

OFF-SITE SOIL & GROUNDWATER INVESTIGATION

AT

FORMER TEXACO STATION 15101 Freedom Avenue San Leandro, California

November 5, 2003

Project 2552

Prepared for

Mr. Mohammed Pazdel 15101 Freedom Avenue San Leandro, California

Prepared by

SOMA Environmental Engineering, Inc. 2680 Bishop Drive, Suite 203 San Ramon, California



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November 6, 2003

Ms. Eva Chu Alameda County Health Care Services Agency 1131 Harbor Bay Parkway, Suite 250 Alameda, California 94502-6577

NOV 1 0 2003 SOLID MEDICAL WASTE MANAGEMENT COUNTY OF ALAMEDA

Subject: STID 4473/RO0000473

Texaco Gasoline Service Station (Formerly Freedom ARCO Station) Site Address: 15101 Freedom Avenue, San Leandro, California

Dear Ms. Chu:

As requested in your letter of August 29, 2003, enclosed for your review is SOMA's report entitled "Off-Site Soil & Groundwater Investigation" for the subject site.

Thank you for your time in reviewing this report. If you have any questions or comments, please call me at (925) 244-6600.

Sincerely,

Mansour Sepehr, Ph.D., PE Principal Hydrogeologist

Enclosure

cc: Mr. Mohammad Pazdel w/enclosure

CERTIFICATION

This report has been prepared by SOMA Environmental Engineering, Inc. on behalf of Mr. Mohammed Pazdel, the property owner of 15101 Freedom Avenue, San Leandro, California to comply the Alameda County Health Care Services' request, dated August 29, 2003.

Mansour Sepehr, Ph.D., P.E. Principal Hydrogeologist



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1.0 INTRODUCTION

This report has been prepared by SOMA Environmental Engineering, Inc., (SOMA) on behalf of Mr. Mohammed Pazdel, the property owner of 15101 Freedom Avenue, San Leandro, California. This report is being prepared based on workplan approval letters, dated August 20 and 29, 2003, from the Alameda County Health Care Services (ACHCS).

As shown in Figure 1, the property is located at 15101 Freedom Avenue, San Leandro, California (the "Site"). The Site is situated between 151st Street and Fairmont Avenue with Freedom Avenue bordering the Site on the northeast and residential properties on the southwest. Currently, there are three underground storage tanks (USTs) at the Site: one 20,000-gallon gasoline UST, one 8,000-gallon gasoline UST, and one 6,000-gallon diesel UST.

1.1 Background

Since the 1960's, the Site has been used as a gasoline service station. In 1985, Mr. Mohammad Pazdel purchased the business and in 1992 he purchased the property from Mr. Mohammad Mashhoon. From 1985 until 1997, when Mr. Pazdel sold the business, the Site operated as the "Freedom ARCO Station". To comply with the UST upgrade regulations, in 1999, three 10,000-gallon single-walled USTs were removed and replaced by new double-walled fuel tanks. During the UST upgrade, petroleum hydrocarbon contaminants were detected in the subsurface soils beneath the old USTs.

Mr. Pazdel subsequently retained SOMA to conduct an on-site soil and groundwater investigation involving the installation of five groundwater monitoring wells, as illustrated in Figure 2. Soil and groundwater analytical results indicated that elevated petroleum hydrocarbon contamination existed on the eastern half of

the Site and that the contaminated groundwater plume had probably migrated to the south/southeast. With residential properties downgradient from the Site, SOMA recommended an off-site soil and groundwater investigation. After reviewing SOMA's report, the ACHCS requested a workplan that was approved in a letter dated August 29, 2003. This report presents the findings of SOMA's off-site soil and groundwater investigation.

1.2 Previous Activities

On May 20, 1999, Geo-Logic oversaw the removal of three 10,000-gallon USTs, approximately 250 feet of product piping, and six dispensers at the Site. Paradiso Mechanical, Inc. removed and over-excavated the old USTs. The on-site overseeing agency was the ACHCS.

After excavation and removal, the three USTs and product piping were transported to the ECI facility in Richmond, California for proper disposal. On May 20 and May 21, 1999, Geo-Logic collected soil samples from beneath the USTs, product piping, and dispensers. On May 20, 1999, seven soil samples (T1W, T2W, T3W, T1E, T2E, T3E, and an additional soil sample at T1W) were collected from the west and east sides of the tank excavation pit ranging in depth from 12 to 14 feet below ground surface (bgs). In addition, six soil samples (P1, P2, P4, P5, P6, and P7) were collected from beneath the dispensers ranging in depth from 2.5 to 3 feet bgs. One soil sample (P3) was collected from beneath the product lines at 2.5 feet bgs. On May 21, 1999, eight additional soil samples (P8, P9, P10, P11, P12, P13, P14, and P15) were collected beneath the product piping and in the area of the dispensers, at depths ranging from 3 to 3.5 feet bgs. Stockpile soil samples were also collected on May 21, 1999.

On June 2, 1999, additional soil samples were collected during over-excavation of the product piping and from the bottom of the tank excavation pit. An additional soil sample (P12) was collected from beneath the product piping at a depth of 5 feet bgs. Three additional soil samples were collected in the western portion of

the tank cavity and ranged in depth from 16.5 to 24.5 feet bgs, to help define the vertical extent of the hydrocarbon contamination.

The soil samples collected during the removal and over-excavation activities were submitted to Calcoast Analytical in Emeryville, California. Soil samples were analyzed for total petroleum hydrocarbons as gasoline (TPH-g) using EPA Method 8015, benzene, toluene, ethylbenzene and xylene (BTEX) and Methyl tertiary Butyl Ether (MtBE) using EPA Method 8020. The presence of MtBE was confirmed using EPA Method 8260B. Total lead was analyzed using EPA Method 6010A. The concentration of TPH-g in the soil samples ranged from 0.76 mg/Kg (P3-2.5 ft bgs) to 4,000 mg/Kg (T1W-24.5 ft bgs). Benzene concentrations ranged from 28 mg/Kg (T1W-13.5 ft bgs) to non-detectable levels (P2 through P6, and P14) at depths ranging from 2.5 to 3 feet bgs.

On July 7, 1999, Paradiso Mechanical, Inc. installed a 20,000-gallon gasoline UST, an 8,000-gallon gasoline UST, and a 6,000-gallon diesel tank inside the tank cavity.

In July 2001, CSS Environmental Services (CSS), of San Rafael, California, at the request of the ACHCS, conducted an additional site investigation to further investigate potential petroleum hydrocarbon contamination discovered during the removal and upgrade of USTs at the Site. During that investigation, CSS drilled five temporary well boreholes (SB-1 through SB-5) using the direct-push method. The soil borings were advanced to the maximum depth of 31 feet. It appeared that the groundwater beneath the Site is semi-confined so that after drilling, groundwater stabilized at depths of 17 to 20 feet bgs. The results of that investigation indicated that the petroleum-impacted soils were generally encountered below a 19-foot depth interval and were predominantly present within the capillary fringe, just above the saturated zone. The maximum concentrations of TPH-g and BTEX in the soil samples collected between 19 and 25.5 feet bgs were 470, 2.6, 16, 12, and 73 mg/Kg, respectively. MtBE was not detected in any

of the soil samples at the analytical method reporting limit of 0.005 mg/Kg. The maximum concentrations of TPH-g and BTEX in the groundwater samples collected from the soil borings were 83, 19, 1.8, 1.5, and 73 mg/L, respectively. MtBE was detected in the groundwater at each of the borings except SB-4. The maximum reported concentration was 87 mg/L at SB-2.

In April 2002, SOMA performed an on-site soil and groundwater investigation involving the installation of five monitoring wells to a total depth of 30 feet. Soil samples collected from the capillary fringe contained TPH-g ranging from 23,000 μg/Kg in borehole MW-1 to 1,500,000 μg/Kg in borehole MW-5. Benzene ranged from non-detectable levels (less than 5.3 ug/Kg) in borehole MW-2 to 750 μg/Kg in borehole MW-3. Elevated levels of toluene, ethylbenzene and xylenes and strong petroleum hydrocarbon odors were reported in soil samples collected from borehole MW-5. Toluene was reported to range from 30 μg/Kg (borehole MW-4) to 5,200 μg/Kg (borehole MW-5). Ethylbenzene was reported to range from 220 μg/Kg (borehole MW-1) to 20,000 μg/Kg (borehole MW-5). Xylenes were reported to range from 167 μg/Kg (borehole MW-2) to 67,000 μg/Kg (borehole MW-5). MtBE was not detected in the soil samples. However, laboratory reporting limits for this constituent were as high as 2,000 μg/Kg.

Since May 2002, SOMA has performed quarterly groundwater monitoring at the Site. Historically, elevated levels of petroleum hydrocarbons have been detected in the groundwater with TPH-g as high as 52,000 μ g/L (MW-3), benzene at 6,100 μ g/L (MW-3) and MtBE at 7,800 μ g/L (MW-4). With elevated levels of petroleum hydrocarbons in the most downgradient well MW-5, it appeared that the petroleum hydrocarbon contamination in the groundwater migrated beyond the Site's southern boundary.

Figure 2 illustrates the locations of the groundwater monitoring wells:

1.3 Regional Geology

The U. S. Geological Survey (USGS) mapped the Site on Late Pleistocene age (10,000 to 70,000 years old) alluvium consisting of irregularly interbedded clay, silt, sand and gravel. Due to the age of this alluvium, these stream-deposited sediments are typically more consolidated than alluvial deposits of Holocene age.

In developed urban areas such as the Bay Area, earthwork construction often involves the emplacement of artificial fill derived from nearby cuts or quarries. Artificial fill is emplaced over native earth materials to provide level building pads and base rock for roadways.

1.4 Site Hydrogeology

Based on the on-site monitoring well borehole logs, underlying sediments generally consists of stiff to hard silty clay and clayey silt with intervening layers of medium dense to very dense sand/gravel sediments.

On the west side of the Site, silt/clay sediments predominate with an occasional discontinuous layer of sand/gravel sediments. In these boreholes and borehole MW-4, below approximately 20 to 25 feet bgs, slight to moderate petroleum hydrocarbon odors were encountered and decreased substantially with depth in the underlying silty clay aquitard.

On the east side of the Site, a two- to nine-foot thick sand/gravel layer was encountered below approximate depths of 13 to 16 feet bgs. Below approximately 20 feet bgs, strong petroleum hydrocarbon vapors were encountered in boreholes MW-3 and MW-5 that also decrease substantially in the subjacent clay aquitard.

Groundwater was first encountered at approximately 25 to 29 feet bgs. Groundwater levels later stabilized to approximately 21 to 23 feet bgs, indicating the presence of confined/semi-confined water-bearing zones.

1.5 Nature and Extent of Groundwater Contamination

Based on SOMA's prior investigation, the most contaminated on-site plumes exist along the eastern and southeastern boundaries of the Site. Quarterly monitoring events have documented that the on-site groundwater flows to the south and occasionally to the east.

With elevated concentrations of the Site's related contaminants at such close proximity to the eastern and southern property lines, it was concluded that the groundwater plume had probably migrated off-site to the south/southeast. The results of the initial investigation did not delineate the downgradient extent of the groundwater chemical plumes. Due to the high solubility and mobility of MtBE, it is expected that the MtBE plume has already migrated beyond the Site's southern boundary.

2.0 SCOPE OF WORK

Based on SOMA's approved workplan dated July 22, 2003, the scope of work involved performing an off-site soil and groundwater investigation to evaluate the lateral extent of the soil and groundwater contamination. The ACHCS approved the workplan contingent upon adding a borehole between TWB-1 and TWB-4, advancing the boreholes beyond 30 feet bgs to at least 40 feet bgs, continuously collecting soil samples from the capillary fringe to the bottom of the borehole, and submitting selected soil sample from this interval for laboratory analysis. To implement the approved workplan, SOMA complied with the ACHCS directive and incorporated these additional tasks into the following scope of work:

- · Permit acquisition and preparation of a site health and safety plan
- Sensitive Receptor Survey
- Drilling temporary well boreholes and collecting soil and grab groundwater samples
- Laboratory analysis of the soil and groundwater samples
- Grouting the temporary well boreholes.

The following is a brief description of each of the above tasks.

3.0 Field Investigation

3.1 Permit Acquisition and Preparation of a Site Health and Safety Plan

To evaluate the lateral extent of the off-site soil and groundwater contamination, SOMA conducted this soil and groundwater investigation by performing a sensitive receptor survey, borehole drilling, soil sample collection, temporary well installation, and collecting and analyzing grab groundwater samples. Before drilling, SOMA personnel obtained drilling and encroachment permits from the Alameda County Public Works Agency (ACPWA) attached as Appendix A.

Prior to commencing field activity, SOMA prepared a site-specific health and safety plan (HASP). The HASP was designed to address safety provisions during field activities. The safety plan provided procedures to protect the field crew from physical and chemical hazards resulting from drilling and sampling. The HASP established personnel responsibilities, general safe work practices, field procedures, personal protective equipment standards, decontamination procedures, and emergency action plans.

3.2 Sensitive Receptor Survey

SOMA personnel contacted local utility districts to complete the sensitive receptor survey. To locate water supply wells for this survey, SOMA personnel contacted the Department of Water Resources (DWR). Based on the 2,000-foot radius search conducted by DWR, SOMA plotted water supply wells in the Site's vicinity. SOMA personnel also accessed published government maps of the Site's vicinity to locate creeks, lakes and other water bodies within a 0.5 mile radius of the Site. The Sensitive Receptor Survey results are illustrated in Figure 3a and 3b.

Gravel or sand bedding for underground street utilities can transmit groundwater contaminants a considerable distance from their source areas and impact sensitive receptors. SOMA personnel contacted the City of San Leandro, Alameda County Public Works Agency, East Bay Municipal Utility District and the Oro Loma Sanitary District to locate water and sewer mains near the Site. Subsurface utility maps are attached as Appendix B.

3.3 Drilling and Collecting Soil and Groundwater Samples

On September 11, 16, 17 and October 1, 2003, six temporary well boreholes, TWB-1 through TWB-6 were advanced at the locations shown in Figure 4. SOMA initially subcontracted Precision Sampling, Inc. (PSI) to complete the field exploration, however, PSI drilled the first borehole, TWB-4, to only 17.5 feet bgs where borehole was terminated at refusal. SOMA then subcontracted Woodward Drilling, Inc. (WDI) to complete this and the other five boreholes to the completion depth required by the ACHCS.

Using a PowerProbe sampling rig, WDI advanced the temporary well boreholes to a depth of at least 40 feet bgs. Using direct-push technology (DPT), the drilling crew drove a hollow steel sampler lined with plastic tubing to the designated depth and collected continuous soil cores in 4-foot long sections. With 4-foot long polyethylene tubing to contain the continuous soil cores, SOMA's field geologist

observed the full length of the core. The field geologist logged the soil lithology, looked for any evidence of petrochemical contamination (i.e., odor or peculiar colors), and field-screened the soil cores with a photo-ionization detector (PID). The geologic logs are presented in Appendix C.

3.3.1 Soil Sampling

SOMA's field geologist collected soil samples from each temporary well borehole to represent water-bearing zones below the capillary fringe for chemical analysis. These samples were submitted to characterize the water-bearing zones and select screen intervals for future off-site monitoring well installations.

Field personnel collected soil samples by cutting a section of the sediment-filled polyethylene tubing with a clean hacksaw, covering both ends of the soil tube with Teflon tape, and capping the taped ends of the core liner. A permanent marking pen was used to label each tube with the sample ID, the date, the time, and the sampler's initials. Once sealed and labeled, the soil samples were placed on ice in a cooler pending laboratory analysis.

3.3.2 Groundwater Sampling

Due to the high permeability of the water-bearing sediments underlying most of the off-site investigation areas, water samples were collected on the drilling dates. When caving occurred, the drilling crew emplaced a 1-inch diameter PVC casing fitted with 0.01" factory slots to collect groundwater samples. To prevent surficial contamination, rain, or surface water, from entering the boreholes after collecting the groundwater samples, the drilling crew emplaced a six-inch thick bentonite seal near the top of the borehole. Over the bentonite-sealed boreholes in the asphalt-covered areas, the field crew placed a 2-inch thick concrete patch for additional protection until the boreholes were grouted on October 27, 2003.

SOMA's field geologist collected the grab groundwater samples using disposable ½-inch and 1½-inch diameter poly bailers or a Watera™ sampler fitted with narrow gauge plastic tubing. When the first two collection devices were not feasible, a peristaltic pump was used. The Watera™ device consists of a narrow-gauge check-valve that fits into a piece of plastic tubing to collect groundwater samples with minimal disturbance. To avoid cross-contamination between each temporary well, field personnel used a new disposable bailer or fitted the decontaminated Watera™ sampler or peristaltic pump with a new piece of tubing.

Samples were immediately transferred into 40-mL VOA vials, pre-preserved with hydrochloric acid, and amber liter bottles where sufficient groundwater was encountered. The 40-mL vials were properly sealed to prevent the inclusion of any air bubbles and eliminate headspace in the vial. The vials and other containers were placed in an ice chest and delivered with a chain of custody form (COC) to the laboratory for chemical analyses.

3.4 Laboratory Analysis

Soil and groundwater samples collected from the boreholes were analyzed for TPH-g using EPA Method 8015M, BTEX using EPA Method 8021, and gas oxygenates using EPA 8260B. Appendices D and E include the laboratory analytical reports for the soil and groundwater analytical results.

4.0 RESULTS

The following is a brief description of the results from our investigation conducted in accordance with the ACHCS-approved workplan for the Site.

4.1 Sensitive Receptor Survey

SOMA personnel obtained well location information from the DWR, and contacted utility providers to complete these surveys.

4.1.1 Water Well Survey

To obtain information for the water well portion of the Sensitive Receptor Survey, SOMA personnel contacted the DWR. Based on the 2,000-foot radius search conducted by DWR, there are fourteen water supply wells within 2,000 feet of the subject property. Due to the up or cross-gradient location and distance from the source of release, wells #3 through #14 are not considered to be potential receptors. As shown in Figure 3a, one well (#1 at 1575 153rd Street) is located approximately 850 feet south of the Site. The other well is located somewhere along Oriole Street. The location of this well is ambiguous because the driller of well #2 apparently did not note the street address for this well.

4.1.2 Water Bodies

Based on USGS topographic maps, there is no water body within a 0.5-mile radius of the Site. As shown in Figure 3b, the nearest water body, Estudillo Canal, is located about 0.6 miles southwest of the Site. The next closest water body is San Leandro Creek, located approximately 1.5 miles south of the Site. These water bodies are located considerably more than 2,000 feet from the Site, and are not considered probable sensitive receptors.

4.1.3 Adjacent Underground Utilities

To determine the preferred flow path and to further evaluate the potential exposure of each sensitive receptor, SOMA personnel contacted local utility providers to determine the location and alignment of adjacent water and sewer lines. As shown in Appendix B, the Oro Loma Sanitary District (OLSD) provided a utility map that shows a sewer line located approximately 40 feet southeast of the Site along 153rd Street that slopes to the southwest. The OLSD map indicates that the depth of this line is 4.8 feet bgs. The map also shows a sewer main located approximately 80 feet east of the Site, along Fairmont Avenue, that slopes to the south/southwest. The map provided by the OLSD indicates that the depth to the top of the sewer main is 10.2 feet bgs. Given the minimum groundwater

depths as shallow as approximately 19 feet bgs, this utility is probably not submerged. Based on the same data, the sewer line along 153rd Avenue does not appear to be submerged and is not considered a preferential pathway for the contaminated groundwater.

4.2 Hydrogeology and Nature of Off-Site Contamination

The lithologic logs of temporary boreholes along with the existing logs of the groundwater monitoring wells were used to construct geologic cross-sections A-A' and B-B'. Figure 4 shows the location of the geologic cross-sections while Figures 5 and 6 show the geologic cross-sections A-A' and B-B'. As shown in the borehole logs, attached as Appendix C, and the geologic cross-sections, there are approximately 2.5 (TWB-4) to 9.5 feet (TWB-6) of dark gray silt/clay sediments underlying surficial fill materials. Beneath the silt/clay sediments, in boreholes TWB-1, TWB-2, TWB-3, TWB-4, were approximately 6.5 to 22 feet of unsaturated sand/clay and silt/clay with occasional layers of sandy silt.

As shown in the geologic cross-sections there are two distinct water-bearing zones beneath the on- and off-site areas. The shallowest water-bearing zone generally occurs at 21 to 30 feet bgs. As shown in cross-section A-A' and B-B', the first water-bearing zone is underlain by a 2- to 10-foot thick silty clay aquitard.

The shallowest first water-bearing zone was encountered in borehole TWB-1 at approximately 11.5 feet bgs. No petroleum hydrocarbon odor was noted in the upper portion of this shallow water-bearing zone. Beneath a very moist sandy clay lense, at 17.5 to 19.5 feet, this water-bearing zone is highly contaminated with abundant pockets of gasoline free product. Underlying this highly contaminated zone, at 28 feet bgs, is a two-foot thick aquitard of very stiff to hard and damp silty clay. Beneath this aquitard, at approximately 30 to 32 feet bgs is a moderately contaminated second water-bearing zone of sand interbedded with clayey sand. A slight to moderate petroleum hydrocarbon odor was noted in this

zone. Underlying this second water-bearing zone is an aquitard of silty clay with no petroleum hydrocarbon odor.

In borehole TWB-2, the first water-bearing zone occurs between approximately 27.5 and 30 feet bgs. This water-bearing zone consisted of gravelly sand with no petroleum hydrocarbon odor. Underlying the first water-bearing zone was a very stiff and damp one-foot thick silty clay aquitard. Beneath this aquitard, at approximately 31 to 34 feet bgs was the second water-bearing zone consisting of gravelly sand and sand/clay sediments with a stringer of gravelly sand. No petroleum hydrocarbon odors were noted in the second water-bearing zone. Below the second water-bearing zone, this subsurface exploration encountered an aquitard of very stiff to hard and damp silty clay with no petroleum hydrocarbon odor.

Borehole TWB-3 was drilled to approximately 30 feet bgs before the drill rig broke down. In this borehole, the first water-bearing zone of wet sand stringers was encountered between approximately 20 and 21 feet bgs. No petroleum hydrocarbon contamination was noted in borehole TWB-3.

As discussed above, PSI advanced borehole TWB-4 to refusal at approximately 17.5 feet bgs where no groundwater was encountered. In borehole TWB-4A, WDI advanced an adjacent borehole that was continuously sampled from 17.5 to 40 feet bgs. At approximately 30 feet bgs, the first water-bearing zone was encountered. This approximately 10-foot thick zone consists of approximately two feet of sand/clay sediments overlying four feet of clean sand, which overlies about 4 feet of silt/sand sediments. Beneath this first water-bearing zone was an aquitard of very stiff to hard and damp silty clay. No petroleum hydrocarbon contamination was noted throughout boreholes TWB-4 and 4A.

In borehole TWB-5, the first water-bearing zone was encountered at approximately 16 feet bgs. This approximately 8-foot thick zone consists of about

seven feet of very moist sand/clay sediments with wet sand stringers overlying 1-foot of gravelly sand. Beneath this zone was a 2.5-foot thick aquitard of very stiff to hard and damp sandy silt with some clay overlying silty clay. Beneath this aquitard, at approximately 32 to 39 feet bgs was a second water-bearing zone of silt/sand sediments. No petroleum hydrocarbon odor was noted in this zone. Beneath the second water-bearing zone was an aquitard of very stiff and damp silty clay. No petroleum hydrocarbon contamination was noted throughout borehole TWB-5.

In borehole TWB-6, the first water-bearing zone was encountered at approximately 20 to 25.5 feet bgs. This first zone consists of very moist sandy clay with a stringer of wet silty sand. Beneath this first water-bearing zone was a 2.5-foot thick aquitard of very stiff to hard and damp silty clay. Underlying this aquitard, at approximately 28 to 42.5 feet bgs, was a second water-bearing zone of silty sand and silty clay with stringers of wet sand overlying seven feet of clean sand. Underlying the second water-bearing zone was an aquitard of very stiff to hard and damp silty clay. No petroleum hydrocarbon contamination was noted throughout borehole TWB-6.

Table 1 summarizes the observations during the drilling of the temporary boreholes.

4.3 Analytical Results

4.3.1 Soil

As shown in Table 2, soil analytical results indicate that the lab detected TPH-g at a maximum level of 4,000,000 ug/Kg in borehole TWB-1. In borehole TWB-1, the lab detected toluene at 12,000 μg/Kg, ethylbenzene at 56,000 to 84,000 μg/Kg, and total xylenes at 182,000 to 365,000 μg/Kg. In TWB-1, benzene, MtBE, and 1,2 DCA were not detected above elevated laboratory reporting limits of 500, 4.8 and 4.8 μg/Kg, respectively. TWB-1 is located closest to the most contaminated

portion of the Site, which is approximately 125 feet south of the southern property line.

In borehole TWB-2, the lab detected TPH-g at 29,000 µg/Kg, ethylbenzene at 53 µg/Kg, and total xylenes at 288 µg/Kg. No gas oxygenates were detected in this borehole and no petroleum hydrocarbon compounds or gas oxygenates were detected in boreholes TWB-3, TWB-4, TWB-5 and TWB-6.

4.3.2 Groundwater Analytical Results

As shown in Table 3 and Figures 6 through 8, groundwater analytical results indicate that petroleum hydrocarbons were detected in three of the temporary wells with the highest TPH-g and BTEX levels encountered in temporary well TWB-1. In this temporary well, the lab detected TPH-g at 410,000 ug/L, benzene at 2,200 ug/L, toluene at 1,300 μ g/L, ethylbenzene at 1,300 μ g/L, and total xylenes at 25,700 μ g/L. No MtBE or other gas oxygenates were detected in this borehole above laboratory reporting limits.

In temporary well TWB-2, the lab detected TPH-g at 1,700 μ g/L, ethylbenzene at 31 μ g/L, and total xylenes at 51 μ g/L. Gas oxygenates MtBE and 1,2 DCE were detected in this borehole at 34 and 4.7 μ g/L, respectively.

The lab detected only TPH-g in temporary well TWB-3 at 150 µg/L and traces of gas oxygenates in TWB-4A. No BTEX was detected in temporary wells TWB-3, TWB-4A, TWB-5 and TWB-6.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The results of SOMA's current and prior soil and groundwater investigations confirm the existence of an off-site petroleum hydrocarbon plume. Based on the results of this investigation, groundwater contaminants have migrated off-site at

least 300 feet to the southeast with free product extending at least 100 feet south of the Site.

The results of this investigation indicate that nearby utilities are considerably shallower than the highest historical on-site groundwater levels and do not appear to be submerged. The non-submerged utilities do not appear to be preferential flow paths for site-related contaminants migrating off-site.

