B	Analyte is found in the associated Method Blank
E	Compounds whose concentrations exceed the upper level of the calibration range
D	Multiple dilutions reported for analysis; discrepancies between analytes may be due to dilution
X	Results within quantitation range; chromatographic pattern not typical of fuel

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography
Laboratory Control Spikes

QC Batch #: DW990107
Matrix: Water
Units: µg/L

Date analyzed: 02/03/99
Date extracted: 02/02/99
Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/L	SA µg/L	SR µg/L	SP µg/L	SP %R	SPD µg/L	SPD %R	RPD	QC LIMITS	
										RPD	%R
Diesel	8015M	<50.0	950	ND	773	81	794	84	2.7	25	57-129

Definition of Terms:

- na: Not Analyzed in QC batch
- MB: Method Blank
- SA: Spike Added
- SR: Sample Result
- RPD(%): Duplicate Analysis - Relative Percent Difference
- SP: Spike Result
- SP (%R) Spike % Recovery
- SPD: Spike Duplicate Result
- SPD (%R) Spike Duplicate % Recovery
- NC: Not Calculated

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography

QC Batch #: GBG4990128

Matrix: Water

Units: µg/L

Date Analyzed: 01/28/99

Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/L	SA µg/L	SR µg/L	SP µg/L	SP % R	SPD µg/L	SPD %R	RPD	QC LIMITS	
										RPD	%R
Benzene	8020	<0.50	40	ND	40	101	42	105	3.7	25	80-112
Toluene	8020	<0.50	40	ND	40	99	42	105	5.3	25	78-113
Ethyl Benzene	8020	<0.50	40	ND	41	102	43	106	4.5	25	79-113
Xylenes	8020	<0.50	120	ND	123	103	128	107	4	25	79-114
Gasoline	8015	<50.0	500	ND	443	89	470	94	5.9	25	78-112

Note: LCS and LCSD results reported for the following Parameters:

All

Acceptable LCS and LCSD results are reported when matrix interferences cause MS and MSD results to fall outside established QC limits.

Definition of Terms:

- na: Not Analyzed in QC batch
- MB: Method Blank
- SA: Spike Added
- SR: Sample Result
- RPD(%): Duplicate Analysis - Relative Percent Difference
- SP: Spike Result
- SP (%R): Spike % Recovery
- SPD: Spike Duplicate Result
- SPD (%R): Spike % Recovery
- NC: Not Calculated

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography

QC Batch #: GBG4990208

Matrix: Water

Units: µg/L

Date Analyzed: 02/08/99

Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/L	SA µg/L	SR µg/L	SP µg/L	SP % R	SPD µg/L	SPD %R	RPD	QC LIMITS	
										RPD	%R
Benzene	8020	<0.50	40	ND	37	92	38	94	2.8	25	81-111
Toluene	8020	<0.50	40	ND	37	92	38	96	3.9	25	79-112
Ethyl Benzene	8020	<0.50	40	ND	37	92	37	93	1.4	25	79-112
Xylenes	8020	<0.50	120	ND	111	93	114	95	2	25	79-113
Gasoline	8015	<50.0	500	ND	404	81	379	76	6.5	25	73-114

Note: LCS and LCSD results reported for the following Parameters:

All

Acceptable LCS and LCSD results are reported when matrix interferences cause MS and MSD results to fall outside established QC limits.

Definition of Terms:

- na: Not Analyzed in QC batch
- MB: Method Blank
- SA: Spike Added
- SR: Sample Result
- RPD(%): Duplicate Analysis - Relative Percent Difference
- SP: Spike Result
- SF (%R): Spike % Recovery
- SPD: Spike Duplicate Result
- SPD (%R): Spike % Recovery
- NC: Not Calculated

KENNEDY/JENKS CONSULTANTS

SAMPLE CHAIN-OF-CUSTODY ANALYSIS REQUEST

- 200 New Stine Rd., #115, Bakersfield, CA 93309
- 530 South 336th St., Federal Way, WA 98003
- 2151 Michelson Drive, #100, Irvine, CA 92612
- 2191 East Bayshore Rd., #200, Palo Alto, CA 94303
- 9320 SW Barbur Blvd., #155, Portland, OR 97219
- 5190 Neil Road, #300, Reno, NV 89502
- 3335 Bradshaw Rd., #140, Sacramento, CA 95827
- 222 Folsom St., San Francisco, CA 94107
- 1000 Hill Rd., #200, Ventura, CA 93003

POSSIBLE HAZARDS: Analyte Compounds Stephani
 Date: 1/27/99 Report To: S. Stehling
 Source of Samples: 3600 Alameda Company: K/J
 Sampler Name: M. McNeal Address: 303 2nd St 622 Folsom
 Phone: 415-243-2508 S.F. CA 94107
 Project No.: 950007.20 Phone: 415-243-2522

(5) ANALYSES REQUESTED				
Tot. Purgeable HC (SO ₂)	Tot. Extractable HC (SO ₂)	BTEX (EPA 8020)	Silica gel Clean (EPA 8020)	

Lab Destination: Entech
 Address: 525 Del Rey Ave
Sunnyvale CA 94086
 Phone: 800-287-1799
 Carrier/Way Bill No.: n/a

(1) Lab ID No.	(1) Client ID No.	COLLECTION		(2) Type	(3) Depth	(3) Comp.	(4) Pres.	Turn-around	(5) ANALYSES REQUESTED				Comment/Conditions (Container type, container number, etc.)
		Date	Time						Tot. Purgeable HC (SO ₂)	Tot. Extractable HC (SO ₂)	BTEX (EPA 8020)	Silica gel Clean (EPA 8020)	
G2737	KB-4-13.0/13.5	1/26	1005	S	13/13.5	No	4C	A/A					HOLD 2" Sleeve
G2738	KB-3-17.5/18.0		1200		17.5/18								HOLD
G2739	KB-2-17.5/19.0		1445		17.5/19								HOLD
G2740	KB-5-13.5/14		1530		13.5/14								HOLD
G2741	KB-1-17/17.5	1/27	1205	✓	17/17.5								HOLD
G2742	KB-2-Recon	1/27	0825	W	n/a	HOLD 4C	HOLD 4C	STD	X	X	X		3 Vials, 3-12 amber
G2743	KB-5-Recon	"	0850			NO			X	X	X		Odor "
G2744	KB-3-Recon	"	0920						X	X	X		Poss. sheen "
G2745	127-00P	"	0925						X	X	X		" "
G2746	KB-4-Recon	"	1040						X	X	X		3 Vials, 2-12 amber
G2749	KB-4-Recon (a)	"	1315						X	X	X		1 1-2 amber
G2747	KB-1-Recon	"	1510						X	X	X		3 Vials, 3-12 amber
G2748	127-FB	1/27	1410						X	X	X		
G2750	127-1545	1/25	1545						X	X	X		

- (1) Write only one sample number in each space.
 (2) Specify type of sample(s): Water (W), Solid (S), or indicate type.
 (3) Mark each sample which should be composited in Laboratory as follows: Place an "A" in box for each sample that should be composited into one sample; use sequential letter for additional groups.
 (4) Preservation of sample.
 (5) Write each analyses requested across top. Place an "X" in appropriate column to indicate type of analysis needed for each sample.

SAMPLE RELINQUISHED BY:					SAMPLE RECEIVED BY:				
Print Name	Signature	Company	Date	Time	Print Name	Signature	Company	Date	Time
Mike McNeal	[Signature]	K/J	1/27	1730	E Jimenez	[Signature]	World	1/27	1730
					W.C. VTRAW	[Signature]		01/27/99	7:40 pm

Entech Analytical Labs, Inc.

CA ELAP# 2224

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Kennedy/Jenks Consultants
 622 Folsom Street
 San Francisco, CA 94107
 Attn: Stephani Stehling

R E C E I V E D
FEB 22 1999

KENNEDY/JENKS CONSULTANTS

Date: 2/8/99
 Date Received: 1/27/99
 Project: 950007.20
 PO #:
 Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	KB-5-Recon			KB-3-Recon			KB-4-Recon				
Sample Date	1/27/99			1/27/99			1/27/99				
Sample Time	8:50			9:20			10:40				
Lab #	G2743			G2744			G2746				
	Result	DF	DLR	Result	DF	DLR	Result	DF	DLR	PQL	Method
Results in µg/Liter:											
Analysis Date	2/3/99			2/3/99			2/3/99				
Total TPH-Extractable	730			ND			ND				8015M
Individual TPH Results:											
TPH-Diesel	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Motor Oil	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Bunker Oil	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Jet Fuel (JP-5)	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Stoddard	730 ^x	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Hydraulic Oil	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
TPH-Fuel Oil	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M

DF=Dilution Factor

ND=None detected above DLR

PQL=Practical Quantitation Limit

DLR=Detection Reporting Limit

· Silica gel cleanup performed prior to analysis

· Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #2224)


 Michelle L. Anderson, Lab Director

STANDARD LAB QUALIFIERS July, 1998

All Entech lab reports now reference standard lab qualifiers. These qualifiers are noted in the adjacent column to the analytical result and are adapted from the U.S. EPA CLP program. The current qualifier list is as follows:

Qualifier	Description
U	Compound was analyzed for but not detected
J	Estimated valued for tentatively identified compounds or if result is below PQL but above MDL
N	Presumptive evidence of a compound (for Tentatively Identified Compounds)
B	Analyte is found in the associated Method Blank
E	Compounds whose concentrations exceed the upper level of the calibration range
D	Multiple dilutions reported for analysis; discrepancies between analytes may be due to dilution
X	Results within quantitation range; chromatographic pattern not typical of fuel

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography
Laboratory Control Spikes

QC Batch #: DW990107

Date analyzed: 02/03/99

Matrix: Water

Date extracted: 02/02/99

Units: µg/L

Quality Control Sample: Blank Spike

PARAMETER	Method #	MB	SA	SR	SP	SP	SPD	SPD	RPD	QC LIMITS	
		µg/L	µg/L	µg/L	µg/L	%R	µg/L	%R		RPD	%R
Diesel	8015M	<50.0	950	ND	773	81	794	84	2.7	25	63-127

Definition of Terms:

- na: Not Analyzed in QC batch
- MB: Method Blank
- SA: Spike Added
- SR: Sample Result
- RPD(%): Duplicate Analysis - Relative Percent Difference
- SP: Spike Result
- SP (%R) Spike % Recovery
- SPD: Spike Duplicate Result
- SPD (%R) Spike Duplicate % Recovery
- NC: Not Calculated

KENNEDY/JENKS CONSULTANTS

SAMPLE CHAIN-OF-CUSTODY ANALYSIS REQUEST

- 200 New Stine Rd., #115, Bakersfield, CA 93309
- 530 South 336th St., Federal Way, WA 98003
- 2151 Michelson Drive, #100, Irvine, CA 92612
- 2191 East Bayshore Rd., #200, Palo Alto, CA 94303
- 9320 SW Barbur Blvd., #155, Portland, OR 97219

- 5190 Nail Road, #300, Reno, NV 89502
- 3336 Bradshaw Rd., #140, Sacramento, CA 95827
- 622 Folsom St., San Francisco, CA 94107
- 1000 Hill Rd., #200, Ventura, CA 93003

POSSIBLE HAZARDS: Analyte Compounds Stephani

Date: 1/27/99 Report To: S. Stehling

Source of Samples: 3600 Alameda Company: K/J

Sampler Name: M. McNeal Address: 303 2nd St 622 Folsom

Phone: 415-243-2508 City: S.F. CA 94107

Project No.: 950007.20 Phone: 415-243-2522

(5) ANALYSES REQUESTED				
<input checked="" type="checkbox"/>	Tot. Purgeable HC (9058)			
<input checked="" type="checkbox"/>	Tot. Extractable HC (905)			
<input checked="" type="checkbox"/>	BTEX (EPA 802)			
<input checked="" type="checkbox"/>	Silica gel Clean (EPA 802)			

Lab Destination: Entech

Address: 525 Del Rey Ave
Sunnyvale CA 94086

Phone: 800-287-1799

Carrier/Way Bill No.: n/a

(1) Lab ID No.	(1) Client ID No.	COLLECTION		(2) Type	(3) Depth	(3) Comp.	(4) Pres.	Turn around	(5) ANALYSES REQUESTED					Comment/Conditions (Container type, container number, etc.)	
		Date	Time						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
G2737	KB-4-13.0/13.5	1/26	1005	S	13/13.5	No	4°C	A/G							HOLD 2' Sleeve
G2738	KB-3-17.5/18.0		1200		17.5/18										HOLD
G2739	KB-2-17.5/19.0		1445		17.5/19										HOLD
G2740	KB-5-13.5/14		1530		13.5/14										HOLD
G2741	KB-1-17/17.5	1/27	1205		17/17.5										HOLD
G2742	KB-2-Recon	1/27	0825	W	n/a	HCL 4°C	HCL 4°C	STD	X	X	X	X			3 Vials, 3-12 amber
G2743	KB-5-Recon	"	0850			No			X	X	X	X			Odor "
G2744	KB-3-Recon	"	0920						X	X	X	X			Poss. sheen "
G2745	1/27-00P	"	0925						X	X	X	X			" "
G2746	KB-4-Recon	"	1040						X	X	X	X			3 Vials, 2-12 amber
G2749	KB-4-Recon (a)	"	1315						X	X	X	X			1 1-2 amber
G2747	KB-1-Recon	"	1510						X	X	X	X			3 Vials, 3-12 amber
G2748	1/27-FB	"	1410						X	X	X	X			
G2750	1/25 1545								X	X	X	X			

- (1) Write only one sample number in each space.
- (2) Specify type of sample(s): Water (W), Solid (S), or Indicate type.
- (3) Mark each sample which should be composited in Laboratory as follows: Place an "A" in box for each sample that should be composited into one sample; use sequential letter for additional groups.
- (4) Preservation of sample.
- (5) Write each analyses requested across top. Place an "X" in appropriate column to indicate type of analysis needed for each sample.

