Subsurface Consultants, Inc.

January 9, 2001
SCI 1039.008

Mr. Don Hwang
Hazardous Materials Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, California 94502-6577

Supplemental Site Characterization Investigation and Groundwater Monitoring Activities – March to October 2000
327-34th Street
Oakland, California

Dear Mr. Hwang:

This letter records the results of a supplemental investigation and ongoing groundwater monitoring activities performed by Subsurface Consultants, Inc. (SCI) at the above-referenced property. The location of the property, referred to herein as the Site, is shown on the Vicinity Map, Plate 1. The configuration of the Site is shown on the Site Plan, Plate 2.

BACKGROUND

On March 4 and 5, 1993, one 1,000-gallon underground storage tank (UST) containing unleaded gasoline and one 1,000-gallon UST containing waste oil were removed by others under the direction ACHCSA. Results of chemical analyses on soil samples collected beneath the ends of the gasoline UST indicated impacts by total petroleum hydrocarbons (TPH) as gasoline, and toluene, ethylbenzene, and xylenes. Soil samples from the waste oil UST excavation showed only relatively low concentrations of TPH as diesel, ethylbenzene, and xylenes.

GeoPlexus, Inc. (GeoPlexus) conducted a soil and groundwater investigation in 1993 to assess petroleum hydrocarbon impacts to groundwater. GeoPlexus installed three groundwater monitoring wells (MW-1 through MW-3, see Plate 2). Analytical testing of soil and groundwater samples from the wells identified impacts from gasoline-range hydrocarbons at two of the wells (MW-2 and MW-3) located downgradient of the former gasoline UST. Approximately 1/4 inch of free product was observed in well MW-3. The product was reportedly gasoline.

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Attachments: Table 1 - Groundwater and Free Product Elevation Data
Table 2 - Summary of Petroleum Hydrocarbon Concentrations in Groundwater
Table 3 - Summary of Bioparameter Data
Plate 1 - Vicinity Map
Plate 2 - Site Plan
Plate 3 - Groundwater Elevation Data (March 2000)
Plate 4 - Groundwater Elevation Data (July 2000)
Plate 5 - Groundwater Elevation Data (October 2000)
Plate 6 - TVHg, Benzene, MTBE Concentrations (July 2000)
Appendix A – Agency Letters
Appendix B - Boring Permits, Well Logs and USCS Classification
Appendix C - Field Forms
Appendix D - Analytical Test Reports/Chain-of-Custody Documents

cc: Strough Family Trust of 1983
c/o Mr. Don Strough
2 Sea View Avenue
Piedmont, California 94611

Mr. Jonathan Redding, Esq.
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SCI was retained in September 1997 to evaluate the presence of free floating and dissolved phase petroleum hydrocarbons in existing wells MW-1 through MW-3. SCI installed two additional wells, MW-4 and MW-5, in June 1998. Results of the June 1998 subsurface investigation were presented in the Report of Groundwater Monitoring Activities and Additional Subsurface Investigation, dated November 17, 1998. Quarterly groundwater monitoring of the five onsite wells was performed by SCI from June 1998 to January 1999. In March 1999, SCI petitioned the ACHCSA to allow a reduction in the testing and sampling program. In May 1999, the ACHCSA verbally approved modifying the monitoring program to include semi-annual sampling of all the wells and quarterly free product removal. SCI has been retained to continue the monitoring program.

The most likely sources of the gasoline impacts (former onsite UST and dispensing systems) have been removed, and investigation and monitoring of the degree and extent of impacts is ongoing. In a letter dated November 8, 1999 (copy presented in Appendix A), the ACHCSA requested that additional work be conducted at the Site to (1) further characterize the downgradient extent of the contaminant plume, and (2) evaluate the likelihood of contaminant plume migration via an existing concrete box culvert transecting the east side of the Site. To address these requests, SCI proposed to research construction details for the concrete box culvert and install two additional down-gradient monitoring wells. The ACHCSA approved the scope of supplemental investigation in their letter dated March 8, 2000 (copy presented in Appendix A).

QUARTERLY FREE PRODUCT REMOVAL EVENT – MARCH 2000

On March 20, 2000, SCI checked Site wells for free floating product. Well MW-2 contained 0.026 feet (5/16") of free product. Approximately 5 gallons of water/product mixture was bailed from well MW-2 with a new disposable bailer until visible free product was no longer observed in the purge water. The water/product mixture was placed in a labeled 55-gallon steel drum and left onsite for later disposal by others. No free product was observed in any other wells. Groundwater elevation and free product measurements are presented in Table 1.

RESEARCH AND FIELD TRACING OF UNDERGROUND CULVERT

Pursuant to ACHCSA's request (letter dated November 8, 1999), SCI conducted research at the City of Oakland Public Works Department (City) to obtain information regarding construction details for an underground culvert known to be aligned with a historic creek bed[1]. During

[1] Creek and Watershed Map of Oakland and Berkeley, Compiled by Janet Sowers, Published by the Oakland Museum, 1995.

previous Site reconnaissance, SCI had observed a storm drain manhole in the parking area on the east side of the Site. No drain inlets were observed onsite.

Through our review of city records, SCI reviewed a City map indicating that the culvert was referred to as a 5-foot by 6-foot reinforced concrete box culvert. The culvert is aligned from north to south coming into the Site, and then angles eastward toward Broadway. SCI further learned that a cave-in occurred along the alignment of the culvert below the Site during the winter of 1983. Repair plans prepared by Jordan, Casper, Woodman, Dobson (JCWD) indicate that the cave-in was located in the parking lot area on the east side of the Site structure, about 35 feet south of an existing manhole and along the culvert alignment. City records department personnel indicated that the property owner likely took responsibility for the repairs, since no easement was ever approved for the culvert by the City.

Although the cause of the cave-in was not described on the plans reviewed, it appears that an 11-foot long segment of the culvert was replaced, and a 5-foot diameter pipe liner was placed into the culvert. The pipe liner extends from the newly repaired area northward about 70 feet. It is unclear whether access to the culvert through the existing manhole, was obstructed by the pipe liner. Specifications regarding the material used to backfill the culvert trench were not available.

The JCWD plans indicate that the culvert flow line in the area of the repair is located about 22.5 feet below the pavement. This places the flow line of the culvert at approximately 4 to 6 feet below the groundwater table, as measured in July and October 2000.

Our Site visit conducted in July 2000 revealed that the existing storm drain manhole located on the east side of the Site has been paved over. SCI retained the services of a subsurface utility locator to trace the alignment of the culvert. The traced alignment concurs well with the alignment presented on the plans within City records (Plate 2).

MONITORING WELL INSTALLATION - JULY 2000

On July 7, 2000, SCI installed two groundwater monitoring wells (MW-6 and MW-7) on the east side of the Site. The new wells are approximately 30 feet west (MW-6) and 30 feet east (MW-7) of the culvert alignment. The well locations are presented on Plate 2. SCI completed Alameda County Public Works Agency drilling permit applications for each well. Copies of the permits are presented in Appendix B.

Wells MW-6 and MW-7 were installed to depths of 30 and 35 feet below the existing ground surface (bgs) in borings drilled using a truck-mounted drill rig, equipped with hollow-stem augers. Drilling and sampling equipment were steam cleaned prior to each use. Cleaning water was placed into a labeled 55-gallon steel drum and left onsite for later disposal by others.

SCI's field geologist observed drilling operations and logged the materials encountered in accordance with the Unified Soil Classification System (USCS). Logs of the monitoring well test borings, as well as the USCS key are presented in Appendix B. SCI collected soil samples at 3- to 5-foot intervals and screened soil cuttings in the field using an organic vapor meter (OVM). OVM readings are presented on the respective boring logs. Soil samples were retained in cleaned liners, which were labeled and stored in an ice-filled cooler. Soil cuttings were stored onsite in labeled 55-gallon drums pending later disposal by others.

Wells were constructed of 2-inch-diameter, Schedule 40 PVC pipe having flush threaded joints. The upper 10 feet of well MW-6 and the upper 15 feet of well MW-7 consist of solid PVC casing. The lower 20 feet of the wells consist of machine-slotted well screen having 0.010-inch slots, and capped at the bottom. The annular spaces around the screen sections were backfilled with No. 3 sand to 2 feet above the top of the screens. Bentonite seals, approximately 2 feet in thickness, were placed above the sand packs. The annular space, above the bentonite seals, were backfilled with neat cement grout. The wells were finished below grade in traffic-rated utility boxes and were secured with locking caps. Well completion details are graphically presented on the respective boring logs.

An elevation survey of the new wells was conducted on August 14, 2000. The elevation of the top of casings were referenced to the top of casing for well MW-3, with an assumed elevation of 100.00 feet.

The test borings confirmed that the Site is underlain by interbedded alluvial soils. The soils encountered in the well borings, however, do differ. Well boring MW-7, located on the east side of the culvert alignment, encountered about 20 feet of sandy gravel overlaying sandy lean clays, and no OVM readings were recorded for the soil cuttings. Well boring MW-6 encountered numerous alluvial layers similar to the soils encountered in the other borings drilled on the west side of the culvert. Well boring MW-6 also encountered a well-graded sand layer at a depth of 29 feet. This layer was not observed in well boring MW-7, however, it was previously observed in borings MW-3, MW-4, and B-6. OVM readings were also detected in boring MW-6 within the upper 10 feet of the boring.

Groundwater was encountered during drilling at depths ranging from 20 to 21.5 feet bgs, and stabilized at depths varying between 16 and 18 feet bgs in a permeable unit. The groundwater possessed no noticeable odor or sheen.

GROUNDWATER MONITORING EVENT – JULY 20000

On July 20, 2000 the semi-annual monitoring event was performed. Initially, the depth-to-water and the presence of free product was measured and checked in all wells. Approximately 0.017

feet (1/5") of free product was detected in well MW-2. Groundwater elevation data and free product data are summarized in Table 1.

Wells MW-6 and MW-7 were then developed using new disposable bailers. Approximately 10 well casing volumes of water were removed from each well. The wells were each surged by episodes of immersing/removing the bailer for three to 5 minutes, following the removal of 10, 20, 25 and 30 gallons of water. Wells MW-1, MW-3, MW-4 and MW-5 were purged of approximately 3 well casing volumes of water using new disposable bailers. Well MW-2 was not purged due to the presence of free product. Measurements of pH, temperature, conductivity and dissolved oxygen (DO) were made during development and purging, and are recorded on field forms presented in Appendix C. Well development and purge water was placed into labeled 55-gallon steel drums and left onsite for later disposal by others.

After the wells recharged to within 80 percent of their initial level, the wells were sampled. Groundwater samples were decanted into pre-cleaned containers, placed in ice-filled coolers, and remained chilled until delivery to the analytical laboratory. Chain-of-custody documentation accompanied the samples to the laboratory.

Curtis & Tompkins, Ltd., a state-certified chemical testing laboratory, performed chemical analyses on groundwater samples. The testing program included the following:

- Total extractable hydrocarbons as diesel (TEHd) and motor oil (TEHo), using EPA Method 8015 with silica gel cleanup,
- Total Volatile Hydrocarbons as gasoline (TVHg), using EPA Method 8015m,
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX), using EPA Method 8020,
- Methyl tertiary butyl ether (MTBE), using EPA method 8260,
- Nitrate (NO_3), ferrous iron (Fe[II]), manganese (Mn), and sulfate (SO_4), using standard methods, and
- Ammonia (NH_3), ortho-phosphate (o-PO_4), and carbon dioxide (CO_2), using standard methods.

Groundwater analytical test results are summarized in Table 2. Field and laboratory measurements of various bioparameters are summarized in Table 3. Analytical test reports and chain-of-custody documents are presented in Appendix D.

QUARTERLY FREE PRODUCT REMOVAL – OCTOBER 2000

On October 11, 2000, SCI checked Site wells for free floating product. Although strong gasoline odors were detected in wells MW-2 and MW-3, SCI observed no free product or hydrocarbon sheen in any of the onsite wells. Groundwater elevation data are presented in Table 1.

DISCUSSION OF RESULTS

Groundwater Gradient and Flow Direction

Groundwater elevations appear to fluctuate about 4 to 5 feet during a hydrologic cycle. The depth to groundwater has varied from about 15 feet bgs at well MW-4 (March 2000) to about 23 feet bgs at well MW-5 (October 2000). Based on the groundwater elevation data, the groundwater gradient in the northern portion of the Site is relatively flat (0.002 ft/ft) and toward the south. Well MW-5, located approximately 100 feet southwest of wells MW-1 through MW-4, has a groundwater surface elevation 1 foot lower than in these wells. The calculated gradient in the southern portion of the Site is approximately 0.015 ft/ft toward the south. The groundwater flow directions for the March, July, and October 2000 events are shown on Plates 3 through 5, respectively.

The calculated gradients discussed above do not include the elevation data for well MW-7, as this well appears to be completed in a different aquifer. As discussed previously, well MW-7 did not encounter soil layers similar to those encountered in the borings drilled on the west side of the culvert.

The construction of the culvert may also account for the differences observed between groundwater levels measured between wells MW-6 and MW-7. The groundwater elevation measured in well MW-6, located about 60 feet cross gradient from well MW-7, is almost 2.5 feet lower than the level measured in well MW-7. The depressed groundwater elevation in well MW-6 may suggest that the flow of water in the culvert system, or the potential presence of permeable material in the culvert trench, is affecting the groundwater flow regime in the immediate area of the culvert. The extent of the culvert's influence is unknown.

Free Product

Free phase product removal has been conducted periodically from wells MW-2 and MW-3 since October 1997. The product is reportedly gasoline. The amount of free product/impacted groundwater mixture removed from these wells is summarized in Table 1. To date, 52 gallons of free product/impacted water have been removed from the Site.

July 2000 Groundwater Test Results

Analyses detected TVHg at concentrations of 69,000 and 210 micrograms per liter (ug/L) in wells MW-3 and MW-4, respectively. A TEHd concentration of 2,900 ug/L was also detected in well MW-3, however the laboratory chromatogram for groundwater sample MW-3 indicates that weathered gasoline constituents contributed to the diesel quantification.

BTEX concentrations ranging from 1,600 to 14,000 ug/L were detected in well MW-3, while BTEX concentrations ranging from 4.6 to 91 ug/L were detected in well MW-4.

Analyses detected MTBE at concentrations of 3.4, 3300, 1500, 1.9, and 160 ug/L in wells MW-1 and MW-3 through MW-6, respectively. Besides trace MTBE concentrations in well MW-1 and MW-5, no other tested petroleum hydrocarbons were detected at concentrations at or above analytical reporting limits.

Biodegradation

Field measurements indicate groundwater conditions suitable for both aerobic and anaerobic biodegradation. Measured pH levels ranged from 6.35 to 7.43, which are similar to those measured during previous events. DO levels ranged from 2.05 to 7.37 milligrams per liter (mg/L), high enough to support aerobic biodegradation. Lower DO concentrations appear to correlate with wells where higher hydrocarbon concentrations were detected. Elevated Fe (II) and depressed NO_3 concentrations in downgradient wells MW-4 and MW-6, may also indicate local anaerobic microbial activity via ferric iron reduction and denitrification near these wells, where DO concentrations were lowest.

Conditions conducive to both aerobic and anaerobic biodegradation exist at the Site. This coupled with the analytical data from well MW-4, which has shown reduced TVHg and BTEX concentrations, strongly suggest that the degradation of gasoline constituent hydrocarbons is occurring at the Site.

CONCLUSIONS

Data collected over the past 8 years indicate that the TVHg and BTEX plume is stable and has not migrated outside the limits of the Site building. The only gasoline constituent detected in the furthest downgradient/cross-gradient well (MW-6) was MTBE at a concentration of 160 ug/L. MTBE is a very mobile chemical, which tends to be at the front edge of a gasoline plume. This concentration, however, is well below the interim MTBE risk-based screening level (RBSL) of 8,000 ug/L established the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) for the protection of surface water aquatic life.

The MTBE detection in well MW-6 may indicate that the culvert and/or culvert trench is potentially acting as a preferential pathway for groundwater migration, altering the local groundwater flow regime near the culvert. It is unknown if the hydraulic influence of the culvert reaches well MW-6, which is located approximately 30 feet west of the culvert. No MTBE concentrations were detected in well MW-7, which is located approximately 30 feet east of the culvert alignment.

A section of the underground culvert beneath the Site has been repaired and lined in the area adjacent to well MW-6. No other information was available regarding the construction of the culvert, i.e. the material used to backfill the culvert trench is unknown. It also appears that the manhole providing access to the culvert has been paved over, and it is possible that the pipe liner installed in the culvert may block access into the culvert at that location.

As such, the research conducted and data collected during this investigation appear to be inconclusive as to whether the culvert intercepts the MTBE plume.

RECOMMENDATIONS

Based on the observed stability of the TVHg and BTEX plume, and because the MTBE concentration in MW-6 is well below the interim surface water RBSL established by the SFBRWQCB, SCI recommends continued groundwater monitoring as the appropriate course of action at the Site. Monitoring should be conducted for 1 additional year, comprising 2 semi-annual sampling events and 4 quarterly free-product removal events. If this is acceptable, the next event will be conducted in January 2001.

If you have any questions, please call either of the undersigned.

Yours very truly,

Subsurface Consultants, Inc.