The results of this investigation document that there are two downgradient water supply wells in close proximity of the Site. SOMA recommends testing the water supply wells for constituents of concern to evaluate if these wells have been impacted by the site-related contaminants.

Due to the presence of at least two distinct water-bearing zones in the on- and offsite areas, SOMA recommends installing off-site groundwater monitoring wells to evaluate and monitor the extent of the groundwater plumes. The results will help verify the groundwater flow direction and determine the stability of the chemical plumes. These off-site wells will be screened in the proper water-bearing zones. When the plume stability and other relevant parameters have been determined, SOMA will evaluate all the available data to determine the most effective and economical mode of remediation.

6.0 REFERENCES

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Tables

Table 1 Field Observations During Drilling 15101 Freedom Avenue San Leandro, California

Borehole No. Distance from the Site (ft)		Water-Bearing Zone (Depth in feet bgs)	Observation		
TWB-1	125	1 st WBZ (11.5-28)	Free product w/ strong PHC* odor in lower portion Moderate PHC odor		
		2 nd WBZ (30-32)			
TWB-2	265	1 st WBZ (27.5-30)	No PHC odor		
		2 nd WBZ (31-34)	No PHC odors		
TWB-3	290	1 st WBZ (20-21)	No PHC odors		
		2 nd WBZ	Terminated at 30 feet bgs – WBZ Not observe		
TWB-4/4A	750	1 st WBZ (30-40)	No PHC odors		
		2 nd WBZ	2 nd WBZ not observed		
TWB-5	460	1 st WBZ (16-24)	No PHC odors		
		2 nd WBZ (32-39)	No PHC odors		
TWB-6	530	1 st WBZ (20-20.5)	No PHC odors		
		2 nd WBZ (28-42.5)	No PHC odors		

NOTE: All distances and depths are approximate. * PHC: Petroleum Hydrocarbon

Table 2

Soil Analytical Data

Petroleum Hydrocarbon and Gas Oxygenate Analyses

September 16,17, and October 1, 2003

15101 Freedom Avenue, San Leandro, California

Sample Id.	TPH-g (ug/kg)	Benzene (µg/kg)	Toluene (μg/kg)	Ethyl- Benzene (μg/kg)	Total Xylenes (μg/kg)	MtBE* (μg/kg)	1,2 DCE (μg/kg)
TWB-1 @ 16-16.5	<1.000	<5.2	<5.2	<5.2	<5.2	<4.8	<4.8
TWB-1 @ 18-18.5	1.800°	<5.2	<5.2	<5.2	<5.2	<4.8	<4.8
TWB-1 @ 21.5-22	3,300,000	<500	<500	56,000	182,000	<1,800	<1,800
TWB-1 @ 24-24.5	4,000,000	<1,000	12,000	84,000	365,000	<1,300	<1,300
TWB-2 @ 22-20.5	29.000 ^T	<25	<25	53	288 ^C	<4.8	<4.8
TWB-2 @ 29.5-30	<990	<5.0	<5.0	<5.0	<5.0	<4.5	<4.5
TWB-2 @ 31-31.5	1,600	<5.3	<5.3	9.7 ^C	7.5	<4.6	<4.6
TWB-2 @ 33-33.25	<1,100	<5.4	<5.4	<5.4	<5.4	<4.6	<4.6
TWB-3 @ 20-20.5	<1.000	<5.2	<5.2	<5.2	<5.2	<4.9	<4.9
TWB-4A @ 33-33.5	<1.100	<5.3	<5.3	<5.3	<5.3	<5.0	<5.0
TWB-5 @ 32-32.5	<1,100	<5.3	<5.3	<5.3	<5.3	<4.4	<4.4
TWB-6 @ 20-20.5	<1,000	<5.2	<5.2	<5.2	<5.2	<4.5	<4.5
TWB-6 @ 28-30	<960	<4.8	<4.8	<4.8	<4.8	<4.7	<4.7
TWB-6 @ 38-39	<1,100	<5.4	<5.4	<5.4	<5.4	<4.8	<4.8

Notes:

Petroleum Hydrocarbons analyzed by EPA 8015 and 8021

Gas Oxygenates analyzed by EPA 3260B - all other gas oxygenates not detected above laboratory detection limits

- < : not detected above laboratory reporting limits.
- H: Heavier hydrocarbons contributed to the quantitation
- Y: Sample exhibits chromatographic pattern that does not resembe standard.
- ^C: Presence confirmed but RPD between columns exceeds 40%.

Table 3

Groundwater Analytical Data Petroleum Hydrocarbon and Gas Oxygenate Analyses

September 16,17, and October 1, 2003 15101 Freedom Avenue, San Leandro, California

Sample Id.	TPH-g (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl- benzene (ug/l)	Xylenes (ug/l)	MtBE (ug/l)	1,2 DCA (ug/l)
TWB-1	410,000	2.200 ^C	1,300 ^C	9,400	25,700	<20	<20
TWB-2	1,700	<0.5	<0.5	31	51	34	5
TWB-3	150 ^{HY}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TWB-4A	<50	<0.5	<0.5	<0.5	<0.5	2	<0.5
TWB-5	<50	<0.5	<0.5	<0.5	<0.5	<0.5	2
TWB-6	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Notes:

Petroleum Hydrocarbons analyzed by EPA 8015 and 8021

Gas Oxygenates analyzed by EPA 3260B - all other gas oxygenates not detected above laboratory detection limits

< : not detected above laboratory reporting limits.

H: Heavier hydrocarbons contributed to the quantitation

Y: Sample exhibits chromatographic pattern that does not resembe standard.

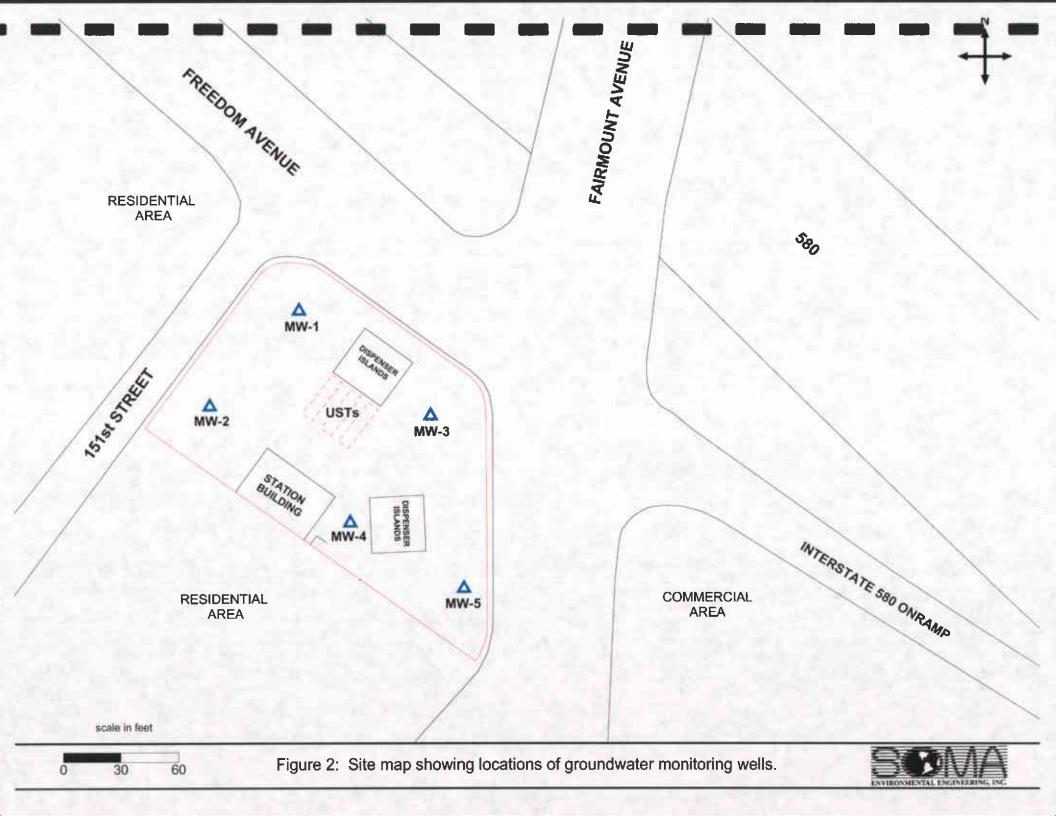
^c: Presence confirmed but RPD between columns exceeds 40%.

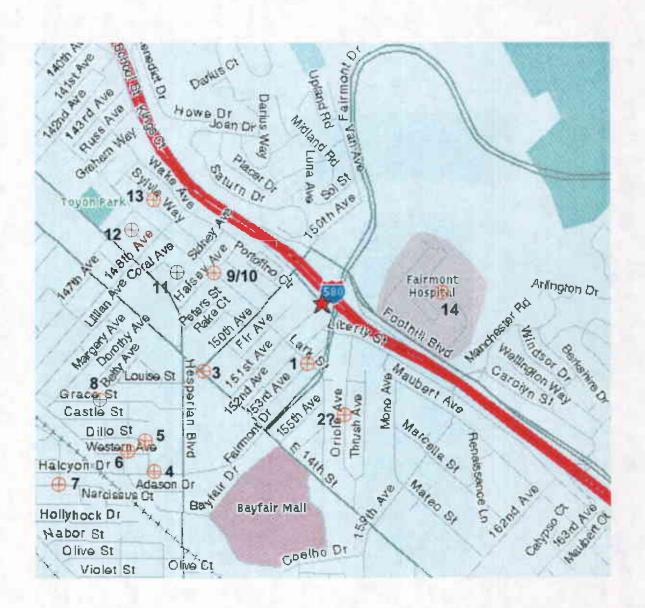
Figures



SOMA

Figure 1: Site vicinity map.





Water Supply Well

approximate scale 0.75 inches = 1,000 feet



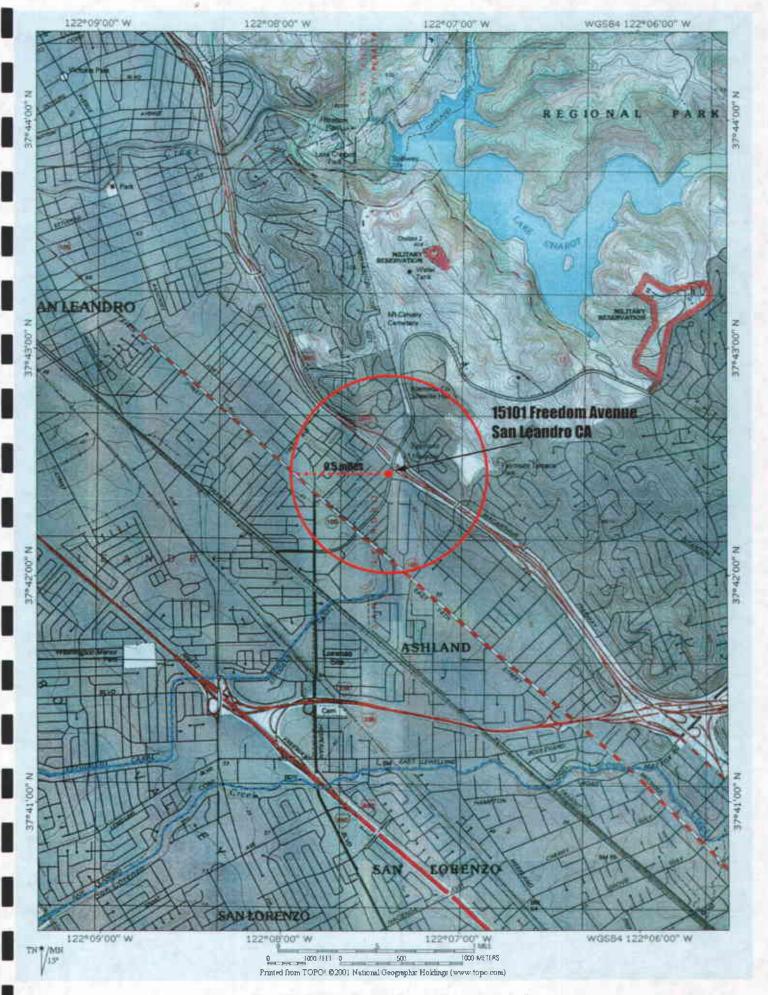
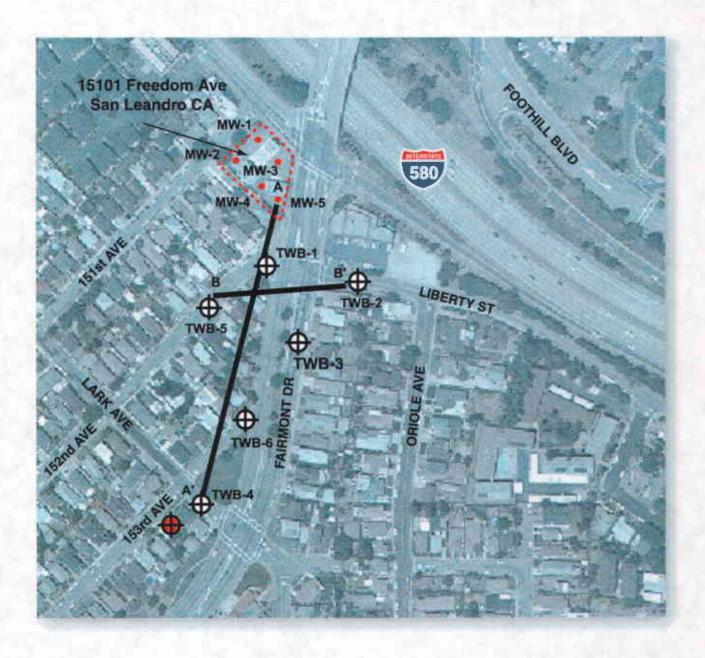


Figure 3b: Sensitive Receptor Survey: Nearest water bodies.





MONITORING WELL BOREHOLE

TEMPORARY WELL BOREHOLE

WATER SUPPLY WELL

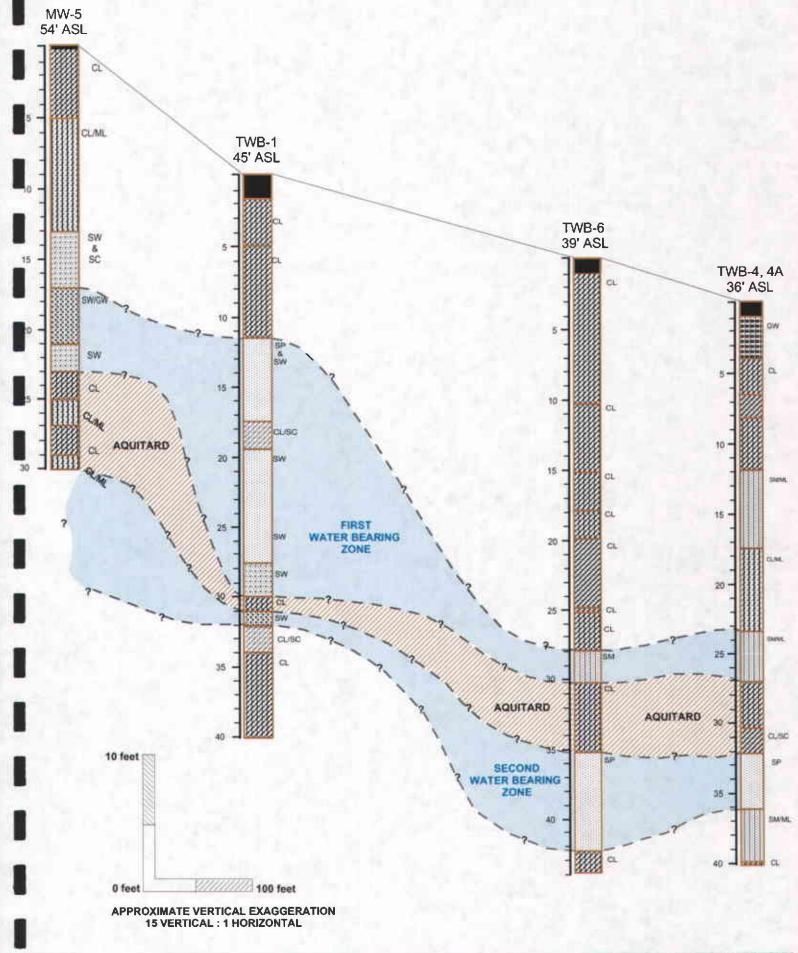
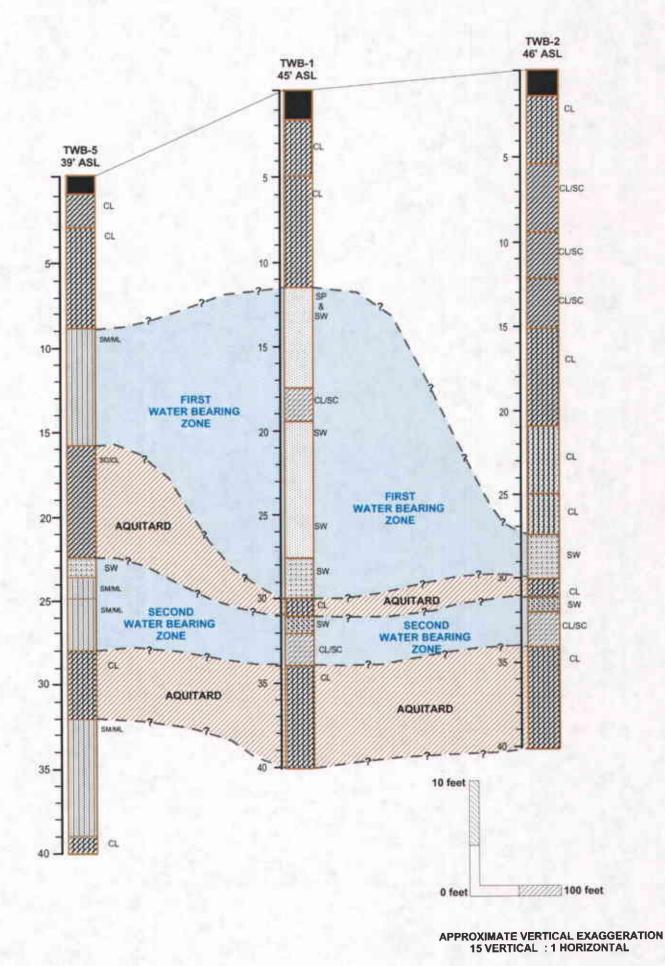
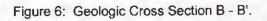


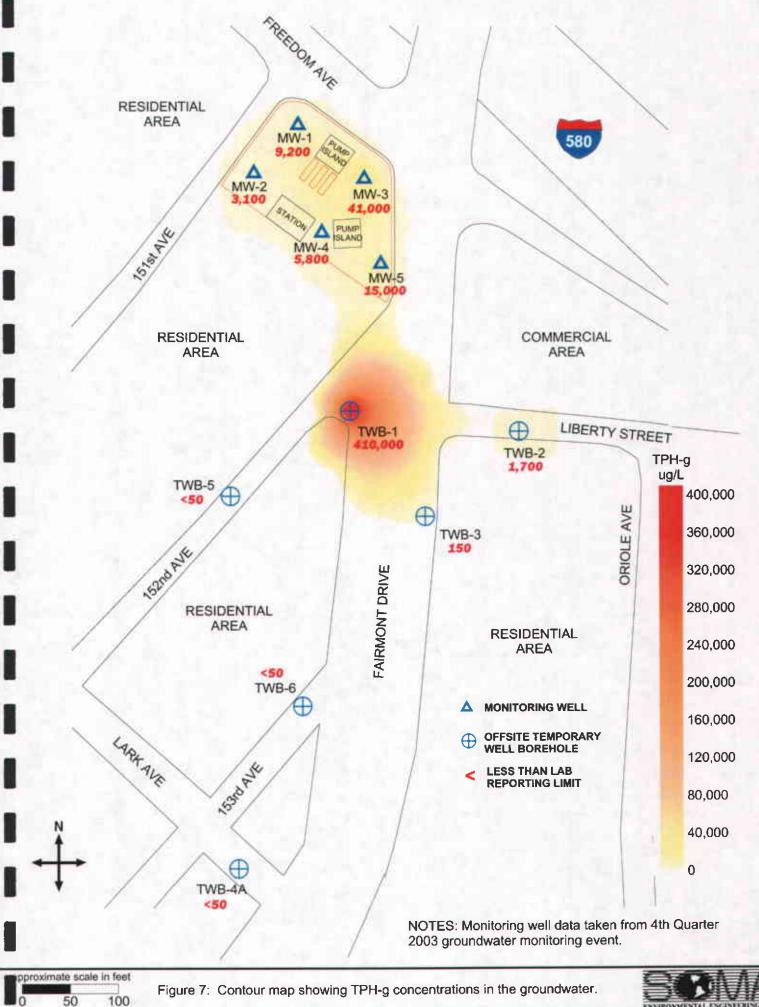
Figure 5: Geologic Cross Section A - A'.



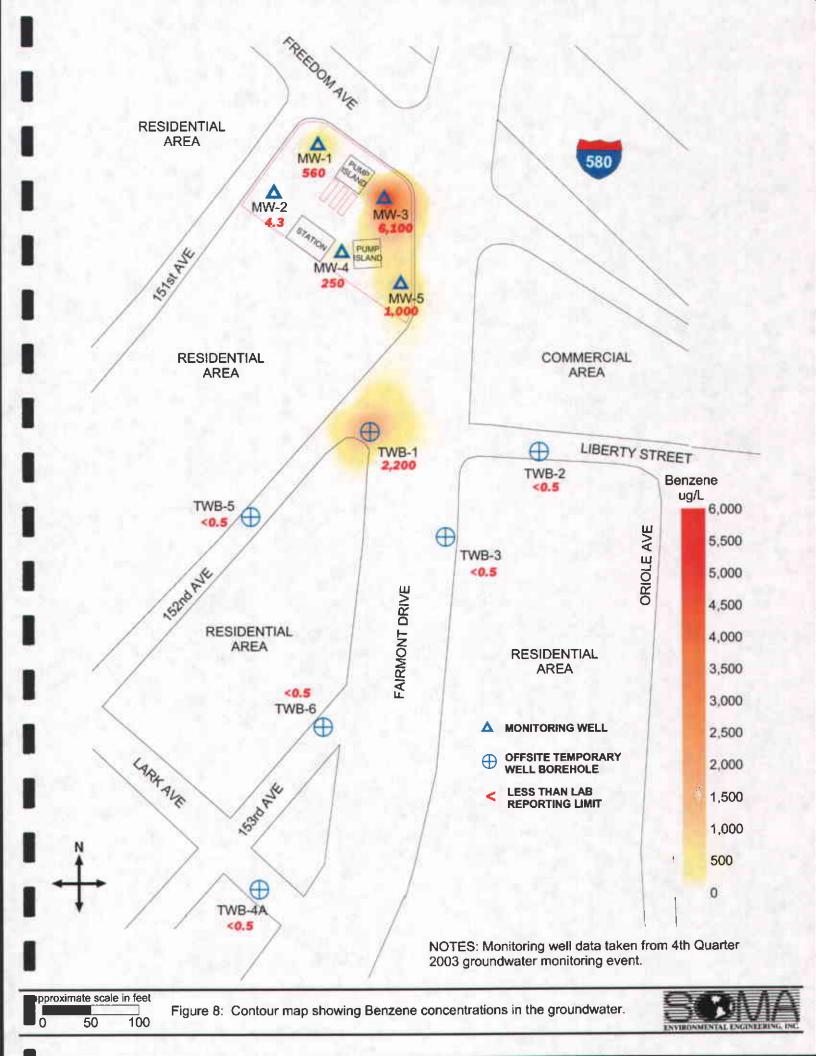












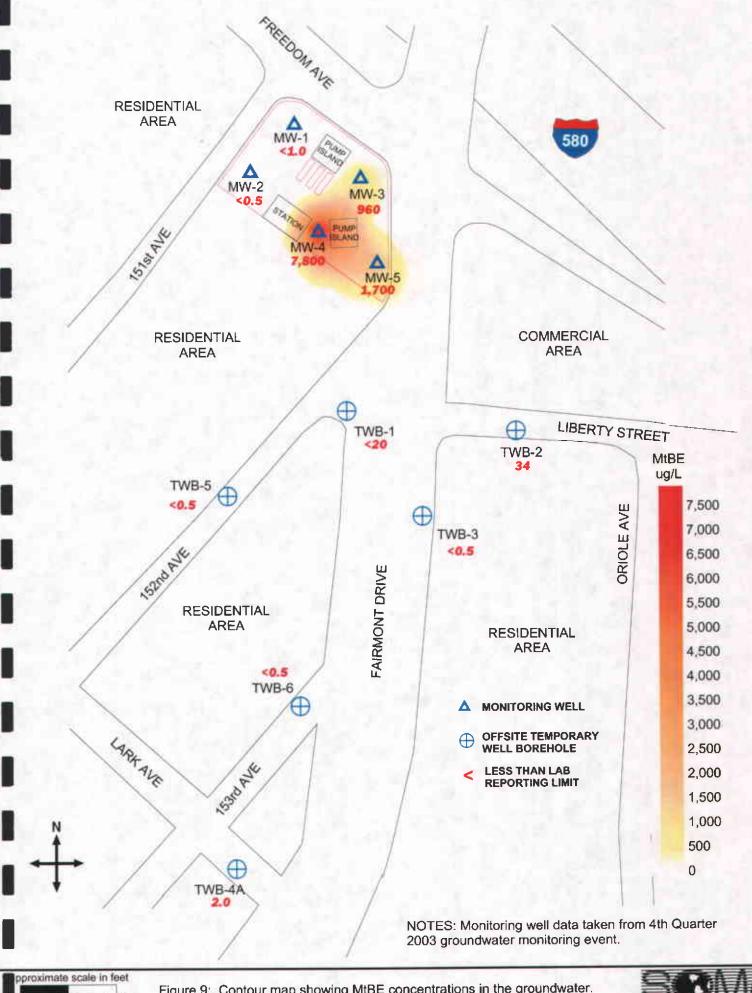


Figure 9: Contour map showing MtBE concentrations in the groundwater.