* Please provide chromatograms with results

SAMPLE RELINQUISHED BY:

Print Name	Signature	Company	Date	Time
Mike McNeal	<i>[Signature]</i>	K/J	1/27	1730
	<i>[Signature]</i>			

SAMPLE RECEIVED BY:

Print Name	Signature	Company	Date	Time
E Jimenez	<i>[Signature]</i>	Wood	1/27	1730
W.C. VITKAW	<i>[Signature]</i>			

01/27/99 7:40 pm

KENNEDY/JENKS CONSULTANTS

SAMPLE CHAIN-OF-CUSTODY ANALYSIS REQUEST

POSSIBLE HAZARDS: Analyte Compounds Stephani
 Date: 1/27/99
 Source of Samples: 3600 Alameda
 Sampler Name: M. McNeal
 Phone: 415-243-2508
 Project No.: 950007.20
 Report To: S. Stehling
 Company: K/D
 Address: 303 2nd St 622 Folsom
B.F. CA 94107
 Phone: 415-243-2522

- 200 New Stine Rd., #115, Bakersfield, CA 93309
- 530 South 336th St., Federal Way, WA 98003
- 2151 Michelson Drive, #100, Irvine, CA 92612
- 2191 East Bayshore Rd., #200, Palo Alto, CA 94303
- 9320 SW Barbur Blvd., #155, Portland, OR 97219

- 5190 Neil Road, #300, Reno, NV 89502
- 3338 Bradshaw Rd., #140, Sacramento, CA 95827
- 1222 Folsom St., San Francisco, CA 94107
- 1000 Hill Rd., #200, Ventura, CA 93003

(5) ANALYSES REQUESTED			
Tot. Porgeable HC (8050)	Tot. Extractable HC (905)	BTEX (EPA 802)	Silica gel Clean (EPA 305)

Lab Destination: Entech
 Address: 525 Del Rey Ave
Sunnyvale CA 94086
 Phone: 800-287-1799
 Carrier/Way Bill No.: n/a

(1) Lab ID No.	(1) Client ID No.	COLLECTION		(2) Type	(2) Depth	(3) Comp.	(4) Pres.	Turn-around	(5) ANALYSES REQUESTED				Comment/Conditions (Container type, container number, etc.)
		Date	Time						Tot. Porgeable HC (8050)	Tot. Extractable HC (905)	BTEX (EPA 802)	Silica gel Clean (EPA 305)	
G2737	KB-4-13.0/13.5	1/26	1005	S	13/13.5	No	4C	1/4					HOLD 2" Sleeve
G2738	KB-3-17.5/18.0		1200		17.5/18								HOLD
G2739	KB-2-17.5/18.0		1445		17.5/18								HOLD
G2740	KB-5-13.5/14		1530		13.5/14								HOLD
G2741	KB-1-17/17.5	1/27	1205		17/17.5								HOLD
G2742	KB-2-Recon	1/27	0825	W	n/a	H2O	H2O	STD	X	X	X	X	3 VOAS, 3-1L amber
G2743	KB-5-Recon	"	0850			NO			X	X	X	X	Odor "
G2744	KB-3-Recon	"	0920						X	X	X	X	Poss. sleeve "
G2745	1/27-DUP	"	0925						X	X	X	X	" "
G2746	KB-4-Recon	"	1040						X	X	X	X	3 VOAS, 2-1L amber
G2747	KB-4-Recon (a)	"	1315						X	X	X	X	1 1-L amber
G2747	KB-1-Recon	"	1510						X	X	X	X	3 VOAS, 3-1L amber
G2748	1/27-PB	"	1410						X	X	X	X	
G2749	1/25-1595		1545						X	X	X	X	

- (1) Write only one sample number in each space.
 - (2) Specify type of sample(s): Water (W), Solid (S), or indicate type.
 - (3) Mark each sample which should be composited in Laboratory as follows: Place an "A" in box for each sample that should be composited into one sample; use sequential letter for additional groups.
 - (4) Preservation of sample.
 - (5) Write each analyses requested across top. Place an "X" in appropriate column to indicate type of analysis needed for each sample.
- * Please provide chromatograms with results

SAMPLE RELINQUISHED BY:					SAMPLE RECEIVED BY:				
Print Name	Signature	Company	Date	Time	Print Name	Signature	Company	Date	Time
Mike McNeal	<i>[Signature]</i>	K/D	1/27	1730	E Jimenez	<i>[Signature]</i>	World	1/27	1730
					received via				
					W.C. UTRAW	<i>[Signature]</i>			

01/27/99 7:40 pm

Entech Analytical Labs, Inc.

CA ELAP# 2224

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

February 4, 1999

Stephani Stehling
Kennedy/Jenks Consultants
622 Folsom Street
San Francisco, CA 94107

RECEIVED
MAR 10 1999
KENNEDY/JENKS CONSULTANTS


Subject: 8 Water Samples
Lab #'s: G2742-G2750
Project Name: 3600 Alameda
Project Number: 950007.20
P.O. Number:
Method(s): EPA 8015M/8020

Dear Stephani Stehling.

Chemical analysis on the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. USEPA protocols for sample storage and preservation were followed.

Entech Analytical Labs, Inc. is certified by the State of California (#2224). If you have any questions regarding procedures or results, please call me at 408-735-1550.

Sincerely,


Michelle L. Anderson
Lab Director

KENNEDY/JENKS CONSULTANTS

SAMPLE CHAIN-OF-CUSTODY ANALYSIS REQUEST

11200 Now Sline Rd., #115, Bakerfield, CA 93309
 11530 South 336th St., Federal Way, WA 98003
 112151 Michelson Drive, #100, Irvine, CA 92612
 112191 East Bayshore Rd., #200, Palo Alto, CA 94303
 119320 SW Barbur Blvd., #155, Portland, OR 97219

115190 Neal Road, #300, Reno, NV 89502
 113330 Bradshaw Rd., #140, Sacramento, CA 95827
 11222 Folsom Blvd., #200, Sacramento, CA 95827
 111000 Hill Rd., #200, Ventura, CA 93003

POSSIBLE HAZARDS: Analyte Compounds Stephan:
 Date: 1/27/99 Report To: S. Stehling
 Source of Samples: 3600 Alameda Company: K/J
 Sampler Name: M. McNeal Address: 303 2nd St 622 Folsom
 Phone: 415-243-2505 S.F. CA 94107
 Project No.: 950007.20 Phone: 415-243-2522

(5) ANALYSES REQUESTED				
Tot. Purgeable HC (3015)	Tot. Extractable HC (3015)	BTEX (EPA 3020)	Silica gel Clean (EPA 302)	

Lab Destination: Entech
 Address: 525 Del Rey Ave
Sunnyvale CA 94086
 Phone: 800-287-1799
 Carrier/Way Bill No.: n/a

(1) Lab ID No.	(1) Client ID No.	COLLECTION		(2) Type	(3) Depth	(3) Comp.	(4) Pres.	Turn-around	(5) ANALYSES REQUESTED					Comment/Conditions (Container type, container number, etc.)	
		Date	Time						Tot. Purgeable HC (3015)	Tot. Extractable HC (3015)	BTEX (EPA 3020)	Silica gel Clean (EPA 302)			
G2737	KB-4-13.0/13.5	1/26	1005	S	13/13.5	No	YC	AM							HOLD 2" Sleeve
G2738	KB-3-17.5/18.0		1200		17.5/18										HOLD
G2739	KB-2-17.5/18.0		1445		17.5/18										HOLD
G2740	KB-5-13.5/14		1530		13.5/14										HOLD
G2741	KB-1-17/17.5	1/27	1205		17/17.5										HOLD
G2742	KB-2-Recon	1/27	0835	W	1/4	HCC 402	HCC 402	STD	X	X	X				3 VIALS, 3-1L amber
G2743	KB-5-Recon	"	0850			NO			X	X	X				Odor "
G2744	KB-3-Recon	"	0920						X	X	X				Poss skin "
G2745	127-DUP	"	0925						X	X	X				"
G2746	KB-4-Recon	"	1040						X	X	X				3 VIALS, 2-1L amber
G2749	KB-4-Recon (a)	"	1315						X	X	X				1-1L amber
G2747	KB-1-Recon	"	1510						X	X	X				3 VIALS, 3-1L amber
G2748	127-1B	"	1410						X	X	X				
		1/25	1545						X	X	X				

1) Write only one sample number in each space.
 2) Specify type of sample (S) Water (W), Solid (S), or indicate type.
 3) Mark each sample which should be composited in Laboratory as follows: Place an "A" in box for each sample that should be composited into one sample; use sequential letter for additional groups.
 4) Preservation of sample.
 5) Write each analyses requested across top. Place an "X" in appropriate column to indicate type of analysis needed for each sample.

* Please provide chromatograms with results

SAMPLE RELINQUISHED BY:

SAMPLE RECEIVED BY:

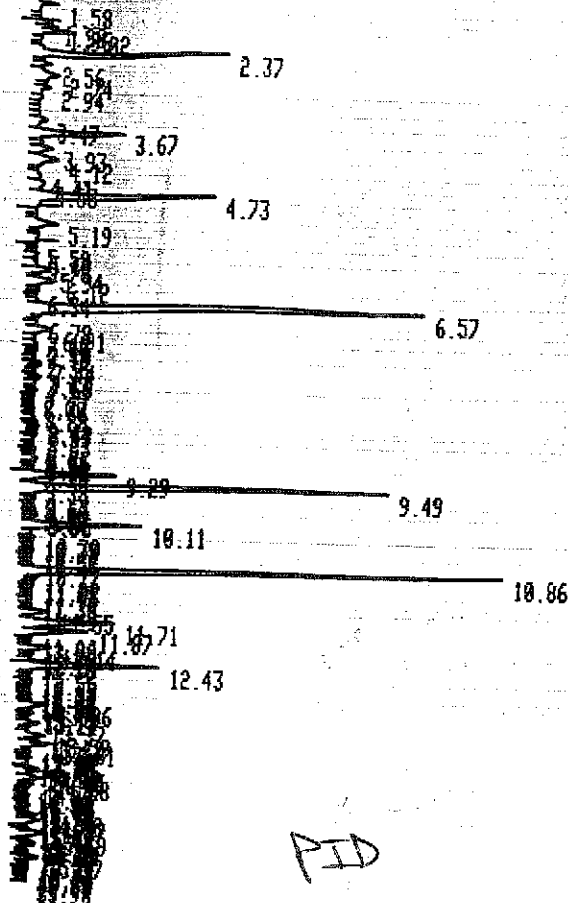
Print Name	Signature	Company	Date	Time	Print Name	Signature	Company	Date	Time
Mike McNeal	[Signature]	K/J	1/27	1730	E Jimenez	[Signature]	World	1/27	1730
					W.C. Vikari	[Signature]		01/27/99	7:44 pm

GC4

1/28/99

START

Gas Std



RUN # 1559

JAN/28/99 07:44:04

WORKFILE ID: B

WORKFILE NAME:

AREA%:

RT	AREA	TYPE	AR/HT	AREA%
1.58	5946	PP	0.040	0.434
1.90	4495	BY	0.049	0.328
1.96	5124	VV	0.038	0.374
2.02	13123	VV	0.049	0.958
2.37	73688	PV	0.052	5.378
2.56	5350	VV	0.056	0.391
2.74	16750	VV	0.111	1.223
2.94	6242	VV	0.068	0.456
3.47	5344	VV	0.071	0.390
3.67	42938	VV	0.067	3.134
3.93	8187	VV	0.071	0.598
4.12	15804	VV	0.099	1.154
4.41	2301	PV	0.078	0.168
4.53	5532	VV	0.105	0.404
4.73	104110	VB	0.079	7.599
5.19	13553	PV	0.083	0.989
5.69	3220	VP	0.065	0.235
5.94	6811	BY	0.068	0.497
6.12	12713	PV	0.083	0.928
6.57	203810	VV	0.078	14.876
6.91	16045	VV	0.102	1.171
7.00	2510	VP	0.056	0.183
7.14	3338	PV	0.067	0.244
7.35	2261	VV	0.052	0.165
7.60	2222	VP	0.045	0.272