Gene Ng
Project Engineer

Jeriann N. Alexander, PE, REA
Civil Engineer 40469 (expires 3/31/03)
Registered Environmental Assessor 03130 (expires 7/01)

GYN: JNA: 1039.008\qtrm_7_2000

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
327 34TH STREET
OAKLAND, CALIFORNIA

Monitoring Well	Date	Elevation[1]	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Product Elevation (feet)	Free Product/Purge Water Removed (Gallons)
MW-1	7/27/93	100.00	20.79[2]	NA	79.21	NA	NA
	10/2/97		21.22	--	78.78	--	--
	6/30/98		18.21	--	81.79	--	--
	7/29/98		18.74	--	81.26	--	--
	8/26/98		19.28	--	80.72	--	--
	10/1/98		19.93	--	80.07	--	--
	10/30/98		20.22	--	79.78	--	--
	11/30/98		19.99	--	80.01	--	--
	12/28/98		19.81	--	80.19	--	--
	1/25/99		19.62	--	80.38	--	--
	2/26/99		17.18	--	82.82	--	--
	12/15/99		21.01	--	78.99	--	--
	3/20/00		16.25	--	83.75	--	--
	7/20/00		19.63	--	80.37	--	--
	10/11/00		20.80	--	79.20	--	--
MW-2	7/27/93	101.27	22.10[2]	NA	79.17	NA	NA
	10/2/97		22.91	0.43	78.36	78.79	7
	6/30/98		19.69	0.45	81.58	82.03	9
	7/29/98		20.11	0.29	81.16	81.45	--
	8/26/98		20.54	0.08	80.73	80.81	--
	10/1/98		21.52	0.42	79.75	80.17	6
	10/30/98		21.54	0.10	79.73	79.83	<.001
	11/30/98		21.21	0.04	80.06	80.10	--
	12/28/98		21.10	0.02	80.17	80.19	1

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OAKLAND, CALIFORNIA

Monitoring Well	Date	Elevation[1]	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Product Elevation (feet)	Free Product/Purge Water Removed (Gallons)
MW-2	1/25/99		20.80	0.01	80.47	80.48	6
(continued)	2/26/99		18.00	sheen	83.27	--	1
	12/15/99		22.42	0.025	78.85	78.88	3
	3/20/00		17.09	0.026	84.18	84.21	5
	7/20/00		20.86	0.017	80.41	80.43	3
	10/11/00		22.10	--	79.17	--	1
MW-3	7/27/93	101.29	22.28[2]	0.02	79.01	79.03	--
	10/2/97		22.71	0.03	78.58	78.61	6
	6/30/98		19.47	--	81.82	--	--
	7/29/98		20.01	--	81.28	--	--
	8/26/98		20.62	--	80.67	--	--
	10/1/98		21.33	--	79.96	--	--
	10/30/98		21.62	--	79.67	--	--
	11/30/98		21.31	--	79.98	--	--
	12/28/98		21.15	0.06	80.14	80.20	1
	1/25/99		20.79	--	80.50	--	--
	2/26/99		18.02	--	83.27	--	--
	12/15/99		22.43	0.0083	78.86	78.87	3
	3/20/00		17.14	--	84.15	--	--
	7/20/00		20.98	--0.2	80.31	--	--
	10/11/00		22.24	--	79.05	--	--
MW-4	6/30/98	98.65	16.93	--	81.72	--	--

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
327 34TH STREET
OAKLAND, CALIFORNIA

Monitoring Well	Date	Elevation[1]	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Product Elevation (feet)	Free Product/Purge Water Removed (Gallons)
MW-4 (continued)	7/29/98		17.48	--	81.17	--	--
	8/26/98		18.65	--	80.00	--	--
	10/1/98		18.74	--	79.91	--	--
	10/30/98		19.02	--	79.63	--	--
	11/30/98		18.74	--	79.91	--	--
	12/28/98		18.60	--	80.05	--	--
	1/25/99		18.32	--	80.33	--	--
	2/26/99		15.81	--	82.84	--	--
	12/15/99		19.83	--	78.82	--	--
	3/20/00		14.90	--	83.75	--	--
	7/20/00		18.38	--	80.27	--	--
	10/11/00		19.61	--	79.04	--	--
MW-5	6/30/98	100.9	20.60	--	80.30	--	--
	7/29/98		21.52	--	79.38	--	--
	8/26/98		22.21	--	78.69	--	--
	10/1/98		22.95	--	77.95	--	--
	10/30/98		23.23	--	77.67	--	--
	11/30/98		23.13	--	77.77	--	--
	12/28/98		23.18	--	77.72	--	--
	1/25/99		22.61	--	78.29	--	--
	2/26/99		19.78	--	81.12	--	--
	12/15/99		24.19	--	76.71	--	--
	3/20/00		19.15	--	81.75	--	--
	7/20/00		21.84	--	79.06	--	--
	10/11/00		23.40	--	77.50	--	--

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
327 34TH STREET
OAKLAND, CALIFORNIA

Monitoring Well	Date	Elevation[1]	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Product Elevation (feet)	Free Product/Purge Water Removed (Gallons)
MW-6	7/20/00	96.60	18.30	--	78.30	--	--
	10/11/00		18.69	--	77.91	--	--
MW-7	7/20/00	96.75	15.93	--	80.82	--	--
	10/11/00		16.90	--	79.85	--	--

[1] Elevations are referenced to monitoring well MW-1, with an assumed datum of 100.00 feet.
[4] Measurements by others
-- Product not observed
NA = Data not available

TABLE 2
SUMMARY OF PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUNDWATER
327 34TH STREET
OAKLAND, CALIFORNIA

Location	Date	Groundwater Elevation† (feet)	TVHg (µg/L)	TEHd (µg/L)	TEHo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Oil & Grease (mg/L)
MW-1	07/27/1993	79.21	<50	<50	--	<0.5	<0.5	<0.5	<0.5	--	<5
	10/02/1997	78.78	<50	--	--	<0.5	<0.5	<0.5	<0.5	<2	--
	06/30/1998	81.79	84	--	--	<0.5	<0.5	2.1	0.55	2.1	--
	10/01/1998	80.07	<50	--	--	<1.0	<1.0	<1.0	<1.0	<2.0	--
	01/25/1999	80.38	<50	--	--	<1.0	<1.0	<1.0	<1.0	<2.0	--
	12/16/1999	78.99	<50	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	--
	07/20/2000	80.37	<50	<50	<300	<0.50	<0.50	<0.50	<0.50	3.4	--
MW-2	07/27/1993	79.17	120,000	--	--	10,000	27,000	2,900	20,000	--	--
	10/02/1997	78.36	*	--	--	*	*	*	*	*	*
	06/30/1998	81.58	72,000	--	--	7,300	18,000	2,500	15,600	5,500	--
	10/01/1998	79.75	84,000	--	--	6,400	17,000	2,600	17,000	2,000	--
	01/25/1999	80.48	130,000	--	--	9,000	26,000	3,800	27,500	5,800	--
	12/16/1999	78.85	*	--	--	*	*	*	*	*	--
	07/20/2000	80.41	*	*	*	*	*	*	*	*	*
MW-3	07/27/1993	79.01	330,000	--	--	9,100	24,000	5,300	33,000	--	--
	10/02/1997	78.58	36,000	--	--	4,200	11,000	1,800	10,600	3,500	--
	06/30/1998	81.82	51,000	--	--	4,800	11,000	1,200	7,100	3,900	--
	10/01/1998	79.96	38,000	--	--	3,900	8,500	1,200	6,000	2,300	--
	01/25/1999	80.50	51,000	--	--	4,000	10,000	1,200	6,700	2,900	--
	12/16/1999	78.86	*	--	--	*	*	*	*	*	--
	07/20/2000	80.31	69,000	2,900	<300	5,700	14,000	1,600	9,300	3,300	--

TABLE 2
SUMMARY OF PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUNDWATER
327 34TH STREET
OAKLAND, CALIFORNIA

Location	Date	Groundwater Elevation† (feet)	TVHg (µg/L)	TEHd (µg/L)	TEHo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Oil & Grease (mg/L)
MW-4	06/30/1998	81.72	10,000	--	--	2,200	930	850	2,100	1,800	--
	10/01/1998	79.91	1,100	--	--	570	46	130	36	1,300	--
	01/26/1999	80.33	290	--	--	230	<8.3	<8.3	<8.3	1,300	--
	12/16/1999	78.82	<50	--	--	5.8	<0.50	<0.50	<0.50	1,400	--
	07/20/2000	80.27	210	<50	<300	91.0	4.6	19	12.9	1,500	--
MW-5	06/30/1998	78.69	<50	--	--	<0.5	<0.5	<0.5	<0.5	23	--
	10/01/1998	77.95	<50	--	--	<1.0	<1.0	<1.0	<1.0	<2.0	--
	01/26/1999	78.29	<50	--	--	<1.0	<1.0	<1.0	<1.0	<2.0	--
	12/16/1999	76.71	<50	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	--
	07/20/2000	79.06	<50	<50	<300	<0.50	0.98	<0.50	<0.50	2	--
MW-6	07/20/2000	78.30	<50	<50	<300	<0.50	<0.50	<0.50	<0.50	160	--
MW-7	07/20/2000	80.82	<50	<50	<300	<0.50	<0.50	<0.50	<0.50	<0.50	--

NOTES:
TVHg = Total Volatile Hydrocarbons as gasoline
TEHd = Total Extractable Hydrocarbons as diesel
TEHo = Total Extractable Hydrocarbons as motor oil
MtBE= Methyl Tertiary Butyl Ether
-- = Not analyzed

mg/L = milligrams per liter
µg/L = micrograms per liter
<50 = not detected at or above listed analytical reporting limit
* = This sample contained free-product and was not analyzed.
†= Arbitrary datum (see Table 1)

TABLE 3
SUMMARY OF BIOPARAMETER DATA
327 34TH STREET
OAKLAND, CALIFORNIA

Location	Date	TVHg (µg/L)	CO_2 Field (mg/L)	CO_2 Lab (mg/L)	DO Field (mg/L)	DO Lab (mg/L)	pH Field (mg/L)	pH Lab (mg/L)	Fe(II) (mg/L)	Mn (mg/L)	SO_4 (mg/L)	$N\text{-}NH_3$ (mg/L)	$N\text{-}NO_3$ (mg/L)	$o\text{-}PO_4$ (mg/L)
MW-1	06/30/1998	84	204	--	5	5.1	6.16	6.4	0.15	0.046	55	<0.1	<0.1	2
	10/01/1998	<50	192	--	3.6	--	6.49	--	--	--	--	--	--	--
	01/25/1999	<50	--	--	3.4	--	6.72	--	--	--	--	--	--	--
	12/15/1999	<50	--	--	3.31	--	6.52	--	--	--	--	--	--	--
	07/20/2000	<50	--	120	7.37	--	6.66	--	0.13	<0.01	54	<0.1	3.4	<0.2
MW-2	06/30/1998	72,000	185	--	2.2	--	5.98	--	--	--	--	--	--	--
	10/01/1998	84,000	230	--	2.7	--	6.47	--	--	--	--	--	--	--
	01/25/1999	130,000	386	--	0.3	--	6.69	--	--	--	--	--	--	--
	12/15/1999	*	--	--	*	--	*	--	--	--	--	--	--	--
	07/20/2000	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-3	06/30/1998	51,000	300	--	2.2	3.2	6.03	6.6	1.4	9.8	13	1.4	<0.1	2.4
	10/01/1998	38,000	240	--	2.1	--	6.65	--	--	--	--	--	--	--
	01/25/1999	51,000	238	--	1.2	--	7.01	--	--	--	--	--	--	--
	12/15/1999	*	--	--	*	--	*	--	--	--	--	--	--	--
	07/20/2000	69,000	--	128	2.05	--	6.73	--	3.9	6.6	20	<0.1	0.55	<0.2
MW-4	06/30/1998	10,000	222	--	2.6	3.5	6.18	6.6	0.14	4.3	14	0.8	0.8	1.5
	10/01/1998	1,100	320	--	3.4	--	6.71	--	--	--	--	--	--	--
	01/26/1999	290	475	--	6.7	--	7.00	--	--	--	--	--	--	--
	12/15/1999	<50	--	--	1.75	--	7.02	--	--	--	--	--	--	--
	07/20/2000	210	--	126	3.88	--	6.67	--	9.5	5.3	11	<0.1	0.04	<0.2

TABLE 3
SUMMARY OF BIOPARAMETER DATA
327 34TH STREET
OAKLAND, CALIFORNIA

Location	Date	TVHg (µg/L)	CO_2 Field (mg/L)	CO_2 Lab (mg/L)	DO Field (mg/L)	DO Lab (mg/L)	pH Field (mg/L)	pH Lab (mg/L)	Fe(II) (mg/L)	Mn (mg/L)	SO_4 (mg/L)	$N\text{-}NH_3$ (mg/L)	$N\text{-}NO_3$ (mg/L)	$o\text{-}PO_4$ (mg/L)
MW-5	06/30/1998	<50	220	--	4.3	--	6.1	--	--	--	--	--	--	--
	10/01/1998	<50	256	--	4.8	--	6.71	--	--	--	--	--	--	--
	01/26/1999	<50	305	--	9.7	--	7.04	--	--	--	--	--	--	--
	12/15/1999	<50	--	--	2.72	--	7.19	--	--	--	--	--	--	--
	07/20/2000	<50	--	134	5.58	--	6.35	--	0.11	0.017	49	<0.1	3.9	<0.2
MW-6	07/20/2000	<50	--	122	2.72	--	6.66	--	120	1.9	53	6	0.05	<0.2
MW-7	07/20/2000	<50	--	32.2	7.15	--	7.43	--	<0.1	0.018	7.5	<0.1	2.6	0.13

NOTES:
TVHg = Total Volatile Hydrocarbons as gasoline
µg/L = micrograms per liter
mg/L = milligrams per liter
-- = test not requested
* = This sample contained free-product and was not analyzed.
Fe(II) = ferrous iron
Mn = manganese
SO_4 = sulfate
$N\text{-}NH_3$ = nitrate nitrogen
$N\text{-}NO_3$ = nitrogen as ammonia
o-PO4 = ortho phosphate

N

APPROXIMATE SCALE (feet)

0 800 1600

VICINITY MAP

Subsurface Consultants, Inc.
Geotechnical & Environmental Engineers

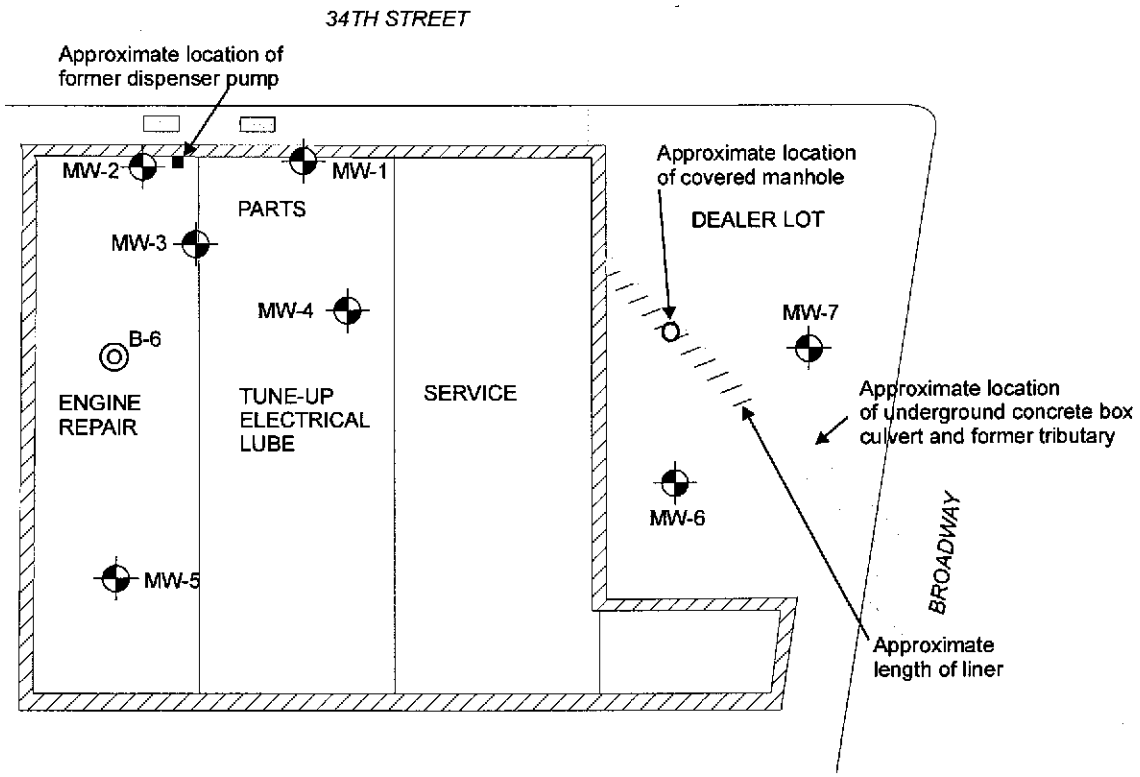
327 34TH STREET
OAKLAND, CALIFORNIA

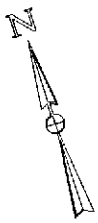
JOB NUMBER	DATE	APPROVED
1039.008	12/00	

PLATE 1

LEGEND

- Limits of site structures
- Monitoring well location
- Boring location
- Approximate location of former underground storage tank





APPROXIMATE SCALE (feet)