Appendix A

Drilling and Encroachment Permits

MAR TI ON MEN ON AT IN



ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESQUECES SECTION
39 FLAMIURTST. HAYWARD CA. 24544-1395
PHONE (510) ER-4633 Junes 400
FAX (510) TR-2319
APPLICANTE; PLEASE ATTACITA SETS MAP FOR ALL DEBLEMS PLRMET APPLICATIONS
DESTRUCTION OF WELLS DVER 45 FERT REQUIRES A SEPARATE PERMIT APPLICATION

DRILLING PERMIT APPLICATION

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San Leandro, CA	APM APM
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	PERMIT COMPTIONS
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APPLICANT	- Calaba a CPSDs within 50 days after committee of
Also B. B. C.	permitted wighted Dopartment of Water Resummen.
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200 5000-1112110h-041 NV -553-144-0000	approval data
SOMA Env. Eng. Fin9 25-244-6601 Address 2680-fishop Dv. Phone -925-244-6600 Try San Ramon CA 94583	n. Water filter were. I 1. Minimum melaco scal phickers is two wiches of
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ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD, CA. 94544-1395
PHONE (510) 670-6633 James Yoo FAX (510) 782-1939

PERMIT NO. W03-0828

WATER RESOURCES SECTION GROUNDWATER PROTECTION ORDINANCE BEI-GENERAL CONDITIONS: GEOTECHNICAL & CONTAMINATION BOREHOLES

- Prior to any drilling activities shall be the applicants responsibilities to contact and coordinate a Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits required for that Federal, State, County or to the City and follow all City or County Ordinances. No work shall begin until all the permits and requirements have been approved or obtained.
- Borcholes shall not be left open for a period of more than 24 hours. All borcholes left open more than 24 hours
 will need approval from Alameda County Public Works Agency, Water Resources Section. All borcholes shall
 be backfilled according to permit destruction requirements and all concrete material and asphalt material shall be
 to Caltrans Spec or County/City Codes. No borchole(s) shall be left in a manner to act as a conduit at any time.
- 3. Permitte, permittee's, contractors, consultants or agents shall be responsible to assure that all material or waters generated during drilling, boring destruction, and/or other activities associated with this Permit will be safely hundled, properly managed, and disposed of according to all applicable federal, state, and local statues regulating such. In no case shall these materials and/or waters be allowed to enter, or potentially enter, on-or off site storm sewers, dry wells, or waterways or be allowed to move off the property where wok is being completed.
- 4. Permit is valid only for the purpose specified herein September 8, to September 15, 2003. No changes in construction procedures, as described on this permit application. Borcholes shall not be converted to monitoring wells, without a permit application process.
- 5. Drilling Permit(s) can be voided/ canceled only in writing. It is the applicants responsibilities to notify Alameda County Public Works Agency, Water Resources Section in writing for an extension or to cancel the drilling permit application. No drilling permit application(s) shall be extended beyond minety (90) days from the original start date. Applicants may not cancel a drilling permit application after the completion date of the permit issued has passed.
- 6. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.

AUG-27-03 WED 05:47 PM



ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION 399 FLMITURST ST. HAYWARD CA. 34344-1393 PHONE (510) STR-4633 Laures You FAX (\$10)782-1937

APPLICANTS) THEATE ATTACH A SITE MAPFOR ALL DRILLING PLRIMIT APPLICATIONS DESTRUCTION OF WELLS DVER 45 EVET REQUIRES A STEAMATE PERSON APPLICATION

DRILLING PERMIT APPLICATION FOR OFFICE USE FOR APPLICANT TO COMPLETE EDCATES OF PROBETT 15101 Froedom Ave. PERLINT HUMBER WELL NUMBER San Leandro, PERMIT CONDITIONS Circles Permit Requirements Apply CLEENT Mohammed Pazde 1. A permit application should be submitted so as in MARIE 35840 ALONSOF CUMOP winds at the ACTIMA office feet days prior to proposed pending date. 2. Submit to ACTWA within 60 days after complemen of Co-Fremont CA APPLICANT printing might Department of Webs Research. Roger W. Paplor None SOML Env. Eng. Fas 925 244 5601 Miss 2680 nishep Dv. Plant 925 244 6600 City Stin Ramon CA 94583 Well Completion Report. 1. Promit is valid if proper not began within 90 days of R. WATER SHIPPLY WELLS. CA San Ramon 1. Minimum surface real thickerss is two makes of cement Brown by years by exchien TYPE OF PROJECT ? Minimum gant dopit is 56 feet for unminipal and Geografinical laverageries With Commention Industrial walls or 20 fact for donnains and in ignium L Gegeral Cultodie Protestion wells uniters a larger depth is enoughly approved. Water Supply Contranienture C. CHOUNDWATER MUNITORING WESLE Well Distructions 11 Manisoring INCLIMING PIEZOMETERS I Minimum stather seal thickness is two inches of PROPOSED WATER ANTILY WELL USE cuncut grout placed by benju. Reprintment Dissection H May Denterty --- IT 2.34/minutes seed depth for monthsming wells is the ranke green 4 n Municipal Exercises depth posetimble or 20 feet. CERT'S CHARCAL / Con to the to Time Backfill back inde by notice with example pools or consent. Citier. 34 halamacal DENSE PRO MECHADISE groundered missage. Upper two-three fact replaced in Lind ... Air Dotsey 11 Aware Mark Roward E. CATHORIC Woodward trille 24.7 Pill hole sande sone with concrete placed by trustice. Procession Samplists. DRIN LERY NAME WRLL DISTRUCTION Soul wroup of work size. A septume permit is required CS7 636 DRN LERES FRENCE NO. for well a deeper than 45 feet. G. KPYCIAL CUNNITIONS WELL PROJECTS MOTE: One application must be submitted for each well or well Dell Unto Plainett. description, identified barries are one applied from ore acceptable Caster Diameter Dunth Ar generical and contamination insultigations. Odner's Well Namen distant Shal Deput ____ CEUTECTRYICAL PROJECTS 1 10 years better 10-Max Imura Northern Buriege . 5.7. Repth 3.5 A 9-8-03 USUMATED STANTING DATE APPROVED FETHATED COMPLETION DATE Abstract this purerist and Alamola County Chainance No 73-61. I hearthy agree in nationally with all page APPLICANC'S NIGHATURE Rev.3-04-02 PLEASUPRINT NAME FOR 12



ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION 399 ELMHURST ST. HAYWARD, CA. 94544-1395 PHONE (510) 678-6633 James Yoo FAX (510) 782-1939

PERMIT NO. W03-0828

WATER RESOURCES SECTION GROUNDWATER PROTECTION ORDINANCE R#1-GENERAL CONDITIONS: GEOTECHNICAL & CONTAMINATION BOREHOLES

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- 6. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.

Front Number __ 203 LD 4316 Work Order (WO)* Number 50000 Permit Browner Date 9/9/03 " Tais WO u / it nex Print Emirales Dets 9/8/04 COUNTY OF ALAMEDA PUBLIC WORKS AGENCY 397 Elmburg St., Hayward, CA 94541 - Phone: (510) 270-5429 - Fee: (510) 293-5940 ROADWAY ENCROACHMENT PERMIT or again of the Alexanda Coming Onto Ties Formis is sessed in accompany with Comme July Site Addinge Name & Address of Property Owners fiter Vicinity com of Monumorid Portil GOI Ruchim 1330 TIGHT CLAY OF Enivold CA 94553 (Dain mercence to im completed by the Agency) Phone Number: This permit is issued to the sweet _ / contractor _ ; Name & Address of Contractor: if "owner" is churched, has she is _ / is not _ exempt from the organization that work is the sandway be Praction Sampling 1400 4. 50% 4 performed by a licensed entereuer. Rumond Phone Number, 510.227.4575 The Applicant intends to perform the following week scope: Environmental ster characterization of solling survey Robins Wonlier's Compensation Interests of Decimation: I beneder a Commente of the property of perjusy, there I will, thereing the periusy of any and all which anthonous by that persons, putting the requirements of the Scare Labor Costs with attention to Worker's Compensument Insurement, at challength below.

I will maintain the following series and policy:

I will maintain the following series and policy: Liment Committee Dack I having miles, marker penaltry of perjuty, these Eheld the following constructor's listeness which is in foll large and officer, neglecture applicable provisions of the State Business and Professions Code. Licent Class und No. CS7# 636387 in's bisme and Point bine to have beg . part best ! WOZ - B71-072339-013 All work and/or scars deal be performed in accordance with the popularments of Chapter 12.08 and, unless otherwise specified below, shall be fully compliant with each of the turbut and conditions of the areached General Provisions: lasp. Fee or Deposit_: \$50 Bond Information: Work Completed (Date): 1001 SIMILE Alameda County Impactor: I wordly that the information that I have control into this permit application it contest, and Lagrance comply with all of the same and confrience and crists requirement of the intest Frank. Signature of Applicant

 All encroachments authorized by this Permit shall be subject to inspection by a County representative.

The planned inspections will be performed by the County office(s) designated below; unless
otherwise indicated, it shall be the Permittee's responsibility to notify the designated office(s)
- prior to the start of the encroachment.

Case 1:- The work described in this Permit must be inspected and accepted by the County. Contact the Permit Inspection Office at 670-6601 at least 24 hours in advance to arrange for the required tests and inspections.

Case 2:- The work described in this Permit must be inspected and accepted by the County. Contact Traffic Engineering at 670-6456 or 670-5599 at least 24 hours in advance to arrange for the required tests and inspections.

Case 3:- Some or all of the work described in this Permit must be inspected by the following representative of the County:

Case 4:- Notification of the County is not required.

If the face of this Permit is marked to indicate that the assigned County WO is open for charges, a
job account will be opened and the assigned inspectors will charge the actual cost of all required
tests and inspections against this account. All cost overruns must be resolved prior to close-out of
this Permit. Any underruns will returned to the Permittee as soon as possible following the closeout.

CAUTIONI

Most traffic signals and some streetlights are connected to their power sources with underground wiring. Many signals are also wired to traffic detector loops buried in the roadway. None of these County-owned wiring runs are included in the Underground Service Alert (USA) review and marking processes.

If you intend to excavate the roadway right-of-way within 500' of a traffic signal, or wherever the streetlight wiring is underground, you must contact the County traffic signal maintenance office for the necessary review and marking.

IF YOU ARE CLOSE TO SIGNALS OR STREET LIGHTS, CALL ERIK DAYTON AT (510) 670-5537, AT LEAST 48 HRS. IN ADVANCE OF YOUR PLANNED DIG.

WARNINGI

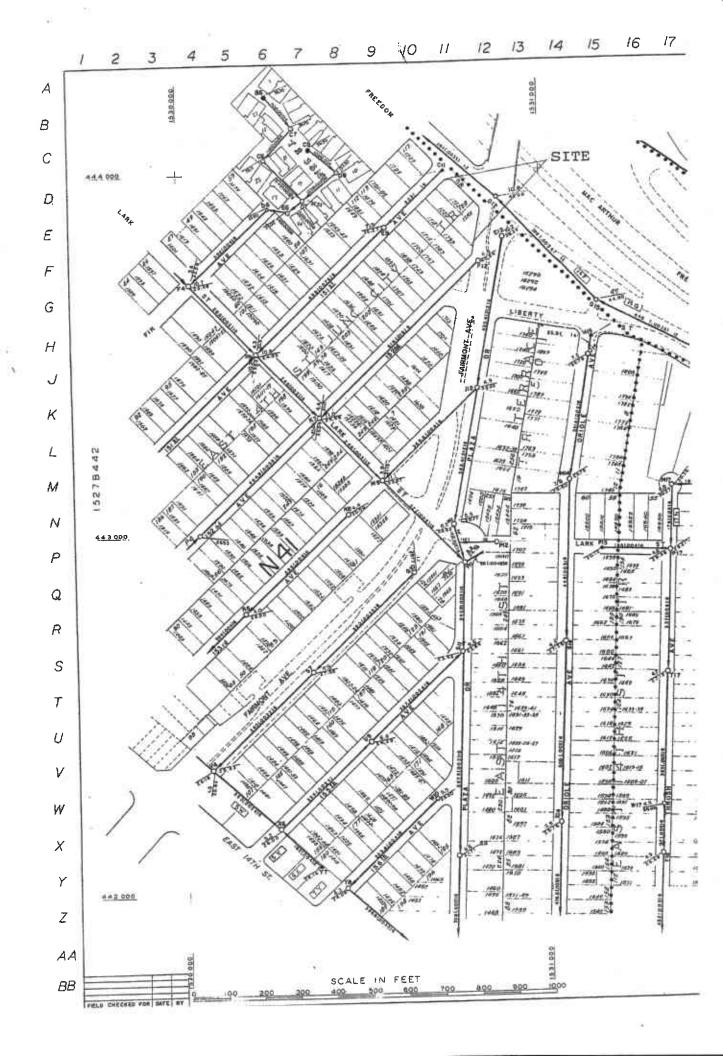
If you fail to notify us - and dig through or damage our loops or wire runs - you will be charged for the cost of our emergency repairs (\$300 - \$500, or more)!

Revised 4/5/01

P.03/03

Appendix B

Subsurface Utility Maps



Appendix C

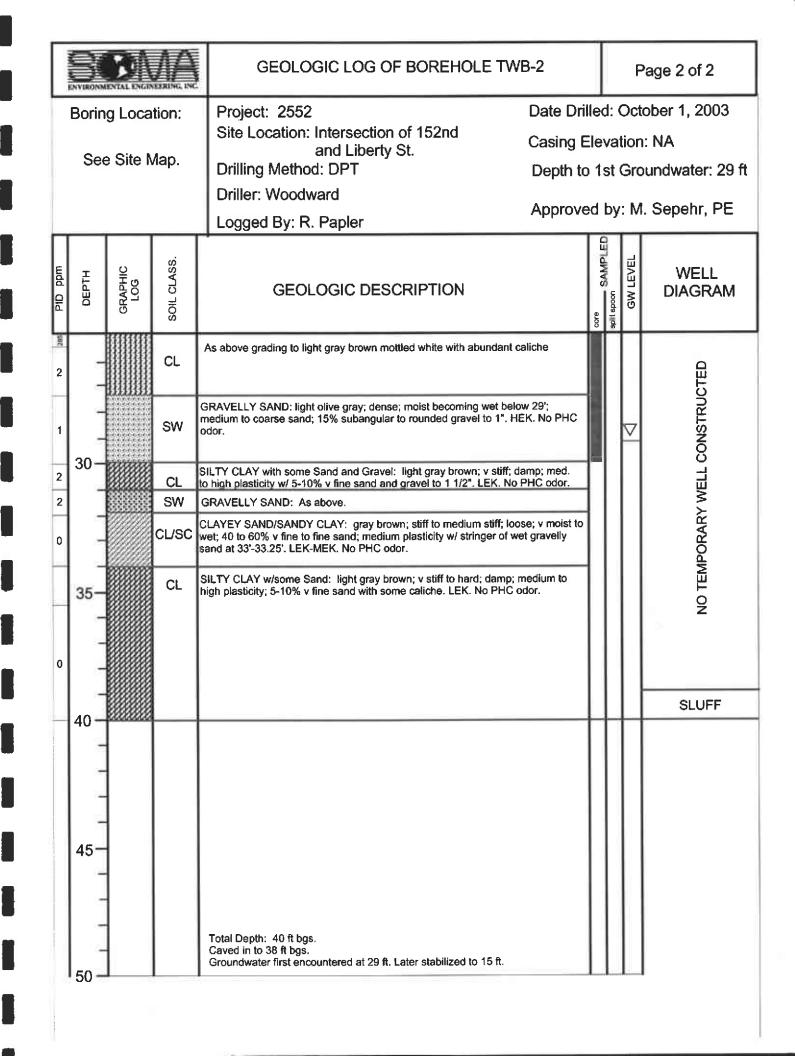
Borehole Logs

- Date (Date)	NVIRONM	NTAL ING	NEESENG, INC	GEOLOGIC LOG OF BOREHOLE TWB-1	1			F	Page 1 of 2		
		g Loca		Site Location: Intersection of 152nd and Liberty St. Drilling Method: DPT	(asing Fig/ation, NA						
mdd Oll	DEРТН	GRAPHIC LOG	SOIL CLASS.	GEOLOGIC DESCRIPTION		core SAMPLED	sp i spoon	GW LEVEL	WELL DIAGRAM		
10	10-	CL CL SP & SW		7" Asphalt over 15" Baserock SILTY CLAY: dark gray; medium stiff; moist; plastic. Low estimated periodic (LEK). No petroleum hydrocarbon (PHC) odor. SILTY CLAY w/ some Sand and Gravel: light gray brown becoming grabelow 8'; v. stiff; damp, becoming moist below 8'; 5-10% v. fine sand and w/ some caliche at 5-5.5'. LEK. No PHC odor. As above. SAND interbedded w/ GRAVELLY SAND: olive gray; medium dense; m becoming wet below 16'; fine to coarse w/ 15-20% subangular-subround gravel to 1 1/2". HEK. No PHC odor.	y brown d gravel	The same of the sa			NO TEMPORARY WELL CONSTRUCTED		
285 226 245 86 55 68	20-	CL/SC SW		SANDY CLAY/CLAYEY SAND: olive gray; medium stiff; v. moist; 40-60 to fine sand; medium high plasticity. HEK-MEK. Moderate and odor. SAND w/ some Gravel: olive gray; medium dense; moist becoming the product below 34/; fine to coarse; 5-10% subrounded gravel to 3/4". HEIP HC door.	in de la comp				SLUFF		

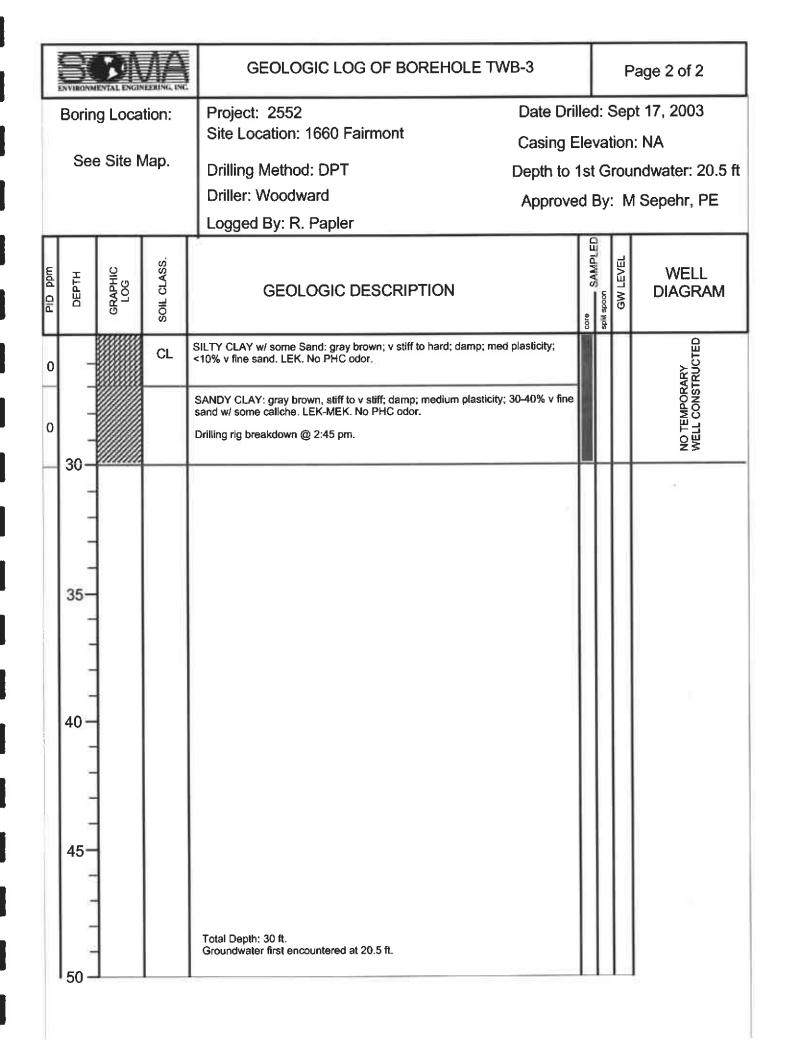
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PETSAGE LINE	NVIRONN	III III III III III III III III III II	NEERING, INC	GEOLOGIC LOG OF BOREHOLE TWE		Page 2 of 2							
		ng Loca e Site.N		Project: 2552 Site Location: Intersection of 152nd and Liberty St. Drilling Method: DPT	Casing E	le	vat	tior	tober 1, 2003 n: NA oundwater: 16 f				
				Driller: Woodward Logged By: R. Papler	•				// Sepehr, PE				
rild old	рертн	GRAPHIC LOG	SOIL CLASS.	GEOLOGIC DESCRIPTION	GEOLOGIC DESCRIPTION								
5	-		sw	SILTY SAND: gray; medium dense; moist; fine to coarse; poorly sor silt. MEK. Slight to mode; codor.	ted; 30%								
8	30-		CL	SILTY CLAY: olive gray mottled gray brown; v stiff to hard; damp to plasticity w/ some caliche at 29-29.5'. Slight PLS odor.	moist; high	THE REAL PROPERTY.							
9	-		SP&SC	SAND interbedded w/ CLAYEY SAND: olive gray and mottled; media moist to v moist; fine to medium. HEK. Slight 1995 odor.	um dense;								
	-		CL	SILTY CLAY: olive gray; medium; moist to v moist; high plasticity with calliche. LEK. National controls.					SLUFF				
7	35-		CL	SILTY CLAY w/ some Sand: gray brown mottled clive gray; medium becoming stiff below 36'; v. moist becoming damp below 36'; high pla No PHC odor	stiff asticity. LEK.	THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER, WHEN THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TW							
	45-			Total Depth: 40 ft bgs. Groundwater first encountered at 16 ft. Later stabilized to 17.5 ft. Caved in to 24 ft bgs.									

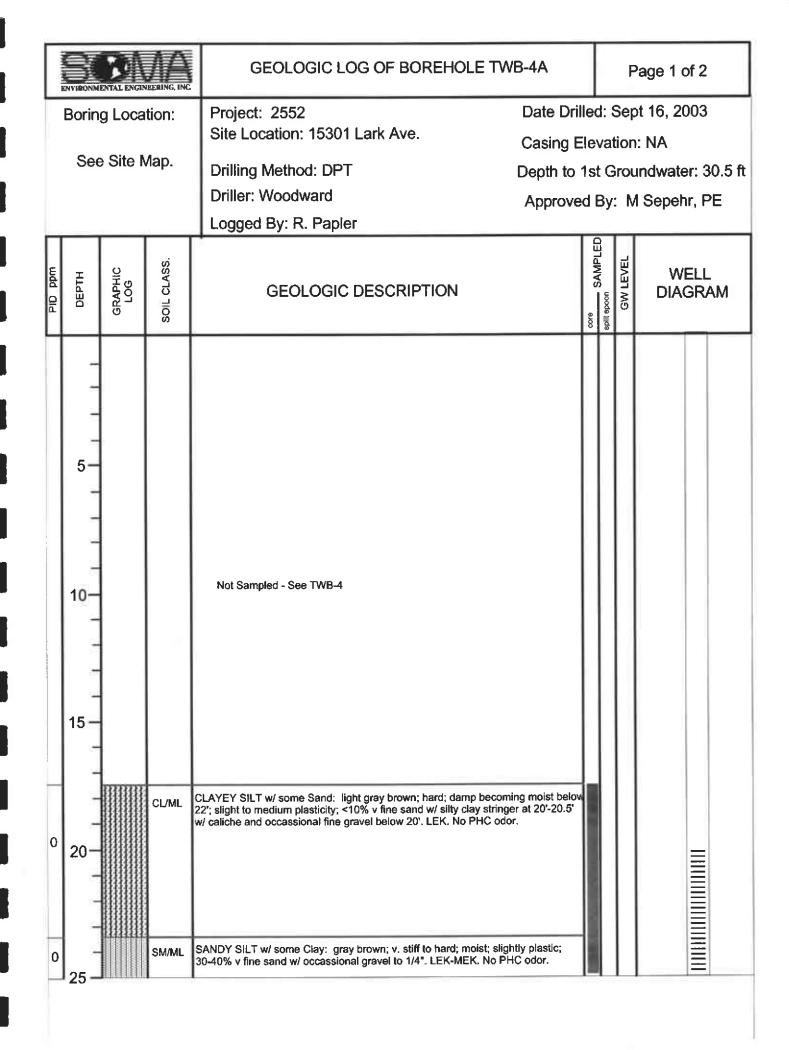
PET LABOUR LABOR	NVIRONM	GENTAL ENG	NEEDLING, INC	GEOLOGIC LOG OF BOREHOLE TV	E TWB-2 Page 1 of 2						
	Borin	ng Loca	ation:	Project: 2552 Site Location: 1760 Fairmont Ave.	Date Drill Casing E				ober 1, 2003 n: NA		
	See	e Site I	Мар.	Drilling Method: DPT	_				oundwater: 29 f		
				Driller: Woodward	•				1 Sepehr, PE		
				Logged By: R. Papler	, , , , , , , , , , , , , , , , , , , ,		-,		·		
וואל טוד	ОЕРТН	GRAPHIC LOG	SOIL CLASS.	GEOLOGIC DESCRIPTION		CORB SAMPLED	split spoon	GW LEVEL	WELL DIAGRAM		
I				5" Asphalt over 3" Concrete over 10" Baserock.							
3			CL	SILTY CLAY: dark gray becoming medium dark brownish gray w/stiff to stiff; moist; high plasticity. Low estimated permeability (LEK) petroleum hydrocarbon (PHC) odor.	depth; med. . Slight						
-	5-			As above grading to sandy clay below 4.5'							
,	-		cl/sc	SANDY CLAY/CLAYEY SAND: light gray brown; v. stiff; damp; me 40-60% v fine sand. LEK. No PHC odor.	edium plasticity;	STATE OF THE PERSON NAMED IN			WELL CONSTRUCTED		
	10-		CL/SC	SANDY CLAY/CLAYEY SAND w/ some Gravel: light gray brown; v damp; 40-60% v fine sand. LEK-MEK. No PHC odor.	stiff to dense;	100					
5	- - 15-		CL/SC	SANDY CLAY/CLAYEY SAND: light gray brown; v. stiff; medium de becoming v moist at 15'; 40-60% v fine to medium coarse sand; me w/ damp gravelly sand stringers at 12.5'-12.75' and 14.75'-15.25'. MPHC odor.	edium plasticity	The second		•	NO TEMPORARY \		
6	-		CL	SILTY CLAY: olive gray mottled light gray brown above 16'; v stiff to becoming v moist at 20.5'; medium to high plasticity w/ moist clayers sand stringer at 19'-19.5'. LEK. No PHC odor.	o hard; damp y sand/gravelly	The Control of			ON ON		
5	20-					THE REAL PROPERTY.					
2	2	-	CL	CLAYEY SILT/SILTY CLAY: light gray brown mottled olive gray; wedium plasticity w/ some caliche at 22.5'-24.5' and 25.5'-27.25' w moist sandy clay at 23.5'-24'.	stiff to hard; v/ stringer of	D STORY					
	25 -										