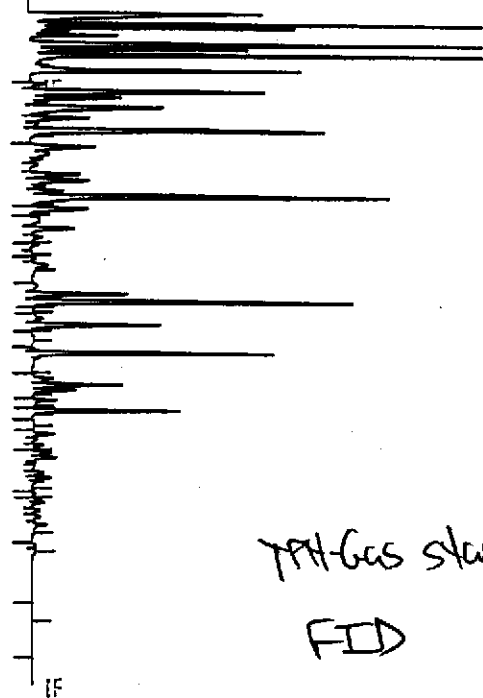
GC4

1/28/99

* RUN # 1559 JAN 28, 1999 07:44:42

START

IF



PAH-Gas standard

FID

IF

TIMETABLE STOP

RUN# 1559 JAN 28, 1999 07:44:42

AREA#

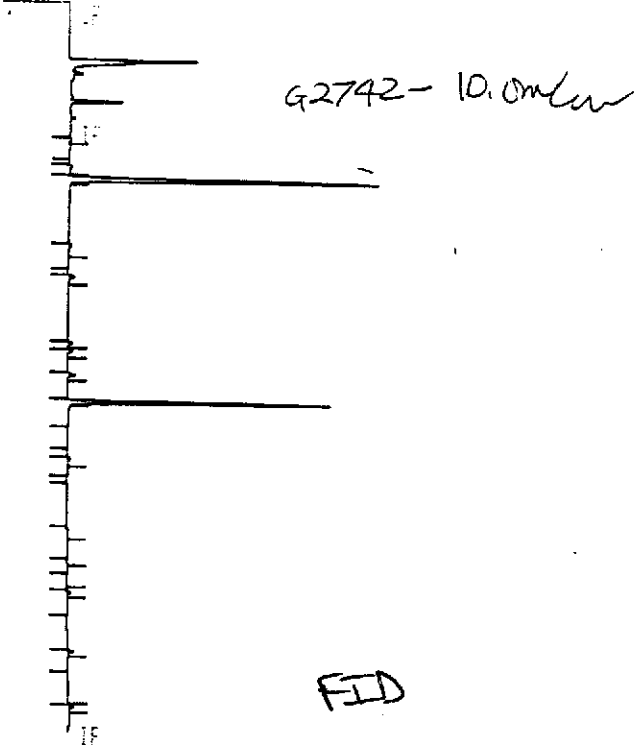
RT	AREA	TYPE	WIDTH	AREA%
3.474	56628	BP	.061	.45224
3.620	1186322	PV	.083	9.47415
3.845	378715	VV	.069	3.02448
4.127	848019	VP	.105	6.77241
4.402	260239	PV	.074	2.07831
4.745	1368286	VB	.077	10.92734
5.200	357726	BV	.090	2.85688
5.960	264102	PV	.087	2.10916
6.135	299920	VV	.085	2.39527
6.422	100100	VV	.094	1.43831
6.580	1644855	VB	.075	13.13607
6.930	316295	BB	.091	2.52598
7.190	110370	BV	.169	.88143
7.469	219420	VP	.082	1.75232
7.712	58476	PB	.079	.46700
8.510	96040	PB	.105	.77338
9.293	386637	VP	.066	3.08774
9.501	1253079	PB	.064	10.00728
9.954	63614	BV	.098	.50803
10.124	561602	VB	.072	4.48504
10.875	814310	VV	.055	6.50321
11.556	122817	PV	.091	.96084
11.730	419457	VV	.077	3.34985
11.877	155080	VB	.059	1.23849

12.460 99419 VB .066 3.66303

TOTAL AREA=2789673
MUL FACTOR=1.0000E+00

KB-2

* RUN # 1593 JAN 29, 1999 02:25:03
START



TIMETABLE STOP

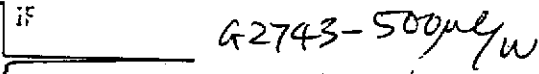
RUN# 1593 JAN 29, 1999 02:28:03

AREA%

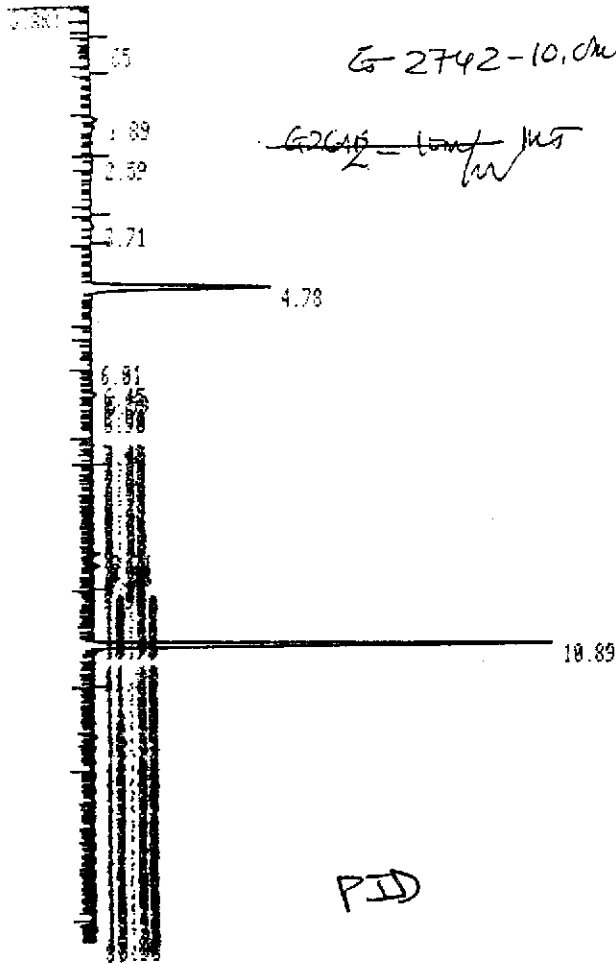
RT	AREA	TYPE	WIDTH	AREA%
4.795	1438127	PB	.876	62.36886
10.903	867714	PB	.854	37.63114

TOTAL AREA=2305842
MUL FACTOR=1.0000E+00

* RUN # 1594 JAN 29, 1999 02:58:20
START



TOTAL AREA= 467168
 MUL FACTOR= 1.0000E+00



RUN # 1593 JAN/29/99 02:27:26
 WORKFILE ID: B
 WORKFILE NAME:

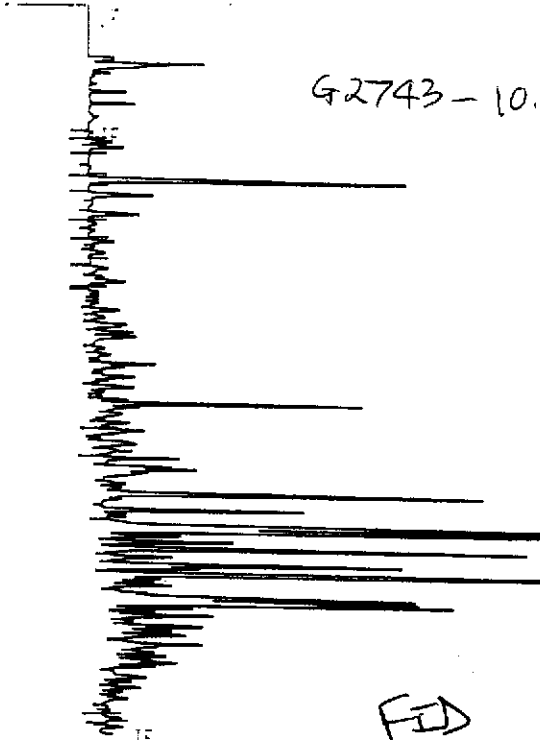
AREA#	RT	AREA	TYPE	AR/HT	AREA%
	1.89	3049	PV	0.055	0.710
	3.71	2025	PV	0.069	0.471
	4.78	106420	VV	0.078	24.768
	6.45	2082	PV	0.058	0.485
	6.59	4290	VV	0.072	0.999
	6.81	2015	PP	0.062	0.469
	7.45	3519	PV	0.066	0.819
	7.64	2835	PP	0.052	0.668
	7.92	2277	VP	0.054	0.530
	8.14	2034	D VV	0.041	0.473
	8.34	2000	PV	0.038	0.466
	8.81	2028	D VP	0.038	0.472
	8.90	2166	VV	0.043	0.504
	9.53	2253	D VV	0.025	0.524
	9.68	2461	VV	0.066	0.573
	10.00	2175	PV	0.037	0.506
	10.12	2604	VV	0.043	0.606
	10.34	2693	VV	0.046	0.627
	10.53	2762	VP	0.042	0.643
	10.59	3948	PV	0.068	0.919
	10.69	2721	VV	0.039	0.633
	10.89	240720	VV	0.057	56.027
	11.22	2697	D VV	0.042	0.628
	11.31	4036	D VP	0.073	0.939

16.223 32744 SF .976 2.12126
 15.200 76298 PB .076 2.06656

TOTAL AREA=2486446
 MUL FACTOR=1.0000E+00

K6-5

* RUN # 1611 JAN 29, 1999 13:11:52
 START



TIMETABLE STOP

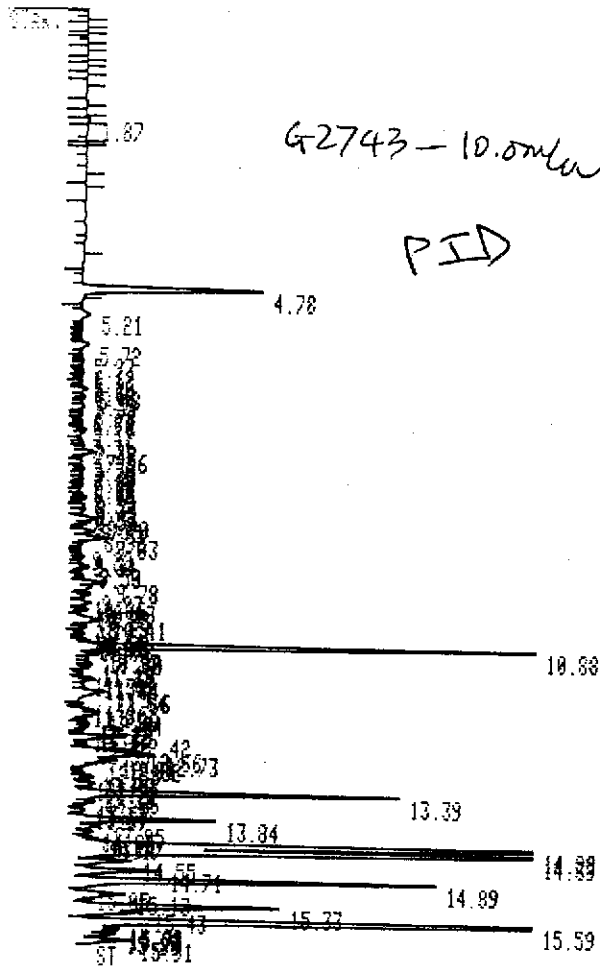
RUN# 1611 JAN 29, 1999 13:11:52

AREA#

RT	AREA	TYPE	WIDTH	AREA%
3.759	105838	PV	.070	.27831
3.911	145995	VB	.067	.38390
4.798	1457962	PB	.076	3.83382
5.223	339770	BV	.084	.89345
5.734	260796	PB	.082	.68578
6.004	52981	PP	.091	.13932
6.490	111496	BV	.074	.29319
6.787	84791	VB	.082	.22296
7.205	134708	BV	.108	.35422
7.450	71633	VV	.074	.18836
7.564	212918	VB	.092	.55962
8.325	156275	VV	.080	.41094
8.525	104922	VV	.099	.27590
8.713	301386	VV	.127	.79252
9.932	215857	VV	.079	.56761
9.849	309973	VV	.106	.81510
9.367	90518	VV	.093	.23802
9.546	130209	VV	.099	.34239
9.802	276361	VV	.069	.72671
10.153	257575	VV	.092	.67731
10.432	232632	PV	.087	.61172
10.797	140117	VV	.064	.36845
10.895	918250	VV	.057	2.41461
10.999	288894	VV	.101	.75967
11.189	180454	VV	.109	.47452

13.17	23722	VV	0.070	5.019
15.57	2268	D VV	0.040	0.488
15.78	2224	D VV	0.043	0.471

TOTAL AREA= 472638
 MUL FACTOR= 1.0000E+00



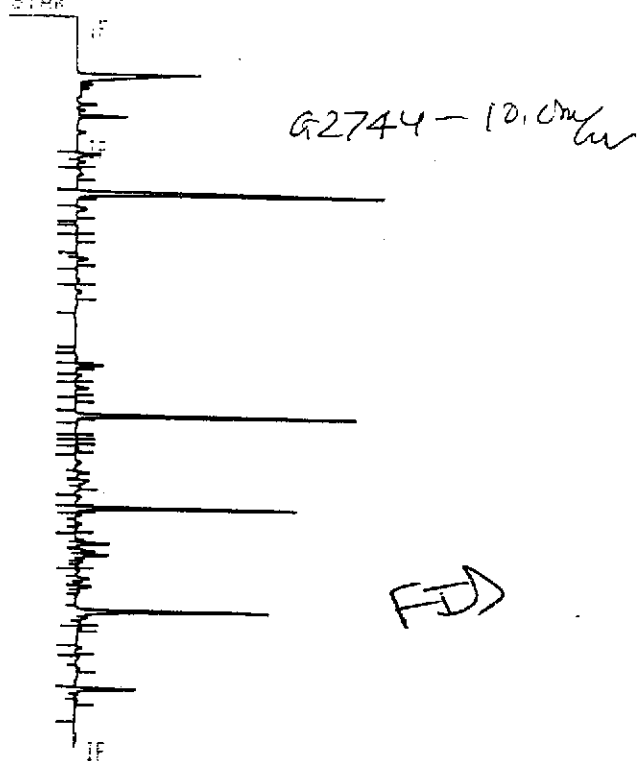
RUN # 1611 JAN/29/99 13:11:17
 WORKFILE ID: 8
 WORKFILE NAME:

RT	AREA	TYPE	AR/HT	AREA%
4.78	106270	PB	0.077	3.605
5.21	10669	VH	0.110	0.362
5.22	2708	HH	0.084	0.262
				0.069

TOTAL AREA=3305501
MUL FACTOR=1.0000E+00

KB-3

* RUN # 1595 JAN 29, 1999 03:28:19
START



TINETABLE STOP

RUN# 1595 JAN 29, 1999 03:28:19

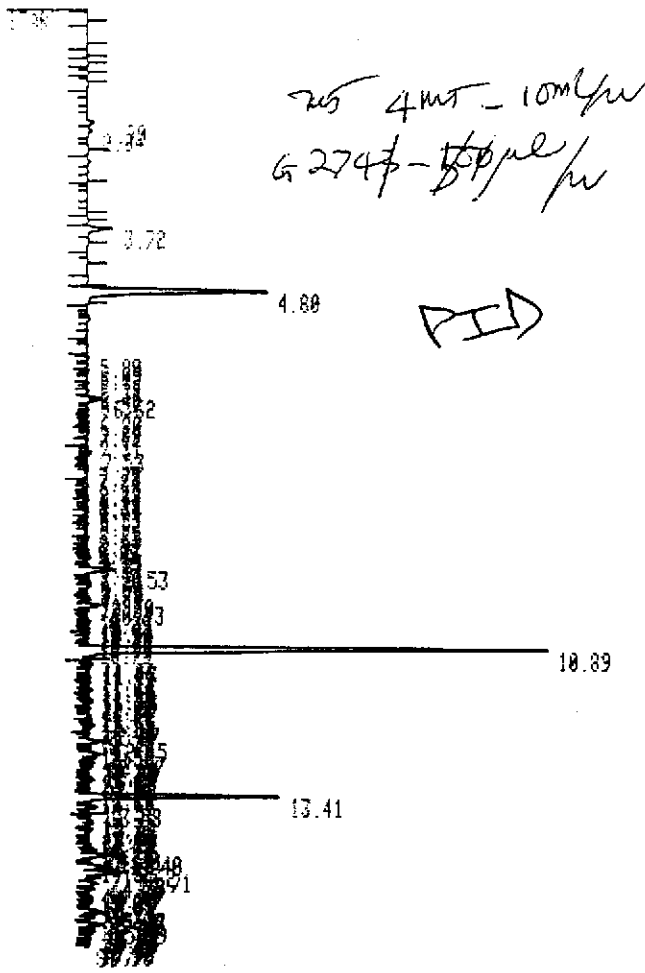
AREAS:

RT	AREA	TYPE	WIDTH	AREA%
3.735	113365	BV	.073	2.26704
4.813	1432440	PB	.077	28.89819
5.245	69512	BB	.096	1.40234
9.547	106451	PB	.061	2.14755
10.155	62122	BB	.070	1.25326
10.906	911529	PB	.054	18.38927
12.466	66329	PP	.071	1.33813
12.680	69605	PV	.067	1.40422
13.419	703622	PB	.053	14.19494
14.410	123405	VP	.057	2.40959
14.625	88240	PV	.069	1.78016
14.730	137310	VV	.066	2.77011
15.391	67970	PV	.076	1.37139
15.612	63065	PV	.060	1.27228
16.292	720360	PV	.062	14.53262
18.428	221518	BV	.059	4.46892

TOTAL AREA=4956851
MUL FACTOR=1.0000E+00

* RUN # 1596 JAN 29, 1999 03:50:39
START





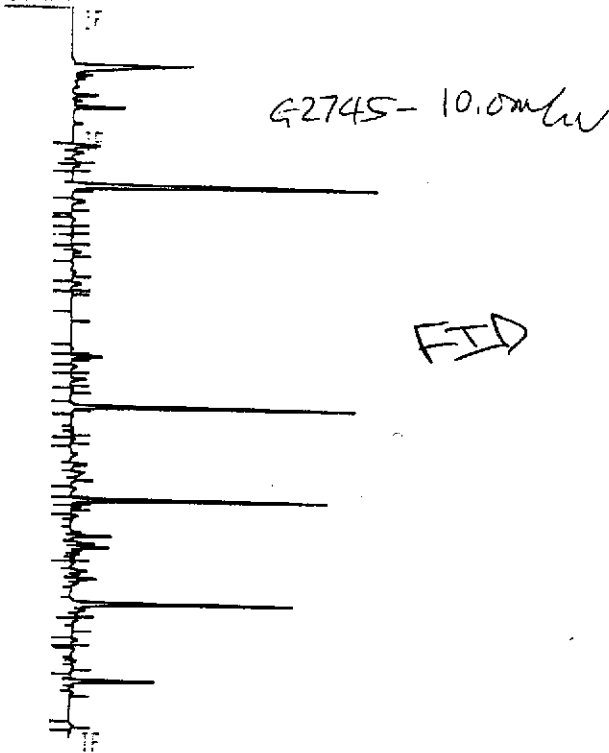
RUN # 1595 JAN/29/99 03:27:43
 WORKFILE ID: B
 WORKFILE NAME:

RT	AREA	TYPE	AR/HT	AREA%
1.90	3610	PV	0.066	0.520
2.04	3343	VP	0.065	0.489
3.72	11842	PP	0.061	1.734
4.80	105650	PB	0.078	15.466
5.90	2898	PV	0.065	0.424
6.03	3085	VP	0.067	0.452
6.46	3236	VV	0.073	0.474
6.62	6061	VV	0.041	0.987
7.84	2071	I PB	0.081	0.420
8.34	2391	VV	0.043	0.350
8.53	3724	D PV	0.063	0.545
8.91	5253	VP	0.087	0.769
9.03	2913	D VV	0.045	0.426
9.31	2258	D VV	0.027	0.331
9.53	19937	VV	0.076	2.918
9.78	4527	VV	0.054	0.663
10.13	10207	VV	0.066	1.494
10.41	2014	D VV	0.022	0.295
10.54	3928	VP	0.047	0.575
10.61	3127	PV	0.038	0.458
10.69	2237	D VV	0.039	0.328
10.89	238650	VV	0.054	34.935
11.77	2586	D VV	0.032	0.379
12.02	4837	VV	0.068	0.700
12.14	2065	D VV	0.026	0.302

TOTAL AREA=4956851
MUL FACTOR=1.0000E+00

1/27 Dur

* RUN # 1596 JAN 29, 1999 03:58:39
START



TIMETABLE STOP

RUN# 1596 JAN 29, 1999 03:58:39

AREA#

RT	AREA	TYPE	WIDTH	AREA%
3.735	131493	BV	.075	2.27572
3.934	59065	VP	.076	1.02222
4.823	1447320	PB	.073	25.04045
5.256	87338	BB	.096	1.51154
7.547	51190	BB	.076	.98593
9.555	110927	PB	.060	2.05824
10.166	87397	BB	.082	1.51256
10.913	931554	PB	.054	16.12230
12.187	63796	BP	.119	1.10410
12.470	66787	PP	.075	1.50200
12.685	78731	PV	.089	1.36258
13.426	820058	PB	.052	14.19256
14.320	52973	PV	.071	.91679
14.416	144331	VP	.056	2.49790
14.631	104332	PV	.068	1.80565
14.735	160202	VV	.067	2.77258
15.398	84178	PV	.075	1.45695
15.618	111063	VV	.068	1.92214
16.298	857050	PV	.064	14.83278
18.434	300297	PV	.059	5.19717

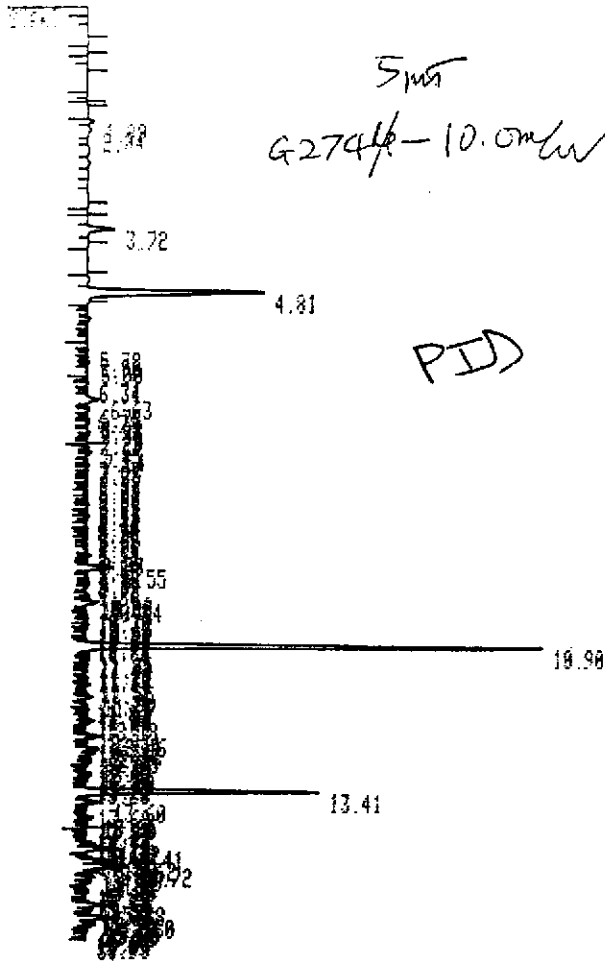
TOTAL AREA=5779083
MUL FACTOR=1.0000E+00

* RUN # 1597 JAN 29, 1999 04:29:00
START

IF

G2745-10.0ml

TOTAL AREA= 683140
 MUL FACTOR= 1.0000E+00



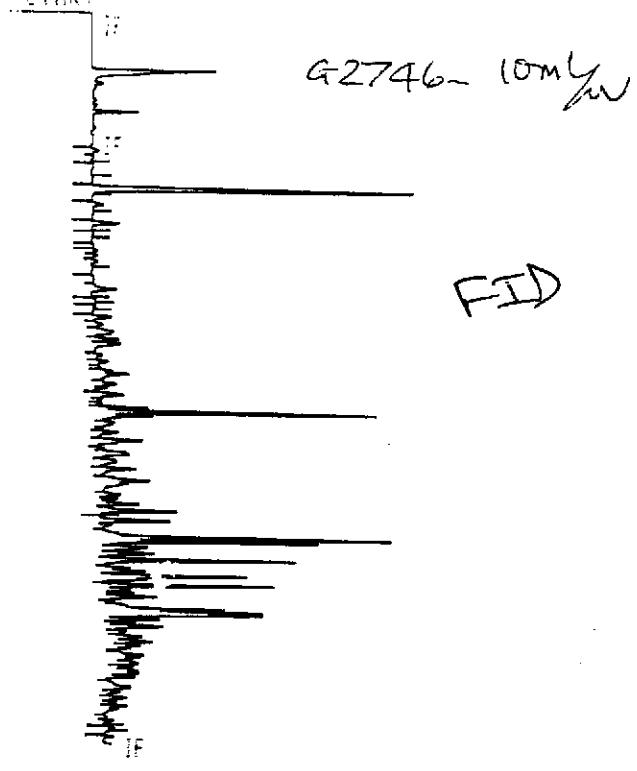
RUN # 1596 JAN/29/99 03:58:02
 WORKFILE ID: B
 WORKFILE NAME:

AREA%	RT	AREA	TYPE	AR/HT	AREA%
	1.89	2919	BV	0.056	0.388
	2.04	3062	YY	0.080	0.398
	3.72	12937	PP	0.062	1.683
	4.81	105630	PB	0.079	13.740
	6.34	2415	PV	0.058	0.314
	6.63	11315	YY	0.091	1.472
	6.78	2909	D VP	0.058	0.378
	7.03	2445	D VP	0.056	0.318
	7.20	2379	YY	0.052	0.310
	7.45	2896	PH	0.042	0.377
	7.54	2253	D HH	0.025	0.293
	7.67	2739	D HH	0.047	0.356
	8.01	4048	HH	0.068	0.527
	8.28	3851	D HH	0.062	0.501
	8.29	3010	HH	0.054	0.392
	8.45	4343	D HH	0.065	0.565
	8.64	2829	D HH	0.039	0.368
	8.70	2713	D HH	0.043	0.353
	8.76	3920	HH	0.080	0.510
	9.02	2894	HH	0.049	0.376
	9.11	2361	D HH	0.040	0.307
	9.23	5708	HH	0.096	0.743
	9.33	2224	D HH	0.025	0.289

TOTAL AREA=3.8029E+07
MUL FACTOR=1.0000E+00

KB-4

* RUN# = 1612 JAN 29, 1999 13:42:16
START



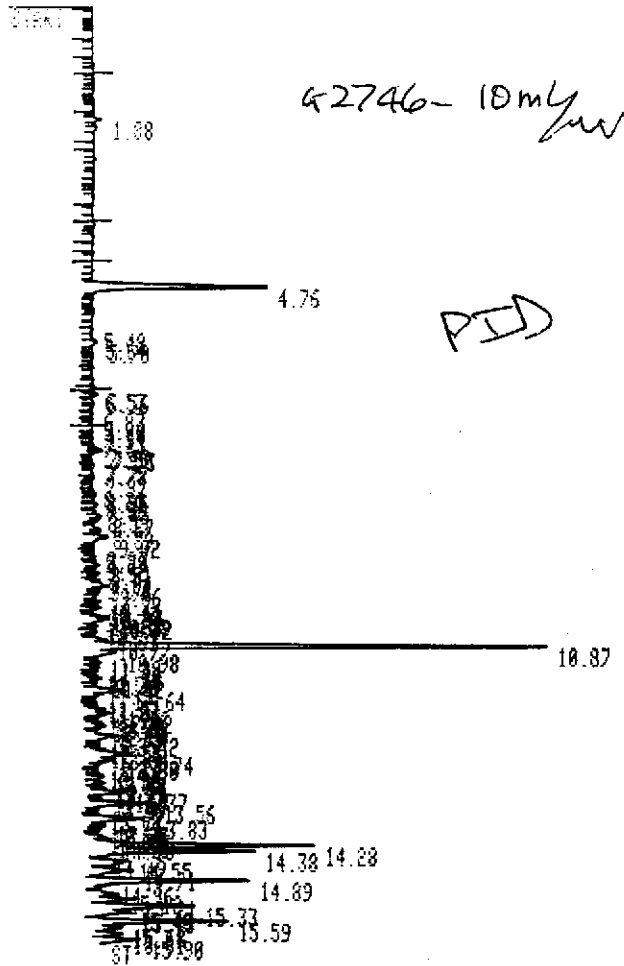
TIMETABLE STOP

RUN# 1612 JAN 29, 1999 13:42:16

AREA#

RT	AREA	TYPE	WIDTH	AREA#
4.769	1479519	FB	.076	8.46857
5.193	62574	FB	.091	.35841
5.706	139702	BB	.078	.80018
7.540	164640	VB	.103	.94301
8.304	97670	PV	.076	.55943
8.583	71156	VV	.099	.40756
8.695	207674	VV	.148	1.18950
8.912	134383	VV	.080	.76971
9.030	197455	VV	.108	1.13097
9.350	65909	VV	.102	.37751
9.532	85726	VV	.085	.49102
9.787	84946	VV	.066	.48655
9.873	240913	VV	.105	1.37909
10.137	155216	VV	.104	.88904
10.432	179036	PV	.094	1.02547
10.785	213972	VV	.063	1.22558
10.882	963115	VV	.056	5.51647
10.991	314517	VV	.087	1.80147
11.176	151531	VV	.120	.86793
11.440	114641	VV	.080	.65663
11.648	272333	VV	.092	1.55985
12.032	264658	VV	.130	1.51589
12.244	168810	VV	.139	.96690
12.425	213364	VV	.088	1.22209
12.739	298610	VV	.091	1.65308
13.125	112293	VV	.082	.64318
13.231	80820	VV	.069	.46292
13.381	153391	VV	.062	.87858
13.575	334320	VB	.071	1.91490
13.845	278092	PV	.065	1.59284
14.294	1159483	VV	.066	6.64121