0 60 120

SITE PLAN

Subsurface Consultants, Inc.
Geotechnical & Environmental Engineers

327 34TH STREET
OAKLAND, CALIFORNIA

JOB NUMBER	DATE	APPROVED
1039.008	11/00	

PLATE 2

A1039.008.01.CDR

LEGEND

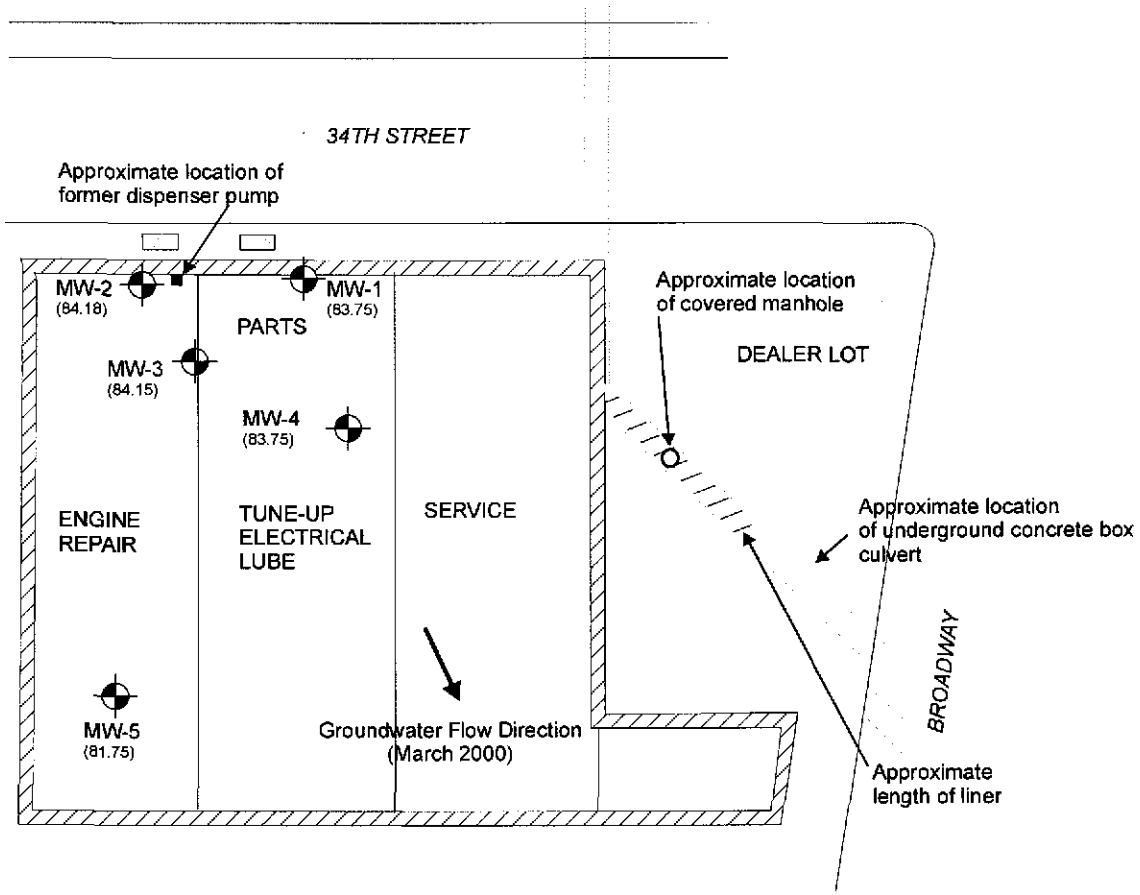
Limits of site structures

Monitoring well location

(80.31) Groundwater elevation (March 2000)

Boring location

Approximate location of former underground storage tank



N

APPROXIMATE SCALE (feet)

0 60 120

GROUNDWATER ELEVATION DATA (MARCH 2000)

Subsurface Consultants, Inc.
Geotechnical & Environmental Engineers

327 34TH STREET
OAKLAND, CALIFORNIA

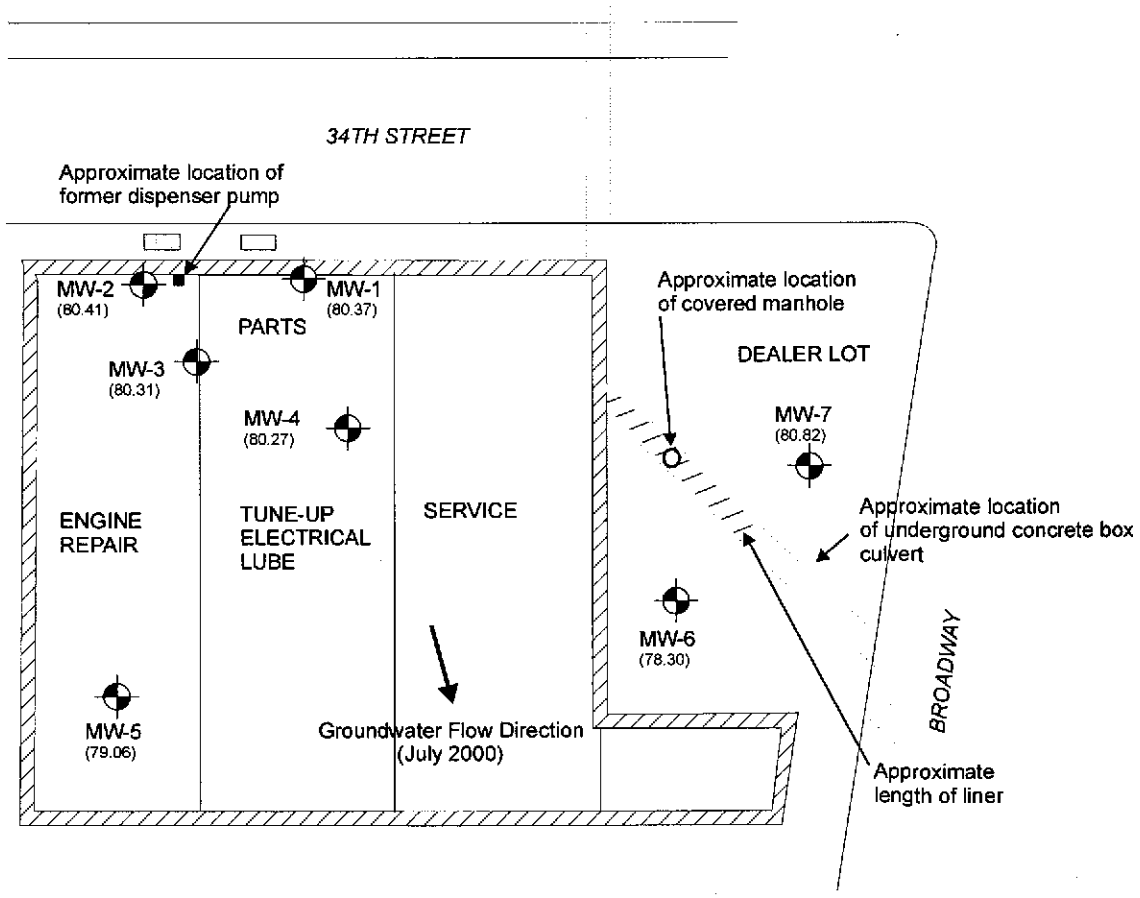
JOB NUMBER	DATE	APPROVED
1039.008	12/00	

PLATE 3

A1039.008.02.CDR

LEGEND

- Limits of site structures
- Monitoring well location
- (80.31) Groundwater elevation (July 2000)
- Boring location
- Approximate location of former underground storage tank



N

APPROXIMATE SCALE (feet)

0 60 120

GROUNDWATER ELEVATION DATA (JULY 2000)

Subsurface Consultants, Inc.
Geotechnical & Environmental Engineers

327 34TH STREET
OAKLAND, CALIFORNIA

JOB NUMBER	DATE	APPROVED
1039.008	12/00	

PLATE 4

A1039.008.03.CDR

LEGEND

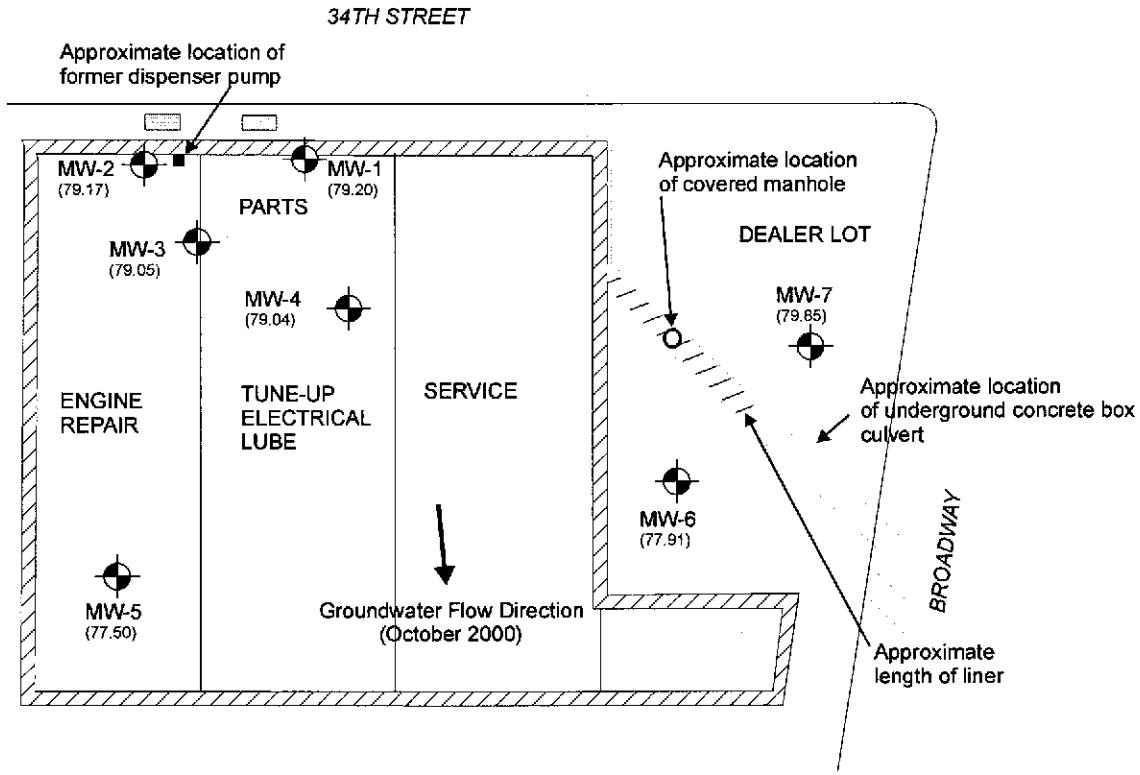
Limits of site structures

Monitoring well location

(80.31) Groundwater elevation (October 2000)

Boring location

Approximate location of former underground storage tank



N

APPROXIMATE SCALE (feet)

0 60 120

GROUNDWATER ELEVATION DATA (OCTOBER 2000)

SCI Subsurface Consultants, Inc.
Geotechnical & Environmental Engineers

327 34TH STREET
OAKLAND, CALIFORNIA

JOB NUMBER	DATE	APPROVED
1039.008	12/00	

PLATE 5

A1039.008.04.CDR

LEGEND

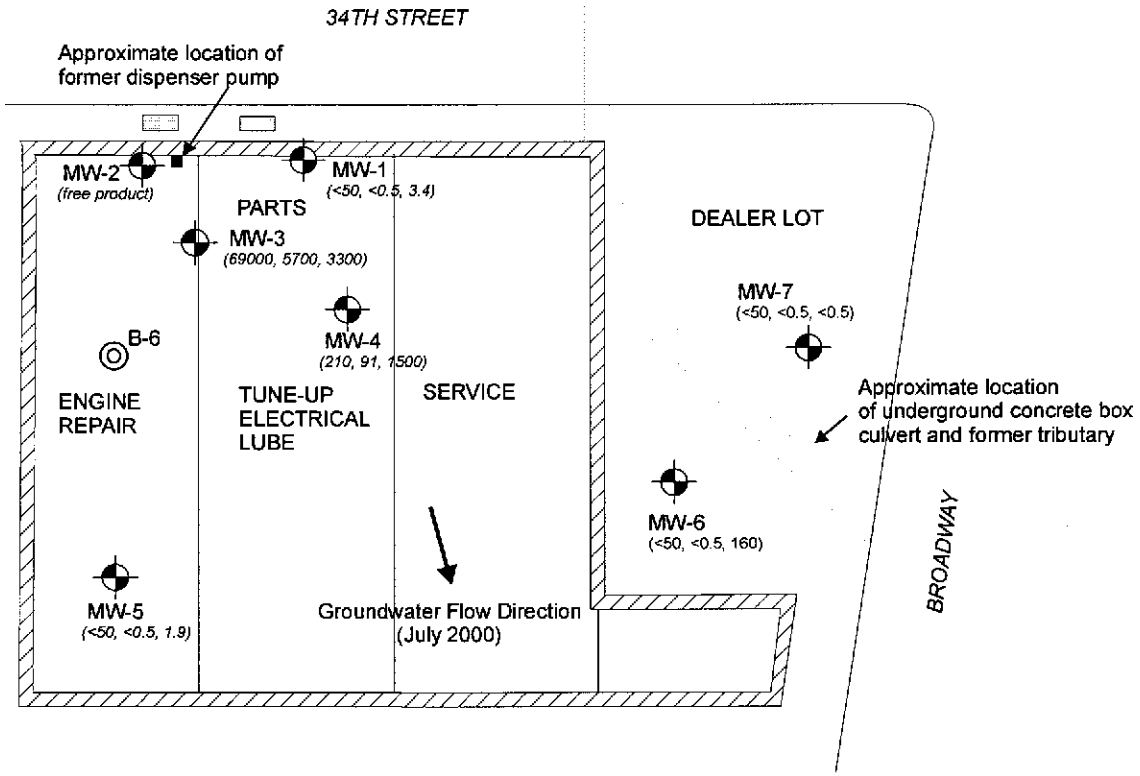
Limits of site structures

Monitoring well location

(210,91,1500) TVH, Benzene, MtBE Levels in ug/l

Boring location

Approximate location of former underground storage tank



N

APPROXIMATE SCALE (feet)

0 60 120

TVH, BENZENE, MtBE CONCENTRATIONS JULY 2000

Subsurface Consultants, Inc.
Geotechnical & Environmental Engineers

327 34TH STREET
OAKLAND, CALIFORNIA

JOB NUMBER	DATE	APPROVED
1039.008	12/00	

PLATE 6

A1039.008.05.CDR

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway
Alameda, CA 94502-6577
(510) 567-6700
(510) 337-9432

November 08, 1999

Don Strough
Strough Family Trust of 1983
P.O. Box 489
Orinda, CA 94563

STID: 3035
Re: Investigations at Val Strough Chevrolet, located at 327 34th Street, Oakland, CA 94609

Dear Mr. Strough,

I have recently been designated as the new caseworker to oversee investigations at the above site. According to our case files, one 1,000-gallon gasoline underground storage tank (UST) and one 1,000-gallon waste oil UST were removed from the site in March 1993. Soil samples collected from beneath the former tanks identified Total Petroleum Hydrocarbons as gasoline (TPHg), TPH as diesel (TPHd), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Consequently, in July 1993, three monitoring wells (MW-1 through MW-3) were installed at the site. Groundwater samples collected from these wells identified elevated levels of TPHg and BTEX. No additional groundwater samples were collected from these wells until October 1997, when free product, along with elevated contaminant concentrations, were identified in these wells. Consequently, two additional monitoring wells (MW-4 and MW-5) were installed at the site in June 1998 to further delineate the extent of the contaminant plume. Since the installation of MW-4 and MW-5, all five on-site monitoring wells have been sampled three times. Per the last groundwater monitoring event in January 1999, free product was observed in both Wells MW-2 and MW-3, and the furthest downgradient (southeasterly) on-site well, MW-4, identified 290ppb TPHg, 230ppb benzene, and 1,300ppb MTBE.

MTBE is known to migrate faster and further than TPHg and BTEX in groundwater due to it's high affinity to groundwater, and is much slower to biodegrade than the other gas constituents. Consequently, this office is concerned with the elevated MTBE concentrations being identified in downgradient Well MW-4, and is requiring that the contaminant plume be further characterized/delineated. Per the "Creek and Watershed Map of Oakland & Berkeley," published by the Oakland Museum of California, there is an underground culvert running below the eastern portion of the site. The required characterization work should provide information to this office on the liklihood of this culvert acting as a conduit for contaminant plume migration.

A workplan addressing the above required work should be submitted to this office within 60 days of the date of this letter (January 03, 2000). Any requests for extensions of the due date, or modifications of the required tasks, should be submitted to this office in writing.

Lastly, per my conversation with Jeriann Alexander, Subsurface Consultants, Inc., on November 08, 1999, the site has received pre-approval from the State UST Cleanup Fund for continued quarterly groundwater monitoring and monthly free product removal. The next quarterly

groundwater monitoring event and free product removal is required to be implemented within 45 days of the date of this letter (i.e., **by December 20, 1999**). A report documenting the work should be submitted to this office within 45 days after completing field activities.

If you have any questions or comments, please contact me at (510) 567-6763.

Sincerely,

Juliet Shin, R.G.
Hazardous Materials Specialist

Cc: Jeriann Alexander
Subsurface Consultants, Inc.
3736 Mt. Diablo Blvd., Ste 200
Lafayette, CA 94549-3659

Jonathan Redding
Wendel, Rosen, Black & Dean, LLP
P.O. Box 2047
Oakland, CA 94604-2047

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

March 8, 2000

Don Strough
Strough Family Trust of 1983
PO Box 489
Orinda, CA 94563

Dear Mr. Strough:

Subject: Val Strough Chevrolet, 327-34th St., Oakland, CA 94609;
StId 3035

"Groundwater Monitoring Report and Scope of Work for Additional Plume Characterization" by Subsurface Consultants, Inc., dated February 7, 2000, was reviewed. The bioparameters used, CO_2, DO, and pH, may not be adequate to demonstrate bioremediation. Provide justification. The "Scope of Additional Site Characterization" is acceptable with the previous agreement that the presence of free product will be checked in all wells on a quarterly basis and if present it will be removed using a bailer and stored for proper and timely disposal. Please submit reports of the free product status including amount found, method used for removal, amount removed, etc.

If you have any questions, you may contact me at (510) 567-6746.