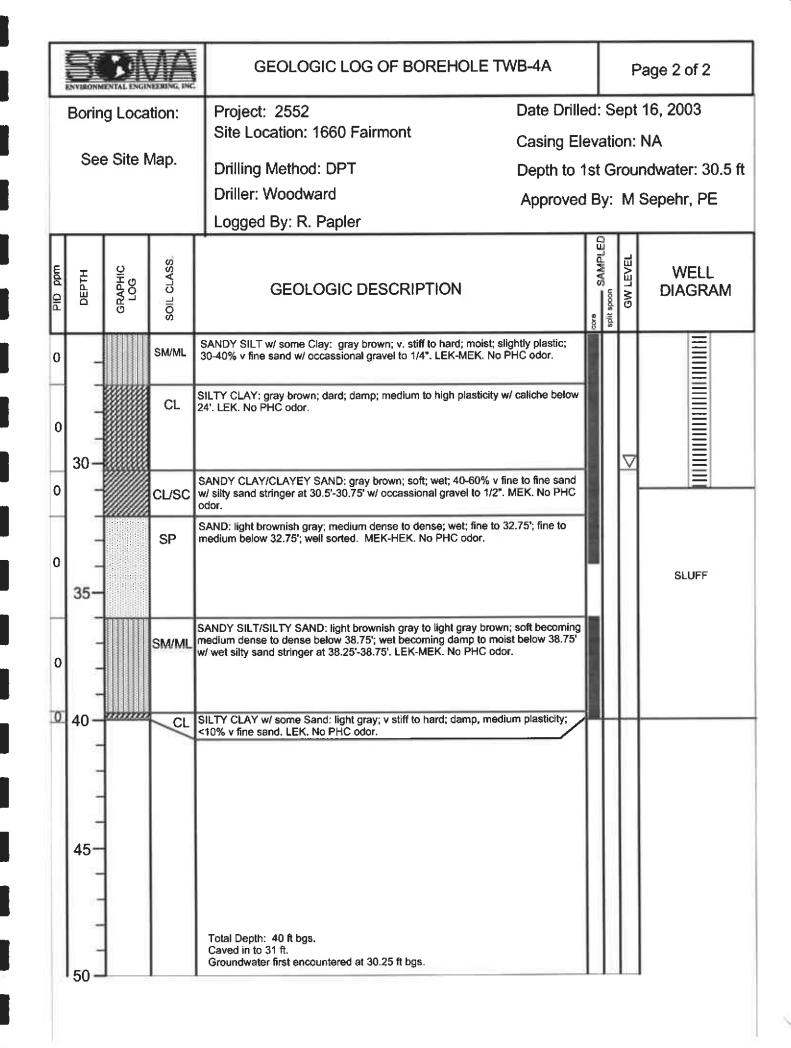


-	SYLLONM	ENTAL ENGIN	EERING, INC	GEOLOGIC LOG OF BOREHOLE TWB	-3			F	Page 1 of 2
	Borin	g Locat	tion:	1	Date Dril	lec	d: 8	Sep	ot 17, 2003
				Site Location: 1660 Fairmont Ave.	Casing E	le	vat	tior	n: NA
	See	e Site M	lap.	Drilling Method: DPT	Depth to	1s	t G	iro	undwater: 20.5 fl
				Driller: Woodward	Approve	d I	Зу:	: 1	/ Sepehr, PE
				Logged By: R. Papler		_	_	_	
PID ppm	рертн	GRAPHIC LOG	SOIL CLASS.	GEOLOGIC DESCRIPTION		core SAMDI ED	split spoon	GW LEVEL	WELL DIAGRAM
7				10" Asphalt over 36" (?) Baserock.					
	2 2								UCTED
	5-			No recovery					/ELL CONSTRI
0	10-		CL	SILTY CLAY: dark gray; medium stiff; moist; high plasticity w/ minor of estimated permeability (LEK). No petroleum hydrocarbon (PHC) odor	caliche. Low	The second second			TEMPORARY WELL CONSTRUCTED
0	- - 15 -		CL	SILTY CLAY/CLAYEY SILT w/ some Sand: light to medium gray bro to hard; damp becoming moist below 14.5'; medium plasticity; <10-15 sand w/ occassional angular gravel to 1 1/2". LEK. No PHC odor.	wn; v stiff % v fine				T ON
0	-		CL	SILTY CLAY w/ some Sand: olive gray brown becoming olive gray w v stiff to hard; damp becoming v moist w/ depth; <10-15% v fine sand of wet sand at 20.5' and wet gravelly sand at 21'. LEK. No PHC odor.	w/ stringer				
1	20 –							ř	1
0	-		CL	SANDY CLAY w/ some Gravel: gray brown; medium stiff; v moist be w/ depth; 20-40% v fine sand; <10% well rounded gravel to 1". LEK-MPHC odor.	coming moist IEK. No	No. of Lot, Lot, Lot, Lot, Lot, Lot, Lot, Lot,			
	25 –		CL	SiLTY CLAY w/ some Sand: gray brown; v stiff to hard; damp; med p <10% v fine sand. LEK. No PHC odor.	lasticity;				



	NVIRONM	P TELL ENGIN	AA BEBLING, INC.	GEOLOGIC LOG OF BOREHOLE TWB-4			F	Page 1 of 1			
	Borin	g Loca	tion:	Site Location: 15301 Lark Ave	e Drille ing Ele		-	ot 11, 2003			
	See	e Site N	Лар.	Drilling Method: DPT Dep	Oriller: PSI Approved						
PID ppm	ОЕРТН	GRAPHIC LOG	SOIL CLASS.	Logged By: R. Papler GEOLOGIC DESCRIPTION	6707	split spoon	GW LEVEL	WELL DIAGRAM			
٦				12" Asphalt and Baserock.		Γ	Г				
0	-		GW	SILTY GRAVEL w/ some Sand: yellowish brown; medium dense; moist; <2 silt; <10% v fine sand. Medium estimated permeability (MEK). No petroleur hydrocarbon (PHC) odor.	20% n			RUCTED			
0	5-		CL	SILTY CLAY: dark gray grading light gray w/ depth; stiff to v stiff; molst; high plastic. LEK. No PHC odor.	hly			NO TEMPORARY WELL CONSTRUCTED			
0			L CL	SANDY CLAY/CLAYEY SAND: light gray; medium stiff; moist; medium plas 40-70% v fine sand w/ gravelly sand stringer at 7.25'-8.25'. MEK-LEK. No P odor.	sticity; HC			ORARY			
0	- 10- -		CL	SILTY CLAY: dark to medium gray brown grading light gray brown w/ depth v stiff; moist; highly plastic w/ some charcoal fragments w/ caliche increasin w/ depth. LEK. No PHC odor.	n; ng			NO TEMP			
0	15 —		SM/ML	SANDY SILT w/ some Clay: light gray brown; v stiff; damp; slight to mediur plasticity; 40% v fine sand w/ clayey silt stringer at 12'-12.5' w/ silty sand str at 13'-13.5' w/ fine gravel below15' w/ some caliche grading more clayey w/ LEK. No PHC odor.	ringer 📗						
	20-										
	1/2			Total Depth: 17.5 ft bgs at refusal. No first groundwater encountered.							
1	25 –						1	i.			





	NYIRONN	S III	NEERLING, LIN	GEOLOGIC LOG OF BOREHOLE TWB-5	,			1	Page 1	of 2	
		ng Loca e Site N		Site Location: 152 Street	asing E	le	vat	ioi	pt 16, 20 n: NA undwate		6.51
				D-11 18/ dd	•				/I Seper		
mdd Olla	DEPTH	GRAPHIC LOG	SOIL CLASS.	GEOLOGIC DESCRIPTION		COTE SAMPIED	split spoon	GW LEVEL	W DIA	ELL GRA	M
T				4" Asphalt over 8" Baserock.							
	=		CL	SANDY CLAY/SILTY CLAY: dark gray brown; moist; plastic. Medium to estimated permeability (MEK-LEK). No petroleum hydrocarbon (PHC) or	low ior. (fill)						
0	5- - -		CL	SILTY CLAY: dark gray; medium stiff; moist; high plasticity. LEK. No PHO As above grading to light gray below 8.5'.	codor.	THE PERSON		*			
D	10- - - -		SM/ML	SANDY SILT w/ some Clay: light gray brown; hard to v stiff; damp becomoist w/ depth; slight plasticity; 20-40% v fine sand; <10-15% clay w/ ca at 10'-11'. LEK. No PHC odor.	ming liche						
	15 -		SC/CL	SANDY CLAY/CLAYEY SAND: gray brown; soft to medium stiff; v moist;	high						
0	20-		30/01	plasticity; 40-60%v fine to fine sand w/ stringers of wet sand at 18' and w gravelly sand at 19.25'. MEK-HEK. No PHC odor.	당	THE PERSON NAMED IN		\vee			
1	-		sw	GRAVELLY SAND: light brownish gray, medium dense to dense; wet, fir coarse; 15-20% subangular to rounded gravel to 3/4*. HEK. No PHC odd							
2			SM/ML	SANDY SILT w/ some Clay: gray brown; v. stiff to hard; damp to moist; plasticity; 15-30% v fine sand; <10-15% clay. LEK. No PHC odor.							

ENVIRO	NMENTAL ENGI	NEERSNG, INC.	GEOLOGIC LOG OF BOREHOLE TWB-5 Page 2 of 2							
Bor	ing Loca	ation:	Project: 2552 Date Do Site Location: 152 Street Casing				ot 16, 2003			
S	ee Site N	Vlap.	Drilling Method: DPT Depth to	1s	t G	rou	undwater: 16.5 ft // Sepehr, PE			
			Logged By: R. Papler		_					
РІО ррт ОЕРТН	GRAPHIC LOG	SOIL CLASS.	GEOLOGIC DESCRIPTION	core	sp 1 spoon	GW LEVEL	WELL DIAGRAM			
0		SM/ML	SANDY SILT w/ some Clay: gray brown; v. stiff to hard; damp to moist; slight plasticity; 15-30% v fine sand; <10-15% clay. LEK. No PHC odor.							
0 30	_	CL	SILTY CLAY: gray brown; medium stiff; moist to v moist; high plasticity. LEK. No PHC odor.				SLUFF			
0 35	- - - -	SM/ML	SILTY SAND/SANDY SILT w/ some Clay; gray brown; medium dense to loose; wet; 40-60% v fine sand; <10-15% clay. MEK. No PHC odor. As above w/ stringer of moist sand clay at 38'-38.25'.							
0 40		CL	SILTY CLAY w/ some Sand: gray brown; v stiff; damp; <10-15% v fine sand decreasing w/ depth. LEK. No PHC odor.	1	L	L				
45			Total Depth: 40 ft bgs. Caved in to 30 ft. Groundwater first encountered at 33 ft bgs.							

:

	ENVIRONM	S I	NEESUNG, ENC	GEOLOGIC LOG OF BOREHOLE TWI	3-6			F	Page 1	of 2	
	Borin	g Loca	ition:	Project: 2552 Site Location: 621 153 Street	Date Dril Casing E					2003	
	See	e Site N	Иар.	Drilling Method: DPT	Depth to					ater:	20 ft
				Driller: Woodward	Approve						
				Logged By: R. Papler			_		•		
PID ppm	ОЕРТН	GRAPHIC LOG	SOIL CLASS.	GEOLOGIC DESCRIPTION		COMPLETE	split spoon	GW LEVEL		VELL \GR/	
Г				4" Asphalt over 8" baserock.							
0	5-		CL	SILTY CLAY: dark gray; medium stiff; moist; high plasticity. Low estipermeability (LEK). No petroleum hydrocarbon (PHC) odor. As Above As above grading to light gray below 8' w/ charcoal fragments and continuous stiff to medium plasticity. LEK. No PHC odor.	aliche.	Street Publishers and the second seco					
1	15 — -		CL	As above grading sandier w/ occassional angular gravel to 3/4". SILTY CLAY w/ some Sand: gray brown; v stiff; moist becoming v milling plasticity; <10% v fine sand grading sandler w/ depth w/ 1" string medium to coarse sand at 17.9". LEK. No PHC odor.	oist w/ depth; er of v. moist					=	
0	-		CL	SILTY CLAY/CLAYEY SILT w/ some Sand: light gray brown; v stiff to medium plasticity. LEK. No PHC odor.	hard; damp;			∇			
5	20— - - - - - 25—		CL	SANDY CLAY: gray brown; soft to medium stiff; v. moist; high plastic v fine sand w/ stringer of wet silty sand at 20' w/ minor caliche. MEK-odor.	ity; 30-40% LEK. No PHC						

199613996136	NVIBONM	FALL ENGIN	EERING, INC	GEOLOGIC LOG OF BOREHOLE TW	′B-6	Page 2 of 2							
ı	Borin	ig Loca	tion:	Project: 2552 Site Location: 152 Street	Date Drille			ot 16, 2003					
	See	e Site M	lap.	Drilling Method: DPT				oundwater: 20 ft					
				Driller: Woodward	Approved	Ву	: N	/ Sepehr, PE					
_				Logged By: R. Papler		0	_						
PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS.	GEOLOGIC DESCRIPTION	90L9	split spoon	GW LEVEL	WELL DIAGRAM					
	1-		$\overline{}$	SANDY CLAY: gray brown; soft to medium stiff; v. moist; high plastic v fine sand w/ stringer of wet silty sand at 20' w/ minor caliche. MEK- odor.	ity; 30-40%								
	150		CL	SILTY CLAY w/ some Sand: gray brwon; v stiff to hard; damp; med w/ occassional subrounded gravel to 1/4" w/ minor caliche below 27 No PHC odor.	ium plasticity .75'. LEK.								
	1		SM	SILTY SAND: gray brown; loose; wet; 50-70% v fine to medium sand No PHC odor.	d. MEK-HEK.								
	30-		CL	SILTY CLAY w/ some Sand: gray brown; v stiff to moist becoming v 31.5', medium plasticity; <10% v fine sand w/ stringer of gravelly cla 31.75' w/ wet clayey sand at 32'-32.5' w/ wet fine sand at 32.5'-33'. I PHC odor.	y at 31.25'-			SLUFF					
	35-		SP	SAND: gray brown; loose to medium dense; set; fine to medium; v v w/ stringer of clayey sand at 39.75'-40'. HEK-MEK. No PHC odor.	well sorted								
The same of the sa	40 — -												
	- FE		CL	SILTY CLAY: light gray; v stiff to hard; damp; high plasticity w/ occa angular gravel to 1/2" w/ some caliche below 44.5'. LEK. No PHC o									
	45 -												
	- 50 -			Total Depth: 44 ft bgs. Caved in to 28 ft bgs.									

Appendix D

Laboratory Reports of Soil Analytical and Chain of Custody Form



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 9471O, Phone (510) 486-0900

ANALYTICAL REPORT

Prepared for:

SOMA Environmental Engineering Inc. 2680 Bishop Dr. Suite 203 San Ramon, CA 94583

Date: 02-OCT-03 Lab Job Number: 167652

Project ID: 2552

Location: 15101 Freedom Avenue

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:

Reviewed by:

Operations Manager

This package may be reproduced only in its entirety.

NELAP # 01107CA

Page _____of ____

Analyses

Analytica	a Laboratory 2323 Fifth St Berkeley, C (510)486-09 (510)486-05	Since 1878 treet A 94710 00 Phone			Sampler:	12	LW	Pa	ple	N	C&T LOGIN#	676s	ス				2						
Project No:	2652		 -		Report To:	J	od	11	B	de	24-				7,	RILACE	STWO IE						
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Project P.O.	.:				Telephone:	_(gv	5)	24	44	.4600	<u> </u>		24	H	, k	40						
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Signature



Curtis & Tompkins Laboratories Analytical Report 15101 Freedom Avenue EPA 5030B Location: Lab #: 167652 SOMA Environmental Engineering Inc. Prep: Client: oje<u>ct#:</u> 84634 Batch#: trix: Soil 09/17/03 Received: as received lsis: 1.000 Diln Fac

Field ID: Type:

TWB-3@20-20.5

SAMPLE

167652-001

Sampled: Analyzed:

09/17/03

09/18/03

L ID: 167652	-001		
Analyte Gasoline C7-C12 Benzene bluene	Result ND ND ND ND	5.2 ບ 5.2 ນ	Units Analysis mg/Kg 8015B ug/Kg EPA 8021B ug/Kg EPA 8021B
hylbenzene m,p-Xylenes o-Xylene	ND ND	5.2 · u	ug/Kg EPA 8021B ug/Kg EPA 8021B ug/Kg EPA 8021B

122	Surmonate	%RE(Limits	Analysis
E	rifluorotoluene (FID) Bromofluorobenzene (FID) Brifluorotoluene (PID)	98 116 85	56-144 51-142 45-150	8015B 8015B EPA 8021B
	comofluorobenzene (PID)	101	42-138	EPA 8021B

eld ID:

TWB-4A@33-33.5

SAMPLE

167652-002

Sampled: Analyzed:

09/16/03 09/18/03

Units Analysis Result Analyte mg/Kg 8015B ug/Kg EPA 8021B 1.1 5.3 5.3 ND asoline C7-C12 NDenzene ug/Kg EPA 8021B ND Toluene ug/Kg EPA 8021B 5.3 ND Ethylbenzene ug/Kg EPA 8021B 5.3 5.3 ND p-Xylenes uq/Kq EPA ИD Xylene

Surrogate	% REC	Timets	Analysis
Trifluorotoluene (FID)	100 116	56-144 51-142	8015B 8015B
rifluorotoluene (PID)	86	45-150	EPA 8021B
Bromofluorobenzene (PID)	101	42-138	EPA 8021B



Curtis & Tompkins Laboratories Analytical Report 15101 Freedom Avenue EPA 5030B Location: Lab #: 167652 SOMA Environmental Engineering Inc. Prep: Client: roject#: 2552 84634 09/17/03 Batch#: Soil atrix: asis: as received 1.000 Received: Diln Fac:

Field ID: Type:

TWB-5@32-32.5

SAMPLE

Sampled: Analyzed:

09/16/03 09/18/03

167652-006 ı∰b ID:

	Peci t	RL	Units	Analysis
Gasoline C7-C12	ND	1.1	mg/Kg	8015B EPA 8021B
Penzene	ND ND	٠ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ	11a/Ka	EPA 8021B
pluene thylbenzene	ND .	5 B	11a/Ka	EPA 8021B
m, p-Xylenes	, ND	5.3 5.3	ug/Kg	EPA 8021B EPA 8021B
o-Xylene	ND		<u> </u>	

Surrogate	*REC	Limits	Analysis
Trifluorotoluene (FID) Bromofluorobenzene (FID) mrifluorotoluene (PID) romofluorobenzene (PID)	95	56-144	8015B
	110	51-142	8015B
	83	45-150	EPA 8021B
	98	42-138	EPA 8021B

eld ID:

TWB-6@20-20.5

SAMPLE

167652-009

Sampled: Analyzed:

09/17/03 09/19/03

Analyte	Result		<u>its</u>	
asoline C7-C12	ND	1.0 mg	/Kg	8015B EPA 8021B
enzene	ND	5.2 ug 5.2 ug	/ Kg / Ka	EPA 8021B
Toluene	ND ND	5.2 uc	/Kq	EPA 8021B
Ethylbenzene	ND	5 2 uc	/Ka	EPA 8021B
, p-Xylenes -Xylene	ND	5.2 uc	/ <u>K</u> q	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID) Promofluorobenzene (FID) Prifluorotoluene (PID) Bromofluorobenzene (PID)	93 110 79 95	J	8015B 8015B EPA 8021B EPA 8021B



Curtis & Tompkins Laboratories Analytical Report 15101 Freedom Avenue Location: 167652 Lab #: EPA 5030B SOMA Environmental Engineering Inc. Prep: Client: 2552 oject#: 84634 Batch#: Soil trix: 09/17/03 Received: as received sis: 1.000 Dil<u>n Fac:</u>

Field ID:

TWB-6@28-30 SAMPLE Sampled: Analyzed: 09/17/03 09/19/03

Type: SAMPLE LD: 167652-010

	Partilia	RIL	Units Analysis
Analyte	ND	0.96	mg/Kg 8015B
Gasoline C7-C12	ND	4 R .	ug/Kg EPA 8021B
Benzene	ND	4 B	ua/Ka EPA 8021B
luene	ND	4 8	ua/Ka EPA 8021B
hylbenzene m,p-Xylenes	ND	4.8	ug/Kg EPA 8021B
o-Xylene	ND	4.8	ug/Kg EPA 8021B
O-VATETIC			

Surrogate	%RE	c Limits	Analysis
Trifluorotoluene (FID) Bromofluorobenzene (FID) Trifluorotoluene (PID) comofluorobenzene (PID)	94	56-144	8015B
	110	51-142	8015B
	80	45-150	EPA 8021B
	95	42-138	EPA 8021B

Feld ID:

TWB-6@38-39 SAMPLE 167652-011 Sampled: Analyzed: 09/17/03 09/19/03

	Result	RL	Units	Analysis
Analyte	ND	1.1		15B [
asoline C7-C12	ND	5.4	ug/Kg EF ug/Kg EF	A 8021B
enzene Toluene	$\stackrel{\sim}{m}$	5.4 5.4	ug/Kg EF	A 8021B
Ethylbenzene	ND ND	5.4	ua/Ka EF	PA 8021B
, p-Xylenes	ND	5.4	ug/Kg EF	A 8021B

Curronate	%REC	Limits	Analysis
Trifluorotoluene (FID) romofluorobenzene (FID) rifluorotoluene (PID) Bromofluorobenzene (PID)	95	56-144	8015B
	111	51-142	8015B
	81	45-150	EPA 8021B
	95	42-138	EPA 8021B

Type: Lab ID:

BLANK QC226184 Analyzed:

09/18/03

20.2 :				
	Result	RL	Units	Analysis
Analyte	ND	1.0	mg/Kg 801	5B
asoline C7-C12	ND	5.0	ug/Kg EPA	. 8021B
Benzene Toluene	ND	5.0	ug/Kg EPA	, 8021B
thylbenzene	ND	5.0	ug/Kg EPA ug/Kg EPA	0021B
n, p-Xylenes	ND	5.0	ug/Kg EPA	8021B 8021B
- Žvlene	<u>ND</u>	5.0	uq/rq bin	. 00212

Surrogate	%REC	Limits	Analysis
Crifluorotoluene (FID)	95	56-144	8015B
romofluoropenzene (FID)	110	51-142	8015B EPA 8021B
Trifluorotoluene (PID)	82	45-150 42-138	EPA 8021B
Bromofluorobenzene (PID)	96	42-130	BFA 6021D

D= Not Detected RL= Reporting Limit Page 3 of 3



	Curtis & Tompkins Labor	atories Analy	tical Report
lab #: Lient: Project#:	167652 SOMA Environmental Engineering Inc.	Location: Prep: Analysis:	15101 Freedom Avenue EPA 5030B EPA 8021B
Type: Lb ID: Ltrix: Units:	LCS QC226185 Soil ug/Kg	Basis: Diln Fac: Batch#: Analyzed:	as received 1.000 84634 09/18/03

Analyte	Spiked	Result	%rec	Limits
Basoline C7-C12	n n	AI		22 123
enzene	50.00	47.49	95	80-121
oluene	50.00	47.78	96	80-120
ordene thylbenzene	50.00	45.37	91	79-120
tnymenzene	100.0	101.0	101	76-120
n p-Xylenes -Xylene	50.00	48.59	97	80-120

Surrogate	Resu	lt %REC	Limits	
rifluorotoluene (FID)	NA			
romofluorobenzene (FID)	NA			1
Trifluorotoluene (PID)		85	45-150	
Promofluorobenzene (PID)		98	42-138	



	Curtis & Tompkins Labor	atories Ana	
hb #: Lient:	167652 SOMA Environmental Engineering Inc.	Location: Prep:	15101 Freedom Avenue EPA 5030B
Project#:	2552	Analysis:	8015B
Type:	LCS	Basis:	as received
Type: ab ID: Matrix:	QC226186	Diln Fac:	1.000
matrix:	Soil	Batch#:	84634
Units:	mg/Kg	Analyzed:	09/18/03

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	5.000	5.494	110	80-120
enzene	, NA			
	· NA			
bluene Ethylbenzene	NA			
m.n-Xvlenes	AN			
m,p-Xylenes -Xylene	NA	•		

Surrogate	Resul	t %REC	Limits	
Prifluorotoluene (FID)		108	56-144	
romofluorobenzene (FID)		113	51-142	
Trifluorotoluene (PID)	NA		•	
Promofluorobenzene (PID)	NA			



		Curtie £	Tompkins L	shor	stories lns	alytical Report
		CUL CES &	tompicino Di		acorreo ane	ary credi Nepone
ab #:	16765	52			Location:	15101 Freedom Avenue
lient:	SOMA	Environmental	Engineering :	Inc.	Prep:	EPA 5030B
Project#:	2552				Analysis:	8015B
Field ID:		TWB-3@20-20	. 5	•	Diln Fac:	1.000
SS Lab ID):	167652-001			Batch#:	84634
Aatrix:		Soil			Sampled:	09/17/03
Units:		mg/Kg			Received:	09/17/03
asis:		as received		_	Analyzed:	09/18/03

pe:

MS

Lab ID:

QC226224

Analyte	MSS Result	Spiked	Result	%REC	' Limits
asoline C7-C12	<0.09400	10.00	10.49	105	24-134
enzene	•	N.	A		
Toluene	·	N.	A		
thylbenzene		N.	A		
,p-Xylenes		N.	A		
thylbenzene ,p-Xylenes o-Xylene		N.	Α		•

Surrogate	Re	sult %REC	Limits	
Trifluorotoluene (FID)		116	56-144	
Bromofluorobenzene (FID)		119	51-142	
rifluorotoluene (PID)	NA			
romofluorobenzene (PID)	NA			

Гуре

MSD

Lab ID:

QC226225

Analyte	Spiked F	Result	%RE(2 Limits	RPD	Lim
Casoline C7-C12	10.75	8.692	81	24-134	26	32
Benzene	NA					
oluen e	AИ					
thylbenzene	AN					
m,p-Xylenes	NA					
thylbenzene m,p-Xylenes Xylene	NА					

Surrogate	Resul	Lt %REC	Limits	
Trifluorotoluene (FID)		96	56-144	
romofluorobenzene (FID)		99	51-142	
Trifluorotoluene (PID)	NA		·	
Bromofluorobenzene (PID)	NA			



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue EPA 5030B Location: Lab #: 167652 Prep: Analysis: SOMA Environmental Engineering Inc. Client: EPA 8260B roject#: 84630 09/17/03 Batch#: Soil atrix: Received: ug/Kg hits: <u> Analyzed:</u> 09/18/03 as received Basis:

Field ID:

TWB-3@20-20.5

167652-001

Type: Leb ID:

SAMPLE

Diln Fac: Sampled:

0.9804 09/17/03

Analyte 98 tert-Butyl Alcohol (TBA) ND4.9 ND MTBE sopropyl Ether (DIPE) thyl tert-Butyl Ether (ETBE) Methyl tert-Amyl Ether (TAME) 4.9 ND 4.9 ND 4.9 ND 4.9 ND 1,2-Dichloroethane ND 2-Dibromoethane