TOTAL AREA= 2947980
 MUL FACTOR= 1.0000E+00



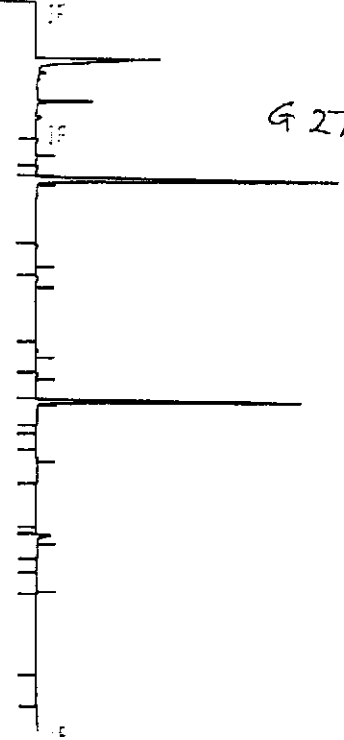
RUN # 1612 JAN/29/99 13:41:48
 WORKFILE ID: B
 WORKFILE NAME:

AREA#	RT	AREA	TYPE	AR/HT	AREA%
	1.88	3199	PV	0.051	0.232
	4.76	106440	VV	0.079	7.705
	5.64	2316	PV	0.062	0.168
	5.70	4007	VV	0.068	0.290
	7.14	2289	PH	0.069	0.166
	7.48	2141	HH	0.035	0.155
	7.58	2258	HH	0.024	0.164
	7.53	2767	D HH	0.025	0.200
	8.25	2225	HH	0.037	0.161
	8.36	3313	HH	0.056	0.240
	8.45	5273	HH	0.069	0.382
	8.59	3800	HH	0.055	0.275
	8.67	5714	HH	0.051	0.414
	8.89	6067	HH	0.058	0.439
	9.02	15377	HH	0.095	1.113
	9.23	2429	HH	0.041	0.176
	9.51	5933	HH	0.066	0.430
	9.64	2172	D HH	0.023	0.157
	9.76	2685	HH	0.027	0.194
	9.85	12121	D HH	0.073	0.878
	10.11	4863	HH	0.047	0.352
	10.23	4852	HH	0.046	0.351

TOTAL AREA=2342114
MUL FACTOR=1.0000E+00

KB-1

* RUN # 1598 JAN 29, 1999 04:59:15
START



G 2747 - 10.0ml/w

FID

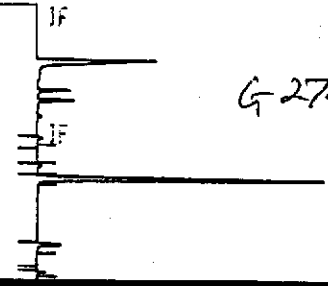
TIMETABLE STOP

RUN# 1598 JAN 29, 1999 04:59:15

AREA%	RT	AREA	TYPE	WIDTH	AREA%
	4.816	1413431	PS	.077	61.27341
	10.913	838262	PS	.053	36.33936
	14.563	55868	PS	.063	2.38724

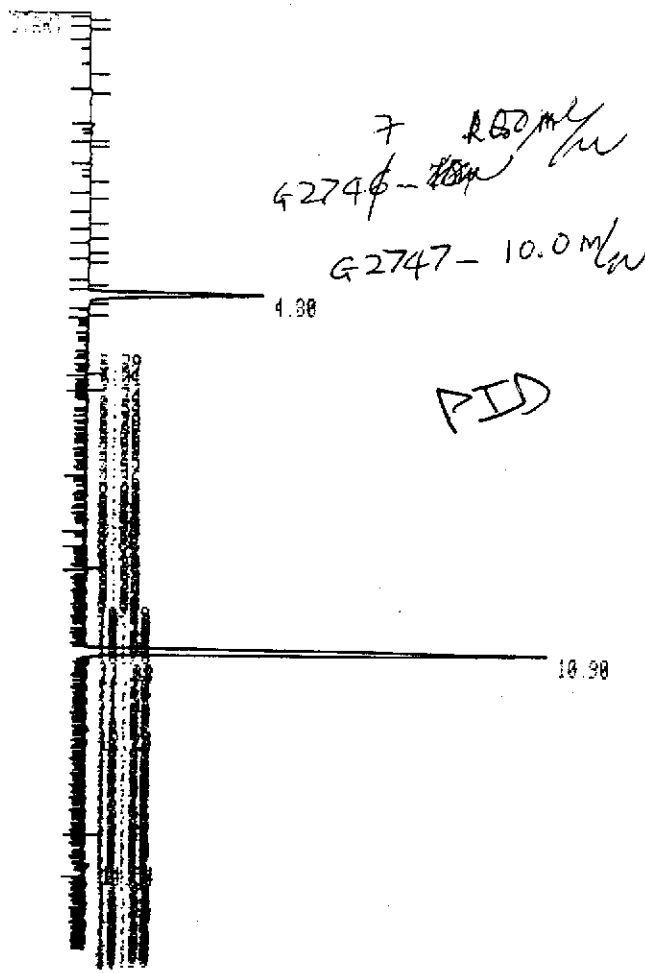
TOTAL AREA=2386762
MUL FACTOR=1.0000E+00

* RUN # 1599 JAN 29, 1999 05:29:33
START



G 2748 - 10.0ml/w

TOTAL AREA= 431768
 MUL FACTOR= 1.0000E+00



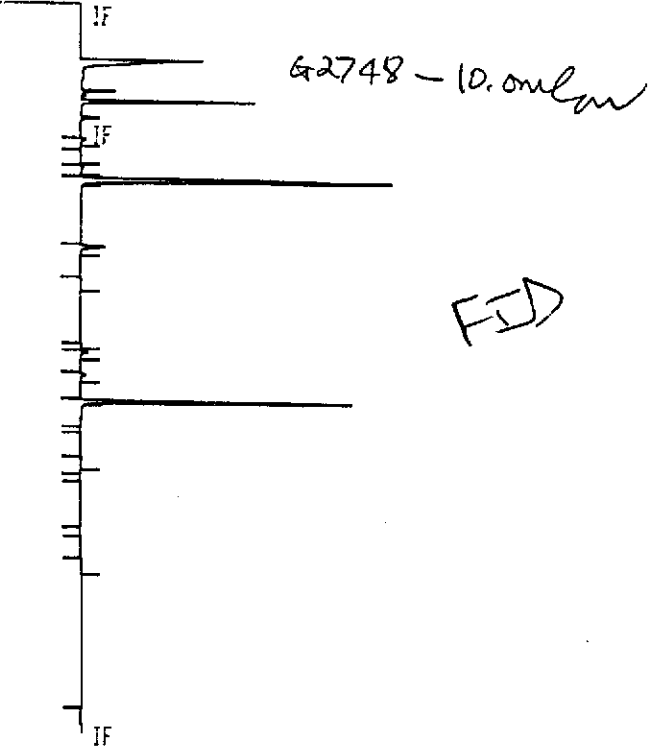
RUN # 1598 JAN/29/99 04:58:38
 WORKFILE ID: B
 WORKFILE NAME:

AREA#	RT	AREA	TYPE	AR/HT	AREA%
	4.00	102370	BB	0.078	26.130
	5.92	2339	PP	0.063	0.597
	6.79	2839	D VP	0.060	0.725
	6.92	3069	PV	0.069	0.783
	7.01	2911	D VV	0.063	0.743
	7.57	2155	VV	0.047	0.550
	8.14	3008	D VV	0.064	0.768
	8.23	2200	VV	0.041	0.562
	8.45	3444	PP	0.060	0.879
	8.95	2705	I PB	0.077	0.690
	9.52	2109	BH	0.049	0.538
	10.00	2094	D PH	0.036	0.535
	10.46	3113	HH	0.067	0.795
	10.90	235100	HH	0.055	60.029
	11.33	3095	VV	0.048	0.790
	11.40	2704	VV	0.048	0.690
	11.97	2478	D PV	0.038	0.633
	12.34	2663	VV	0.049	0.680
	12.56	2865	D VV	0.048	0.731
	12.94	2220	D VV	0.037	0.567
	14.22	2119	VV	0.045	0.541
	14.35	2044	D VP	0.038	0.522
	14.44	2050	D VV	0.040	0.523

MUL FACTOR=1.0000E+00

1/27FB

* RUN # 1755 FEB 4, 1999 12:14:31
START



TIMETABLE STOP

RUN# 1755 FEB 4, 1999 12:14:31

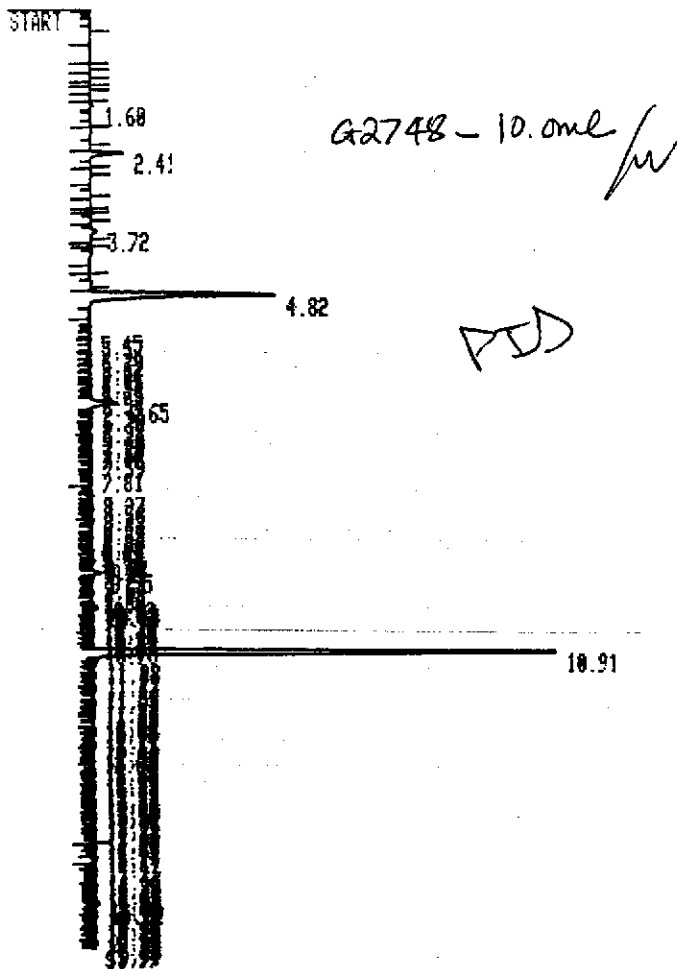
AREA%	RT	AREA	TYPE	WIDTH	AREA%
	4.835	1474018	PB	.078	60.35291
	6.660	102600	BB	.068	4.20418
	10.925	865634	PB	.053	35.44293

TOTAL AREA=2442333
MUL FACTOR=1.0000E+00

* RUN # 1756 FEB 4, 1999 12:45:32
START

IF

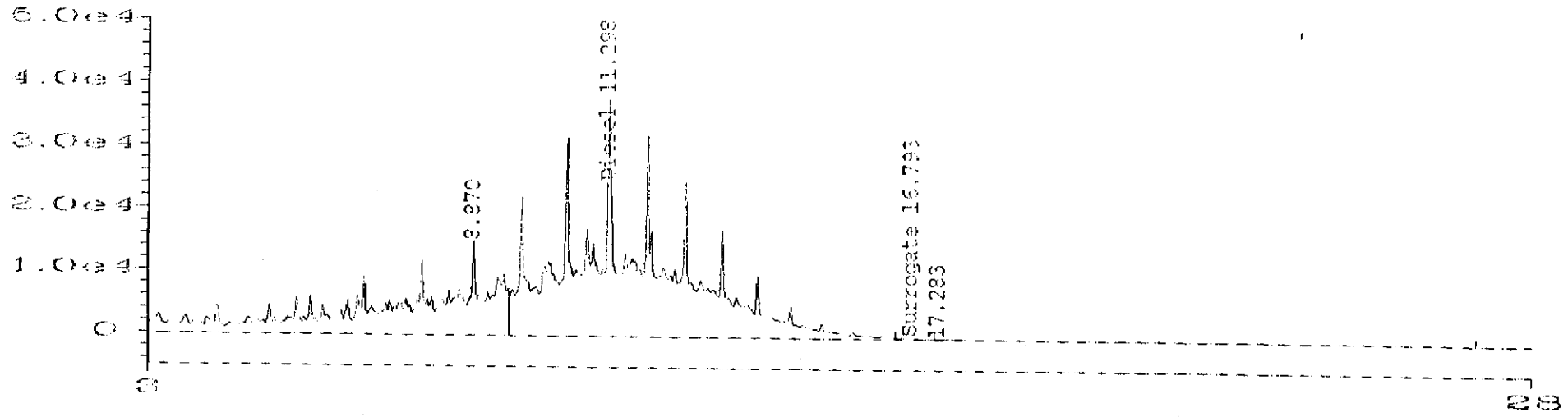
TOTAL AREA= 2254200
 MUL FACTOR= 1.0000E+00