Sincerely,

Don Hwang
Hazardous Materials Specialist

C: Gene Ng, Jeriann Alexander, Subsurface Consultants, Inc., 3736 Mt. Diablo Blvd., Suite 200, Lafayette, CA 94549-3659

File

07/03/2000 12:03 FAX

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD, CA 94544
PHONE (510) 670-5554 FAX (510) 782-1939

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 327 34th St. Oakland

California Coordinates Source ____ ft. Accuracy ± ____ ft.
CCN ____ ft. CZE ____ ft.
APN ____

CLIENT
Name Strough Family Trust of 1983
Address 2 Sea View Ave. Phone (510) 525-5000
City Piedmont Zip 94611

APPLICANT
Name Subsurface Consultants Fax (925) 299-7970
Address 3736 Mt. Diablo Blvd. #200 Phone (925) 299-7860
City Lafayette Zip 94549

TYPE OF PROJECT
Well Construction
Cathodic Protection ☐
Water Supply ☑
Monitoring ☐
Geotechnical Investigation ☐
General ☐
Contamination ☐
Well Destruction ☐

PROPOSED WATER SUPPLY WELL USE
New Domestic ☐ Replacement Domestic ☐
Municipal ☐ Irrigation ☐
Industrial ☐ Other ____ ☐

DRILLING METHOD:
Mud Rotary ☐ Air Rotary ☐ Auger ☑
Cable ☐ Other ☐

DRILLER'S LICENSE NO. C57-522125

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum Depth 35 ft.
Casing Diameter 2 in. Number 3
Surface Seal Depth ____ ft.

GEOTECHNICAL PROJECTS
Number of Borings ____ Maximum Depth ____ ft.
Hole Diameter ____ in.

ESTIMATED STARTING DATE 7/12/00
ESTIMATED COMPLETION DATE 7/12/00

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [signature] DATE 7/3/00

FOR OFFICE USE

PERMIT NUMBER W00-418
WELL NUMBER ____
APN ____

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A) GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted work the original Department of Water Resources — WELL COMPLETION REPORT —
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

(C) GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

E. CATHODIC
Fill hole above anode zone with concrete placed by tremie.

F. WELL DESTRUCTION
See attached.

G. SPECIAL CONDITIONS

APPROVED [signature] DATE 7-7-00

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD, CA 94544
PHONE (510) 670-5554 FAX (510) 782-1939

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 327 34th St. Oakland

California Coordinates Source ____ ft. Accuracy ± ____ ft.
CCN ____ ft. CCE ____ ft.
APN ____

CLIENT
Name Strough Family Trust of 1983
Address 7 Sea View Ave. Phone (510) 825-8000
City Piedmont Zip 94611

APPLICANT
Name Subsurface Consultants Fax (925) 299-7970
Address 3736 Mt. Diablo Blvd. #200 Phone (925) 299-7860
City Lafayette Zip 94549

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	☐	General	☐
Water Supply	☐	Contamination	☐
Monitoring	☑	Well Destruction	☐

PROPOSED WATER SUPPLY WELL USE

New Domestic	☐	Replacement Domestic	☐
Municipal	☐	Irrigation	☐
Industrial	☐	Other ____	☐

DRILLING METHOD:

Mud Rotary	☐	Air Rotary	☐	Auger	☑
Cable	☐	Other	☐		

DRILLER'S LICENSE NO. C57-522125

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum Depth 25 ft.
Casing Diameter 2 in. Number 2
Surface Seal Depth ____ ft.

GEOTECHNICAL PROJECTS
Number of Borings ____ Maximum Depth ____ ft.
Hole Diameter ____ in.

ESTIMATED STARTING DATE 7/12/00
ESTIMATED COMPLETION DATE 7/12/00

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [signature] DATE 7/3/00

FOR OFFICE USE

PERMIT NUMBER W00-417
WELL NUMBER ____
APN ____

PERMIT CONDITIONS

Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted work the original Department of Water Resources WELL COMPLETION REPORT.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected commination, tremied cement grout shall be used in place of compacted cuttings.

E. CATHODIC
Fill hole above anode zone with concrete placed by tremie.

F. WELL DESTRUCTION
See attached.

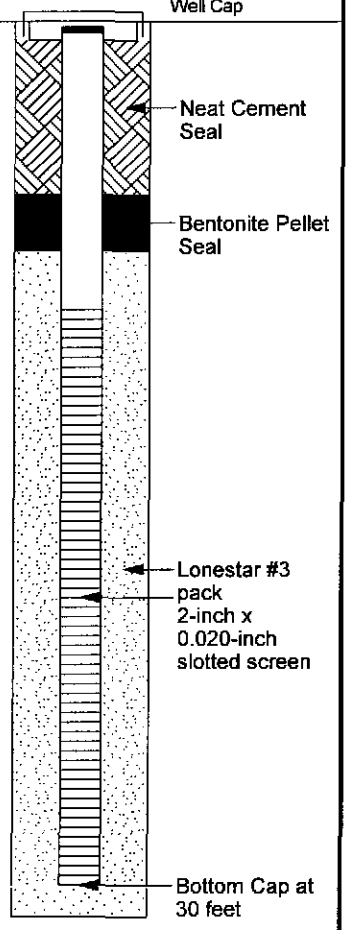
G. SPECIAL CONDITIONS

APPROVED [signature] DATE 7-7-00

Project Name & Location: 327 34th Street Oakland, California	Ground Surface Elevation: Top of Casing Elevation 96.60 feet Elevation Datum: TOC of MW-3 = 100 feet
Drilling Coordinates: not surveyed	Start: Date 7/17/00 Time 08:45 / Finish: Date 7/17/00 Time 12:30
Drilling Company & Driller: BAEi, Jeff	Drilling Fluid: None / Hole Diameter: 8"
Rig Type & Drilling Method: CME 75 / Hollow Stem Auger	
Sampler Type(s): A) California (2.5" O.D., 2.0" I.D.)	Logged By: ES / ▽ G.W.L. During Drilling ▼ Before developement on 7/20/00
Sampling Method(s): A) 140 lb automatically tripped hammer w/30" drop	Backfill Method: Well constructed / Date: 7/17/00

Depth (feet)	Sampler Type	Blows/6 inches or Pressure	Blows/12 inches	OVM (ppm)	Sample Interval	Graphic Log	SOIL DESCRIPTIONS GROUP NAME (GROUP SYMBOL) color, consistency/density, moisture condition, other descriptions (Local Name or Material Type)
0				13			**ASPHALT 8 - INCHES THICK** **COBBLES UP TO 8 - INCHES IN DIMETER** **CLAYEY SAND WITH GRAVEL (SC)** Dark brown, loose, moist, medium to coarse grain sand, with brick fragments (fill)
5	A	3 3 4	7	96			**LEAN CLAY WITH SAND (CL)** *Dark brown, soft, moist* **CLAYEY SAND WITH GRAVEL (SC)** Dark brown, loose, moist, medium to coarse grain sand, with brick fragments (fill)
10	A	1 2 4	6	13			**LEAN CLAY WITH SAND (CL)** Mottled brown and orange soft, moist, with brick fragments
15	A	3 4 4	8	0			**CLAYEY SAND (SC)** Mottled brown, loose, soft, moist
20	A	1 1 2	3	0			**POORLY GRADED SILTY SAND (SM)** Grayish green, loose, moist
25	A	3 6 8	13	0			**LEAN CLAY WITH SAND (CL)** Light brown, very soft, moist **POORLY GRADED SAND WITH SILT(SP)** Gray, loose, wet
30	A	6 11 28	39	0			**WELL GRADED SAND WITH GRAVEL (SW)** Orange, loose, wet, clay lens from 30.25 to 30.75 feet
35							Bottom of boring at 31.5 feet below ground surface.
40							

WELL CONSTRUCTION



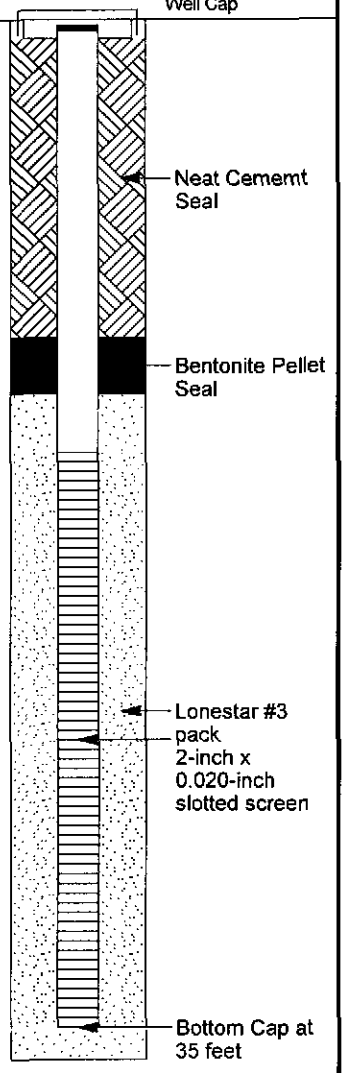
LOG OF BORING 1039-008.GPJ GEO-ENV.GDT 12/7/00

SCI Subsurface Consultants, Inc. Geotechnical & Environmental Engineers	327 34th Street Oakland, California		BORING **MW-6**
	JOB NUMBER 1039.008	DATE 12/00	

Project Name & Location: 327 34th Street Oakland, California	Ground Surface Elevation: Top of Casing Elevation 96.60 feet Elevation Datum: TOC of MW-3 = 100 feet
Drilling Coordinates: not surveyed	Start: Date 7/17/00 Time 13:00 — Finish: Date 7/17/00 Time 15:00
Drilling Company & Driller: BAEi, Jeff	Drilling Fluid: None — Hole Diameter: 8"
Rig Type & Drilling Method: CME 75 / Hollow Stem Auger	
Sampler Type(s): A) California (2.5" O.D., 2.0" I.D.)	Logged By: ES — ▽ G.W.L. During Drilling; ▼ Before developement on 7/20/00
Sampling Method(s): A) 140 lb automatically tripped hammer w/30" drop	Backfill Method: Well constructed — Date: 7/17/00

Depth (feet)	Sampler Type	Blows/6 inches or Pressure	Blows/12 inches	OVM (ppm)	Sample Interval	Graphic Log	SOIL DESCRIPTIONS GROUP NAME (GROUP SYMBOL) color, consistency/density, moisture condition, other descriptions (Local Name or Material Type)
0							**ASPHALT 4 - INCHES THICK** **CLAYEY SAND WITH GRAVEL (SC)** Orange-brown, medium dense, moist, angular gravel, cobbles and chert
5	A	12 8 12	20	0			
10	A	3 6 11	17	0			
15	A	5 7 11	18	0			▼
20	A	3 7 9	16	0			▽ **LEAN CLAY WITH SAND (CL)** Mottled brown and green, soft, moist
25	A	4 7 11	18	0			**SANDY CLAY (CL)** Light brown, medium stiff, moist
30	A	4 8 10	18	0			**LEAN CLAY (CL)** Light brown, medium stiff, moist
35	A	9 8 13	21	0			Becomes stiff at 35 feet
40							Bottom of boring at 36.5 feet below ground surface.

WELL CONSTRUCTION



LOG OF BORING 1039-008.GPJ GEO-ENV.GDT 12/7/00

SCI **Subsurface Consultants, Inc.**
Geotechnical & Environmental Engineers

327 34th Street
Oakland, California

JOB NUMBER 1039.008 — DATE 12/00

BORING **MW-7**

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487-93)

MAJOR DIVISIONS			GROUP NAMES	
COARSE-GRAINED SOILS More than 50% retained on the No. 200 sieve	GRAVELS More than 50% of coarse fraction retained on No. 4 sieve	Clean gravels less than 5% fines	GW	Well-graded gravel, Well-graded gravel with sand
			GP	Poorly graded gravel, Poorly graded gravel with sand
		Gravels with more than 12% fines	GM	Silty gravel, Silty gravel with sand
			GC	Clayey gravel, Clayey gravel with sand
	SANDS 50% or more of coarse fraction passes No. 4 sieve	Clean sand less than 5% fines	SW	Well-graded sand, Well-graded sand with gravel
			SP	Poorly graded sand, Poorly graded sand with gravel
		Sands with more than 12% fines	SM	Silty sand, Silty sand with gravel
			SC	Clayey sand, Clayey sand with gravel
FINE-GRAINED SOILS 50% or more passes the No. 200 sieve	SILTS AND CLAYS Liquid Limit Less than 50%		ML	Silt, Silt with sand or gravel, Sandy or gravelly silt, Sandy or gravelly silt with gravel or sand
			CL	Lean clay, Lean clay with sand or gravel, Sandy or gravelly lean clay, Sandy or gravelly lean clay with gravel or sand
			OL	Organic silt or clay, Organic silt or clay with sand or gravel, Sandy or gravelly organic silt or clay, Sandy or gravelly organic silt or clay with gravel or sand
	SILTS AND CLAYS Liquid Limit Greater than 50%		MH	Elastic silt, Elastic silt with sand or gravel, Sandy or gravelly elastic silt, Sandy or gravelly elastic silt with gravel or sand
			CH	Fat clay, Fat clay with sand or gravel, Sandy or gravelly fat clay, Sandy or gravelly fat clay with gravel or sand
			OH	Organic silt or clay, Organic silt or clay with sand or gravel, Sandy or gravelly organic silt or clay, Sandy or gravelly organic silt or clay with gravel or sand
HIGHLY ORGANIC SOILS			Pt	Peat

For definition of dual and borderline symbols, see ASTM D2487-93.

KEY TO TEST DATA AND SYMBOLS

Perm	-	Permeability
Consol	-	Consolidation
LL	-	Liquid Limit
PI	-	Plasticity Index
Gs	-	Specific Gravity
MA	-	Particle Size Analysis
-200	-	Percent Passing No. 200 Sieve
ND	-	Not Detected
■	-	Tube Sample
⊠	-	Bag or Bulk Sample
◫	-	Lost Sample
▽	-	First Groundwater
▼	-	Stabilized Groundwater

	Shear Strength (psf)	Confining Pressure (psf)	
TxUU	3200	(2600)	Unconsolidated-Undrained Triaxial Shear
TxCU	3200	(2600)	Consolidated-Undrained Triaxial Shear
TxCD	3200	(2600)	Consolidated-Drained Triaxial Shear
SSCU	3200	(2600)	Consolidated-Undrained Simple Shear
SSCD	3200	(2600)	Consolidated-Drained Simple Shear
DSCD	2700	(2000)	Consolidated-Drained Direct Shear
UC	470		Unconfined Compression
LVS	700		Laboratory Vane Shear
FV	300		Field Vane Shear
RFV			
TV	800		Torvane Shear
PP	400		Pocket Penetrometer *(actual reading divided by 2)*

SCI Subsurface Consultants, Inc.
Geotechnical & Environmental Engineers

327 34th Street
Oakland, California

JOB NUMBER	DATE	APPROVED
1039.008	12/00	

GROUNDWATER DEPTHS

Project Name: 327 34th St. (Free Product Removal)

Job No.: 1039.008

Measured by: Gene Ng

Well	Date	Time	Groundwater Depth (feet)	Comments
MW-1	3/20/00	0935	16.25	No product, no odor
MW-4	↓	0938	14.90	No product, no odor
MW-5		0945	19.15	No product, no odor
MW-2		0952	17.09	Strong HC odor, 5/16" product, 5 gal. bail
MW-3	↓	0955	17.14	Strong HC odor, no free product

Subsurface Consultants, Inc.

WELL SAMPLING FORM

PROJECT NAME: Stroup
JOB NO. 1039.0008
SAMPLED BY: E. Silverman
DATE: 7/20/00
WEATHER:

WELL NO.: MW-1
WELL CASING DIAMETER: 2"
WELL MATERIAL:
TOC ELEVATION:

TOTAL DEPTH OF CASING (BTOC) 30.68 FEET
DEPTH TO GROUNDWATER (BTOC) 19.63 FEET (9.05)
FEET OF WATER IN WELL 11.05 FEET

CALCULATED PURGE VOLUME 5.4 gallons
(feet of water * casing dia^2 * .0408 * # of Volumes)
FREE PRODUCT
PURGE METHOD

MEASUREMENT METHOD TAPE & PASTE ELECTRONIC SOUNDER OTHER

FIELD MEASUREMENTS

GALLONS REMOVED	TIME	pH	TEMP	CONDUCTIVITY (µMHOS/CM)	TURBIDITY	ORP (mV)	DO (mg/l)	COMMENTS (odor, color, ...)
1.15	0	6.22	19.31	0.469	0.327	199.6	7.37	Clear
	1.0	6.14	19.00	0.784	0.580	225.8	3.27	Cloudy
	3.0	6.50	19.24	0.666	0.816	230.0	3.10	No Odor
	5.0	6.60	18.85	0.809	0.720	245.5	2.40	
1.40	6.0	6.66	18.64	0.833	0.618	243.5	2.41	Cloudy

DEPTH TO GROUNDWATER WHEN 80% RECOVERED BC35

ACTUAL DEPTH TO GROUNDWATER BEFORE SAMPLING (BTOC) 22.78 3:35

SAMPLING METHOD

CONTAINERS / PRESERVATIVE
3 / None — 40 ML
2 / — — LITER (Amber)
3 / HCl — ~~OTHER~~ 40 mL
1 / unpreserved — ~~OTHER~~ poly
250 mL poly w/ HCl

ANALYSES:
TEHd, TEHo
TVH-g, BTEX
MTBE
CO_3, Fe^{2+}, Mn, SO_4^{2-}
N-NH_3, N-NO_3, O-PO_4^{3-}

MISC FIELD OBSERVATION:

Subsurface Consultants, Inc.