8	Surrogate	SERISC.	Limits	
	Dibromofluoromethane	95	74-128	-
	L,2-Dichloroethane-d4	87	76-130	
	oluene-d8	98	80-120	
	romofluorobenzene	97	76-125	

eld ID:

TWB-4A@33-33.5

Diln Fac: Sampled:

1.000 09/16/03

SAMPLE Lab ID: 167652-002

Ana vte	Resu	lt RL
ert-Butyl Alcohol (TBA)	ND	100
MTBE	ND	5.0
Isopropyl Ether (DIPE)	ND	5.0
thyl tert-Butyl Ether (ETBE)	ND	5.0
ethyl tert-Amyl Ether (TAME)	ND	5.0
2-Dichloroethane	ND	5.0
1,2-Dibromoethane	ND	5.0

Surrogate	%REC	Limits	
ibromofluoromethane	97	74-128	
1,2-Dichloroethane-d4	87	76-130	
Toluene-d8	95	80-120	
romofluorobenzene	99	76-125	



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue Location: Lab #: Client: 167652 EPA 5030B Prep: Analysis: SOMA Environmental Engineering Inc. EPA 8260B 2552 oject#: Batch#: B4630 trix: 09/17/03 09/18/03 Received: ug/Kg its: Analyzed: as received

Field ID: Type:

TWB-5@32-32.5

SAMPLE

167652-006

Diln Fac: Sampled:

0.8772 09/16/03

La ID: 167652-006			
Analyte tert-Butyl Alcohol (TBA) MTBE opropyl Ether (DIPE) hyl tert-Butyl Ether (ETBE) Methyl tert-Amyl Ether (TAME) 1,2-Dichloroethane 2-Dibromoethane	Result ND	88 4.4 4.4 4.4 4.4 4.4 4.4	

Surrocate	%RE(e limits	
Dibromofluoromethane	95	74-128	
1 2-Dichloroethane-d4	88	76-130	· ·
luene-d8	95	80-120	
romofluorobenzene	98	76-125	

eld ID:

TWB-6@20-20.5

Lab ID:

Diln Fac: Sampled:

0.8929 09/17/03

SAMPLE 167652-009

Analyte ert-Butyl Alcohol (TBA) MTBE Isopropyl Ether (DIPE) thyl tert-Butyl Ether (ETBE) bthyl tert-Amyl Ether (TAME) , 2-Dichloroethane 1, 2-Dibromoethane	Result ND	R1 89 4.5 4.5 4.5 4.5 4.5 4.5
---	---	---

Surrogate	*REC	Limits	4
ibromofluoromethane 1,2-Dichloroethane-d4	98 89	74-128 76-130	
Toluene-d8 Promofluorobenzene	94 100	80-120 76-125	_]



	Gasoline O	kygenates by GC/	
Lab #: Client:	167652 SOMA Environmental Engineering Ir 2552	Location: nc. Prep: Analysis:	15101 Freedom Avenue EPA 5030B EPA 8260B
mits: Basis:	Soil ug/Kg as received	Batch#: Received: Analyzed:	84630 09/17/03 09/18/03

Field ID:

TWB-6@28-30

Diln Fac: Sampled:

0.9434 09/17/03

SAMPLE Type: 167652-010 b ID:

Analyte	Rest	I.E. RL
tert-Butyl Alcohol (TBA)	ИD	94
MTBE	ND ND	4.7
sopropyl Ether (DIPE) thyl tert-Butyl Ether (ETBE) Methyl tert-Amyl Ether (TAME)	ND.	4.7
Methyl tert-Amyl Ether (TAME)	ND	4.7
1,2-Dichloroethane	ND	4.7
.2-Dibromoethane	יי	

Surrogate	%REC	Limits	
Dibromofluoromethane	97	74-128	
2-Dichloroethane-d4	90	76-130	•
bluene-d8	96	80-120	
romofluorobenzene	99	76-125	

eld ID:

TWB-6@38-39

Diln Fac: Sampled:

0.9615 09/17/03

4.8

4.8

Type: Lab ID:

MTBE

SAMPLE 167652-011

Result <u>Analyte</u> 96 ert-Butyl Alcohol (TBA) ND4.8 4.8 ND Isopropyl Ether (DIPE)

thyl tert-Butyl Ether (ETBE)

ethyl tert-Amyl Ether (TAME)

1,2-Dichloroethane ND4.8 ND 4.8

ND

ND

ND

erice Vinces Surrogate ibromofluoromethane 74-128 86 76-130 1,2-Dichloroethane-d4 87 80-120 76-125 93 Toluene-d8 112 romofluorobenzene

,2-Dibromoethane



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue Location: 167652 Lab #: EPA 5030B EPA 8260B Prep: Analysis: SOMA Environmental Engineering Inc. Client: roject#: 2552 84630 09/17/03 Batch#: itrix: Soil Received: ug/Kg as received 09/18/03 Analyzed: Basis:

Type: Lab ID:

BLANK QC226167 Diln Fac:

1.000

Analyte		Result RL
tert-Butyl Alcohol (TBA)	NA	
MTBE	ND	5.0
Leopropyl Ether (DIPE) thyl tert-Butyl Ether (ETBE)	NA NA	·
ethyl tert-Amyl Ether (TAME)	NA	
1,2-Dichloroethane	ND	5.0
1,2-Dibromoethane	ND	5.0

			v.noner-104.300008.jor-1080000000000	
8	Surrogate	*KEC	2000 Students	
П	pibromofluoromethane	91	74-128	
Ţ	1,2-Dichloroethane-d4	83	76-130	
Ι.	Toluene-d8	94	80-120	•
Н	romofluorobenzene	97	76-125	
ч	Comorradoros			

BLANK QC226168 Diln Fac: 1.000

Analyte	Resi	11t Ku 100
tert-Butyl Alcohol (TBA)	ND	
TBE	ND	5.U 5.0
sopropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)	ND	5.0 5.0
Ethyl tert-Butyl Ether (ETBE)	ND	5.0
Methyl tert-Amyl Ether (TAME)	ND	5.0
2-Dichloroethane	ND	5.0
,2-Dibromoethane	ND	3.0

_			
	9 R E (Limits	
		54 355	
ibromofluoromethane	92	74-128	
201011011101111111111111111111111111111	0.7	76-130	•
,2-Dichloroethane-d4	0/	10-130	·
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	96	80-120	
oluene-d8	20		1
Bromofluorobenzene	97	76-125	
BLOROLIGOTOBETIZETIE			



	Gasoline Oxyg	enates by	GC/MS
■ ab #:	167652	Location:	15101 Freedom Avenue
		Prep:	EPA 5030B
lient: Project#:	2552	Analysis:	EPA 8260B
	LCS	Basis:	as received
Type: ab ID: matrix:	OC226164	Diln Fac:	1.000
atrix:	Soil	Batch#:	84630
Units:	ug/Kg	Analyzed:	09/18/03

Analyte	Spiked	Result	%RE(C Limits	
tert-Butyl Alcohol (TBA)	N	A			
MTBE	50.00	41.69	83	73-121	
sopropyl Ether (DIPE)		A			
sopropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)	N	A			
Methyl tert-Amyl Ether (TAME)	N	A			

Surrogate	%REC	: Limits
Dibromofluoromethane	85	74-128
, 2-Dichloroethane-d4	78	76-130
oluene-d8	94	80-120
Bromofluorobenzene	95	76-125



	Gasoline Oxyg	penates by GC	
Leb #:	167652	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2552	Analysis:	EPA 8260B
Matrix:	Soil	Diln Fac:	1.000
Units:	ug/Kg	Batch#:	84630
Esis:	as received	Analyzed:	09/18/03

BS

Lab ID:

QC226165

Sniked	Result	%RE(Limits
250.0	247.3	99	70-130
	JA		
50,00	44.53	89	70-130
50.00	44.15	88	70-130
50.00	42.24	84	70-130
	50.00 50.00	250.0 247.3 NA 50.00 44.53 50.00 44.15	250.0 247.3 99 NA 50.00 44.53 89 50.00 44.15 88

***	Surrogate	Resu.	E
I	Dibromofluoromethane	NA	ļ
1:	<u>l</u> 2-Dichloroethane-d4	NA	
Н	oluene-d8	NA	
Н	romofluorobenzene	NA	

BSD

Lab ID:

QC226166

	Result		Limits	(2000000000000000000000000000000000000	Lim
)	251.1	100	70-130	2	20
NA				_	2.0
00	45.90	92		3	20
00	45.33	91	70-130	3	20
	43.52	87	70-130	3	20
)	NA	NA 00 45.90 00 45.33	NA 45.90 92 90 45.33 91	NA 45.90 92 70-130 90 45.33 91 70-130	NA 45.90 92 70-130 3 90 45.33 91 70-130 3

Surrogate	Result
Dibromofluoromethane	NA.
1,2-Dichloroethane-d4	NA
oluene-d8	NA
1,2-Dichloroethane-d4 oluene-d8 Bromofluorobenzene	NA



	Gasoline Oxyg	enates by GC	/ms
Ipp #: 16765 Quient: SOMA Project#: 2552	2 Environmental Engineering Inc.	Location: Prep: Analysis:	15101 Freedom Avenue EPA 5030B EPA 8260B
Field ID: NS Lab ID: Matrix: Units: Fisis:	ZZZZZZZZZZ 167659-001 Soil ug/Kg as received	Diln Fac: Batch#: Sampled: Received: Analyzed:	1.000 84630 09/18/03 09/18/03 09/19/03

MS

Lab ID:

QC226257

	MCC Deen F	Spiked	Result	%REC	Limits
Analyte	<0.2100	50.00	42.83	86	48-133
Surrogate	%REC Limits				

Description	Surrogate	%REC	Limits		
2-Dichloroethane-d4 84 76-130 Toluene-d8 96 80-120		93	74-128		
Toluene-d8 96 80-120		84	76-130		
		96	80-120		
	Promofluorobenzene	99	76-125	 	

MSD

Lab ID:

QC226258

Analyte		Spiked 50.00	45	t .82	92	48-133	7	20
TBE								
Surrogate ibromofluoromethane	%REC 93	74-128						
2-Dichloroethane-d4	86	76-130						
oluene-d8	95	80-120						
romofluorobenzene	102	76-125						



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 9471O, Phone (510) 486-0900

ANALYTICAL REPORT

Prepared for:

SOMA Environmental Engineering Inc. 2680 Bishop Dr. Suite 203 San Ramon, CA 94583

Date: 16-OCT-03

Lab Job Number: 167941 Project ID: 2552

Location: 15101 Freedom Avenue

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:

roject Manage

Reviewed by:

Operations Manager

This package may be reproduced only in its entirety.

NELAP # 01107CA



Laboratory Number:

167941

Client:

SOMA Environmental Engineering Inc.

Project:

2552

Request Date:

10/2/2003

CASE NARRATIVE

This hardcopy data package contains sample results and batch QC results for eight soil samples requested from the above referenced project on October 2, 2003. The samples were received on ice and intact.

Total Volatile Hydrocarbons:

In sample <u>TWB-2@31-31.5</u>, the surrogate recoveries are outside control limits. The sample was rerun and results confirm.

No other analytical problems were encountered.

Purgeable Organics (EPA 8260):

The recovery for MTBE in the blank spike duplicate of batch 85167 is outside acceptance limits. Another set of blank spikes were analyzed in this batch for MTBE and results are acceptable.

No other analytical problems were encountered.

CHAIN OF CUSTODY FORM

RW Patter

_	_	_	_
Page		_of	<u> </u>

Analyses

Curtis & Tompkins, Ltd.

Analytical Laboratory Since 1878 2323 Fifth Street Berkeley, CA 94710 (510)486-0900 Phone (510)486-0532 Fax

Project No:	1552	

Project Name: Pardel /SL: 15101 Rudown

Project	P.O.:	
110,001		

Company: 50MA

Turnaround Time: Standard

Matrix

Sampler:

Report To:

Telephone:

Fax: Preservative

(925) 244. (eleo

C&T

LOGIN#_

167941

	Laboratory Number	Sample ID.	Sampling Date Time	Soil	Water	Waste	# of Containers	된	H ₂ SO	ÖNH	띨		Field Notes	14.	RIE 2	¥ ₹	1226						
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2		WB-12-18	3150	_	_	$\bot \bot$	<u> </u>	┡	 		Υ_	╀		×			7				<u>l</u>		L.
3		WB102132		17	1			_	_	ļ	<i>γ</i> -	-		7		٠	7					T	_
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b	1 + d)	TWB.20295		×	1			▙		ـــ	Δ	↓_			7		V			\top			П
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Notes:	EOF	Required	

1 oct 2003/9191 DATE/TIME

DATE/TIME

Jake Bobel 10/2/03 11:32 M

OCT 1, 2005 9:15 PM DATE/TIME

DATE/TIME

DATE/TIME

Signature

ricid intact from refugirator cold



Curtis & Tompkins Laboratories Analytical Report 15101 Freedom Avenue Location: ıb #: 167941 EPA 5030B SOMA Environmental Engineering Inc. Prep: ient: 2552 Project#: 10/01/03 Sampled: Soil trix: 10/02/03 Received: as received sis:

eld ID:

TWB-1@16-16.5

SAMPLE

167941-001

Diln Fac:

Batch#: Analyzed: 1.000 85063 10/04/03

Analyta	Result	RL	Units Analysis
asoline C7-C12	ND		mg/Kg 8015B
enzene	MD	5.2	ug/Kg EPA 8021B ug/Kg EPA 8021B
Toluene	ND ND	5.2 5.2	ug/kg EPA 8021B
Ethylbenzene ,p-Xylenes	ND ND	5.2	uq/Kq EPA 8021B
-Xvlene	ND	5.2	ug/Kg EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	100	56-144	8015B
romofluorobenzene (FID)	100	51-142	8015B
rifluorotoluene (PID)	85	45-150	EPA 8021B
Bromofluorobenzene (PID)	88	42-138	EPA 8021B

b ID:

TWB-1@18-18.5

SAMPLE

167941-002

Diln Fac:

Batch#: Analyzed: 1.000

85063 10/04/03

Analuke	Result	RL	Units Analysis
Gasoline C7-C12	1.8 Y	1.0	mg/Kg 8015B ug/Kg EPA 8021B
Benzene Coluene	ND ND	5.2 5.2	ug/Kg EPA 8021B
thylbenzene	ND	5.2	ug/Kg EPA 8021B ug/Kg EPA 8021B
m,p-Xylenes o-Xylene	ND ND	5.2 5.2	ug/Kg EPA 8021B

Surrogate	%REC	Limits	Analysis
rifluorotoluene (FID)	102	56-144	8015B
Bromofluorobenzene (FID)	107	51-142	8015B
Trifluorotoluene (PID)	87	45-150	EPA 8021B
romofluorobenzene (PID)	92	42-138	EPA 8021B
101101110101111111111111111111111111111			

= Value outside of QC limits; see narrative = Presence confirmed, but RPD between columns exceeds 40% Y= Sample exhibits chromatographic pattern which does not resemble standard

D= Not Detected = Reporting Limit age 1 of 5



Curtis & Tompkins Laboratories Analytical Report 15101 Freedom Avenue Location: ab #: 167941 EPA 5030B SOMA Environmental Engineering Inc. Prep: lient: Project#: 2552 10/01/03 Sampled: Soil datrix: 10/02/03 Received: as received <u>asis:</u>

eld ID: pe:

TWB-1@21.5-22

SAMPLE 167941-003

100.0 Diln Fac: Batch#: 85101 10/07/03 Analyzed:

Analyte	Result	RL	Units Analysis
asoline C7-C12	3,300	100	mg/Kg 8015B
enzene	ND	500	ug/Kg EPA 8021B
Toluene	ND	500	ug/Kg EPA 8021B
Ethylbenzene	56,000	500	ug/Kg EPA 8021B
, p-Xylenes	140,000	500	ug/Kg EPA 8021B
-Xylene	42,000	500	ug/Kg EPA 8021B

Surrogate	%REC	Limits	Amaiysis
_Trifluorotoluene (FID)	136	56-144	8015B
Trifluorotoluene (FID)	138	51-142	8015B
rifluorotoluene (PID)	84	45-150	EPA 8021B
Bromofluorobenzene (PID)	94	42-138	EPA 8021B

eld ID: Type: ĎПD:

TWB-1@24-24.5

SAMPLE 167941-004 Diln Fac: Batch#: Analyzed:

200.0 85101 10/06/03

Analysis Units Analyte Result RL mg/Kg 8015B 200 4,000 Gasoline C7-C12 ug/Kg EPA 8021B ug/Kg EPA 8021B 1,000 NDBenzene 12,000 C 1,000 roluene 1,000 ug/Kg EPA 8021B ug/Kg EPA 8021B thylbenzene 84,000 1,000 280,000 h,p-Xylenes ug/Kg EPA 8021B 85,000 1,000 o-Xylene

Surrogate	%REC	P mates	Analysis
rifluorotoluene (FID)	132	56-144	8015B
Bromofluorobenzene (FID)	135	51-142	8015B
Trifluorotoluene (PID)	86	45-150	EPA 8021B
Bromofluorobenzene (PID)	98	42-138	EPA 8021B

t= Value outside of QC limits; see narrative
c= Presence confirmed, but RPD between columns exceeds 40%

Y= Sample exhibits chromatographic pattern which does not resemble standard

ID= Not Detected

L= Reporting Limit age 2 of 5



Curtis & Tompkins Laboratories Analytical Report 15101 Freedom Avenue Location: ab #: 167941 EPA 5030B SOMA Environmental Engineering Inc. Prep: lient: Project#: 2552 10/01/03 Soil Sampled: atrix: 10/02/03 Received: asis: <u>as received</u>

eld ID: pe:

enzene

Toluene

asoline C7-C12

TWB-2@20-20.5

SAMPLE

Analyte

Bromofluorobenzene (PID)

167941-005

Diln Fac:

Batch#:

Analyzed:

5.000 85101

10/06/03 RL Units 5.0 mg/Kg 8015B ug/Kg EPA 8021B ug/Kg EPA 8021B 25 25

ug/Kg EPA 8021B

E	Ethylbenzene ,p-Xylenes -Xylene		53 68 C 220	· · · · · · · · · · · · · · · · · · ·	25 25 25	ug/Kg EPA 8021B ug/Kg EPA 8021B ug/Kg EPA 8021B
	Surrogate	%REC	Limits	Anall	YSIS	
	Frifluorotoluene (FID)	100	56-144	8015B		
	romofluorobenzene (FID)	120	51-142	8015B		
- 13	rifluorotoluene (PID)	69	45-150	EPA 8021B		
				77 0001D		

Result 29 Y

42-138

ND

ND

eld ID: Type: **La**b ID:

TWB-2@29.5-30

SAMPLE

167941-006

Diln Fac:

EPA 8021B

Batch#:

1.000 85101

Analyzed:

10/06/03

anslute	Result	RL	Units	Analysis
Gasoline C7-C12	ND	0.99	mg/Kg	8015B
Benzene	ND	5.0	ug/Kg ug/Kg	EPA 8021B EPA 8021B
Coluene	ND ND	5.0 5.0	ug/Kg ug/Kg	EPA 8021B
thylbenzene A,p-Xylenes	ИĎ	5.0	ug/Kg	EPA 8021B
o-Xvlene	ND	5.0	ug/Kg	EPA 8021B

Surrogate	%REC	Dimits	Analysis
rifluorotoluene (FID)	88	56-144	8015B
Bromofluorobenzene (FID)	111	51-142	8015B
Trifluorotoluene (PID)	66	45-150	EPA 8021B
Bromofluorobenzene (PID)	86	42-138	EPA 8021B

⁼ Value outside of QC limits; see narrative C= Presence confirmed, but RPD between columns exceeds 40% Y= Sample exhibits chromatographic pattern which does not resemble standard

D= Not Detected

L= Reporting Limit age 3 of 5



Curtis & Tompkins Laboratories Analytical Report 15101 Freedom Avenue Location: EPA 5030B SOMA Environmental Engineering Inc. Prep: ient: Project#: 2552 Sampled: 10/01/03 Soil trix: 10/02/0<u>3</u> Received: as received sis:

eld ID:

TWB-2@31-31.5

SAMPLE 167941-007 Diln Fac: Batch#: Analyzed:

1.000 85101 10/06/03

2=-1:01-2	Result	RI	Units Analysis
asoline C7-C12	1.6	1.1 5.3	mg/Kg 8015B ug/Kg EPA 8021B
asoline C7-C12 enzene Toluene	ND ND	5.3	ua/Ka EPA 8021B
Ethylbenzene	9.7 C	5,3 5,3	ug/Kg EPA 8021B ug/Kg EPA 8021B
,p-Xylenes -Xylene	ND	5.3	ug/Kg EPA 8021B

Analysis %REC Limits Surrogate 56-144 8015B rifluorotoluene (FID) 46 8015B romofluorobenzene (FID) 56 51-142 31 * 45-150 EPA 8021B rifluorotoluene (PID) EPA 8021B 42-138 Bromofluorobenzene (PID) 41

eld ID: Type: Lab ID:

TWB-2@33-33.25

SAMPLE

167941-008

Diln Fac:

Batch#: Analyzed: 1.000

85063 10/04/03

	Pagn 14	RL	Uni ts	Analysis
Gasoline C7-C12	ND	1.1		8015B
Benzene	ND	5.4 5.4	ug/Kg	EPA 8021B EPA 8021B
oluene	ND ND	5.4	uq/Kq	EPA 8021B
thylbenzene m,p-Xylenes	ND	5.4	uq/Kg	EPA 8021B
o-Xylene	ND	5.4	ug/Kg	EPA 8021B

Surrogate	%REC	Mimits	Analysis
Prifluorotoluene (FID) Bromofluorobenzene (FID) Trifluorotoluene (PID) Promofluorobenzene (PID)	100	56-144	8015B
	102	51-142	8015B
	86	45-150	EPA 8021B
	88	42-138	EPA 8021B

Value outside of QC limits; see narrative
Presence confirmed, but RPD between columns exceeds 40% Y= Sample exhibits chromatographic pattern which does not resemble standard

p= Not Detected

L= Reporting Limit age 4 of 5

1.1



Curtis & Tompkins Laboratories Analytical Report 15101 Freedom Avenue EPA 5030B Location: ab #: 167941 SOMA Environmental Engineering Inc. Prep: lient: 2552 Project#: 10/01/03 Soil Sampled: atrix: Received: 10/02/03 <u>as received</u> asis:

D:

BLANK QC227862 Batch#: Analyzed: 85063 10/03/03

 $\tilde{1}.000$ ln Fac:

Result	RL	Units Analysis
ND	1.0	mg/Kg 8015B
ND	5.0	ug/Kg EPA 8021B ug/Kg EPA 8021B
		ug/Kg EPA 8021B ug/Kg EPA 8021B
		ug/Kg EPA 8021B
	5.0	ug/Kg EPA 8021B
		ND 5.0 ND 5.0 ND 5.0

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	98	56-144	8015B
romofluorobenzene (FID)	103	51-142	8015B
rifluorotoluene (PID)	83	45-150	EPA 8021B
Bromofluorobenzene (PID)	87	42-138	EPA 8021B

Lab ID: Piln Fac: BLANK OC228010 1.000 Batch#: Analyzed: 85101 10/06/03

	Fe Pesult	Pit	Units	Analysis
Gasoline C7-C12	ND	1.0		8015B
Benzene	ИD	5.0	ug/Kg	EPA 8021B
oluene	ND	5.0	na/ka	EPA 8021B EPA 8021B
thylbenzene m,p-Xylenes	ND ND	5.0		EPA 8021B
o-Xvlene	ND	5.0_	ug/Kg	EPA 8021B

Surrogate	*REC	Trimits	Analysis
rifluorotoluene (FID)	89	56-144	8015B
Bromofluorobenzene (FID)	111	51-142	8015B
Trifluorotoluene (PID)	68	45-150	EPA 8021B
Bromofluorobenzene (PID)	86	42-138	EPA 8021B

Y= Value outside of QC limits; see narrative
C= Presence confirmed, but RPD between columns exceeds 40%
Y= Sample exhibits chromatographic pattern which does not resemble standard
D= Not Detected

L= Reporting Limit age 5 of 5

GC07 TVH 'A' Data File RTX 502

le Name : 167941-002,85063

: G:\GC07\DATA\276A024.raw Name : TVHBTXE

od Start Time : 0.00 min Scale Factor:

End Time : 26.00 min

Plot Offset: 10 mV TWB-1@18-18.5

Sample #: a Date : 10/4/03 04:32 AM

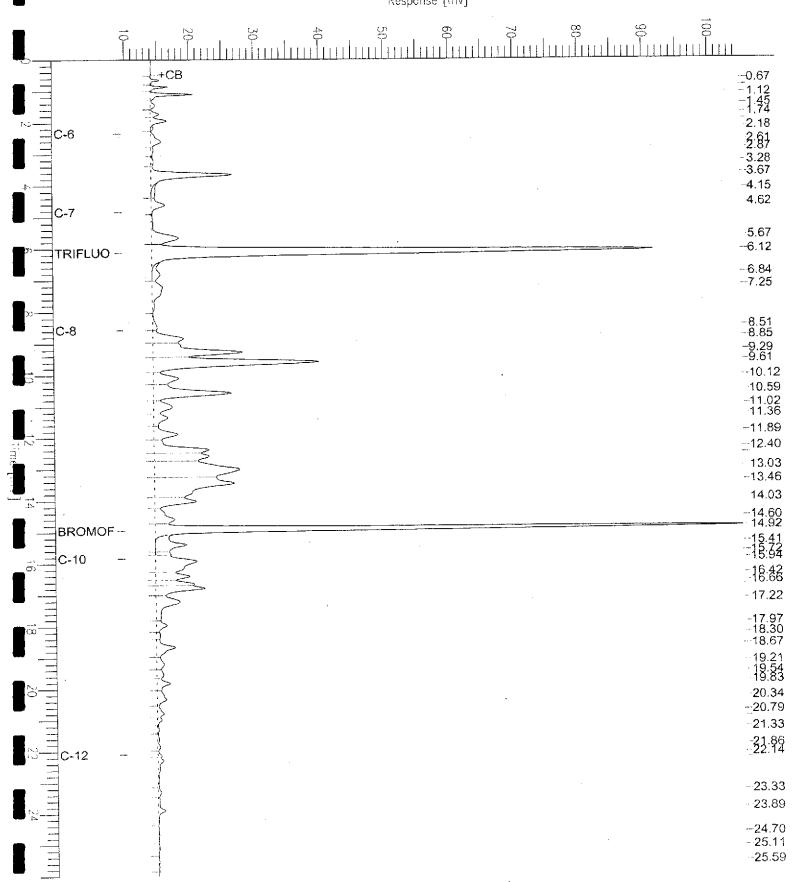
Time of Injection: 10/4/03 04:06 AM Low Point : 9.59 mV