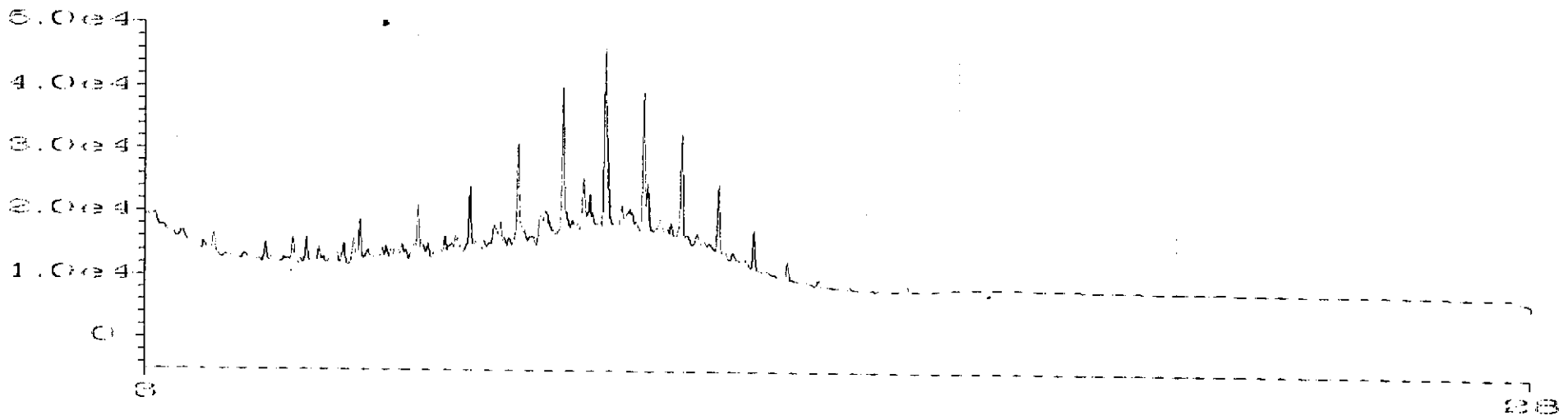
RUN # 1755 FEB/04/99 12:18:22
 WORKFILE ID: C
 WORKFILE NAME:

RT	AREA	TYPE	AR/HT	AREA%
1.68	1256	PV	0.037	0.216
2.41	12552	BP	0.049	2.156
3.72	3087	PB	0.064	0.530
4.82	113860	BP	0.081	19.568
5.45	2428	VV	0.071	0.417
5.57	2582	PV	0.063	0.444
5.92	2699	VV	0.056	0.464
6.01	2932	VV	0.060	0.504
6.15	3177	VV	0.071	0.546
6.23	2014	VV	0.043	0.346
6.35	2214	VV	0.044	0.380
6.65	21062	VV	0.087	3.618
7.59	1933	VV	0.049	0.332
7.81	1498	PV	0.043	0.242
8.23	2903	PH	0.057	0.499
8.36	2296	HH	0.047	0.394
8.45	2277	PH	0.042	0.391
8.64	2641	PH	0.039	0.454
8.73	1372	D HH	0.024	0.236
8.86	1382	D HH	0.024	0.237
8.92	2467	D HH	0.044	0.424
8.98	1175	D HH	0.021	0.202
9.08	2585	HH	0.046	0.444
9.14	1214	D HH	0.020	0.209

Diesel std. 1000ppm

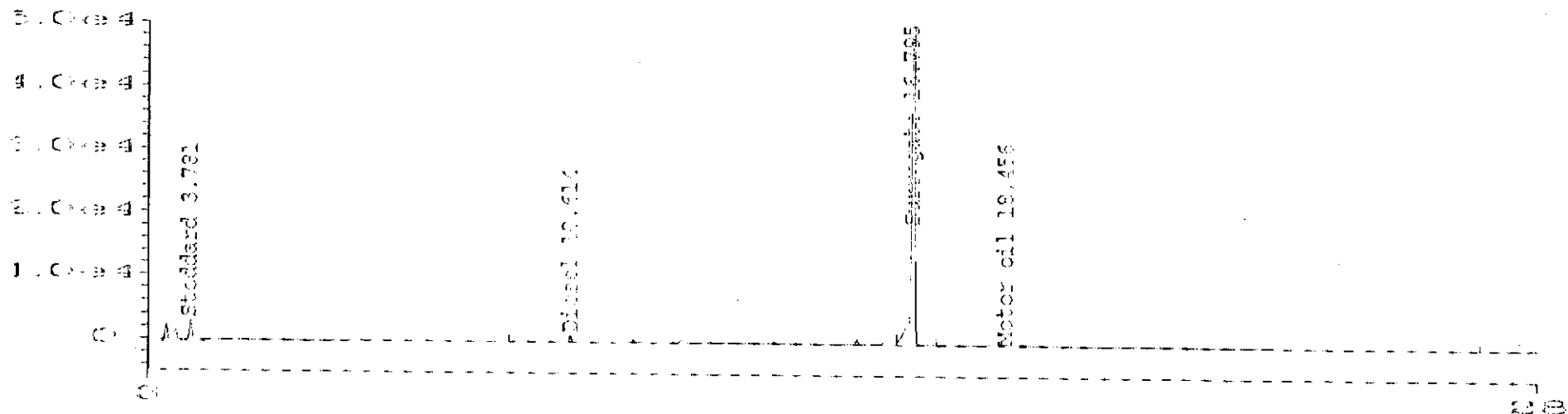


Chromatogram Diff.

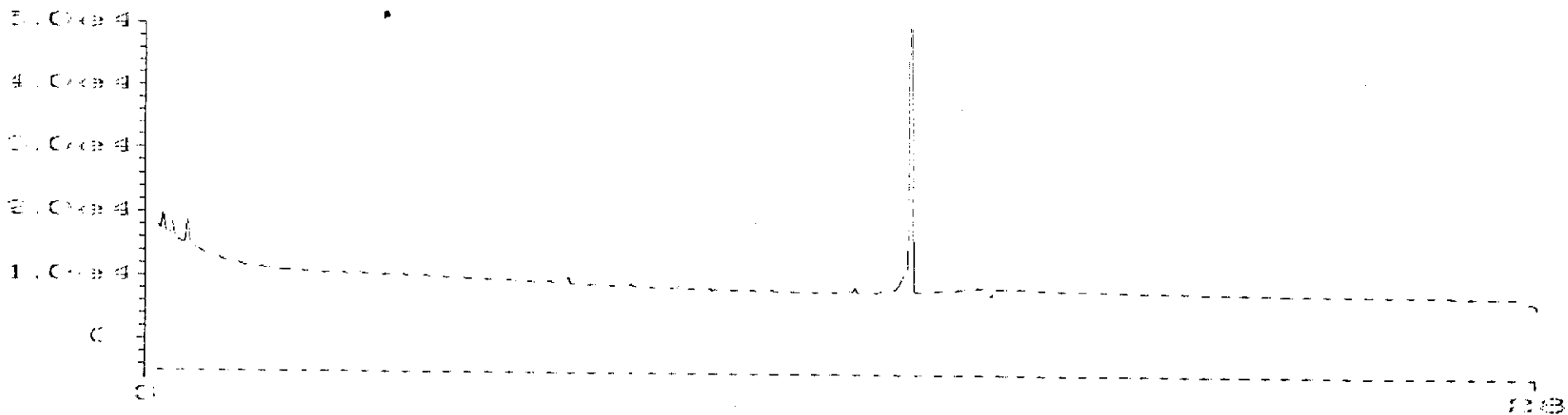


G-2742

KBA

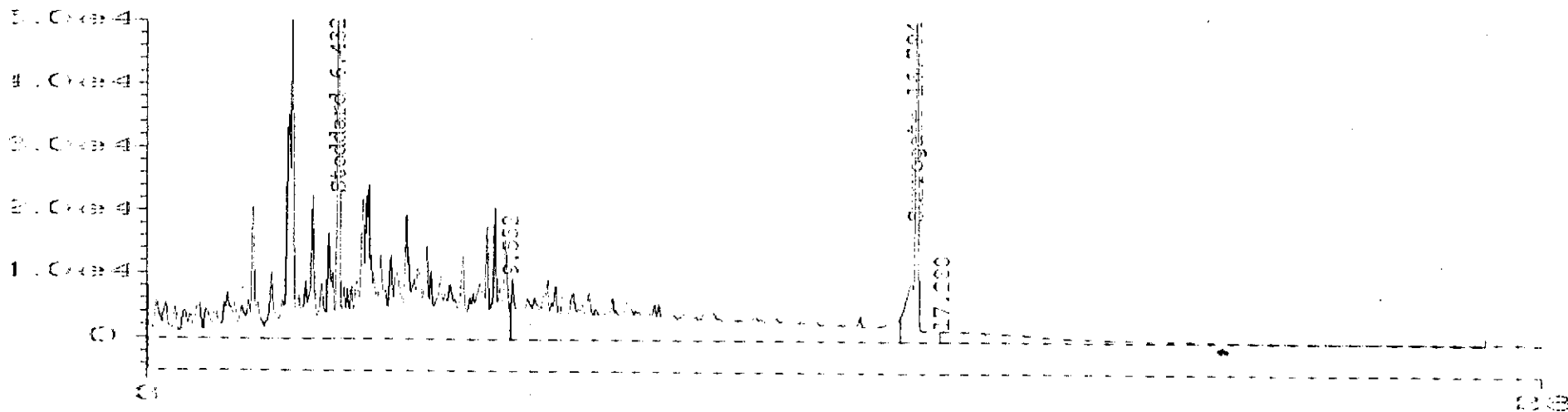


Chromatographic Diff.

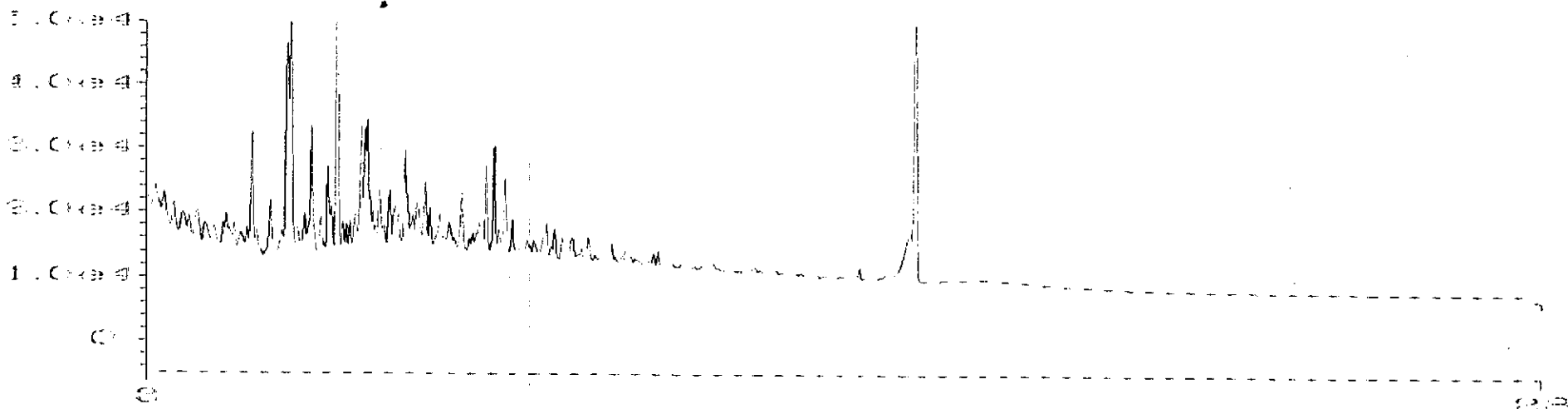


G-2743

KB-5



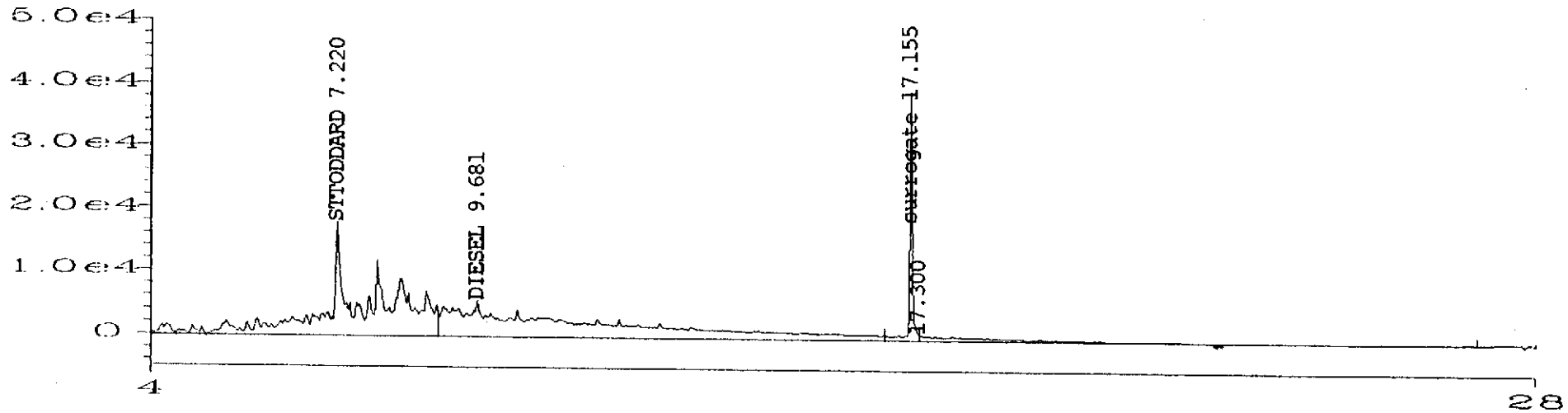
Chromatogram (Diff.)