WELL SAMPLING FORM

PROJECT NAME: Stroup
JOB NO. 1039.008
SAMPLED BY: E. Silverman
DATE: 7/20/00
WEATHER:

WELL NO.: MW-2
WELL CASING DIAMETER: 2"
WELL MATERIAL:
TOC ELEVATION:

TOTAL DEPTH OF CASING (BTOC) 32.46 FEET
DEPTH TO GROUNDWATER (BTOC) 20.86 FEET (9:34)
FEET OF WATER IN WELL 11.60 FEET

CALCULATED PURGE VOLUME 6.0 gallons
(feet of water * casing dia^2 * .0408 * # of Volumes)
FREE PRODUCT 0.2' measured by Tape & Paste
PURGE METHOD

MEASUREMENT METHOD TAPE & PASTE ELECTRONIC SOUNDER OTHER

FIELD MEASUREMENTS

GALLONS REMOVED	TIME	pH	TEMP	CONDUCTIVITY (µMHOS/CM)	TURBIDITY	ORP (mV)	DO (mg/l)	COMMENTS (odor, color, ...)
3	1146	6.37	19.34	0.399	0.298	3.80	0.88	V. strong odor - ≈ 1/16 gal removed

DEPTH TO GROUNDWATER WHEN 80% RECOVERED
ACTUAL DEPTH TO GROUNDWATER BEFORE SAMPLING (BTOC)
SAMPLING METHOD

CONTAINERS / PRESERVATIVE

3 / None — 40 ML
2 / — — LITER (Amber)
3 / HCl — ~~OTHER~~ 40 mL
1 / unpreserved — ~~OTHER~~ Poly
250 mL Poly w/ HCl

ANALYSES:
TEH-d, TEH-o
TVH-g, BTEX
MTBE
CO_2, Fe^{2+}, Mn, SO_4^{2-}
N-NH_3, N-NO_3, o-PO_4^{3-}

MISC FIELD OBSERVATION:

Subsurface Consultants, Inc.

WELL SAMPLING FORM

PROJECT NAME: Straight
JOB NO. 1039.0008
SAMPLED BY: E. Silverman
DATE: 7/21/00
WEATHER:

WELL NO.: MW-3
WELL CASING DIAMETER: 2"
WELL MATERIAL:
TOC ELEVATION:

TOTAL DEPTH OF CASING (BTOC) 20.98 FEET (9.04)
DEPTH TO GROUNDWATER (BTOC) 32.90 FEET
FEET OF WATER IN WELL 11.92 FEET

CALCULATED PURGE VOLUME 5.836 gallons
(feet of water * casing dia^2 * .0408 * # of Volumes)
FREE PRODUCT
PURGE METHOD

MEASUREMENT METHOD TAPE & PASTE ELECTRONIC SOUNDER OTHER

FIELD MEASUREMENTS

GALLONS REMOVED	TIME	pH	TEMP	CONDUCTIVITY (µMHOS/CM)	TURBIDITY	ORP (mV)	DO (mg/l)	COMMENTS (odor, color, ...)
0	1.40	6.73	18.27	0.6602	0.493	-13.4	2.05	clear
2		6.70	18.84	0.714	0.544	-21.4	1.22	
4		6.71	17.11	0.680	0.511	-13.9	1.06	v strong odor.
6		6.73	18.31	0.739	0.564	-21.2	1.86	gray

DEPTH TO GROUNDWATER WHEN 80% RECOVERED
ACTUAL DEPTH TO GROUNDWATER BEFORE SAMPLING (BTOC) 35.62
SAMPLING METHOD

CONTAINERS / PRESERVATIVE
3 / None (40 ML)
2 / — (LITER (Amber))
3 / HCl (~~OTHER~~ 40 mL)
1 / unpreserved (~~OTHER~~ poly)

ANALYSES:
TEHd, TEHo
TVH-g, BTEX
MTBE
CO_2, Fe^{2+}, Mn, SO_4^{2-}
N-NH_3, N-NO_3, o-PO_4^{3-}
250 mL poly w/HCl

MISC FIELD OBSERVATION:

Subsurface Consultants, Inc.

WELL SAMPLING FORM

PROJECT NAME: Stroup
JOB NO. 1039.0008
SAMPLED BY: E. Silverman
DATE: 7/20/00
WEATHER:

WELL NO.: MW-4
WELL CASING DIAMETER: 2"
WELL MATERIAL:
TOC ELEVATION:

TOTAL DEPTH OF CASING (BTOC) 18.37 FEET
DEPTH TO GROUNDWATER (BTOC) 27.42 FEET
FEET OF WATER IN WELL 9.05 FEET

CALCULATED PURGE VOLUME 4.43 gallons
(feet of water * casing dia^2 * .0408 * # of Volumes)
FREE PRODUCT
PURGE METHOD

MEASUREMENT METHOD TAPE & PASTE ELECTRONIC SOUNDER OTHER

FIELD MEASUREMENTS

GALLONS REMOVED	TIME	pH	TEMP	CONDUCTIVITY (µMHOS/CM)	TURBIDITY	ORP (mV)	DO (mg/l)	COMMENTS (odor, color, ...)
0	2:11	6.72	18.40	0.740	0.544	189.9	3.88	Clear
1		6.66	19.01	0.774	0.567	214.1	0.97	Brown
3		6.65	19.09	0.780	0.572	27.2	0.84	Turbid
4		6.62	19.10	0.774	0.572	33.8	0.70	Turbid
4.5		6.64	19.05	0.778	0.571	30.08	1.18	Turbid.

DEPTH TO GROUNDWATER WHEN 80% RECOVERED 29.57
ACTUAL DEPTH TO GROUNDWATER BEFORE SAMPLING (BTOC)
SAMPLING METHOD

CONTAINERS / PRESERVATIVE
3 / None (40 ML)
2 / — (LITER (Amber))
3 / HCl (~~OTHER~~ 40 mL)
1 / unpreserved (~~OTHER~~ Poly)
250 mL Poly w/HCl

ANALYSES:
TEHd, TEHo
TVH-g, BTEX
MTBE
CO_2, Fe^{2+}, Mn, SO_4^{2-}
N-NH_3, N-NO_3, o-PO_4^{3-}

MISC FIELD OBSERVATION:

Subsurface Consultants, Inc.

WELL SAMPLING FORM

PROJECT NAME: Straight
JOB NO. 1039.0008
SAMPLED BY: E. Silverman
DATE: 7/26/00
WEATHER:

WELL NO.: MW-4 5
WELL CASING DIAMETER: 2"
WELL MATERIAL:
TOC ELEVATION:

TOTAL DEPTH OF CASING (BTOC) 28.56 FEET

DEPTH TO GROUNDWATER (BTOC) 21.84 FEET (9.19)

FEET OF WATER IN WELL 6.72 FEET

CALCULATED PURGE VOLUME 3.3 gallons
(feet of water * casing dia^2 * .0408 * # of Volumes)

FREE PRODUCT

PURGE METHOD

MEASUREMENT METHOD TAPE & PASTE ELECTRONIC SOUNDER OTHER

FIELD MEASUREMENTS

GALLONS REMOVED	TIME	pH	TEMP	CONDUCTIVITY (µMHOS/CM)	TURBIDITY	ORP (mV)	DO (mg/l)	COMMENTS (odor, color, ...)
0	2:50	6.74	18.16	0.372	0.278	175.2	5.55	Clear
1		6.74	18.25	0.387	0.289	170.2	6.23	brown
2		6.56	18.44	0.444	0.333	145.5	6.26	
3		6.35	18.19	0.399	0.281	Rec'l	5.14	brown cloudy HC odor

DEPTH TO GROUNDWATER WHEN 80% RECOVERED 23.05

ACTUAL DEPTH TO GROUNDWATER BEFORE SAMPLING (BTOC)

SAMPLING METHOD

CONTAINERS / PRESERVATIVE

3 / None — 40 ML
2 / — — LITER (Amber)
3 / HCl — ~~OTHER~~ 40 mL
1 / unpreserved — ~~OTHER~~ poly
250 mL poly w/ HCl

ANALYSES:

TEHd, TEHo
TVH-g, BTEX
MTBE
CO_2, Fe^{2+}, Mn, SO_4^{2-}
N-NH_3, N-NO_3, o-PO_4^{3-}

MISC FIELD OBSERVATION: Dry @ 3 gallons

Subsurface Consultants, Inc.

WELL SAMPLING FORM

PROJECT NAME: Straight
JOB NO. 1039.0008
SAMPLED BY: E. Silverman
DATE: 7/21/10
WEATHER:

WELL NO.: MW-6
WELL CASING DIAMETER: 2"
WELL MATERIAL:
TOC ELEVATION:

TOTAL DEPTH OF CASING (BTOC) 28.55 FEET

DEPTH TO GROUNDWATER (BTOC) 18.30 FEET

FEET OF WATER IN WELL 10.25 FEET

CALCULATED PURGE VOLUME 10 vols ≈ 16.72 gallons
(feet of water * casing dia^2 * .0408 * # of Volumes)

FREE PRODUCT None

PURGE METHOD

MEASUREMENT METHOD TAPE & PASTE ELECTRONIC SOUNDER OTHER

FIELD MEASUREMENTS

GALLONS REMOVED	TIME	pH	TEMP	CONDUCTIVITY (µMHOS/CM)	TURBIDITY	ORP (mV)	DO (mg/l)	COMMENTS (odor, color, ...)
0	11:40	6.47	18.44	0.6048	0.484	-62.9	2.72	dk grey, v. turbid
3		6.34	19.82	0.6664	0.446	-70.9	1.47	
5		6.34	19.00	0.6612	0.492	-67.5	3.53	
10		6.20	18.42	0.6666	0.1504	-66.3	2.84	no odor.
15		6.62	17.79	0.6638	0.511	-65.2	1.83	
20		6.49	17.64	0.6654	0.499	-64.0	2.06	
25	1231	6.66	18.06	0.696	0.511	-63.8	3.54	sand at bottom of bucket.

DEPTH TO GROUNDWATER WHEN 80% RECOVERED

ACTUAL DEPTH TO GROUNDWATER BEFORE SAMPLING (BTOC) 19.43

SAMPLING METHOD

CONTAINERS / PRESERVATIVE

3 / None — 40 ML
2 / — — LITER (Amber)
3 / HCl — ~~OTHER~~ 40 mL
1 / unpreserved — ~~OTHER~~ poly
250 mL poly w/ HCl

ANALYSES:

TEHd, TEHo
TVH-g, BTEX
MTBE
CO_2, Fe^{2+}, Mn, SO_4^{2-}
N-NH_3, N-NO_3, o-PO_4^{3-}

MISC FIELD OBSERVATION: Swabbed at 0, 5, 10 & 15 gals. 3-5 minutes. DTW after purging

Subsurface Consultants, Inc.

WELL SAMPLING FORM

PROJECT NAME: Stroughe
JOB NO. 1039.0008
SAMPLED BY: E. Silverman
DATE: 7/20/00
WEATHER: Sunny.

WELL NO.: MW-7
WELL CASING DIAMETER: 2"
WELL MATERIAL:
TOC ELEVATION:

TOTAL DEPTH OF CASING (BTOC) 34.95 FEET

DEPTH TO GROUNDWATER (BTOC) 15.93 FEET

FEET OF WATER IN WELL 19.02 FEET

CALCULATED PURGE VOLUME 10 vol ≈ 31 gals. gallons
(feet of water * casing dia^2 * .0408 * # of Volumes)

FREE PRODUCT None

PURGE METHOD

MEASUREMENT METHOD TAPE & PASTE ELECTRONIC SOUNDER OTHER

FIELD MEASUREMENTS

GALLONS REMOVED	TIME	pH	TEMP	CONDUCTIVITY (µMHOS/CM)	TURBIDITY	ORP (mV)	DO (mg/l)	COMMENTS (odor, color, ...)
0	10:01	7.62	19.14	0.858	0.627	196.0	7.15	Clear
5		7.54	16.94	1.314	0.968	235.7	6.78	Cloudy
10		7.50	17.62	1.078	0.748	345.0	6.62	Cloudy
15		7.75	18.42	0.898	0.662	360.0	5.97	Cloudy
20		7.41	17.17	1.026	0.762	255.7	7.39	Slightly turbid
25		7.51	17.41	1.142	0.845	237.5	7.97	turbid
30		7.52	17.92	1.201	0.875	270.4	7.21	turbid
35	11:30	7.43	18.11	1.194	0.874	277.0	7.80	turbid, no odor

DEPTH TO GROUNDWATER WHEN 80% RECOVERED

ACTUAL DEPTH TO GROUNDWATER BEFORE SAMPLING (BTOC) 17.24

SAMPLING METHOD bailer

CONTAINERS / PRESERVATIVE

3 / None (40 ML)
3 / HCl (~~OTHER~~ 40 mL)
2 / — (LITER (Amber))
1 / unpreserved (~~OTHER~~ Poly)
250 mL Poly w/ HCl

ANALYSES:

TEHd, TEHo
TVH-g, BTEX
MTBE
CO_3, Fe^{2+}, Mn, SO_4^{2-}
N-NH_3, N-NO_3, o-PO_4^{3-}

MISC FIELD OBSERVATION: Sumbbed at 0, 10, 20, 25 & 30 gallons for 3-5 m
DTW after purging 32.40 ft

GROUNDWATER DEPTHS

Project Name: Strough
Job No.: 1039.005
Measured by: OBI N2EW1

Well	Date	Time	Groundwater Depth (feet)	Comments
MW-1	10/11/00		20.8	No odor
MW-2	10/11/00		22.1	Strong hydrocarbon odor, No indicator of free prdt. Bailed it. no prdt.
MW-3	10/11/00		22.24	hydrocarbon odor no prdt.
MW-4	10/11/00		19.61	No odor
MW-5	10/11/00		23.40	No odor
MW-6	10/11/00	1045	18.69	No odor
MW-7	10/11/00	1030	16.9	No odor

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

ANALYTICAL REPORT

Prepared for:

Subsurface Consultants
3736 Mt. Diablo Blvd.
Suite 200
Lafayette, CA 94549

Date: 22-AUG-00
Lab Job Number: 146643
Project ID: N/A
Location: Strough

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis.

Reviewed by: _____
Project Manager

Reviewed by: _____
Operations Manager

Curtis & Tompkins, Ltd.

Laboratory Number: **146643**
Client: **Subsurface Consultants, Inc.**
Project Name: **Strough**

Receipt Date: **07/21/00**

CASE NARRATIVE

This hardcopy data package contains sample results and batch QC results for six water samples received from the above referenced project. The samples were received cold and intact.

Total Volatile Hydrocarbons: No analytical problems were encountered.

Total Extractable Hydrocarbons: No analytical problems were encountered.

Gasox: No analytical problems were encountered.

Metals: No analytical problems were encountered.

General Chemistry: The matrix spike recoveries for ferrous iron were outside acceptance limits. The associated laboratory control sample recovery was acceptable.

The matrix spike recoveries for orthophosphate and sulfate were outside acceptance limits. The associated blank spike recoveries were acceptable. No other analytical problems were encountered.

RSK-175: The analysis was performed by Performance Analytical Inc. in Simi Valley, California. Please see the Performance case narrative.

CHAIN OF CUSTODY FORM

146643

PAGE 1 OF 1

PROJECT NAME: Strough

JOB NUMBER: 1039.088 LAB: Curtis & Tompkins

PROJECT CONTACT: E. Silverman TURNAROUND: Standard

SAMPLED BY: E. Silverman REQUESTED BY: E. Silverman

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX: WATER	SOIL	WASTE	AIR			CONTAINERS: VOA	LITER	PINT	TUBE			METHOD PRESERVED: HCL	H_2SO_4	HNO_3	ICE	NONE	SAMPLING DATE: MONTH	DAY	YEAR	TIME	NOTES	ANALYSIS REQUESTED: TPH-d, TPH-o (8015)	VOH-g & BTEX (8015)	MTBE 8260	CO_2 - RSK-175	Fe^{2+} (dissolved)	Mn^{2+} (dissolved)	SO_4^{2-}	N-NH_3	N-NO_3	P-PO_4^{3-}
	MW-1	X						X	X	X				X	X	X	X		07	20	06	0935	1	X	X	X	X	X	X	X	X	X	X
	MW-3	X						X	X	X				X	X		X		07	20	06	0835	1	X	X	X	X	X	X	X	X	X	X
	MW-4	X						X	X	X				X	X		X		07	20	06	0415	1	X	X	X	X	X	X	X	X	X	X
	MW-5	X						X	X	X				X	X		X		07	20	06	0430	1	X	X	X	X	X	X	X	X	X	X
	MW-7	X						X	X	X				X	X		X		07	20	06	0520	1	X	X	X	X	X	X	X	X	X	X
	MW-6	X						X	X	X				X	X		X		07	20	06	0600	1	X	X	X	X	X	X	X	X	X	X

CHAIN OF CUSTODY RECORD

RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
E Silver	7/21/00 8:45	[signature]	7/21 8:50
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
		Lisa Randall	7/20 2:00
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME

COMMENTS & NOTES:
① with silica gel cleanup.