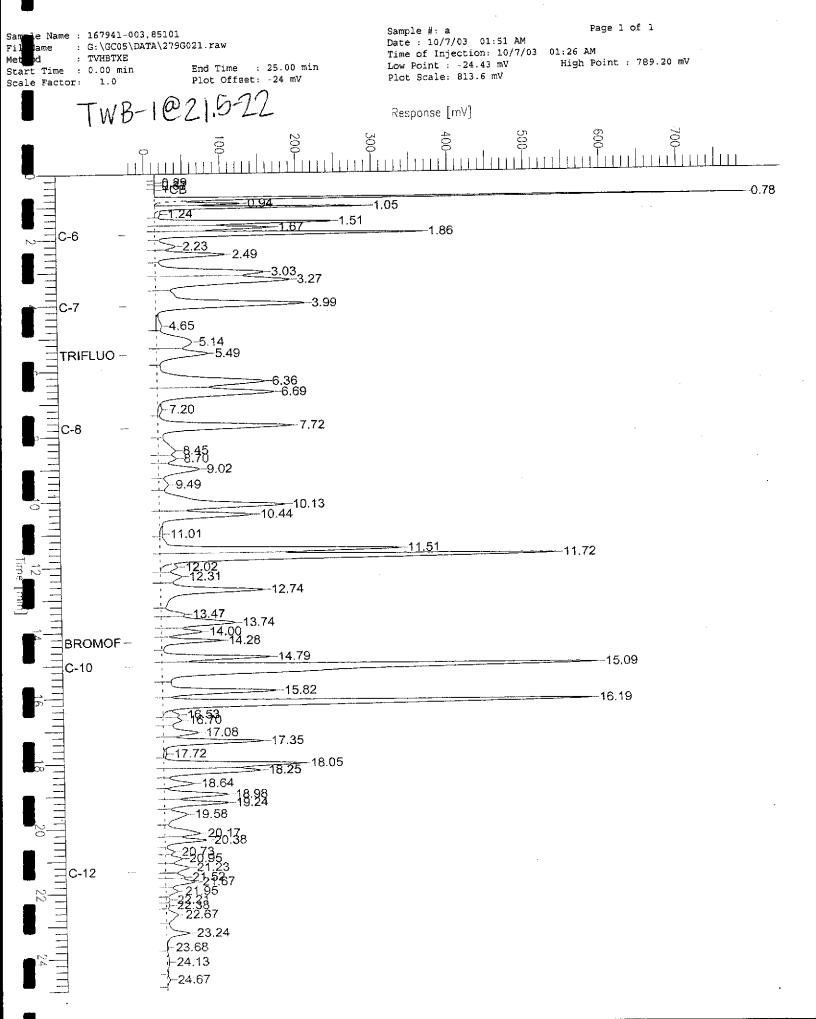
High Point : 104.90 mV

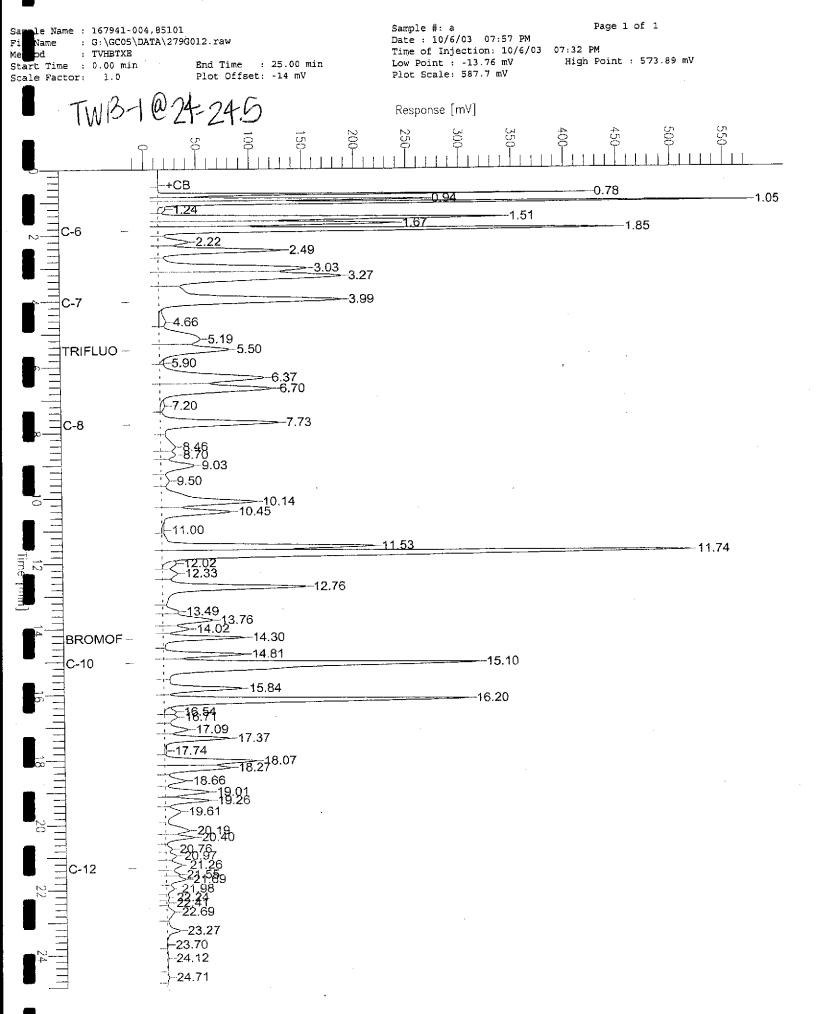
Page 1 of 1

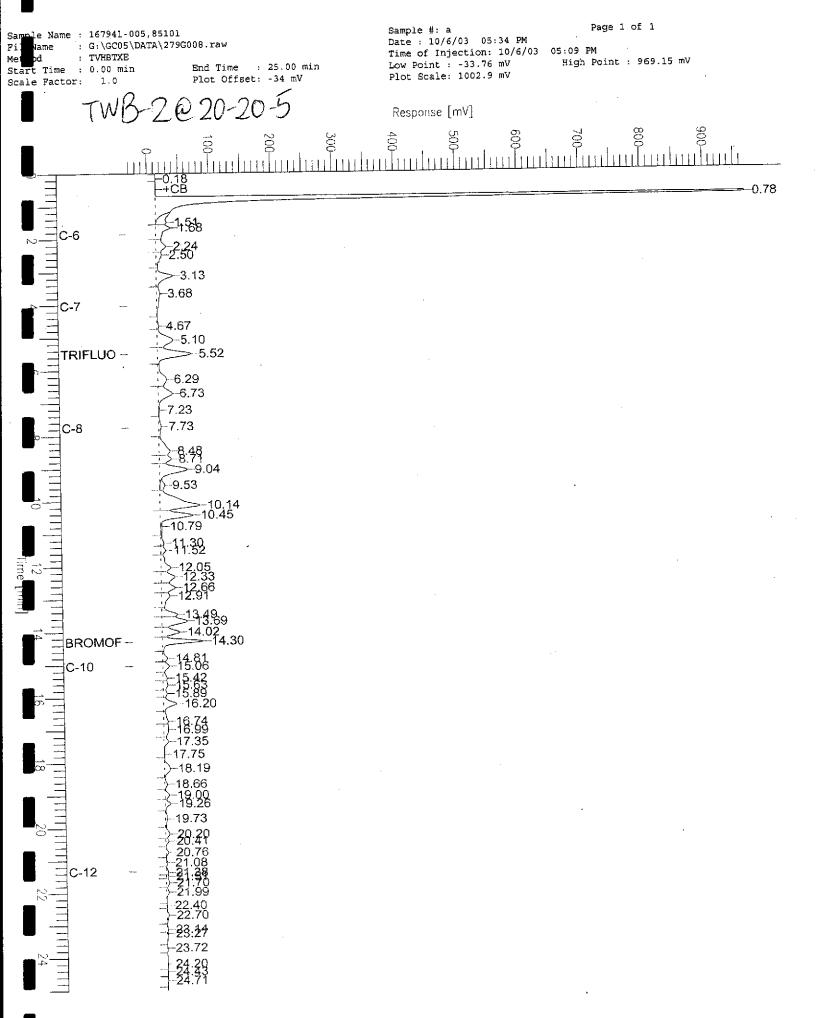
Plot Scale: 95.3 mV

Response [mV]



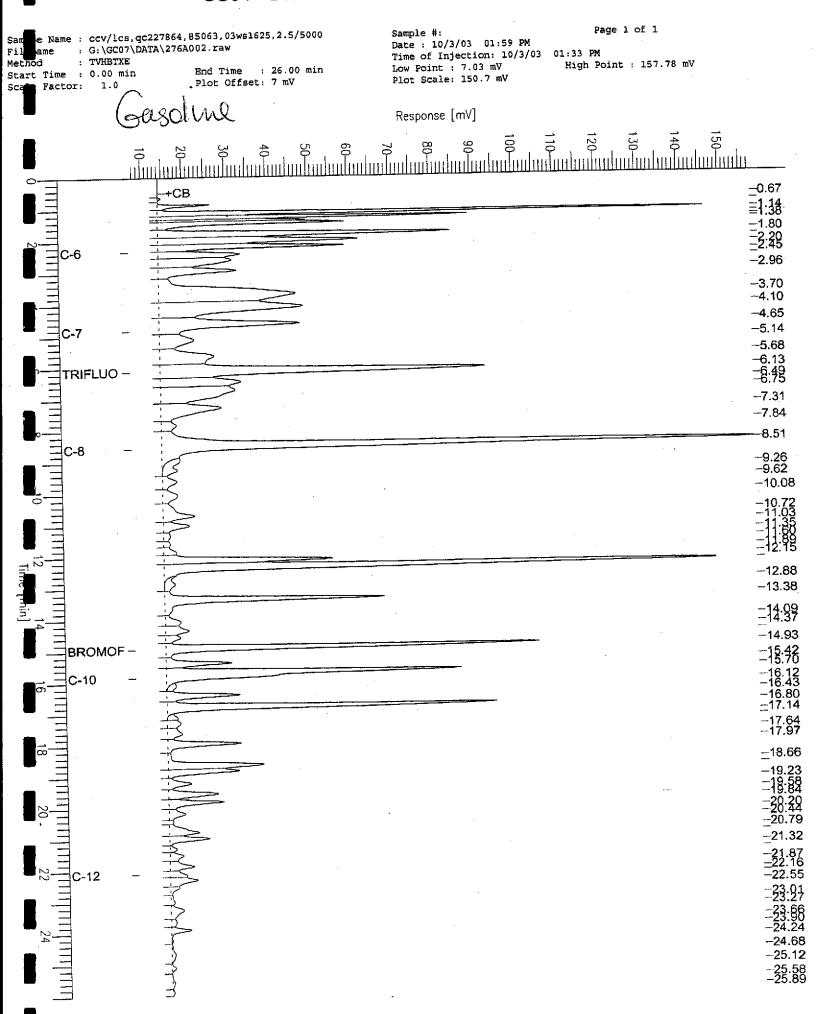


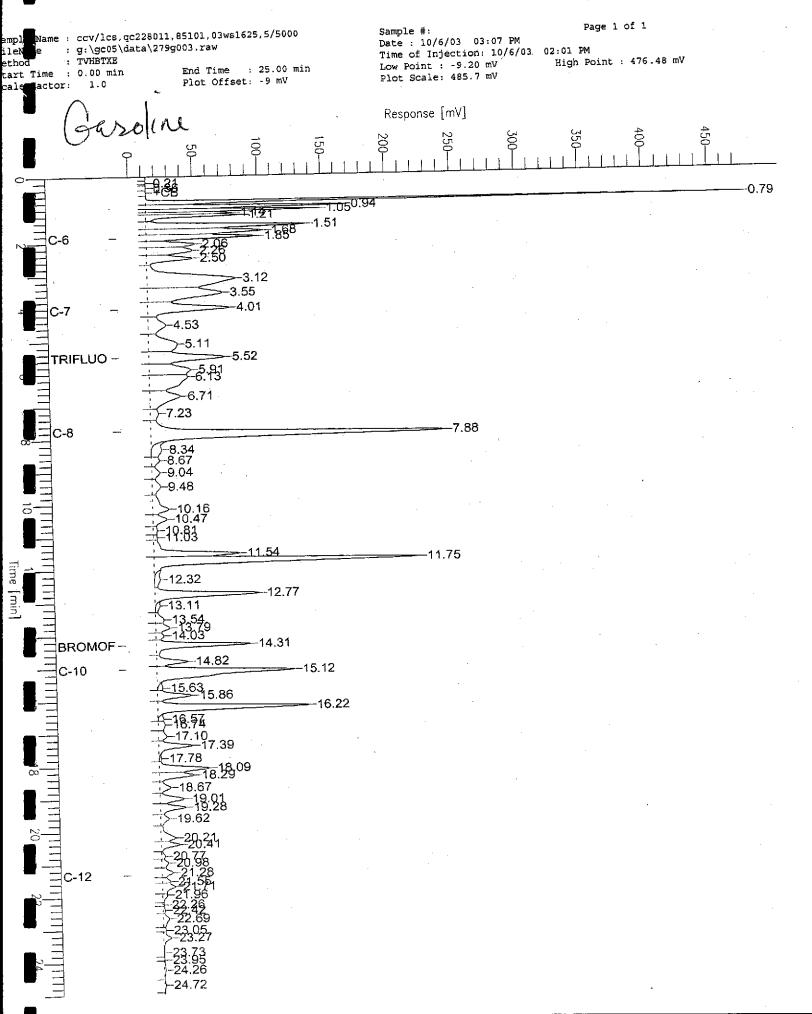




Page 1 of 1 Sample #: a e Name : 167941-007,85101 Date : 10/7/03 12:11 AM Fil : G:\GC05\DATA\279G018.raw Time of Injection: 10/6/03 11:46 PM : TVHBTXE Met High Point : 282.31 mV Low Point : 0.87 mV End Time : 25.00 min Start Time : 0.00 min Plot Scale: 281.4 mV Plot Offset: 1 mV Scale Factor: 1.0 Response [mV] 0.35 0.68 1.281.51 1.61.86 -0.782.22 2.49 ∋_33ુ50 -3.65 -4.004.65 -5.09 ____ 5.51 TRIFLUO -≥-6.37 -6.70 7.21 **≫**-7.73 -9.03 -9.48 →-10.14 →-10.44 10.97 -11.29 -11.72 -12.03 -12.32 -12.65 -12.87 13.48 13.71 14.01 - 14.29 **BROMOF**--14.80 --15.09 C-10 15:84 15.84 16.19 16.51 17.09 17.36 17.67 ≽18:26 ≻18.65 ≻18.99 ≻19.25 -19.62 28:47 28:36 21:23 C-12 21.68 21.96 22.28 22.68 24:29 24.65 --24.98

GC07 TVH 'A' Data File RTX 502







	Curtis & Tompkins Labor	atories Anal	Lytical Report
nb #: lient: Project#:	167941 SOMA Environmental Engineering Inc.	Location: Prep:	15101 Freedom Avenue EPA 5030B EPA 8021B
	LCS	Analysis:	as received
ype: ab ID: atrix:	QC227863 Soil	Diln Fac: Batch#:	1.000 85063
nits:	ug/Kg	Analyzed:	10/03/03

Analyte soline C7-C12		NA		
	50,00	51.88	104	80-121
enzene oluene hylbenzene ,p-Xylenes -Xylene	50.00	50.17	100	80-120
-hulbenzene	50.00	51.58	103	79-120
ny idenzene	100.0	111.3	1 11	76-120
, D-Wilenes	50.00	52.36	105	80-120

Desn	i+ %REC	Limits
11004		
NA		
NA		
	84	45-150
	88	42-138
	Resu NA NA	



	Curtis & Tompkins Labor	atories Anal	ytical Report
nb #:	167941	Location:	15101 Freedom Avenue
Lient:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2552	Analysis:	8015B
Type: ab ID: matrix: Units:	LCS	Basis:	as received
	QC227864	Diln Fac:	1.000
	Soil	Batch#:	85063
	mg/Kg	Analyzed:	10/03/03

Analyte	Spiked	Result	%REC	Limits	
Gasoline C7-C12	5.000	5.477	110	80-120	
Penzene	NA				
pluene	NA				
Ethylbenzene	AM			•	
m,p-Xylenes	AN				
pluene Ethylbenzene m,p-Xylenes -Xylene	NA				

	Ð	eenlt	%REC	Limits	
Surrogate Prifluorotoluene (FID)	••		112	56-144	
romofluorobenzene (FID)			105	51-142	
Trifluorotoluene (PID)	NA				
Promofluorobenzene (PID)	NA				



	Curtis &	Tompkins Labor	atories Ana	lytical Report
I m b #:	167941		Location:	15101 Freedom Avenue
ient:	SOMA Environmental	Engineering Inc.	Prep:	EPA 5030B
ient: Project#:	2552	e e	Analysis:	801 <u>5</u> B
Type:	LCS		Basis:	as received
ib ID:	OC228011		Diln Fac:	1.000
Matrix:	Soil		Batch#:	85101
Units:	mg/Kg		Analyzed:	10/06/03

Analyte	Spiked	Result	%RE	: Limits	
Gasoline C7-C12	10.00	9.786	98	80-120	
E nzene	AN				
	NA				
luene Ethylbenzene m.p-Xylenes	NA				
m.n-Xvlenes	NA				
Xylene	NA NA				

Surrogate	Res	ilt %REC	Limits	
#rifluorotoluene (FID)		112	56-144	
romofluorobenzene (FID)		130	51-142	
Trifluorotoluene (PID)	NA		•	
Promofluorobenzene (PID)	NA			



	Curtis & Tompkins Labor	atories Ar	nalytical Report
:# d a I	167941	Location:	15101 Freedom Avenue
ient:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:		Analysis:	EPA 8021B
	LCS	Basis:	as received
Type:	OC228012	Diln Fac:	1.000
Matrix:	Soil	Batch#:	85101
Units:	ug/Kg	Analyzed:	10/06/03

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-Cl2		AИ		
nzene	100.0	106.1	106	80-121
luene	100.0	94.33	94	80-120
Ethylbenzene	100.0	95.18	95	79-120
	200.0	199.1	100	76-120
n p-Xylenes Xylene	100.0	100.0	100	80-120

Surrogate	Resu	1t %REC	Limits	
Tifluorotoluene (FID)	NA			ŀ
romofluorobenzene (FID)	NA			1
Trifluorotoluene (PID)		70	45-150	
Promofluorobenzene (PID)		89	42-138	



	Curtis &	Tompkins Labor	atories Anal	ytical Report
b #: 1	67941		Location:	15101 Freedom Avenue
	OMA Environmental	Engineering Inc.	Prep:	EPA 5030B
Project#: 2			Analysis:	8015B
Field ID:	ZZZZZZZZZZ		Diln Fac:	1.000
SS Lab ID:	167961-002		Batch#:	85063
matrix:	Soil		Sampled:	10/02/03
Jnits:	mg/Kg		Received:	10/02/03
usis:	as received		Analyzed:	10/03/03

T be:

MS

Lab ID:

QC227881

Analyte	MSS Result	Spiked	Result	%RE(C Limits
asoline C7-C12	<0.09400	10.20	8.681	85	24-134
benzene		NA			
Toluene		AN			
		AN	•		
n-Xvlenes		AИ			
hylbenzene p-Xylenes o-Xylene		NA			

Surrogate	Re	sult %REC	Limits	
Trifluorotoluene (FID)		121	56-144	
Bromofluorobenzene (FID)		112	51-142	
rifluorotoluene (PID)	NA			
promofluorobenzene (PID)	NA			

Type

MSD

Lab ID:

QC227882

Analyte	Spiked	Result	%RE	C Limits	RPD	Lim
Gasoline C7-C12	10.42	8.964	86	24-134	1	32
Benzene	NA					
oluene	NA			•		
thylbenzene	AN					
m,p-Xylenes	AN					
oluene thylbenzene m,p-Xylenes -Xylene	NA			<u> </u>		

Surrogate	Resu	.t %REC	Limits	
Trifluorotoluene (FID)		119	56-144	
romofluorobenzene (FID)		111	51-142	
rifluorotoluene (PID)	NA		•	
Bromofluorobenzene (PID)	NA			

A= Not Analyzed RPD= Relative Percent Difference Page 1 of 1



	Curtis & Tompkins Labor	atories Anal	Lytical Report
a b#:	167941	Location:	15101 Freedom Avenue
	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:		Analysis:	8015B
Gield ID:	TWB-2@29.5-30	Diln Fac:	1.000
S Lab ID		Batch#:	85101
trix:	Soil	Sampled:	10/01/03
Jnits:	mq/Kg	Received:	10/02/03
Msis:	as received	Analyzed:	10/07/03

MS

Lab ID:

QC228088

Analyte	MSS Result	Spiked	Result	%RE(l Limits
Isoline C7-C12	0.09655	10.20	9.443	92	24-134
enzene		NA			
Toluene		NA			
		АИ			
n-Xylenes		NA			
hylbenzene p-Xylenes o-Xylene		NA_			

_						
	Surrogate	Re	sult	%REC	Limits	
H	rifluorotoluene (FID)			110	56-144	ļ
1	Bromofluorobenzene (FID)		•	130	51-142	
	rifluorotoluene (PID)	NA				
Н	romofluorobenzene (PID)	NA				

MSD

Lab ID:

QC228089

Analyte	Spiked	Result	%RE(: Limits	RPD	Lim
asoline C7-C12	10.31	9.829	94	24-134	3	32
Benzene	NА					
	NA					
thylbenzene	NA					
oluene thylbenzene m,p-Xylenes	NA					
-Xylene	NA					

Surrogate	Rei	sult %REC	Limits	
Trifluorotoluene (FID)		114	56-144	
romofluorobenzene (FID)		133	51-142	,
rifluorotoluene (PID)	AM			
Bromofluorobenzene (PID)	AN			

A= Not Analyzed D= Relative Percent Difference

Page 1 of 1



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue Location: 167941 tab #: EPA 5030B EPA 8260B Prep: Analysis: SOMA Environmental Engineering Inc. Client: oject#: 2552 10/02/03 Received: as received sis: 10/01/03 mpled

eld ID: be: Lab ID:

Matrix:

TWB-1@16-16.5 SAMPLE

167941-001 Soil

Units: Diln Fac:

Batch#: Analyzed: ug/Kg

0.9615 85093 10/06/03

Analyte	Resul	RE.
tert-Butyl Alcohol (TBA)	ND	96
MTBE	ND	4.8
	ND	4.8
sopropyl Ether (DIPE) thyl tert-Butyl Ether (ETBE)	ND	4.8
Methyl tert-Amyl Ether (TAME)	ND	4.8
1,2-Dichloroethane	ND	4.8
2-Dibromoethane	ND	4.8

8	Surrogate	*REC	Limits	
D	ibromofluoromethane	98	74-128	
11	,2-Dichloroethane-d4	103	76-130	•
	bluene-d8	101	80-120	
	romofluorobenzene	_102	76-125	

eld ID: be: Lab ID:

Matrix:

TWB-1@18-18.5 SAMPLE

167941-002

Units: Diln Fac: ug/Kg 0.9615 85093 10/06/03

Soil

Batch#: Analyzed:

Result Analyte tert-Butyl Alcohol (TBA) 96 ND 4.8 ND MTBE sopropyl Ether (DIPE) thyl tert-Butyl Ether (ETBE) ethyl tert-Amyl Ether (TAME) 4.8 ND 4.8 ND4.8 ND ND 4.8 1,2-Dichloroethane 4.8 ND 2-Dibromoethane

ş	Surrogate	%RBC	Limits			
ľ	Dibromofluoromethane		74-128			- 1
1	1,2-Dichloroethane-d4	104	76-130			
ı	oluene-d8	101	80-120			ļ
Н	romofluorobenzene	101	76-125		 	



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue Location: 167941 Lab #: EPA 5030B Prep: Analysis: Client: SOMA Environmental Engineering Inc. **EPA 8260B** <u>coject</u># 10/02/03 Received: as received asis: 10/01/03 mpled

eld ID: be: Lab ID:

Matrix:

TWB-1@21.5-22 SAMPLE

167941-003 Soil

Units: Diln Fac: Batch#: Analyzed: ug/Kg 357.I 85167 10/08/03

Result Analyte tert-Butyl Alcohol (TBA) 36,000 $\overline{\mathrm{ND}}$ ND1,800 MTBE 1,800 sopropyl Ether (DIPE) thyl tert-Butyl Ether (ETBE) Methyl tert-Amyl Ether (TAME) ND 1,800 ND 1,800 MDND 1,800 1,2-Dichloroethane 1,800 ИD <u>2-Dibromoethane</u>

Š.	Surrogate	%REC	Limits	
	Dibromofluoromethane	100	74-128	
Ι.	1,2-Dichloroethane-d4	102	76-130	
П	bluene-d8	102	80-120	
	romofluorobenzene	99	76-125	
-				

eld ID: be: Lab ID:

Matrix:

TWB-1@24-24.5 SAMPLE

167941-004 Soil

Units: Diln Fac: Batch#: Analyzed: ug/Kg 250.0 85137 10/07/03

Analyte tert-Butyl Alcohol (TBA) Result 25,000 ND 1,300 ИD MTBE 1,300 sopropyl Ether (DIPE) ND thyl tert-Butyl Ether (ETBE) ethyl tert-Amyl Ether (TAME) ND ND1,300 1,300 1,2-Dichloroethane ND2-Dibromoethane ND 1,300

Carrenage		f 7,4m4+s	300000000000000000000000000000000000000
2 000000000000000000000000000000000000	00000000000000000000000000000000000000	······································	
Dibromofluoromethane	92	74-128	i
DIDIOMOLITOCIONECHAME	24	, -	
1,2-Dichloroethane-d4	99	76-130	- 1
T, Z-Dichitorocchanc ar			
m oluene-d8	89	80-120	
in ordere - do	0,5	• •	
romofluorobenzene	102	76-125	
TOMOTIGOTODCIIZCIIC	<u> </u>	70 123	

Not Analyzed = Not Detected Reporting Limit Page 2 of 7



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue Location: 167941 b #: EPA 5030B SOMA Environmental Engineering Inc. Prep: Client: EPA 8260B Analysis: oject#: as received 10/01/03 10/02/03 Received: lsis: mpled:

ld ID: be: Lab ID: Matrix:

TWB-2@20-20.5 SAMPLE

167941-005 Soil

Units: Diln Fac: Batch#:

Analyzed:

ug/Kg 0.9615 85132 10/07/03

result Analyte 96 tert-Butyl Alcohol (TBA) ND 4.8 ND MTBE sopropyl Ether (DIPE) thyl tert-Butyl Ether (ETBE) Methyl tert-Amyl Ether (TAME) 4.8 ND 4.8 ND 4.8 ND 4.8 1,2-Dichloroethane ND 4.8 ND 2-Dibromoethane