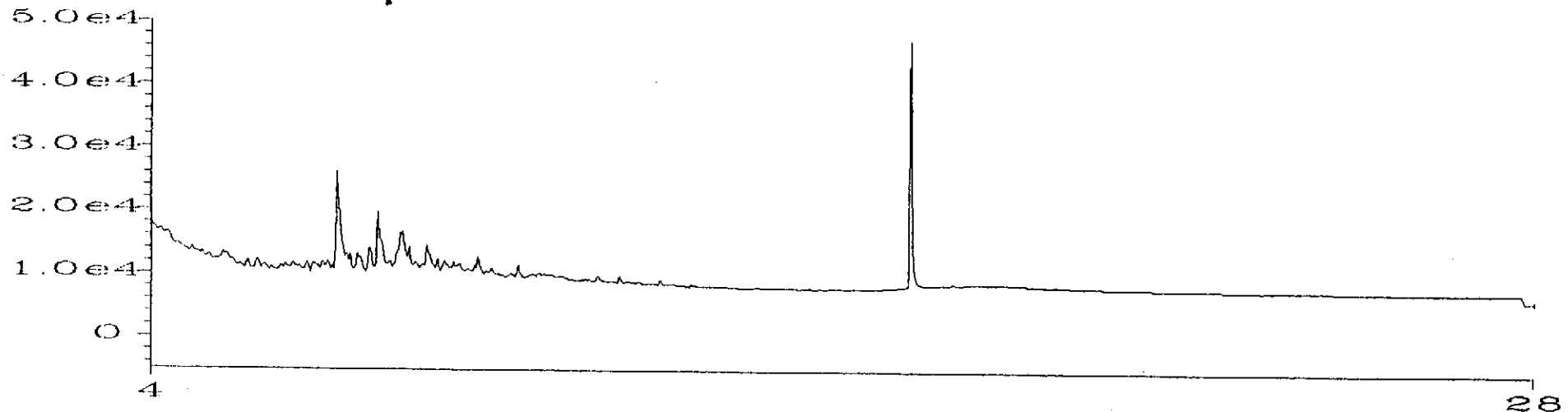
G-2743

KB-5

w/s: gel clamp

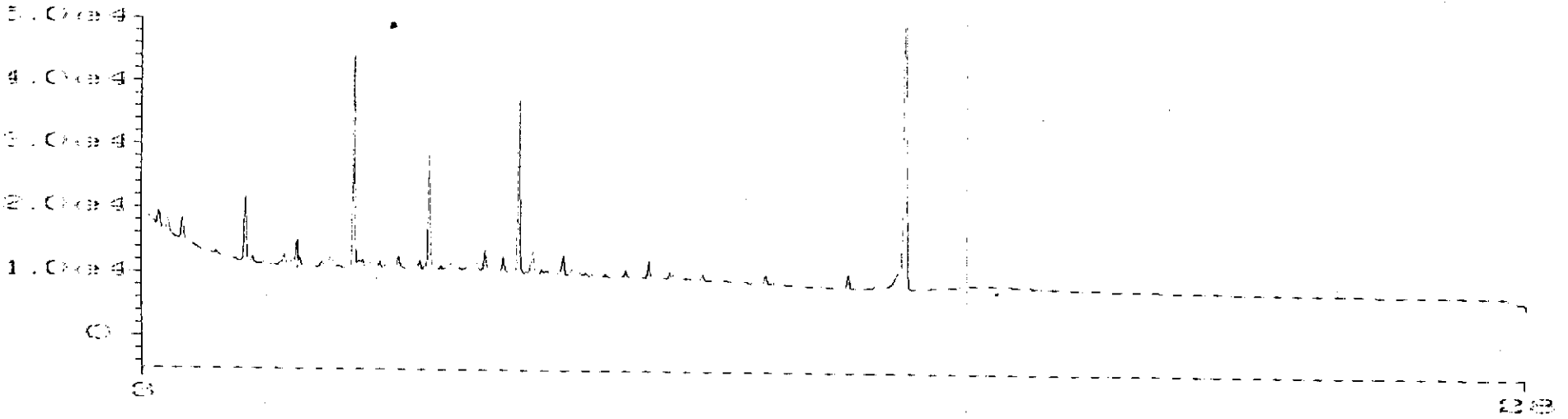
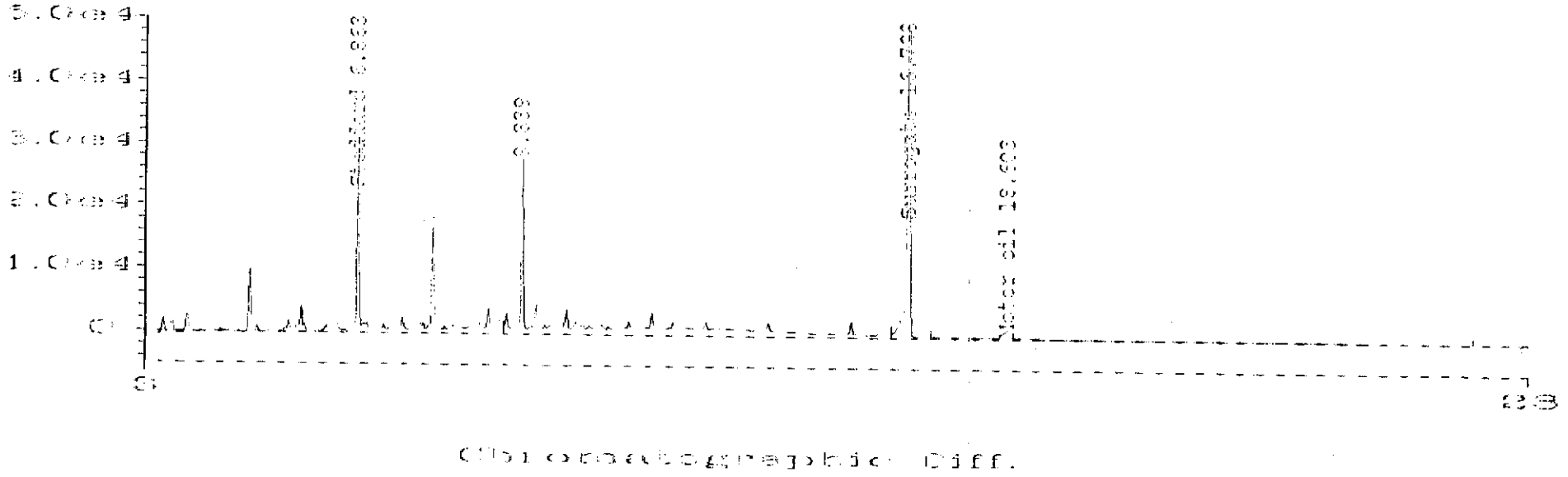


Chromatographic Diff.



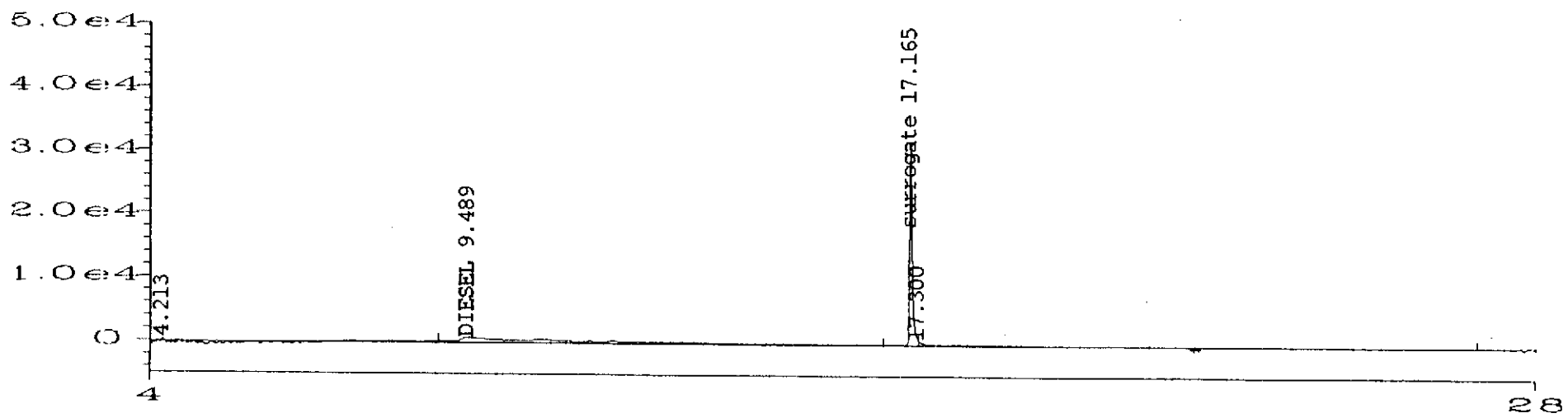
G-2744

KB-3



CHROMATOGRAPHY - DIFFERENTIAL

G-2744
w/5: Gel cleanup



Chromatographic Diff.

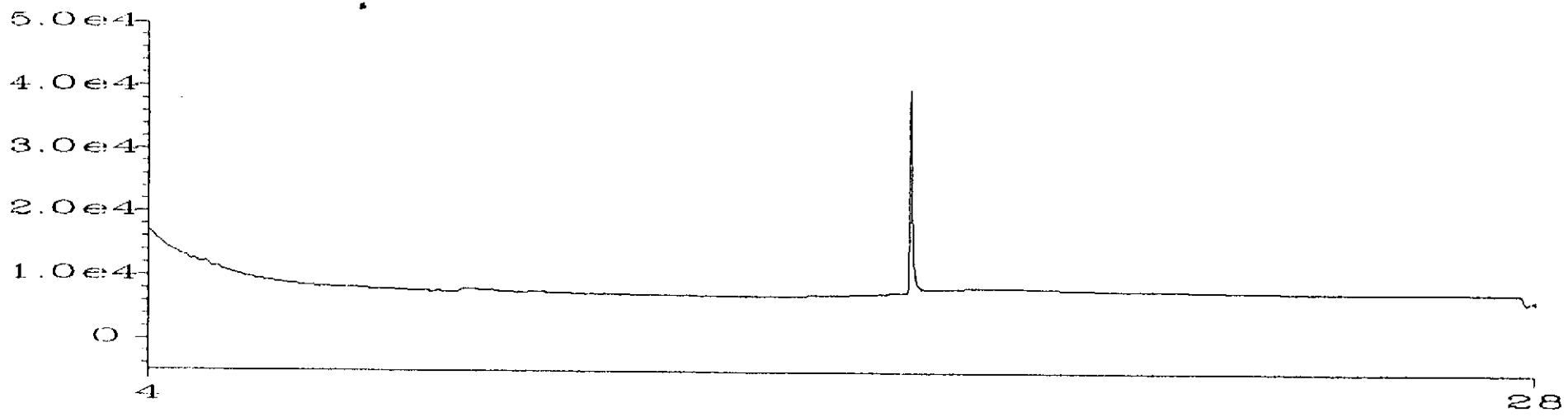
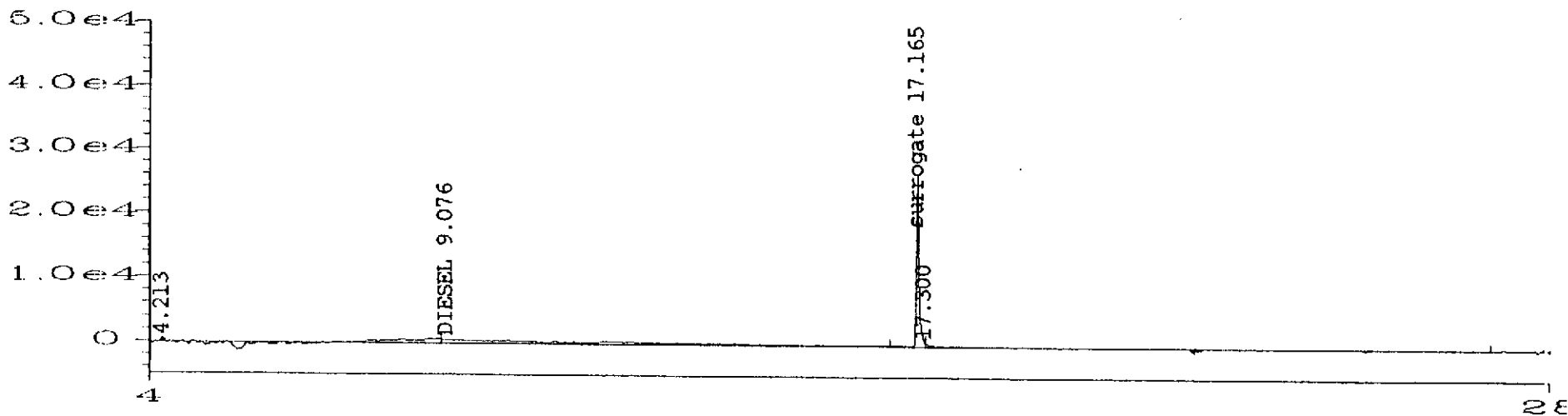


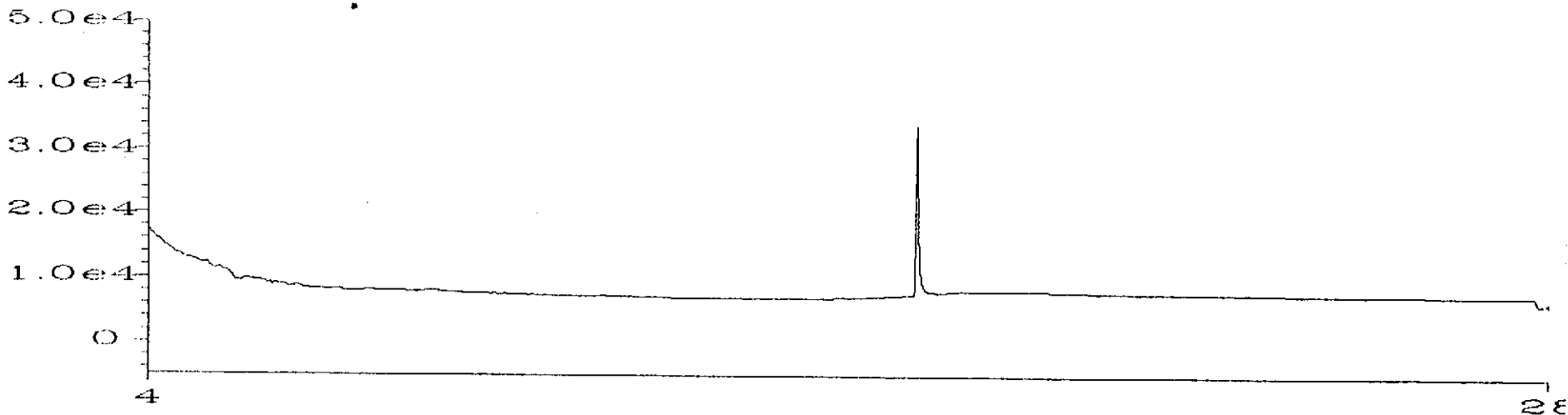
Fig. 1 in D:\HPCHEM\1GC3\902GC3\NV-F0178.D