SCI
Subsurface Consultants, Inc.
171 - 12th Street, Suite 202, Oakland, CA 94607
(510) 268-0461 - FAX: (510) 268-0137
3736 Mt. Diablo Blvd., Ste. 200, Lafayette, CA 94549
(925) 299-7960 - (925) 299-7970

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 5030
Project#:	STANDARD		
Matrix:	Water	Sampled:	07/20/00
Units:	ug/L	Received:	07/21/00
Batch#:	57169		

Field ID:	MW-1	Diln Fac:	1.000
Type:	SAMPLE	Analyzed:	07/22/00
Lab ID:	146643-001		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015M
Benzene	ND	0.50	EPA 8021B
Toluene	0.80	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	112	59-135	EPA 8015M
Bromofluorobenzene (FID)	118	60-140	EPA 8015M
Trifluorotoluene (PID)	116	56-142	EPA 8021B
Bromofluorobenzene (PID)	121	55-149	EPA 8021B

Field ID:	MW-3	Diln Fac:	100.0
Type:	SAMPLE	Analyzed:	07/22/00
Lab ID:	146643-002		

Analyte	Result	RL	Analysis
Gasoline C7-C12	69,000	5,000	EPA 8015M
Benzene	5,700	50	EPA 8021B
Toluene	14,000	50	EPA 8021B
Ethylbenzene	1,600	50	EPA 8021B
o-Xylene	2,900	50	EPA 8021B
m,p-Xylenes	6,400	50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	107	59-135	EPA 8015M
Bromofluorobenzene (FID)	120	60-140	EPA 8015M
Trifluorotoluene (PID)	111	56-142	EPA 8021B
Bromofluorobenzene (PID)	119	55-149	EPA 8021B

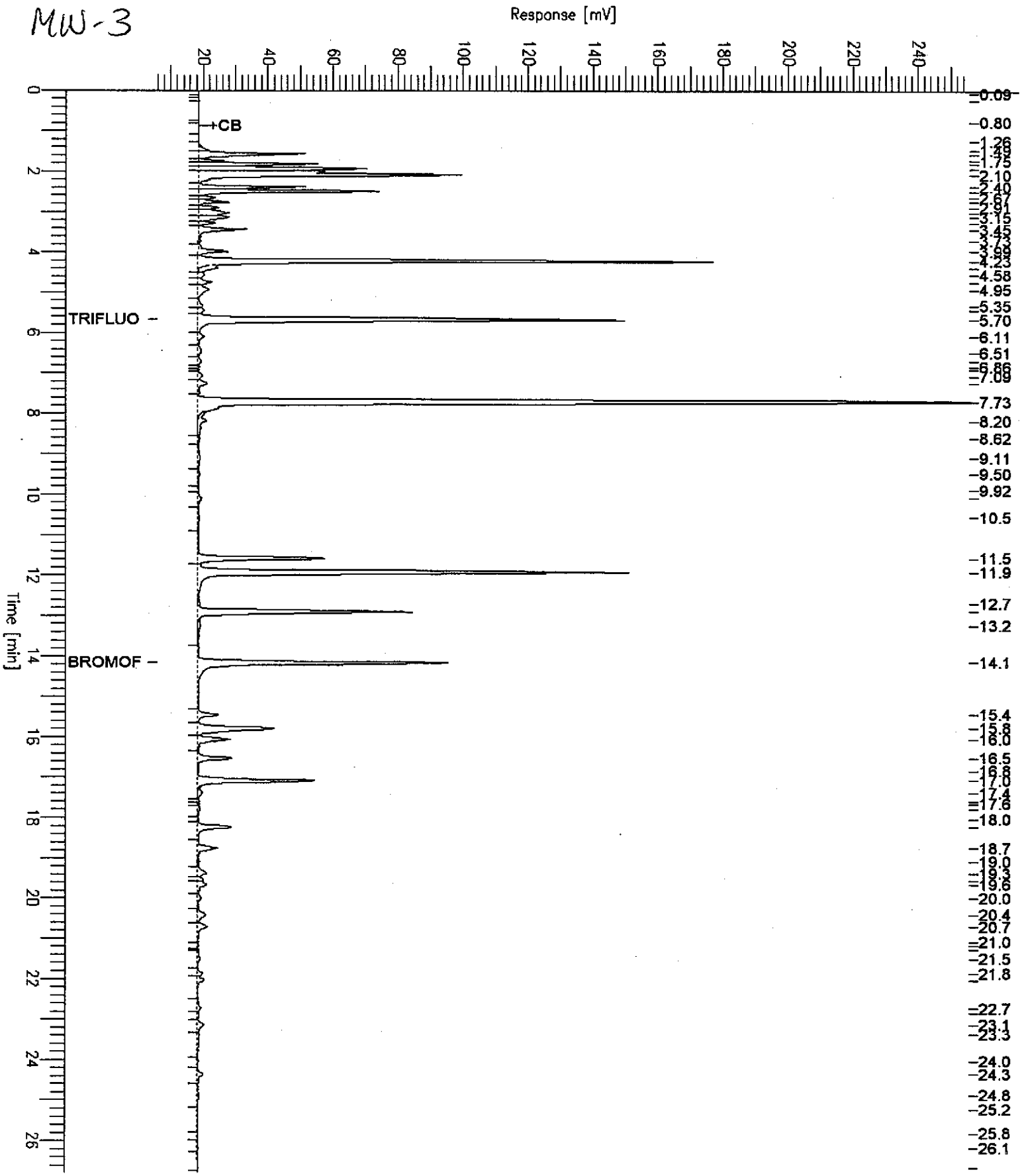
C = Presence confirmed, but confirmation concentration differed by more than a factor of two
ND = Not Detected
RL = Reporting Limit

GC19 TVH 'X' Data File (FID)

Sample Name : 146643-002,57169,+MTBE
FileName : G:\GC19\DATA\203X035.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.80 min
Scale Factor: -1.0 Plot Offset: 6 mV

Sample #: 100X,C1 Page 1 of 1
Date : 7/22/00 02:25 PM
Time of Injection: 7/22/00 01:58 PM
Low Point : 5.78 mV High Point : 255.78 mV
Plot Scale: 250.0 mV

MW-3



Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 5030
Project#:	STANDARD		
Matrix:	Water	Sampled:	07/20/00
Units:	ug/L	Received:	07/21/00
Batch#:	57169		

Field ID:	MW-4	Diln Fac:	1.000
Type:	SAMPLE	Analyzed:	07/22/00
Lab ID:	146643-003		

Analyte	Result	RL	Analysis
Gasoline C7-C12	210	50	EPA 8015M
Benzene	91	0.50	EPA 8021B
Toluene	4.6 C	0.50	EPA 8021B
Ethylbenzene	19	0.50	EPA 8021B
o-Xylene	4.1	0.50	EPA 8021B
m,p-Xylenes	8.8	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	112	59-135	EPA 8015M
Bromofluorobenzene (FID)	122	60-140	EPA 8015M
Trifluorotoluene (PID)	115	56-142	EPA 8021B
Bromofluorobenzene (PID)	122	55-149	EPA 8021B

Field ID:	MW-5	Diln Fac:	1.000
Type:	SAMPLE	Analyzed:	07/22/00
Lab ID:	146643-004		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015M
Benzene	ND	0.50	EPA 8021B
Toluene	0.98	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	109	59-135	EPA 8015M
Bromofluorobenzene (FID)	111	60-140	EPA 8015M
Trifluorotoluene (PID)	112	56-142	EPA 8021B
Bromofluorobenzene (PID)	117	55-149	EPA 8021B

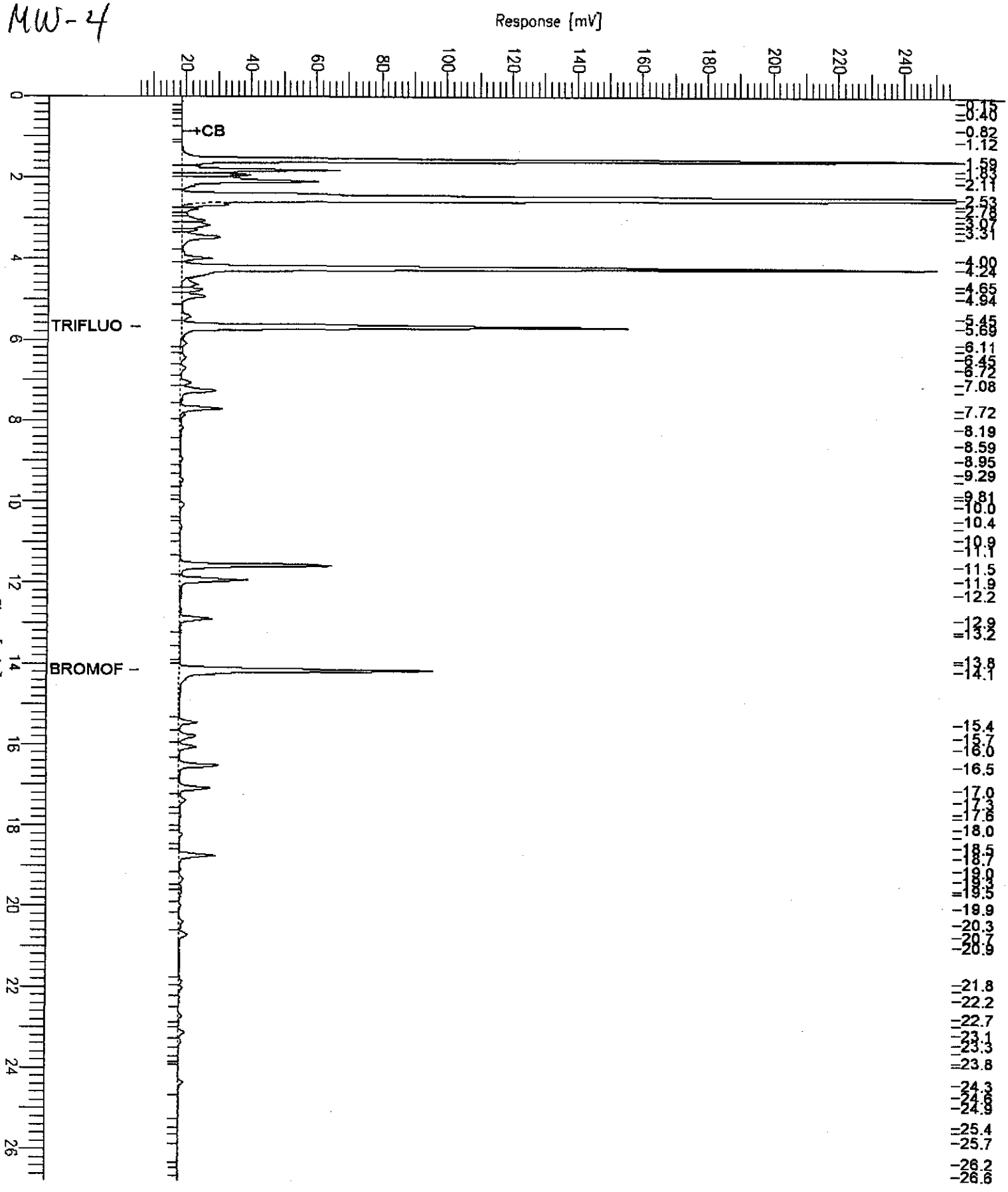
C = Presence confirmed, but confirmation concentration differed by more than a factor of two
ND = Not Detected
RL = Reporting Limit

GC19 TVH 'X' Data File (FID)

Sample Name : 146643-003,57169,+MTBE
FileName : G:\GC19\DATA\203X027.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.80 min
Scale Factor: -1.0 Plot Offset: 6 mV

Sample #: B1 Page 1 of 1
Date : 7/22/00 09:21 AM
Time of Injection: 7/22/00 08:54 AM
Low Point : 5.84 mV High Point : 255.84 mV
Plot Scale: 250.0 mV

MW-4



Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 5030
Project#:	STANDARD		
Matrix:	Water	Sampled:	07/20/00
Units:	ug/L	Received:	07/21/00
Batch#:	57169		

Field ID:	MW-7	Diln Fac:	1.000
Type:	SAMPLE	Analyzed:	07/22/00
Lab ID:	146643-005		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015M
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	112	59-135	EPA 8015M
Bromofluorobenzene (FID)	114	60-140	EPA 8015M
Trifluorotoluene (PID)	114	56-142	EPA 8021B
Bromofluorobenzene (PID)	118	55-149	EPA 8021B

Field ID:	MW-6	Diln Fac:	1.000
Type:	SAMPLE	Analyzed:	07/22/00
Lab ID:	146643-006		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015M
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	113	59-135	EPA 8015M
Bromofluorobenzene (FID)	114	60-140	EPA 8015M
Trifluorotoluene (PID)	117	56-142	EPA 8021B
Bromofluorobenzene (PID)	121	55-149	EPA 8021B

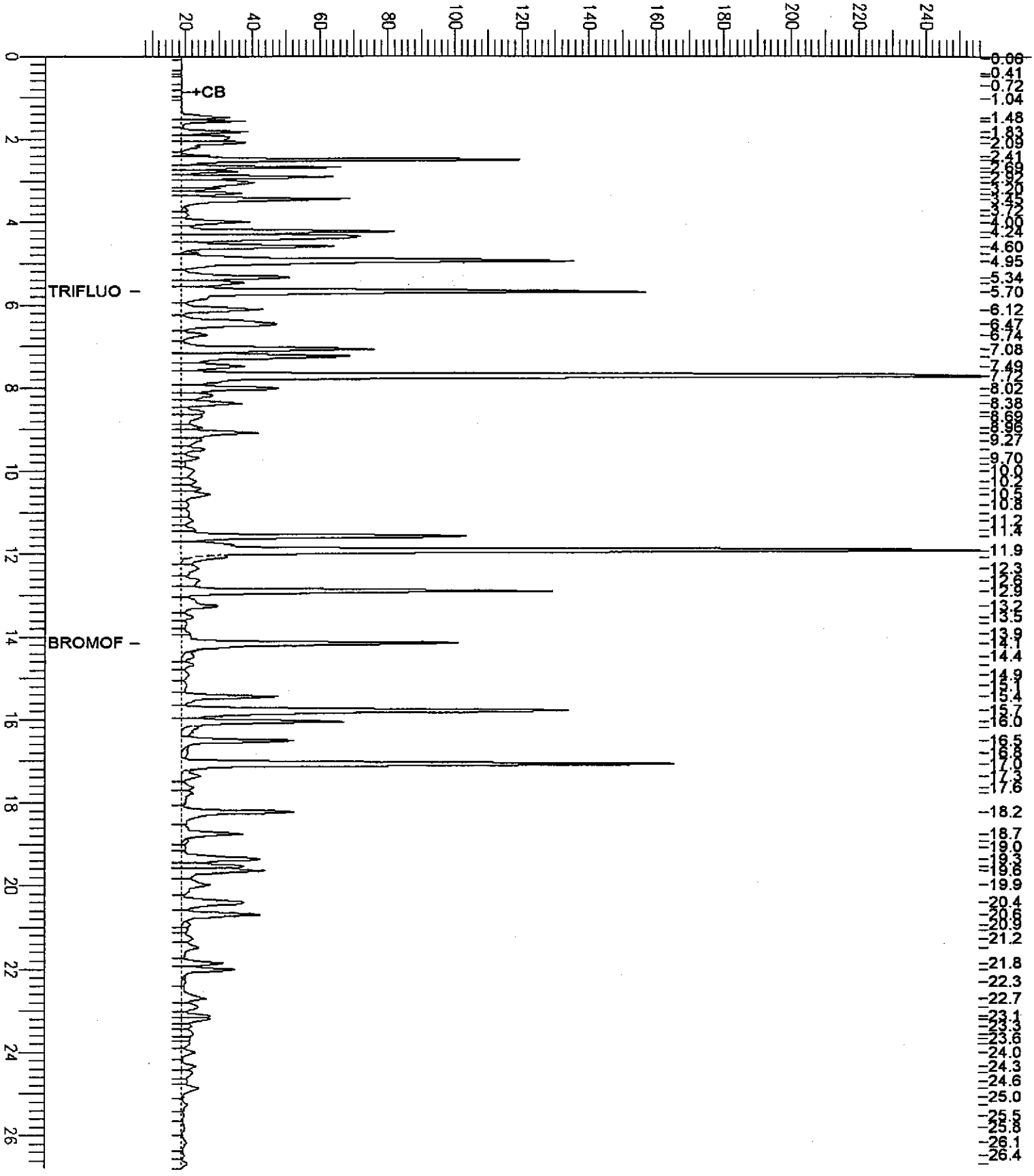
C = Presence confirmed, but confirmation concentration differed by more than a factor of two
ND = Not Detected
RL = Reporting Limit

GC19 TVH 'X' Data File (FID)

Sample Name : CCV/LCS,QC120762,57169,00WS9313,5/5000
FileName : G:\GC19\DATA\203X002.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.80 min
Scale Factor: -1.0 Plot Offset: 6 mV

Sample #: GAS Page 1 of 1
Date : 7/21/00 05:10 PM
Time of Injection: 7/21/00 01:48 PM
Low Point : 6.18 mV High Point : 256.18 mV
Plot Scale: 250.0 mV

Gasoline Standard



Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 5030
Project#:	STANDARD		
Matrix:	Water	Sampled:	07/20/00
Units:	ug/L	Received:	07/21/00
Batch#:	57169		

Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC120761	Analyzed:	07/21/00

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015M
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	108	59-135	EPA 8015M
Bromofluorobenzene (FID)	113	60-140	EPA 8015M
Trifluorotoluene (PID)	112	56-142	EPA 8021B
Bromofluorobenzene (PID)	117	55-149	EPA 8021B

C = Presence confirmed, but confirmation concentration differed by more than a factor of two
ND = Not Detected
RL = Reporting Limit

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 5030
Project#:	STANDARD	Analysis:	EPA 8015M
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC120762	Batch#:	57169
Matrix:	Water	Analyzed:	07/21/00
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	2,000	2,007	100	73-121
Benzene		NA		
Toluene		NA		
Ethylbenzene		NA		
o-Xylene		NA		
m,p-Xylenes		NA		

Surrogate	Result	%REC	Limits
Trifluorotoluene (FID)		124	59-135
Bromofluorobenzene (FID)		134	60-140
Trifluorotoluene (PID)	NA		
Bromofluorobenzene (PID)	NA		

NA= Not Analyzed

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 5030
Project#:	STANDARD	Analysis:	EPA 8021B
Matrix:	Water	Batch#:	57169
Units:	ug/L	Analyzed:	07/22/00
Diln Fac:	1.000		

Type: BS Lab ID: QC120763

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12		NA		
Benzene	20.00	19.08	95	67-117
Toluene	20.00	18.95	95	69-117
Ethylbenzene	20.00	19.64	98	68-124
o-Xylene	20.00	19.53	98	65-129
m,p-Xylenes	40.00	41.08	103	70-125