REC Limits Surrogate 97 Dibromofluoromethane 74-128 76-130 1,2-Dichloroethane-d4 100 80-120 bluene-d8 102 102 76-125 romofluorobenzene

Units:

eld ID: pe: Lab ID:

TWB-2@29.5-30 SAMPLE 167941-006

Soil

Diln Fac: Batch#: Analyzed: ug/Kg 0.9091 85093 10/06/03

Matrix: Result PL . Analyte 91 ert-Butyl Alcohol (TBA) 4.5 ND MTBE sopropyl Ether (DIPE) thyl tert-Butyl Ether (ETBE) ethyl tert-Amyl Ether (TAME) 4.5 ND 4.5 NĎ 4.5 ND 4.5 1,2-Dichloroetĥane ND<u>1,2-Dibromoeth</u>ane ND

			
Surrogate	%REC	Limits	
Bibromofluoromethane	97	74-128	·
1,2-Dichloroethane-d4	101	76-130	
≝ oluene-d8	102	80-120	
romofluorobenzene	104	<u>76-125</u>	

.= Not Analyzed = Not Detected L= Reporting Limit Page 3 of 7



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue Location: 167941 ab #: Prep: EPA 5030B SOMA Environmental Engineering Inc. Client: EPA 8260B Analysis: roject# 2552 10/02/03 Received: as received sis: 10/01/03 <u>mpled</u>:

Field ID: Type: Lab ID: Matrix:

TWB-2@31-31.5 SAMPLE 167941-007 Soil Units: Diln Fac: Batch#:

Analyzed:

ug/Kg 0.9259 85093 10/06/03

Analyte tert-Butyl Alcohol (TBA) Result 93 ND 4.6 ND MTBE 4.6 sopropyl Ether (DIPE)
thyl tert-Butyl Ether (ETBE)
methyl tert-Amyl Ether (TAME) ND 4.6 ND 4.6 ND4.6 ND 1,2-Dichloroethane 4.6 <u>2-Dibromoethane</u> \overline{MD}

 Surrogate
 &REC Limits

 Dibromofluoromethane
 99 74-128

 1,2-Dichloroethane-d4
 105 76-130

 bluene-d8
 104 80-120

 comofluorobenzene
 99 76-125

Feld ID: Toe:

Lab ID:

Matrix:

TWB-2@33-33.25 SAMPLE

167941-008 Soil Units: Diln Fac: Batch#:

Analyzed:

ug/Kg 0.9259 85093 10/06/03

Result Analyte 93 tert-Butyl Alcohol (TBA) ND 4.6 ND MTBE 4,6 sopropyl Ether (DIPE) NDthyl tert-Butyl Ether (ETBE) ethyl tert-Amyl Ether (TAME) 4.6 ND 4.6 ND4.6 ND1,2-Dichloroethane 4.6ND ,2-Dibromoethane

33	Surrogate	%REC	C Limits	*
Ť	bibromofluoromethane	99	74-128	
1	1,2-Dichloroethane-d4	102	76-130	
1.	oluene-d8	98	80-120	ŀ
-	romofluorobenzene	102	76-125	



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue 167941 Location: Lab #: EPA 5030B EPA 8260B Client: SOMA Environmental Engineering Inc. Prep: roject#: Analysis: 2552 10/02/03 Received: asis: as received 10/01/03 <u>ampled</u>

Tupe: Lab ID: Matrix: Units: BLANK QC227981 Soil ug/Kg Diln Fac: Batch#: Analyzed:

1.000 85093 10/06/03

Result Analyte 100 tert-Butyl Alcohol (TBA) ND ND5.0 MTBE 5.0 5.0 sopropyl Ether (DIPE) thyl tert-Butyl Ether (ETBE) Methyl tert-Amyl Ether (TAME) ND ND 5.0 ND 5.0 1,2-Dichloroethane ND 5.0 ND ,2-Dibromoethane

 Surrogate
 %REC
 Limits

 Dibromofluoromethane
 98
 74-128

 1,2-Dichloroethane-d4
 106
 76-130

 oluene-d8
 103
 80-120

 romofluorobenzene
 106
 76-125

Tepe: I.b ID: Matrix:

BLANK QC228132 Soil Diln Fac: Batch#: Analyzed: 1.000 85132 10/07/03

Matrix: Soil
Units: ug/Kg

Analyte	Resulf	RL	
tert-Butyl Alcohol (TBA)	ND	100	
MTBE	ND	5.0	
sopropyl Ether (DIPE)	ND	5.0	
thyl tert-Butyl Ether (ETBE)	ND	5.0	
ethyl tert-Amyl Ether (TAME)	ND	5.0	
1,2-Dichloroethane	ND	5.0	
1,2-Dibromoethane	ND .	5.0	

Surrogate	%REC	Limits	
Dibromofluoromethane	93	74-128	
1,2-Dichloroethane-d4	106	76-130	
m oluene-d8	103	80-120	
romofluorobenzene	107	76-125	

Not Analyzed
Not Detected
Le Reporting Limit
Page 5 of 7



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue Location: 167941 Jab #: Prep: Analysis: EPA 5030B SOMA Environmental Engineering Inc. Client: EPA 8260B 10/02/03 roject#: <u> 2552</u> Received: as received sis: mpled: 10/01/03

Twoe: Lap ID:

BLANK QC228133 Matrix:

Soil

Analyte Result

Output Alcohol (TBA) NA

TBE NA

Isopropyl Ether (DIPE) NA

Ethyl tert-Butyl Ether (ETBE) NA

Ethyl tert-Amyl Ether (TAME) NA

2-Dichloroethane NA

1,2-Dibromoethane NA

Surrogate Result
ibromofluoromethane NA
,2-Dichloroethane-d4 NA
Toluene-d8 NA
Bromofluorobenzene NA

Type: Imb ID: Mutrix: BLANK QC228151 Water Diln Fac: Batch#: Analyzed: 1.000 85137 10/07/03

trix: Water its: ug/L

Analyte	Rest	ilt Rb
ert-Butyl Alcohol (TBA)	ND	100
TBE	ND	5.0
Teopropyl Ether (DIPE)	ND	5.0
Tsopropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)	ND	5.0
methyl tert-Amyl Ether (TAME)	ND	5.0
, 2-Dichloroethane	ND	5.0
2-Dibromoethane	ND	5.0
2-Dibiomoethane		

Surrogate	%REC	Limits	
ibromofluoromethane	95	74-128	
,2-Dichloroethane-d4	101	76-130	
Toluene-d8	102	80-120	
Bromofluorobenzene	102	<u> 76-125</u>	

A= Not Analyzed D= Not Detected L= Reporting Limit Page 6 of 7



Twoe: Lab ID: Matrix: Units: BLANK QC228268 Water ug/L

Diln Fac: Batch#: Analyzed: 1.000 85167 10/08/03

<u> </u>	Heen I	RL	
tert-Butyl Alcohol (TBA)	ND	100	
MTBE	ND	5.0	
sopropyl Ether (DIPE)	ND	5.0	
thyl tert-Butyl Ether (ETBE)	ND	5.0	
Methyl tert-Amyl Ether (TAME)	ND	5.0	
1,2-Dichloroethane	ND	5.0	
► 2-Dibromoethane	ND	5.0	

鑿	Surrogate	%REC	Limits
I	bromofluoromethane	103	74-128
12	_ 2-Dichloroethane-d4	106	76-130
11	oluene-d8	100	80-120
	romofluorobenzene	106	76-125
_			



		Gasoline Oxyg	enates by C	GC/MS
I_b #:	167941		Location:	15101 Freedom Avenue
ient:	SOMA Environmental	Engineering Inc.	Prep:	EPA 5030B
Project#:		_	Analysis:	EPA 8260B
Type:	LCS		Basis:	as received
b ID:	OC227980	•	Diln Fac:	1.000
Mtrix:	Soil		Batch#:	85093
Units:	ug/Kg_		Analyzed:	10/06/03

Analyte	Spiked	Result	%REC	Limits	
tert-Butyl Alcohol (TBA)	N	A			
MTBE	50.00	50.16	100	73-121	
Bopropyl Ether (DIPE)	N	A			
popropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)	Ŋ	A			
Methyl tert-Amyl Ether (TAME)	N	A			

Surrogate	%REC	Limits	
Dibromofluoromethane	98	74-128	
€ 2-Dichloroethane-d4	101	76-130	
luene-d8	101	80-120	
Bromofluorobenzene	100	76-125	



	Gasoline Oxyg	enates by G	e/ms
Lab #:	167941	Location:	15101 Freedom Avenue
ient:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:		Analysis:	EPA 8260B
Type:	LCS	Basis:	as received
b TD:	OC228009	Diln Fac:	1.000
b ID:	Soil	Batch#:	85093
Units:	ug/Kg	Analyzed:	10/06/03

Spiked	Result	%REC	Limits
250.0	286.2	114	70-130
50.00	51.49	103	73-121
50.00	48.72	97	70-130
50.00	49.37	99	70-130
50.00	44.84	90	70-130
	250.0 50.00 50.00 50.00	250.0 286.2 50.00 51.49 50.00 48.72 50.00 49.37	250.0 286.2 114 50.00 51.49 103 50.00 48.72 97 50.00 49.37 99

Surrogate	%REC	Limits
Dibromofluoromethane	97	74-128
2-Dichloroethane-d4	106	76-130
bluene-d8	100	80-120
Bromofluorobenzene	105	76-125



	Gasoline Oxyg	enates by (GC/MS
Lab #:	167941	Location:	15101 Freedom Avenue
lient:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
lient: Project#:	2552	Analysis:	EPA 8260B
Type:	LCS	Basis:	as received
ab ID:	QC228129	Diln Fac:	1.000
atrix:	Soil	Batch#:	85132
Units:	ug/Kg	Analyzed:	10/07/03

Analyte	Spiked	Result	%REC	Limits	
tert-Butyl Alcohol (TBA)	1	A			
MTBE	50.00	52.46	105	73-121	
sopropyl Ether (DIPE)	1	A			
MTBE sopropyl Ether (DIPE) ethyl tert-Butyl Ether (ETBE)	ı	A			
Methyl tert-Amyl Ether (TAME)	1	IA			

Surrogate	%REC	Limits	
Dibromofluoromethane	103	74-128	
, 2-Dichloroethane-d4	105	76-130	
oluene-d8	101	80-120	
Bromofluorobenzene	101	76-125	



	Gasoline Oxy	genates by GO	C/MS
L ab #:	167941	Location:	15101 Freedom Avenue
lient:	SOMA Environmental Engineering Inc	. Prep:	EPA 5030B
Project#:	2552	Analysis:	EPA 8260B
Type:	LCS	Basis:	as received
ab ID:	QC228130	Diln Fac:	1.000
atrix:	Soil	Batch#:	85132
Units:	ug/Kg	Analyzed:	10/07/03

Spiked	Result	%REC	Limits
250.0	257.0	103	70-130
50.00	52.46	105	73-121
50.00	50.34	101	70-130
50.00	50.46	101	70-130
50.00	47.36	95	70-130
	50.00 50.00 50.00	250.0 257.0 50.00 52.46 50.00 50.34 50.00 50.46	250.0 257.0 103 50.00 52.46 105 50.00 50.34 101 50.00 50.46 101

Surrogate	%REC	Limits
Dibromofluoromethane	96	74-128
, 2-Dichloroethane-d4	103	76-130
bluene-d8	103	80-120
Bromofluorobenzene	106	76-125



	Gasoline Oxyg	enates by G	
Imb#:	167941	Location:	15101 Freedom Avenue
ient:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:		Analysis:	EPA 8260B
Type:	LCS	Diln Fac:	1.000
i b ID:	QC228150	Batch#:	85137
Notrix:	Water	Analyzed:	10/07/03
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	N.F			
MTBE	50.00	54.26	109	73-121
	NZ	7		
popropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)	NZ	4		
Methyl tert-Amyl Ether (TAME)	N.	<u> </u>		

Surrogate	%REC	Limits
Dibromofluoromethane	97	74-128
■ 2-Dichloroethane-d4	98	76-130
luene-d8	102	80-120
Bromofluorobenzene	103_	76-125



	Gasoline Oxyg	genates by (GC/MS
Lab #:	167941	Location:	15101 Freedom Avenue
	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
lient: Project#:	2552	Analysis:	EPA 8260B
	LCS	Diln Fac:	1.000
ab ID:	QC228152	Batch#:	85137
Type: ab ID: atrix:	Water	Analyzed:	10/07/03
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	250.0	298.5	119	70-130
MTBE	50.00	54.01	108	73-121
sopropyl Ether (DIPE)	50.00	52.44	105	70-130
sopropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)	50.00	52.80	106	70-130
Methyl tert-Amyl Ether (TAME)	50.00	47.65	95	70-130

Surrogate	%REC	Limits
Dibromofluoromethane	94	74-128
, 2-Dichloroethane-d4	100	76-130
oluene-d8	100	80-120
Bromofluorobenzene	107	76-125



	Gasoline Oxyg	enates by G	C/MS
Lab #:	167941 SOMA Environmental Engineering Inc.	Location: Prep:	15101 Freedom Avenue EPA 5030B
lient: Project#:	2552	Analysis:	EPA 8260B
Matrix: hits: lln Fac:	Water	Batch#:	85167
hits:	ug/L	Analyzed:	10/08/03
lln Fac:	1.000		

Type:

BS

Lab ID:

QC228266

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	250.0	300.4	120	70-130
MTBE	50.00	56.58	113	73-121
	50.00	59.87	120	70-130
sopropyl Ether (DIPE) thyl tert-Butyl Ether (ETBE)	50.00	61.31	123	70-130
Methyl tert-Amyl Ether (TAME)	50.00	49.57	99	70-130

Surrogate	%REC	Limits		
Dibromofluoromethane	98	74-128		
1,2-Dichloroethane-d4	101	76-130		
oluene-d8	98	80-120		
Bromofluorobenzene	107	76-125	·	

Type:

BSD

Lab ID:

				97-00-400-00-0000 007-007-00-00-00-00-00-00-00-00-00-00-00		
Analyte	Spiked	Result	*KBC		RPD	
tert-Butyl Alcohol (TBA)	250.0	320.2	128	70-130	6	20
MTBE	50.00	61.39	123 *	73-121	8	20
sopropyl Ether (DIPE)	50.00	62.55	125	70-130	4	20
Sthyl tert-Butyl Ether (ETBE)	50.00	65.21	130	70-130	6	20
Methyl tert-Amyl Ether (TAME)	50.00	50.69	101	70-130	2	20

Surrogate	%REC	Limits
Dibromofluoromethane	102	74-128
📤, 2-Dichloroethane-d4	103	76-130
oluene-d8	100	80-120
Bromofluorobenzene	106	76-125



		Gasoline Oxyg	enates by G	c/ms
Lab #: Lient: Project#:	167941 SOMA Environmental 2552	Engineering Inc.	Location: Prep: Analysis:	15101 Freedom Avenue EPA 5030B EPA 8260B
Matrix:	Water ug/L 1.000		Batch#: Analyzed:	85167 10/08/03

BS

Lab ID:

QC228264

Analyte	Spiked	Res	ult	%REC	Limits
tert-Butyl Alcohol (TBA)		NA			72 301
MTBE	50.00		56.14	112	73-121
Bopropyl Ether (DIPE)		NA			
sopropyl Ether (DIPE) thyl tert-Butyl Ether (ETBE)		NA			
Methyl tert-Amyl Ether (TAME)		NA			

Surrogate	*REC	Limits	
Dibromofluoromethane	105	74-128	
1 2-Dichloroethane-d4	104	76-130	,
pluene-d8	100	80-120	
Promofluorobenzene	101	76-125	

Type:

BSD

Lab ID:

Analyte	Spiked	ı	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)		AK	00	112	73-121	٥	20
MTBE	50.00		55.92	717	/3-121	J	20
		NΑ			•		
sopropyl Ether (DIPE) thyl tert-Butyl Ether (ETBE)		NA					
Methyl tert-Amyl Ether (TAME)		NA					

Surrogate	%REC		
Dibromofluoromethane	103	74-128	
1,2-Dichloroethane-d4	102	76-130	
oluene-d8	99	80-120	
Bromofluorobenzene	103	76-125	



		Gasoline Oxyg	enates by G	C/MS
I ■b #:	167941		Location:	15101 Freedom Avenue
ient:	SOMA Environmental	. Engineering Inc.	Prep:	EPA 5030B
	2552	- -	Analysis:	EPA 8260B
Field ID:	TWB-1@16-16	5.5	Diln Fac:	0.9615
S Lab II			Batch#:	85093
atrix:	Soil		Sampled:	10/01/03
Jnits:	ug/Kg		Received:	10/02/03
msis:	as received	1	Analyzed:	10/06/03

The:

MS

Lab ID:

QC228047

Analyte	MSS Result	Spiked	Result	%REC	Limits
TBE	<0.2700	48.08	47.85	100	48-133
Surrogate	%REC Limits				
	700 74 170				

Surrogate	%REC	Limits
■ bromofluoromethane	100	74-128
2-Dichloroethane-d4	101	76-130
Toluene-d8	103	80-120
Promofluorobenzene	97	76-125

pe:

MSD

Lab ID:

		48.08	48.35	101	48-133	1	20
TBE		20.00					
Surrogate	%REC	' Limits					
libromofluoromethane	102	74-128					
,2-Dichloroethane-d4	101	76-130					
oluene-d8	99	80-120					
Bromofluorobenzene	97	76-125					



Gasoline Oxy	genates by GC	:/ms
Inb #: 167941 Gient: SOMA Environmental Engineering Inc. Project#: 2552	Location: Prep: Analysis:	15101 Freedom Avenue EPA 5030B EPA 8260B
Field ID: TWB-2@20-20.5 N S Lab ID: 167941-005 Ntrix: Soil Units: ug/Kg Sis: as received	Diln Fac: Batch#: Sampled: Received: Analyzed:	0.9615 85132 10/01/03 10/02/03 10/07/03

The:

MS

Lab ID:

QC228185

	MSS Re	en l'	Spiked	Result	& KEL	TIMETER
Analyte		0.2700	48.08	47.09	98	48-133
Surrogate	%REC	Limits				
■ bromofluoromethane	100	74-128				
2-Dichloroethane-d4	104	76-130				
	107	00 120				

80-120

76-125

107

103

•

be:

Toluene-dB .

Promofluorobenzene

MSD

Lab ID:

TBE		48.08	50.94	106	48-133	8	20
Surrogate	%REC	Limits					
Dibromofluoromethane	100	74-128					
,2-Dichloroethane-d4	103	76-130					
oluene-d8	- 102	80~120					
Bromofluorobenzene	99	76-125	•				



		Gasoline Oxyg	enates by G	C/MS
ab #:	167941		Location:	15101 Freedom Avenue
1, -	SOMA Environmental	Engineering Inc.	Prep:	EPA 5030B
			Analysis:	EPA 8260B
rield ID:	TWB-1@21.5-2	2	Diln Fac:	714.3
S Lab ID	167941-003		Batch#:	85137
trix:	Soil		Sampled:	10/01/03
nits:	ug/Kg		Received:	10/02/03
Asis:	as received		Analyzed:	10/07/03

T þe:

MS

Lab ID:

QC228183

Analyte	MSS Result	Spiked	Result	%REC	Limits
ГВЕ	<200.0	35,710	42,050	118	48-133
	SPPC Timits				

Surrogate	%REC	Limits
■ibromofluoromethane	98	74-128
,2-Dichloroethane-d4	101	76-130
Toluene-d8	97	80-120
<u> Promofluorobenzene</u>	100	76-125

Tee:

MSD

Lab ID:

Analyte TBE		Spiked 35,710	40,280	113	48-133	4	20
							·
Surrogate	%REC	Limits					
Qibromofluoromethane	97	74-128					
,2-Dichloroethane-d4	99	76-130					
oluene-d8	94	80-120					
Bromofluorobenzene	103	76-125					

Appendix E

Laboratory Reports of Groundwater Analytical and Chain of Custody Form



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 9471O, Phone (510) 486-0900

ANALYTICAL REPORT

Prepared for:

SOMA Environmental Engineering Inc. 2680 Bishop Dr. Suite 203 San Ramon, CA 94583

Date: 16-0CT-03

Lab Job Number: 167940

Project ID: 2552

Location: 15101 Freedom Avenue

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

This package may be reproduced only in its entirety.

NELAP # 01107CA

Page 1 of ________



Laboratory Number:

167940

Client:

SOMA Environmental Engineering Inc.

Project:

2552

Request Date:

10/2/2003

CASE NARRATIVE

This hardcopy data package contains sample results and batch QC results for two water samples requested from the above referenced project on October 2, 2003. The samples were received on ice and intact.

Total Volatile Hydrocarbons/BTXE:

In sampleTWB-1 the surrogate trifluorotoluene recovery exceeds control limits due to coelution of the surrogate peak with other hydrocarbon peaks. The associated surrogate bromofluorobenzene is acceptable.

No other analytical problems were encountered.

Purgeable Organics (EPA 8260):

No analytical problems were encountered.

CHAIN OF CUSTODY FORM

Page _ i _ of _i _

Analyses

Curtis & Tompkins, Ltd.

Analytical Laboratory Since 1878 2323 Fifth Street Berkeley, CA 94710 (510)486-0900 Phone (510)486-0532 Fax

•	C&T LOGIN#_	16796	<u>{(</u>

Project No:	2552	

Project Name: Pardel/SL: 15101 Freedom

Project P.O.:

Rep

Sampler:

Report To: Jaya Botak

Company: 40MA

Telephone: (925) 144.6600

Turnaround Time: Standard Fax: (925) 244.(600)

Turnaround	710	011 <u>-41 0-</u>	ľ	Vla	rix	ī		Φ.	res	erv	ativ	е					~	র		,					
Laboratory Number	Sample ID.	Sampling Date Time	-	1	aste	╗	# of Containers ∨ ⊘ A∻	HCL	H ₂ SO	HNO3	ICE	rene		d Notes		144	PIESO	lras	1 1						
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Notes: EDF Required

Hold on TWB. 1 Free Product - call Mansour S.

RELINQUISHED BY:

PORT DATE/TIME

Louce Bobel 10/2/03 11:32 mg

TE/TIME × m. \$

ROK

m. Sepekir

DATE/TIME

DATE/TIME

Signature

rec'd intact from refrigerator cold

DATE/TIME



Curtis & Tompkins Laboratories Analytical Report 15101 Freedom Avenue Location: 167940 EPA 5030B SOMA Environmental Engineering Inc. Prep: ient: Project#: 2552 10/01/03 Sampled: Water Matrix: 10/02/03 Received: ug/L its: 85018 tch#:

Field ID:

Туте:

TWB-1

SAMPLE

Lab ID:

167940-001

Analyzed:

10/03/03

	Result	RL	Diln Fa	c Analysis
Analyte	410,000	2,500	50.00	8015B
Gasoline C7-C12	2,200 C	25	50.00	EPA 8021B
nzene	1,300 C	25	50.00	EPA 8021B
#luene	9,400	25	50.00	EPA 8021B
Ethylbenzene	·	50	100.0	EPA 8021B
p-Xylenes	19,000	25	50.00	EPA 8021B
Xvlene	6,700			

Fifluorotoluene (FID) 179 * 57-150 50.00 8015B Bromofluorobenzene (FID) 127 65-144 50.00 8015B	Surrogate	%REC	Limits	Dila	Fac Analysis
Bromofluorobenzene (FID) 127 65-144 50.00 8015B		179 *	57-150	50.00	8015B
		127	65-144	50.00	B015B
	Trifluorotoluene (PID)	103	54-149	50.00	EPA 8021B
Comofluorobenzene (PID) 89 58-143 50.00 EPA 8021B		89	58-143	50.00	EPA 8021B

ld ID:

TWB-2

SAMPLE

ID:

167940-002

Diln Fac:

1.000

Analyzed:

10/02/03

Analyte	Result	RL	Analysis	
Gasoline C7-C12	1,700	50	8015B	•
	ND	0.50	EPA 8021B	
enzene oluene	ND	0.50	EPA 8021B	
	31	0.50	EPA 8021B	
Ethylbenzene	51	0.50	EPA 8021B	
,p-Xylenes		0.50	EPA 8021B	
-Xylene	ND	5.54		

			Analysis
Surrogate	SKUL	Limits	
rifluorotoluene (FID)	131	57-150	8015B .
Bromofluorobenzene (FID)	111	65-144	8015B
Trifluorotoluene (PID)	87	54-149	EPA 8021B
romofluorobenzene (PID)	83	58-143	EPA 8021B
TOMOTIGOTOBOTIZETIO (170)			