C-2745

w/ silica gel cleanup

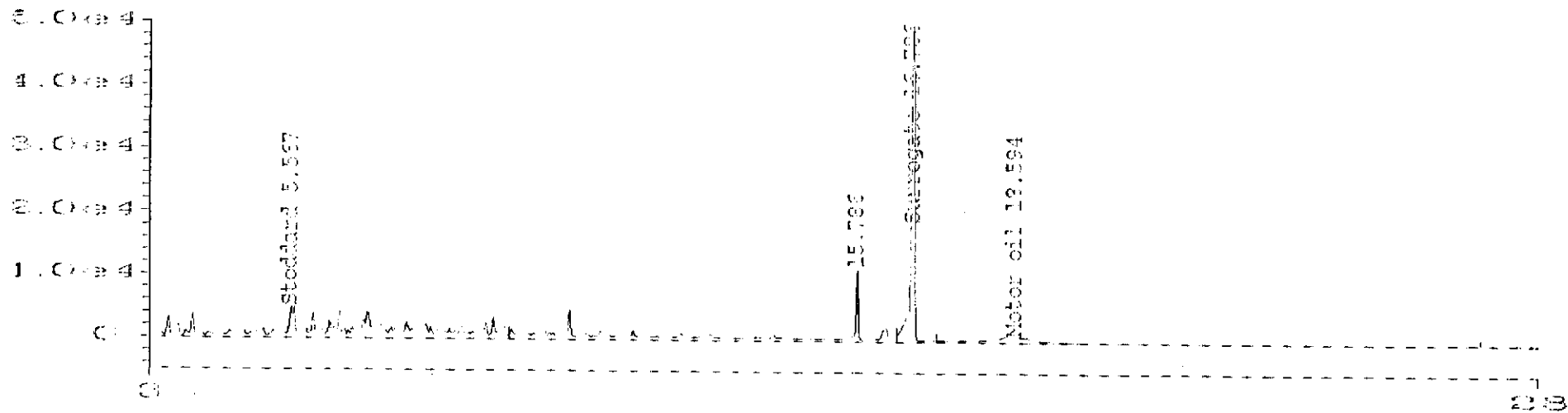


Chromatographic Diff.

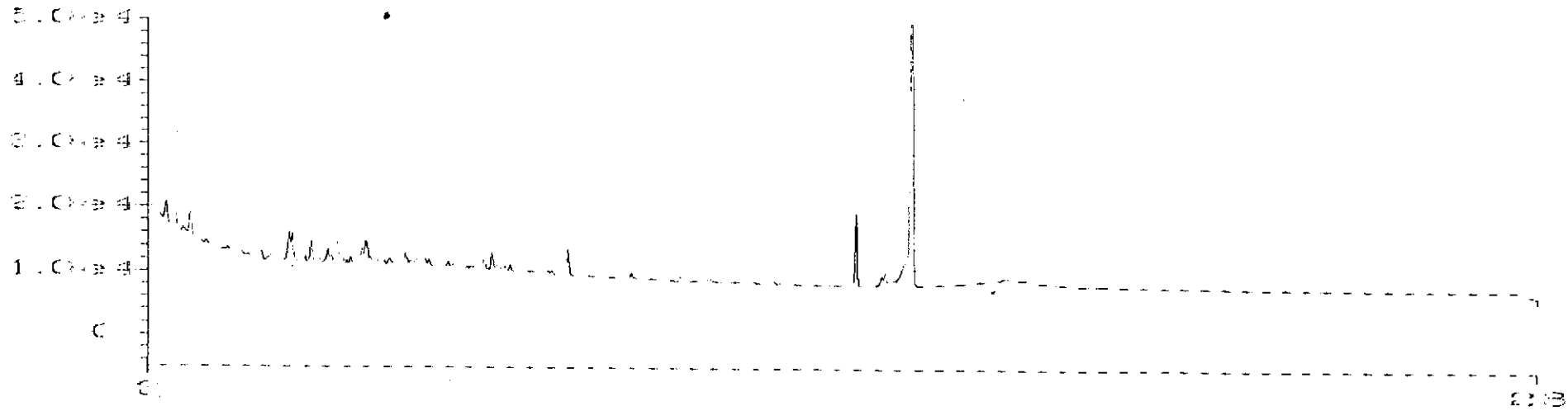


G-2746

KB-4

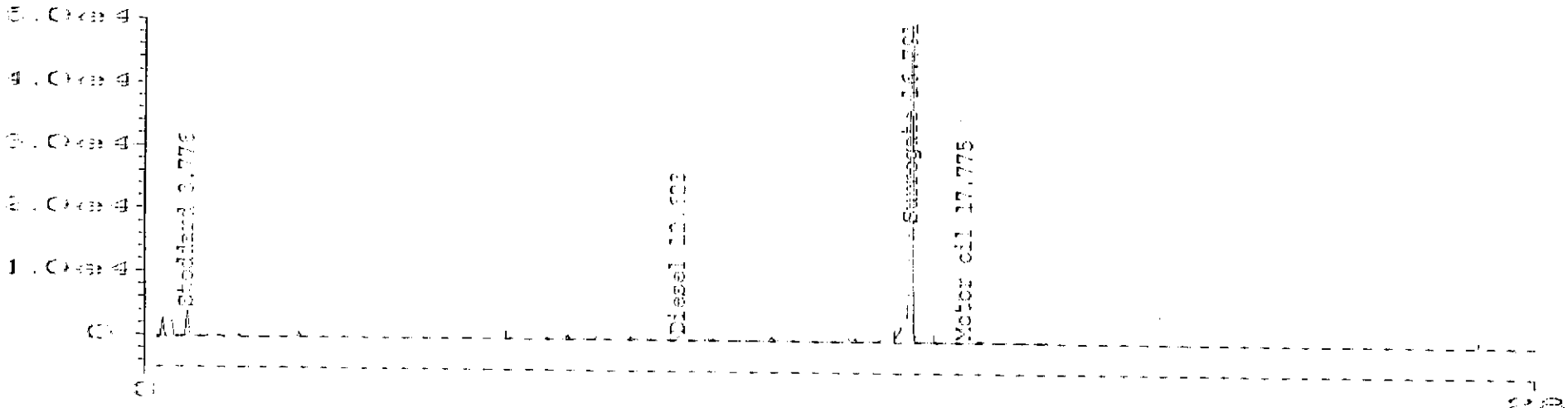


Chromatogram Diff.

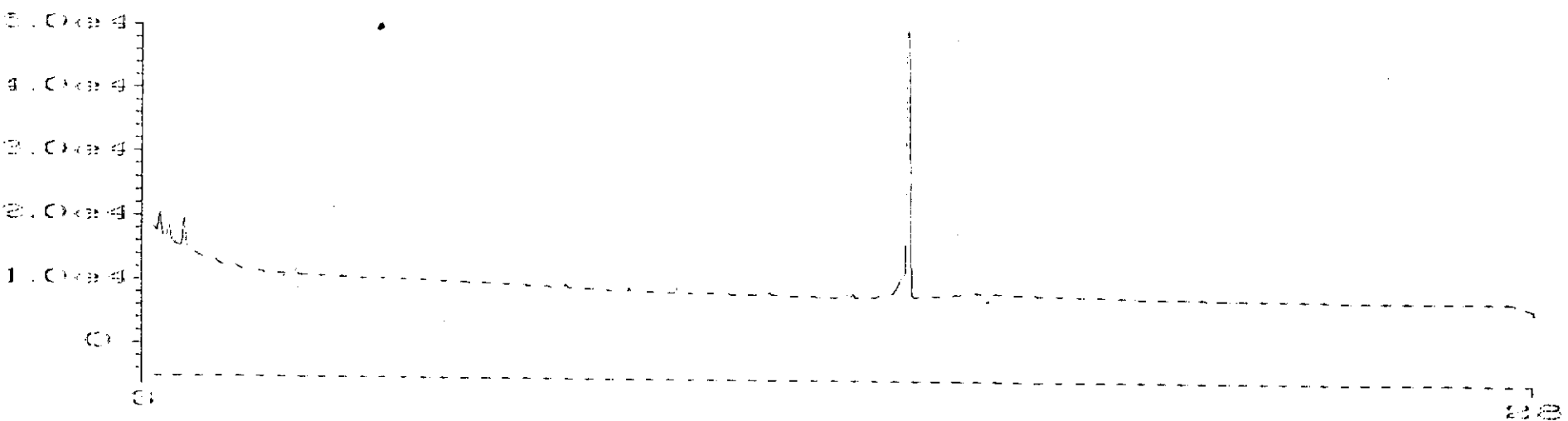


G-2747

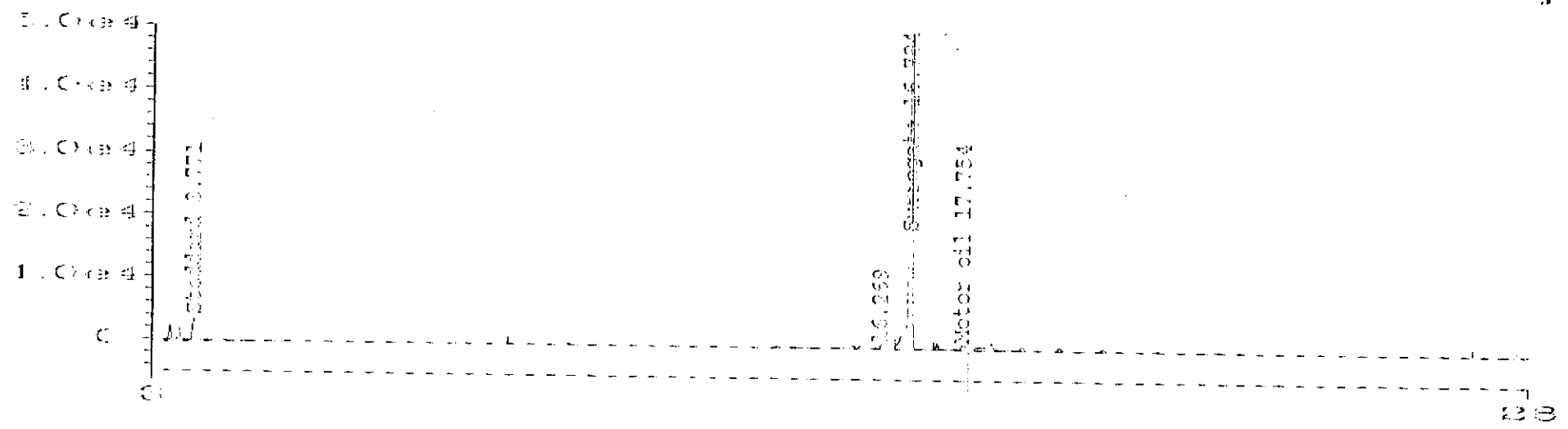
KB-1



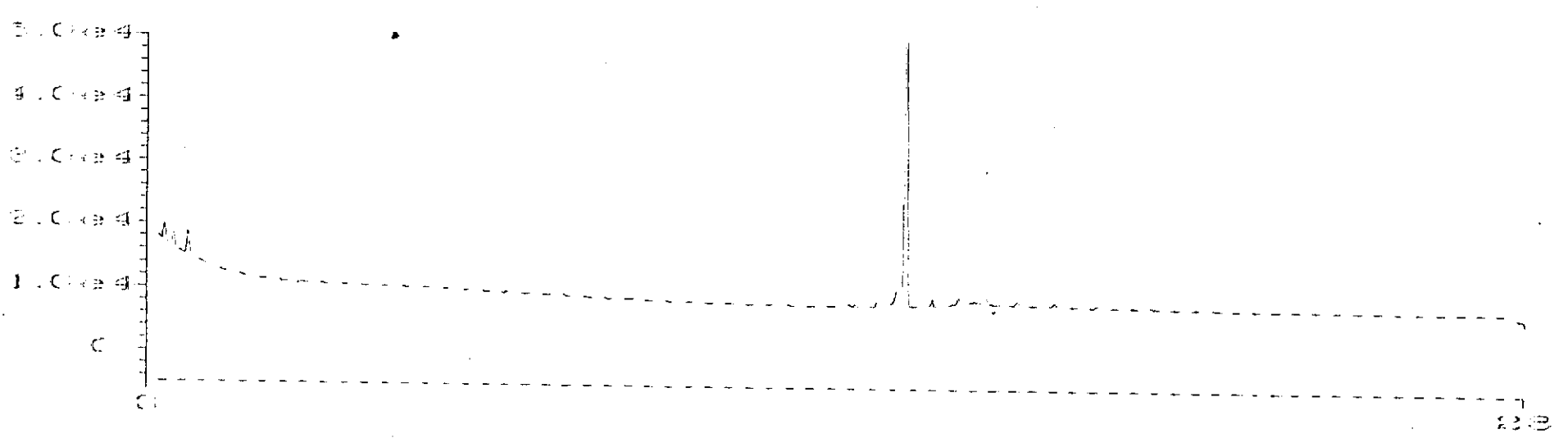
Chromatographic Diff.



G-2748 11/27FB



Chromatogram of 40% Ethanol Diff.



CHROMATOGRAFIA - 10439 D