Surrogate	Result	%REC	Limits
Trifluorotoluene (FID)	NA		
Bromofluorobenzene (FID)	NA		
Trifluorotoluene (PID)		101	56-142
Bromofluorobenzene (PID)		105	55-149

Type: BSD Lab ID: QC120764

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12		NA				
Benzene	20.00	19.08	95	67-117	0	20
Toluene	20.00	18.99	95	69-117	0	20
Ethylbenzene	20.00	19.85	99	68-124	1	20
o-Xylene	20.00	19.74	99	65-129	1	20
m,p-Xylenes	40.00	41.75	104	70-125	2	20

Surrogate	Result	%REC	Limits
Trifluorotoluene (FID)	NA		
Bromofluorobenzene (FID)	NA		
Trifluorotoluene (PID)		101	56-142
Bromofluorobenzene (PID)		104	55-149

NA= Not Analyzed
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 5030
Project#:	STANDARD	Analysis:	EPA 8015M
Field ID:	ZZZZZZZZZZ	Batch#:	57169
MSS Lab ID:	146556-002	Sampled:	07/14/00
Matrix:	Water	Received:	07/14/00
Units:	ug/L	Analyzed:	07/22/00
Diln Fac:	1.000		

Type: MS Lab ID: QC120765

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	34.98	2,000	2,015	99	65-131
Benzene			NA		
Toluene			NA		
Ethylbenzene			NA		
o-Xylene			NA		
m,p-Xylenes			NA		

Surrogate	Result	%REC	Limits
Trifluorotoluene (FID)		126	59-135
Bromofluorobenzene (FID)		134	60-140
Trifluorotoluene (PID)	NA		
Bromofluorobenzene (PID)	NA		

Type: MSD Lab ID: QC120766

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,104	103	65-131	4	20
Benzene		NA				
Toluene		NA				
Ethylbenzene		NA				
o-Xylene		NA				
m,p-Xylenes		NA				

Surrogate	Result	%REC	Limits
Trifluorotoluene (FID)		128	59-135
Bromofluorobenzene (FID)		138	60-140
Trifluorotoluene (PID)	NA		
Bromofluorobenzene (PID)	NA		

NA= Not Analyzed
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 3520
Project#:	STANDARD	Analysis:	EPA 8015M
Matrix:	Water	Sampled:	07/20/00
Units:	ug/L	Received:	07/21/00
Diln Fac:	1.000		

Field ID:	MW-1	Batch#:	57244
Type:	SAMPLE	Prepared:	07/25/00
Lab ID:	146643-001	Analyzed:	07/27/00

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
Hexacosane	85	44-121

Field ID:	MW-3	Batch#:	57244
Type:	SAMPLE	Prepared:	07/25/00
Lab ID:	146643-002	Analyzed:	07/27/00

Analyte	Result	RL
Diesel C10-C24	2,900 L Y	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
Hexacosane	79	44-121

Field ID:	MW-4	Batch#:	57244
Type:	SAMPLE	Prepared:	07/25/00
Lab ID:	146643-003	Analyzed:	07/27/00

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
Hexacosane	71	44-121

Field ID:	MW-5	Batch#:	57244
Type:	SAMPLE	Prepared:	07/25/00
Lab ID:	146643-004	Analyzed:	07/27/00

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
Hexacosane	82	44-121

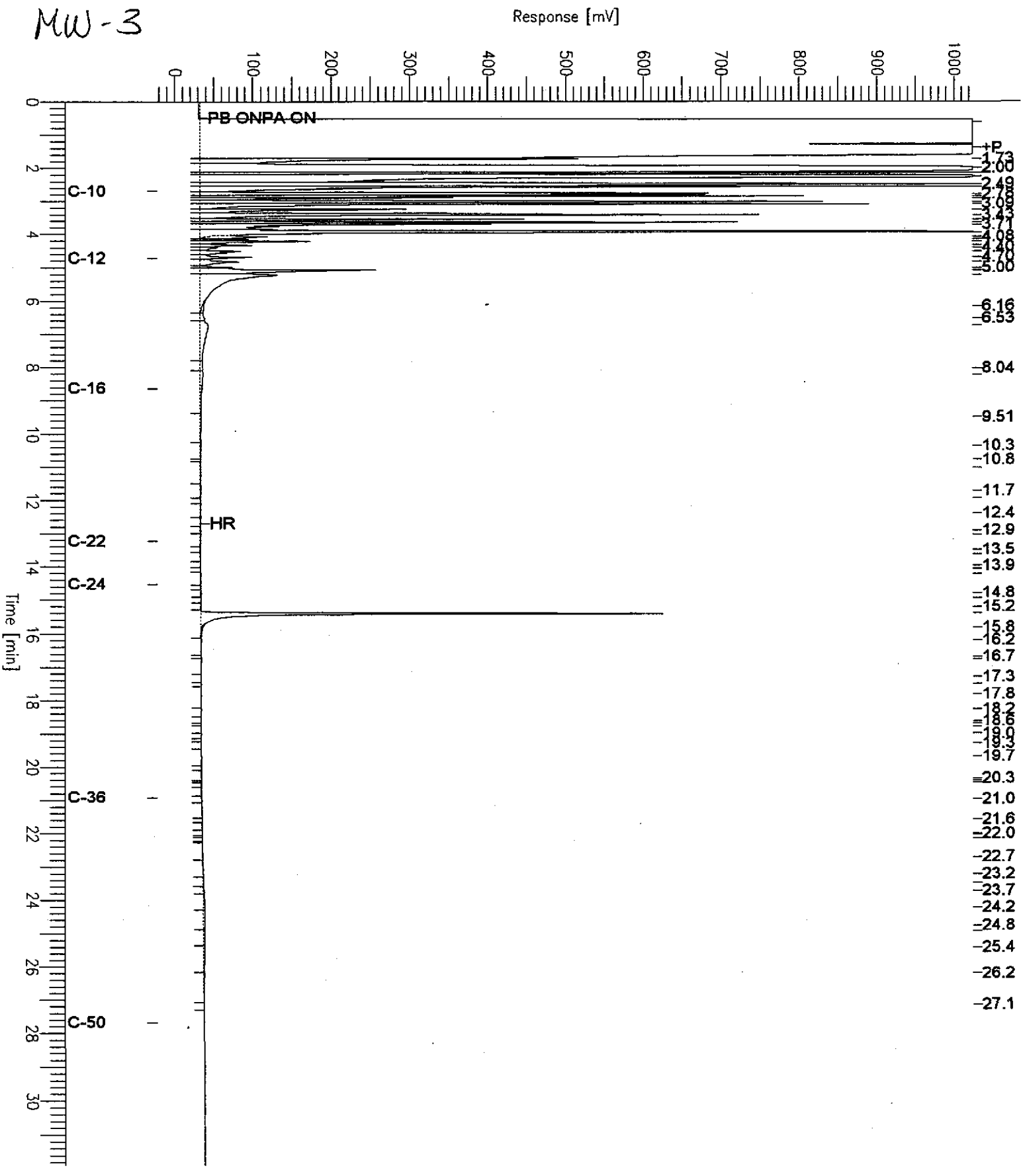
L = Lighter hydrocarbons contributed to the quantitation
Y = Sample exhibits fuel pattern which does not resemble standard
ND = Not Detected
RL = Reporting Limit

Chromatogram

Sample Name : 146643-002sg,57244
FileName : G:\GC15\CHB\207B066.RAW
Method : BTEH180.MTH
Start Time : 0.00 min End Time : 31.90 min
Scale Factor: 0.0 Plot Offset: -22 mV

Sample #: Page 1 of 1
Date : 07/28/2000 12:35 AM
Time of Injection: 07/27/2000 08:55 PM
Low Point : -22.08 mV High Point : 1024.00 mV
Plot Scale: 1046.1 mV

MW-3



Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 3520
Project#:	STANDARD	Analysis:	EPA 8015M
Matrix:	Water	Sampled:	07/20/00
Units:	ug/L	Received:	07/21/00
Diln Fac:	1.000		

Field ID:	MW-7	Batch#:	57302
Type:	SAMPLE	Prepared:	07/27/00
Lab ID:	146643-005	Analyzed:	07/31/00

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
Hexacosane	77	44-121

Field ID:	MW-6	Batch#:	57302
Type:	SAMPLE	Prepared:	07/27/00
Lab ID:	146643-006	Analyzed:	07/31/00

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
Hexacosane	88	44-121

Type:	BLANK	Prepared:	07/25/00
Lab ID:	QC121037	Analyzed:	07/27/00
Batch#:	57244		

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
Hexacosane	86	44-121

Type:	BLANK	Prepared:	07/27/00
Lab ID:	QC121281	Analyzed:	08/03/00
Batch#:	57302		

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
Hexacosane	108	44-121

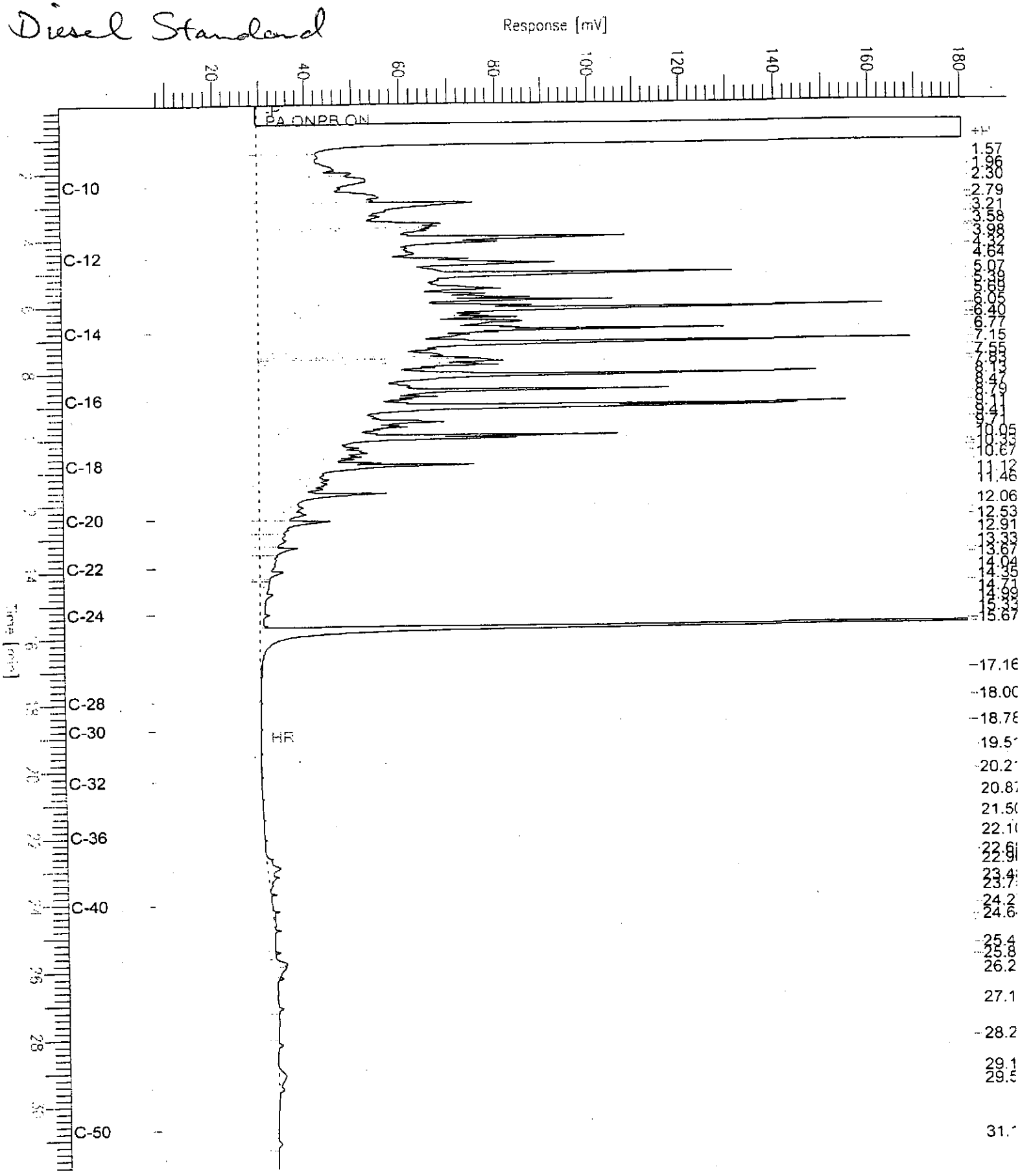
L = Lighter hydrocarbons contributed to the quantitation
Y = Sample exhibits fuel pattern which does not resemble standard
ND = Not Detected
RL = Reporting Limit

Chromatogram

Sample Name : ccv,00ws9461,dsl
FileName : G:\GC13\CHB\207B002.RAW
Method : BTEH164.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 7 mV

Sample #: 500mg/l
Date : 07/25/2000 11:15 AM
Time of Injection: 07/25/2000 10:41 AM
Low Point : 7.11 mV High Point : 180.32 mV
Plot Scale: 173.2 mV

Diesel Standard



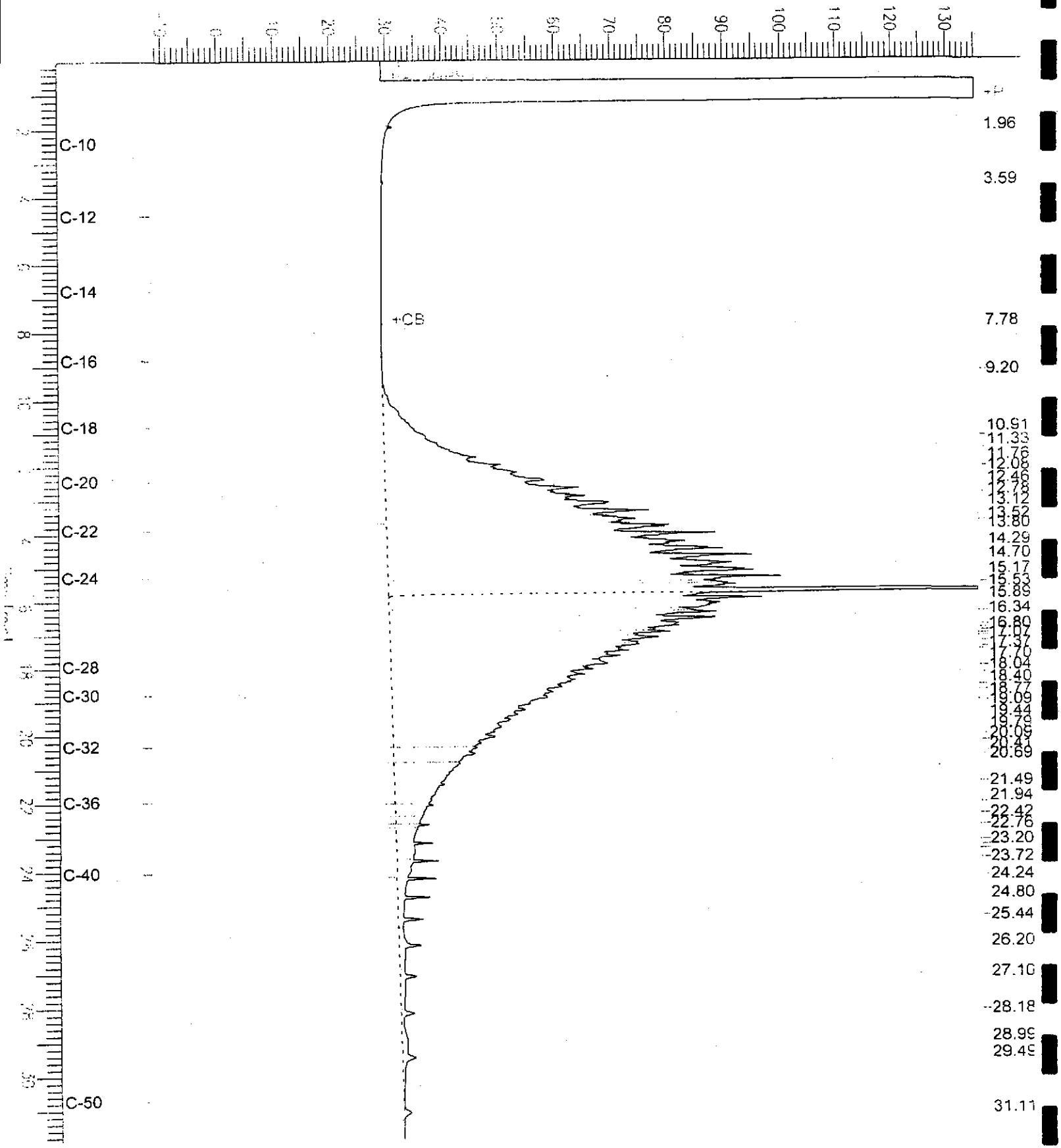
Chromatogram

nple Name : ccv,00ws9383,mo
leName : G:\GC13\CHB\207B003.RAW
thod : BTEH164.MTH
art Time : 0.01 min End Time : 31.91 min
ale Factor: 0.0 Plot Offset: -12 mV

Sample #: 500mg/l Page 1 of 1
Date : 07/25/2000 12:07 PM
Time of Injection: 07/25/2000 11:23 AM
Low Point : -11.89 mV High Point : 135.05 mV
Plot Scale: 146.9 mV

Motor Oil Standard

Response [mV]



Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 3520
Project#:	STANDARD	Analysis:	EPA 8015M
Matrix:	Water	Batch#:	57244
Units:	ug/L	Prepared:	07/25/00
Diln Fac:	1.000	Analyzed:	07/28/00

Type: BS Lab ID: QC121038

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,339	1,656	71	45-110

Surrogate	%REC	Limits
Hexacosane	84	44-121

Type: BSD Lab ID: QC121039

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,339	1,670	71	45-110	1	22

Surrogate	%REC	Limits
Hexacosane	84	44-121

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 3520
Project#:	STANDARD	Analysis:	EPA 8015M
Matrix:	Water	Batch#:	57302
Units:	ug/L	Prepared:	07/27/00
Diln Fac:	1.000	Analyzed:	08/03/00

Type: BS Lab ID: QC121282

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,339	1,646	70	45-110

Surrogate	%REC	Limits
Hexacosane	90	44-121

Type: BSD Lab ID: QC121283

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,339	1,731	74	45-110	5	22

Surrogate	%REC	Limits
Hexacosane	92	44-121

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Gasoline Oxygenates by GC/MS

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 5030
Project#:	STANDARD	Analysis:	EPA 8260A
Matrix:	Water	Sampled:	07/20/00
Units:	ug/L	Received:	07/21/00
Batch#:	57280		

Field ID: MW-1
Type: SAMPLE
Lab ID: 146643-001

Diln Fac: 1.000
Analyzed: 07/27/00

Analyte	Result	RL
MTBE	3.4	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	103	80-122
1,2-Dichloroethane-d4	102	78-123
Toluene-d8	98	80-110
Bromofluorobenzene	106	80-115

Field ID: MW-3
Type: SAMPLE
Lab ID: 146643-002

Diln Fac: 2,500
Analyzed: 07/27/00

Analyte	Result	RL
MTBE	3,300	1,300

Surrogate	%REC	Limits
Dibromofluoromethane	99	80-122
1,2-Dichloroethane-d4	104	78-123
Toluene-d8	99	80-110
Bromofluorobenzene	97	80-115

Field ID: MW-4
Type: SAMPLE
Lab ID: 146643-003

Diln Fac: 50.00
Analyzed: 07/28/00

Analyte	Result	RL
MTBE	1,500	25

Surrogate	%REC	Limits
Dibromofluoromethane	102	80-122
1,2-Dichloroethane-d4	106	78-123
Toluene-d8	97	80-110
Bromofluorobenzene	96	80-115

ND = Not Detected
RL = Reporting Limit

Curtis & Tompkins, Ltd.

Gasoline Oxygenates by GC/MS

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 5030
Project#:	STANDARD	Analysis:	EPA 8260A
Matrix:	Water	Sampled:	07/20/00
Units:	ug/L	Received:	07/21/00
Batch#:	57280		

Field ID: MW-5
Type: SAMPLE
Lab ID: 146643-004
Diln Fac: 1.000
Analyzed: 07/27/00

Analyte	Result	RL
MTBE	1.9	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	97	80-122
1,2-Dichloroethane-d4	102	78-123
Toluene-d8	99	80-110
Bromofluorobenzene	99	80-115

Field ID: MW-7
Type: SAMPLE
Lab ID: 146643-005
Diln Fac: 1.000
Analyzed: 07/27/00

Analyte	Result	RL
MTBE	ND	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	96	80-122
1,2-Dichloroethane-d4	98	78-123
Toluene-d8	98	80-110
Bromofluorobenzene	113	80-115

Field ID: MW-6
Type: SAMPLE
Lab ID: 146643-006
Diln Fac: 1.000
Analyzed: 07/27/00

Analyte	Result	RL
MTBE	160	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	99	80-122
1,2-Dichloroethane-d4	103	78-123
Toluene-d8	97	80-110
Bromofluorobenzene	106	80-115

Type: BLANK
Lab ID: QC121194
Diln Fac: 1.000
Analyzed: 07/27/00

Analyte	Result	RL
MTBE	ND	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	102	80-122
1,2-Dichloroethane-d4	102	78-123
Toluene-d8	97	80-110
Bromofluorobenzene	96	80-115

ND = Not Detected
RL = Reporting Limit

Curtis & Tompkins, Ltd.

Gasoline Oxygenates by GC/MS

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 5030
Project#:	STANDARD	Analysis:	EPA 8260A
Matrix:	Water	Sampled:	07/20/00
Units:	ug/L	Received:	07/21/00
Batch#:	57280		

Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC121195	Analyzed:	07/27/00

Analyte	Result	RL
MTBE	ND	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	87	80-122
1,2-Dichloroethane-d4	101	78-123
Toluene-d8	100	80-110
Bromofluorobenzene	104	80-115

ND = Not Detected
RL = Reporting Limit

Curtis & Tompkins, Ltd.

Gasoline Oxygenates by GC/MS

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	EPA 5030
Project#:	STANDARD	Analysis:	EPA 8260A
Matrix:	Water	Batch#:	57280
Units:	ug/L	Analyzed:	07/27/00
Diln Fac:	1.000		

Type: BS Lab ID: QC121192

Analyte	Spiked	Result	%REC	Limits
MTBE	50.00	47.99	96	49-144

Surrogate	%REC	Limits
Dibromofluoromethane	99	80-122
1,2-Dichloroethane-d4	98	78-123
Toluene-d8	97	80-110
Bromofluorobenzene	88	80-115

Type: BSD Lab ID: QC121193

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	50.00	49.33	99	49-144	3	21

Surrogate	%REC	Limits
Dibromofluoromethane	99	80-122
1,2-Dichloroethane-d4	100	78-123
Toluene-d8	99	80-110
Bromofluorobenzene	88	80-115

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Manganese

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 6010B
Analyte:	Manganese	Sampled:	07/20/00
Matrix:	Filtrate	Received:	07/21/00
Units:	ug/L	Prepared:	07/24/00
Diln Fac:	1.000	Analyzed:	07/26/00
Batch#:	57218		

Field ID	Type	Lab ID	Result	RL
MW-1	SAMPLE	146643-001	ND	10
MW-3	SAMPLE	146643-002	6,600	10
MW-4	SAMPLE	146643-003	5,300	10
MW-5	SAMPLE	146643-004	17	10
MW-7	SAMPLE	146643-005	18	10
MW-6	SAMPLE	146643-006	1,900	10
	BLANK	QC120942	ND	10

ND = Not Detected
RL = Reporting Limit

Manganese

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 6010B
Analyte:	Manganese	Batch#:	57218
Field ID:	ZZZZZZZZZZ	Sampled:	07/21/00
MSS Lab ID:	146651-001	Received:	07/21/00
Matrix:	Filtrate	Prepared:	07/24/00
Units:	ug/L	Analyzed:	07/26/00
Diln Fac:	1.000		

Type	Lab ID	MSS Result	Spiked	Result	RL	%REC	Limits	RPD	Lim
BS	QC120943		500.0	484.0		97	80-113		
BSD	QC120944		500.0	483.0		97	80-113	0	25
SDUP	QC120945	<10.00		ND	10			NC	20
SSPIKE	QC120946	0.1050	500.0	501.0		100	64-128		

NC = Not Calculated
ND = Not Detected
RL = Reporting Limit
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Curtis & Tompkins, Ltd.

Ferrous Iron (Fe+2)

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Analysis:	FE+2
Project#:	STANDARD		
Analyte:	Ferrous Iron (Fe+2)	Sampled:	07/20/00
Matrix:	Water	Received:	07/21/00
Units:	mg/L	Analyzed:	07/21/00
Batch#:	57221		

Field ID	Type	Lab ID	Result	RL	Diln Fac
MW-1	SAMPLE	146643-001	0.13	0.10	1.000
MW-3	SAMPLE	146643-002	3.9	0.20	2.000
MW-4	SAMPLE	146643-003	9.5	0.80	8.000
MW-5	SAMPLE	146643-004	0.11	0.10	1.000
MW-7	SAMPLE	146643-005	ND	0.10	1.000
MW-6	SAMPLE	146643-006	120	8.0	80.00
	BLANK	QC120952	ND	0.10	1.000

ND = Not Detected
RL = Reporting Limit

Curtis & Tompkins, Ltd.

Ferrous Iron (Fe+2)

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Analysis:	FE+2
Project#:	STANDARD		
Analyte:	Ferrous Iron (Fe+2)	Diln Fac:	1.000
Field ID:	MW-6	Batch#:	57221
MSS Lab ID:	146643-006	Sampled:	07/20/00
Matrix:	Water	Received:	07/21/00
Units:	mg/L	Analyzed:	07/21/00

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC120953	121.9	0.8000	123.4	180 *	65-134		
MSD	QC120954		0.8000	129.6	960 *	65-134	5	20
LCS	QC120955		0.8000	0.8260	103	80-110		

* = Value outside of QC limits; see narrative
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Ammonia Nitrogen

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 350.3
Analyte:	Ammonia	Batch#:	57177
Matrix:	Water	Sampled:	07/20/00
Units:	mg/L	Received:	07/21/00
Diln Fac:	1.000	Analyzed:	07/21/00

Field ID	Type	Lab ID	Result	RL
MW-1	SAMPLE	146643-001	ND	0.10
MW-3	SAMPLE	146643-002	ND	0.10
MW-4	SAMPLE	146643-003	ND	0.10
MW-5	SAMPLE	146643-004	ND	0.10
MW-7	SAMPLE	146643-005	ND	0.10
MW-6	SAMPLE	146643-006	6.0	0.10
	BLANK	QC120797	ND	0.10

ND = Not Detected
RL = Reporting Limit

Ammonia Nitrogen

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 350.3
Analyte:	Ammonia	Diln Fac:	1.000
Field ID:	MW-6	Batch#:	57177
MSS Lab ID:	146643-006	Sampled:	07/20/00
Matrix:	Water	Received:	07/21/00
Units:	mg/L	Analyzed:	07/21/00

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
LCS	QC120798		5.000	5.280	106	80-116		
MS	QC120799	6.040	16.00	22.40	102	76-131		
MSD	QC120800		16.00	22.70	104	76-131	1	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Curtis & Tompkins, Ltd.

Nitrate Nitrogen

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 300.0
Analyte:	Nitrogen, Nitrate	Batch#:	57162
Matrix:	Water	Sampled:	07/20/00
Units:	mg/L	Received:	07/21/00
Diln Fac:	1.000		

Field ID	Type	Lab ID	Result	RL	Analyzed
MW-1	SAMPLE	146643-001	3.4	0.05	07/07/00
MW-3	SAMPLE	146643-002	0.55	0.05	07/07/00
MW-4	SAMPLE	146643-003	0.04 J	0.05	07/07/00
MW-5	SAMPLE	146643-004	3.9	0.05	07/07/00
MW-7	SAMPLE	146643-005	2.6	0.05	07/07/00
MW-6	SAMPLE	146643-006	0.05 J	0.05	07/07/00
	BLANK	QC120736	ND	0.05	07/21/00

J = Estimated value
ND = Not Detected
RL = Reporting Limit

Curtis & Tompkins, Ltd.

Nitrate Nitrogen

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 300.0
Analyte:	Nitrogen, Nitrate	Batch#:	57162
Field ID:	ZZZZZZZZZZ	Sampled:	07/18/00
MSS Lab ID:	146609-001	Received:	07/18/00
Matrix:	Water	Analyzed:	07/21/00
Units:	mg/L		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Dil	Fac
BS	QC120737		2.000	2.050	103	90-110				1.000
BSD	QC120738		2.000	2.040	102	90-110	1	20		1.000
MS	QC120739	<10.00	200.0	203.1	102	80-120				200.0
MSD	QC120740		200.0	205.8	103	80-120	1	20		200.0

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Orthophosphate Phosphorous

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 365.2
Analyte:	Orthophosphate (as P)	Batch#:	57162
Matrix:	Water	Sampled:	07/20/00
Units:	mg/L	Received:	07/21/00
Diln Fac:	1.000	Analyzed:	07/07/00

Field ID	Type	Lab ID	Result	RL
MW-1	SAMPLE	146643-001	ND	0.20
MW-3	SAMPLE	146643-002	ND	0.20
MW-4	SAMPLE	146643-003	ND	0.20
MW-5	SAMPLE	146643-004	ND	0.20
MW-7	SAMPLE	146643-005	0.13 J	0.20
MW-6	SAMPLE	146643-006	ND	0.20
	BLANK	QC120736	ND	0.20

J = Estimated value
ND = Not Detected
RL = Reporting Limit

Curtis & Tompkins, Ltd.

Orthophosphate Phosphorous

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 365.2
Analyte:	Orthophosphate (as P)	Batch#:	57162
Field ID:	ZZZZZZZZZZ	Sampled:	07/18/00
MSS Lab ID:	146609-001	Received:	07/18/00
Matrix:	Water	Analyzed:	07/07/00
Units:	mg/L		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Dil Fac
BS	QC120737		5.000	10.20	102	80-110			1.000
BSD	QC120738		5.000	10.12	101	80-110	1	20	1.000
MS	QC120739	<40.00	500.0	0	0 *	34-133			200.0
MSD	QC120740		500.0	0	0 *	34-133	0	20	200.0

* = Value outside of QC limits; see narrative
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Sulfate

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 300.0
Analyte:	Sulfate	Sampled:	07/20/00
Matrix:	Water	Received:	07/21/00
Units:	mg/L	Analyzed:	07/07/00
Batch#:	57162		

Field ID	Type	Lab ID	Result	RL	Dil Fac
MW-1	SAMPLE	146643-001	54	5.0	10.00
MW-3	SAMPLE	146643-002	20	0.50	1.000
MW-4	SAMPLE	146643-003	11	0.50	1.000
MW-5	SAMPLE	146643-004	49	0.50	1.000
MW-7	SAMPLE	146643-005	53	5.0	10.00
MW-6	SAMPLE	146643-006	7.5	0.50	1.000
	BLANK	QC120736	ND	0.50	1.000

ND = Not Detected
RL = Reporting Limit

Curtis & Tompkins, Ltd.

Sulfate

Lab #:	146643	Location:	Strough
Client:	Subsurface Consultants	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA 300.0
Analyte:	Sulfate	Batch#:	57162
Field ID:	ZZZZZZZZZZ	Sampled:	07/18/00
MSS Lab ID:	146609-001	Received:	07/18/00
Matrix:	Water	Analyzed:	07/07/00
Units:	mg/L		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Dil Fac
BS	QC120737		20.00	20.52	103	90-110			1.000
BSD	QC120738		20.00	20.56	103	90-110	0	20	1.000
MS	QC120739	<100.0	2,000	0	0 *	80-120			200.0
MSD	QC120740		2,000	0	0 *	80-120	0	20	200.0

* = Value outside of QC limits; see narrative
RPD= Relative Percent Difference

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

LABORATORY REPORT

Client:	CURTIS & TOMPKINS, LTD.	Date of Report:	08/09/00
Address:	2323 Fifth Street	Date Received:	07/24/00
	Berkeley, CA 94710	PAI Project No:	P2001824
Contact:	Mr. Steve Stanley	Purchase Order:	Verbal

Client Project ID: #146643

Six (6) Liquid Samples labeled:

"MW-1" "MW-3" "MW-4" "MW-5" "MW-7" "MW-6"

The samples were received at the laboratory under chain of custody on July 24, 2000. The samples were received intact. The dates of analyses are indicated on the attached data sheets.

Carbon Dioxide Analysis

The samples were analyzed for Carbon dioxide according to modified RSK Method 175 using a gas chromatograph equipped with a thermal conductivity detector (TCD).

The results of analyses are given in the attached data summary sheet.

Reviewed and Approved:

Ioana Ciurash
Analytical Chemist

Reviewed and Approved:

John Yokoyama
Senior Chemist

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF CARBON DIOXIDE ANALYSIS

Client: Curtis & Tompkins, Ltd.

Client Project ID: 146643
PAI Project ID: P2001824

Test Code: GC/TCD
Instrument ID: HP5890A/TCD #10
Analyst: Joana Ciurash
Matrix: Liquid

Date Sampled: 7/20/00
Date Received: 7/24/00
Date Analyzed: 7/27/00
Volume(s) Analyzed: 0.10 ml

Client Sample ID	PAI Sample ID	D.F.	Carbon Dioxide µg/L	
			Result	Reporting Limit
MW-1	P2001824-001A	1.00	120,000	100
MW-3	P2001824-002A	1.00	128,000	100
MW-4	P2001824-003A	1.00	126,000	100
MW-5	P2001824-004A	1.00	134,000	100
MW-7	P2001824-005A	1.00	32,200	100
MW-6	P2001824-006A	1.00	122,000	100
MW-6	P2001824-006B	1.00	113,000	100
Method Blank	P000727-MB	1.00	ND	100

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified By: RG Date: 8/7/00

2665 Park Center Drive, Suite D, Simi Valley, California 93065 • Phone (805) 526-7161 • Fax (805) 526-7270

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510)486-0900 ph
(510)486-0532 fx

P2001824

Project Number: 146643

Subcontract Lab:

Performance Analytical
2665 Park Center Drive Suite D
Simi Valley, CA 93065
(805) 526-7161

Please send report to: Steve Stanley

Turnaround Time: _____

Report Level: II

Sample ID	Date Sampled	Matrix	Analysis	C&T Lab #
MW-1	20-JUL-00	Water	RSK-175 CO_2	146643-001
MW-3	20-JUL-00	Water	RSK-175 CO_2	146643-002
MW-4	20-JUL-00	Water	RSK-175 CO_2	146643-003
MW-5	20-JUL-00	Water	RSK-175 CO_2	146643-004
MW-7	20-JUL-00	Water	RSK-175 CO_2	146643-005
MW-6	20-JUL-00	Water	RSK-175 CO_2	146643-006

Please report using Sample ID instead of C&T Lab #.

Notes:

RELINQUISHED BY:		RECEIVED BY:	
Ben Smith	7.21.00 5:00 Date/Time	Sharon Malone	7/24/00 0845 Date/Time
	Date/Time		Date/Time

Signature on this form constitutes a firm Purchase Order for the services requested above.