^{*=} Value outside of QC limits; see narrative

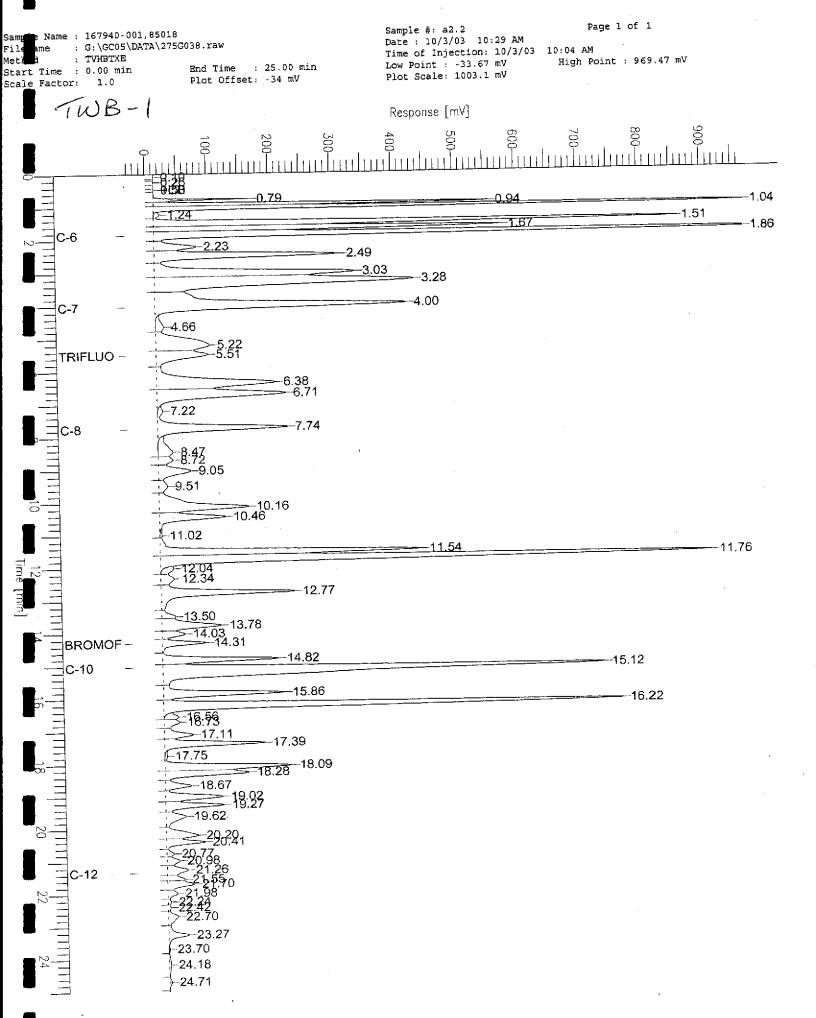
= Not Detected

RL= Reporting Limit

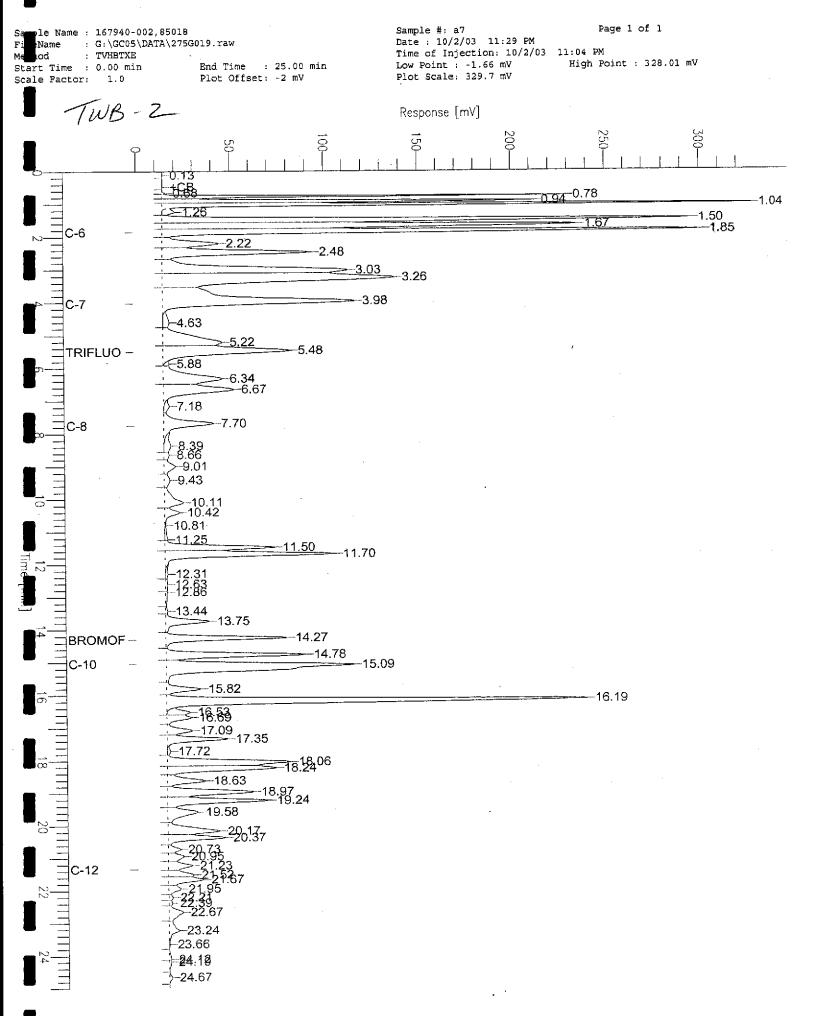
Page 1 of 2

⁼ Presence confirmed, but RPD between columns exceeds 40%

Chromatogram



Chromatogram





Curtis & Tompkins Laboratories Analytical Report 15101 Freedom Avenue Location: EPA 5030B SOMA Environmental Engineering Inc. Prep: ient: Project#: 2552 10/01/03 Sampled: Water atrix 10/02/03 Received: ug/L nits: 85018 Batch#:

BLANK

Diln Fac:

1.000

L ID:

QC227681

Analyzed:

10/02/03

Analyte	Result	RL	Analysis
Casoline C7-C12	ND	50	8015B
	ND	0.50	EPA 8021B
enzene Toluene	ND	0.50	EPA 8021B
	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
p-Xylenes Xylene	ND	0.50	EPA 8021B
- xylene	1917		

Surrogate	& PR(. Limits	Analysis
	0.00	1-0	8015B .
rifluorotoluene (FID)	91	57-150	
Bromofluorobenzene (FID)	90	65-144	8015B
Trifluorotoluene (PID)	70	54-149	EPA 8021B
romofluorobenzene (PID)	71	58-143	EPA 8021B

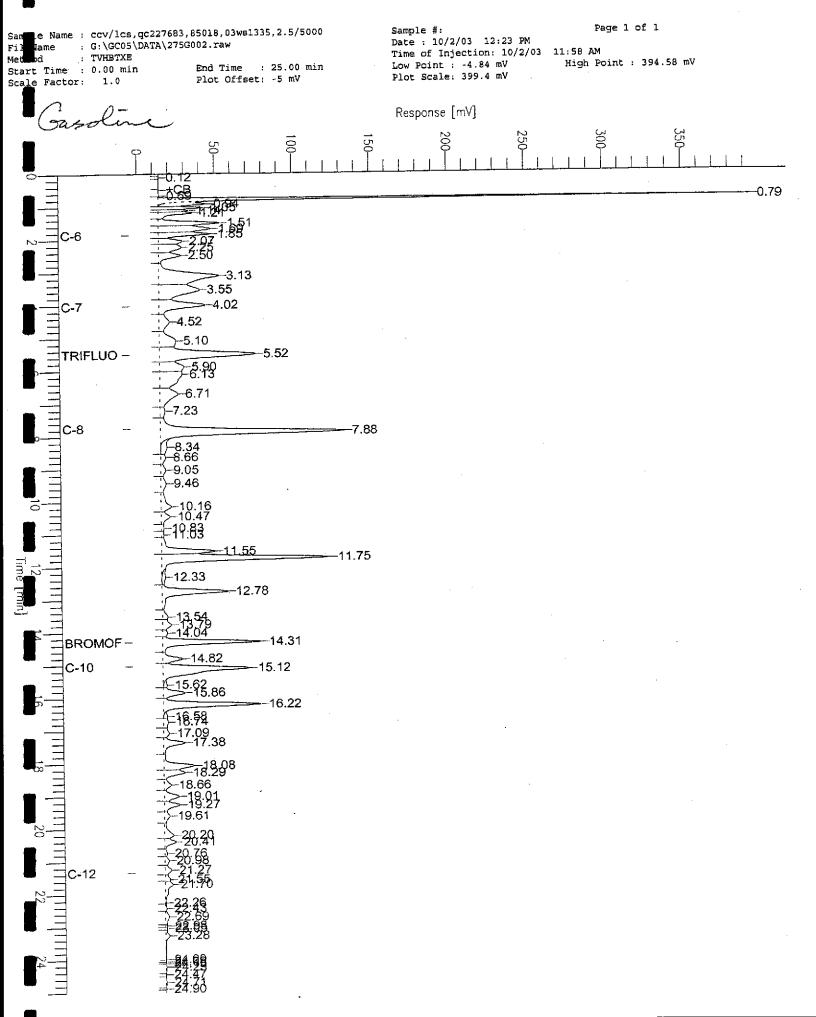
^{*=} Value outside of QC limits; see narrative

r= Presence confirmed, but RPD between columns exceeds 40%

⁼ Not Detected

RL= Reporting Limit

Chromatogram





	Curtis & Tompkins Labor	atories Ana	lytical Report
ib #: dient: Project#:	167940 SOMA Environmental Engineering Inc.	Location: Prep: Analysis:	15101 Freedom Avenue EPA 5030B EPA 8021B
Trpe: Lb ID: Matrix: Units:	LCS QC227682 Water ug/L	Diln Fac: Batch#: Analyzed:	1.000 85018 10/02/03

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-Cl2	<i>T</i>	JA.		
enzene	10.00	11.09	111	78-123
	10.00	10.05	100	79-120
luene Ethylbenzene	10.00	10.04	100	80-120
	20.00	20.95	105	76-120
p-Xylenes Xylene	10.00	10.34	103	80-121
Xylene	10.00	10.51		

Surrogate	Ţ	(esult	%RE(Limits	
rifluorotoluene (FID)	NA		_		
romofluorobenzene (FID)	NA				
Trifluorotoluene (PID)			81	54-149	4
romofluorobenzene (PID)			83	58-143	



Curtis & Tompkins Laboratories Analytical Report 15101 Freedom Avenue Location: 167940 SOMA Environmental Engineering Inc. EPA 5030B Prep: ient: 8015B Analysis: Project#: 2552 1.000 Diln Fac: LCS Type: 85018 Batch#: QC227683 : CI d 10/02/03 Analyzed: Water Matrix: ug/L Units:

****	Spiked	Result	%REC	Limits
Analyte Gasoline C7-C12	1,000	1,015	102	80-120
nzene		NΑ		
		NA		
Luene Ethylbenzene		NA		
p-Xylenes .		AM		
Xylene		NA		

Surrogate	Resi	ilt %REC	Limits	
rifluorotoluene (FID)		115	57-150	
romofluorobenzene (FID)		111	65-144	İ
Trifluorotoluene (PID)	NA			
romofluorobenzene (PID)	NA			



		Curtis &	Tompkins Labor	atories Anal	ytical Report
	16794 SOMA		Engineering Inc.	Location: Prep:	15101 Freedom Avenue EPA 5030B 8015B
roject#: ield ID: S Lab ID atrix: nits:		ZZZZZZZZZZ 167932-002 Water ug/L		Analysis: Batch#: Sampled: Received: Analyzed:	85018 09/26/03 10/02/03 10/02/03
ln Fac:		1.000			

Ty e:

MS

Lab ID:

QC227748

	MSS Result	Spiked	Result	*REC	Limits
Analyte	102.2	2,000	2,297	110	76-120
(soline C7-C12	10212	·	NA		
Benzene			NA		
Toluene			NA		
I hylbenzene			NA		
mp-Xylenes			NA		
o-Xylene					

Surrogate	Re	sult %REC	Limits
Trifluorotoluene (FID)		141	57-150
		135	65-144
Bromofluorobenzene (FID)	***		
cifluorotoluene (PID)	NA		
bromofluorobenzene (PID)	NA		

Type:

MSD

Lab ID:

	Spiked	Result	%REC	Limits	RPD	Lim
Analyte	2,000	2,272	108	76-120	1	20
Gasoline C7-C12	_, _,	NA				
Benzene	•	NA				
oluene thylbenzene		NA				
m,p-Xylenes		NA				
-Xylene		NA				

	Resu	lt %REC	Limits	
Surrogate Trifluorotoluene (FID)		143	57-150	
rilluorotoluene (FID)		138	65-144	
Trifluorotoluene (PID)	NА			
Bromofluorobenzene (PID)	NA			
240				



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue Location: 167940 EPA 5030B Prep: SOMA Environmental Engineering Inc. ient: EPA 8260B Analysis: Project#: 2552 10/01/03 Sampled: Water trix: 10/02/03 Received: ug/L

ld ID:

TWB-1

Diln Fac:

40.00

SAMPLE

Batch#:

85046

D:

167940-001

Analyzed:

10/04/03

Analyte	Resu	lt RL
pert-Butyl Alcohol (TBA)	ND	400
TBE	ND	20
Isopropyl Ether (DIPE)	ND	20
Ethyl tert-Butyl Ether (ETBE)	ND	20
sthyl tert-Amyl Ether (TAME)	ND	20
, 2-Dichloroethane	ND	20
1,2-Dibromoethane	ND	20

Surrogate	%REC	Limits	
Dibromofluoromethane	103	80-121	
1,2-Dichloroethane-d4	102	77-129	
pluene-d8	101	80-120	
bromofluorobenzene	100	80-123	

Field ID:

TWB-2

SAMPLE

167940-002

Diln Fac:

1.000

Batch#:

85095

Analyzed:

10/06/03

Analyte	Result	RL	
ert-Butyl Alcohol (TBA)	ND	10	
TBE	34	0.5	
Sopropyl Ether (DIPE)	ND	0.5	
thyl tert-Butyl Ether (ETBE)	ND	0.5	
ethyl tert-Amyl Ether (TAME)	ND	0.5	
.,2-Dichloroethane	4.7	0.5	
,2-Dichioroethane	ND	0.5	

Surrogate	%REC	Limits
Dibromofluoromethane	101	80-121
,2-Dichloroethane-d4	103	77-129
Foluene-d8	9 9	80-120
Bromofluorobenzene	100	80-123

= Not Detected RL= Reporting Limit Page 1 of 2



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue Location: 167940 EPA 5030B SOMA Environmental Engineering Inc. Prep: ient: EPA 8260B Analysis: Project#: 2552 10/01/03 Sampled: Water trix: 10/02/03 Received: its: ug/L

T**yp**e: Lab ID: BLANK QC227805 Batch#: Analyzed: 85046 10/03/03

Dan Fac:

1.000

)

Analyte	Resu	lt RL
tert-Butyl Alcohol (TBA)	ND	10
TEBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
sthyl tert-Amyl Ether (TAME)	ND	0.5
2-Dichloroethane	ND	0.5
1,2-Dibromoethane	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	101	80-121
1, 2-Dichloroethane-d4	102	77-129
oluene-d8	99	80-120
Bromofluorobenzene	106_	80-123

Type: Imb ID: BLANK QC227990 Batch#: Analyzed: 85095 10/06/03

ln Fac:

1.000

Result	RL
ND	10
ND	0.5
-	0.5
	ND ND ND ND

Dibromofluoromethane 100 80-121 1,2-Dichloroethane-d4 101 77-129	rogate	Surrogate	%REC	Limits
			100	80-121
			101	77-129
roluene-d8 100 80-120			100	80-120
Bromofluorobenzene 101 80-123	nzene		101	80-123

D= Not Detected RL= Reporting Limit Page 2 of 2



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue Location: 167940 EPA 5030B SOMA Environmental Engineering Inc. Prep: Lient: EPA 8260B Analysis: Project#: 2552 1.000 Diln Fac: LCS vpe: Batch#: 85095 QC227988 ab ID: 10/06/03 Analyzed: Water Matrix: ug/L <u>U</u>nits:

Spiked		Result	%REC	Limits	
	NA				
50.00		54.68	109	69-124	
•	NA				
	NА				
	NA				
		NA 50.00 NA NA	NA 50.00 54.68 NA NA	NA 50.00 54.68 109 NA NA	NA 50.00 54.68 109 69-124 NA NA

Surrogate	%REC	Limits	
Dibromofluoromethane	101	80-121	İ
2-Dichloroethane-d4	102	77-129	
oluene-d8	98	80-120	l
Bromofluorobenzene	102	80-123	



		Gasoline Oxyg	enates by G	ec/ms
Imb #: delient: Project#:	167940 SOMA Environmental 2552	Engineering Inc.	Location: Prep: Analysis:	15101 Freedom Avenue EPA 5030B EPA 8260B
Type: The ID: Matrix: Units:	LCS QC227989 Water ug/L		Diln Fac: Batch#: Analyzed:	1.000 85095 10/06/03

Analyte	Spiked	Result	%REC	Limits
	250.0	303.5	121	70-130
CETC-Duckt Imagenat (50.00	55.88	112	69-124
TEE (PIPE)	50.00	59.32	119	70-130
opropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)	50.00	60.35	121	70-130
Ethyl tert-Butyl Ether (ETBE)	50.00	51.59	103	70-130
Methyl tert-Amyl Ether (TAME)	50.00	<u> </u>		

Surrogate	%REC	Limits	
Dibromofluoromethane	96	80-121	
2-Dichloroethane-d4	97	77-129	
pluene-d8	98	80-120	
Bromofluorobenzene	103	80-123	



		Gasoline Öxyg	enates by GO	C/MS
Inb #: Calent: Project#:	167940 SOMA Environmental 2552	Engineering Inc.	Location: Prep: Analysis:	15101 Freedom Avenue EPA 5030B EPA 8260B
Matrix: Units: Diln Fac:	Water ug/L		Batch#: Analyzed:	85046 10/03/03

Type:

BS

Lab ID:

QC227801

Analyte	Spiked	Ī	(esult	%REC	Limits
tert-Butyl Alcohol (TBA)		NA	55.23	110	69-124
MTBE	50.00	NA	JJ 4 25 .		
popropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)		NА			
Methyl tert-Amyl Ether (TAME)		NA			

	Surrogate	%REC	Limits
	oibromofluoromethane	101	80-121
	2-Dichloroethane-d4	99	77-129
Н	bluene-d8	99	80-120
E	Bromofluorobenzene	101	80-123

Type:

BSD

Lab ID:

Analyte	Spiked	j	@esult	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	E0 00	AN	57.00	114	69-124	3	20
TBE CONTONNI Ether (DIPE)	50.00	NA	27.00				
sopropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)		AK AK					
Methyl tert-Amyl Ether (TAME)		IVA			<u> </u>		

	%REC	Limits
Surrogate		
Dibromofluoromethane	101	80-121
2-Dichloroethane-d4	100	77-129
oluene-d8	101	80-120
Bromofluorobenzene	100	80-123



		Gasoline Oxyg	enates by GO	:/MS
Fb #: (mient: Project#:	167940 SOMA Environmental 2552	Engineering Inc.	Location: Prep: Analysis:	15101 Freedom Avenue EPA 5030B EPA 8260B
Matrix: Units:	Water ug/L 1.000		Batch#: Analyzed:	85046 10/03/03

BS

Lab ID:

QC227803

	Spiked	Result	%REC	Limits
Analyte tert-Butyl Alcohol (TBA)	250.0	305.0	122	70-130
-	50.00	56.92	114	69-124
MTBE	50.00	59.33	119	70-130
sopropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)	50.00	61.28	123	70-130
Methyl tert-Amyl Ether (TAME)	50.00	49.90	100	70-130

Surrogate	%REC	Limits	
Dibromofluoromethane	98	80-121	-
≥ 2-Dichloroethane-d4	98	77-129	
oluene-d8	97	80-120	1
Bromofluorobenzene	101	80-123	

Type:

BSD

Lab ID: QC227804

	Spiked	Result	%REC	Limita	RPD	Lim
Analyte	250.0	300.4	120	70-130	2	20
Cere Ducy+ 11200110- (mail	50.00	56.84	114	69-124	0	20
MTBE	50.00	58.23	116	70-130	2	20
sopropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)	50.00	59.56	119	70-130	3	20
Methyl tert-Amyl Ether (TAME)	50.00	49.23	98	70-130	1	20

Dibromofluoromethane 100 80-121 7.2-Dichloroethane-d4 99 77-129 Soluene-d8 98 80-120	Surrogate	%REC	Limits
7.2-Dichloroethane-d4 99 77-129 cluene-d8 98 80-120		100	
oluene-d8 98 80-120			77-129
		98	80-120
Bromof luoropenzene 104 00 125	Bromofluorobenzene	104	80-123



		Gasoline Oxyg	enates by GC	/ms
	167940 SOMA Environmental 2552	Engineering Inc.	Location: Prep: Analysis:	15101 Freedom Avenue EPA 5030B EPA 8260B
Field ID: SS Lab ID Matrix: Units:	ZZZZZZZZZZ		Batch#: Sampled: Received: Analyzed:	85095 10/02/03 10/03/03 10/06/03

pe:

MS

Lab ID:

QC227991

Analyte	MSS I	Result	Spiked	Result	%REC	Limits
TBE	*******	<0.08800	50.00	56.75	113	67-127
	%RE(. Limits				
Surrogate ibromofluoromethane	97	80-121				
,2-Dichloroethane-d4	97	77-129				
Toluene-d8	98	80-120				

80-123

100

pe:

romofluorobenzene

MSD

Lab ID:

ITBE		50.00	54.29	109	67-127	4	20
Surrogate	%REC	' Limits					
Surrogate Dibromofluoromethane	97	80-121					
,2-Dichloroethane-d4	95	77-129					
roluene-d8	99	80-120					
Bromofluorobenzene	103	80-123					



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 9471O, Phone (510) 486-0900

ANALYTICAL REPORT

Prepared for:

SOMA Environmental Engineering Inc. 2680 Bishop Dr. Suite 203 San Ramon, CA 94583

Date: 02-OCT-03
Lab Job Number: 167647

Project ID: 2552

Location: 15101 Freedom Avenue

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

This package may be reproduced only in its entirety.

NELAP # 01107CA

Page 1 of 15____

CHAIN OF CUSTODY FORM



Analyses

Curtis & Tompkins, Ltd.

Analytical Laboratory Since 1878 2323 Fifth Street Borkolov CA 94710

. (3erkeley, C/ 510)486-090 510)486-050	00 Phone			Sampler:	R	w_	<u>Pa</u> 2	de	<u>~</u>			ļ	& CaUR	72						
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Signature

COLDAINTACT

DATE/TIME



Curtis & Tompkins Laboratories Analytical Report 15101 Freedom Avenue Location: 167647 Lab #: EPA 5030B SOMA Environmental Engineering Inc. Prep: Client: roject#: 2552 Batch#: 84626 Water itrix: 09/17/03 Received: units: ug/L 1.000 Diln Fac:

Field ID:

TWB-3 SAMPLE

Sampled: Analyzed:

09/17/03 09/19/03

b ID:

167647-001

Analyte	Result	RL	Analysis
Gasoline C7-C12 Penzene bluene thylbenzene m,p-Xylenes o-Xylene	ND ND ND ND ND ND ND ND ND ND	50 0.50 0.50 0.50 0.50 0.50	8015B EPA 8021B EPA 8021B EPA 8021B EPA 8021B EPA 8021B

E.	Surrogate	%REC	Limits	Analysis
۴	Prifluorotoluene (FID)	96	57-150	8015B
1	Bromofluorobenzene (FID)	130	65-144	8015B
	rifluorotoluene (PID)	77	54-149	EPA 8021B
	romofluorobenzene (PID)	106	58-1 <u>43</u>	EPA 8021B

eld ID:

Lab ID:

TWB-4A SAMPLE 167647-002 Sampled: Analyzed: 09/16/03 09/18/03

	Pesuit	RL	Analysis
Analyte asoline C7-C12	ND	50	8015B
enzene	ND	0.50 0.50	EPA 8021B EPA 8021B
Toluene	ND ND	0.50	EPA 8021B
Ethylbenzene ,p-Xylenes	ND	0.50	EPA 8021B
-Xvlene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
rifluorotoluene (FID)	98	57-150	8015B
romofluorobenzene (FID)	134	65-144	8015B
rifluorotoluene (PID)	78	54-149	EPA 8021B
Bromofluorobenzene (PID)	108	<u> 58-143</u>	EPA 8021B

H= Heavier hydrocarbons contributed to the quantitation Y= Sample exhibits chromatographic pattern which does not resemble standard D= Not Detected

RL= Reporting Limit Page 1 of 3

4.0

Chromatogram

Page 1 of 1 Sample #: a7 Name : 167647-001,84626 Date : 9/19/03 02:00 PM : G:\GC05\DATA\261G024.raw Time of Injection: 9/19/03 01:49 AM : TVHBTXE Meti High Point : 138.73 mV Low Point : 8.55 mV End Time : 25.00 min Start Time : 0.00 min Plot Scale: 130.2 mV Scale Factor: 1.0 Plot Offset: 9 mV TWB-3 Response [mV] -0.79-1.281.66 C-6 >-2.25 2.52 -2.87 3,16 -3.79-5.54TRIFLUO -5.93 6.23 6.69 C-8 -13.1013.45 -13.82 -14.33 BROMOF-C-10 15.58 15.88 16.28 --16.58 -17.41 -<u>17.78</u> 18.11 **--18.67** ____19.32 ____19.65 C-12 =24,583 24.14

24.75



Curtis & Tompkins Laboratories Analytical Report 15101 Freedom Avenue EPA 5030B Location: 167647 Lab #: SOMA Environmental Engineering Inc. Prep: Client: Noject#: Ntrix: Units: 84626 09/17/03 2552 Batch#: Water Received: ug/L 1.000 Diln Fac:

Field ID:

TWB-5 SAMPLE Sampled: Analyzed: 09/16/03 09/18/03

Type: ID:

167647-003

			Amaliya	G No.
Analyte	Result ND	50	8015B	
Gasoline C7-C12	ND	0.50	EPA 8021B	Ï
Inzene	ND	0.50	EPA 8021B	
Toluene Thylbenzene	ND	0.50	EPA 8021B EPA 8021B	
m, p-Xylenes	ND	0.50 0.50	EPA 8021B	
o-Xylène	ND	0.30		

Currogate	%REC	Limits	Analysis
Trifluorotoluene (FID) Bromofluorobenzene (FID) Trifluorotoluene (PID) romofluorobenzene (PID)	98	57-150	8015B
	132	65-144	8015B
	79	54-149	EPA 8021B
	109	58-143	EPA 8021B

eld ID:

TWB-6 SAMPLE 167647-004 Sampled: Analyzed: 09/17/03 09/18/03.

Lab ID:	167647-004			Analys	* C
asoline C7 enzene Toluene Ethylbenzen , p-Xylenes	ne	Result ND ND ND ND ND ND ND ND ND N	RL 50 0.50 0.50 0.50 0.50 0.50	8015B EPA 8021B EPA 8021B EPA 8021B EPA 8021B EPA 8021B	
Xvlene					

Surrogate	2 P F C	Limits	Analysis
rifluorotoluene (FID) romofluorobenzene (FID) rifluorotoluene (PID) Bromofluorobenzene (PID)	96 131 77 106	57-150 65-144	8015B 8015B EPA 8021B EPA 8021B

H= Heavier hydrocarbons contributed to the quantitation V= Sample exhibits chromatographic pattern which does not resemble standard D= Not Detected

RL= Reporting Limit Page 2 of 3



Curtis & Tompkins Laboratories Analytical Report 15101 Freedom Avenue EPA 5030B Location: 167647 Lab #: SOMA Environmental Engineering Inc. 2552 Prep: <u>Cl</u>ient: roject#: trix: 84626 Batch#: Water 09/17/03 Received: ug/L 1.000 Units: Diln Fac:

Type: Lab ID: BLANK QC226154 Analyzed:

09/18/03

	Result	RL	Analysis	
Analyte Gasoline C7-C12	ND	50	8015B EPA 8021B	
Benzene	ND	0.50 0.50	EPA 8021B	
pluene chylbenzene	ND ND	0.50	EPA 8021B	
, p-Xylenes	ND	0.50	EPA 8021B EPA 8021B	
o-Xylene	<u>ND</u>	0.50	EPA 8021B	

Surrogate	%REC	Limits	Analysis
rifluorotoluene (FID) Bromofluorobenzene (FID) Trifluorotoluene (PID) romofluorobenzene (PID)	92	57-150	8015B
	123	65-144	8015B
	74	54-149	EPA 8021B
	98	58-143	EPA 8021B

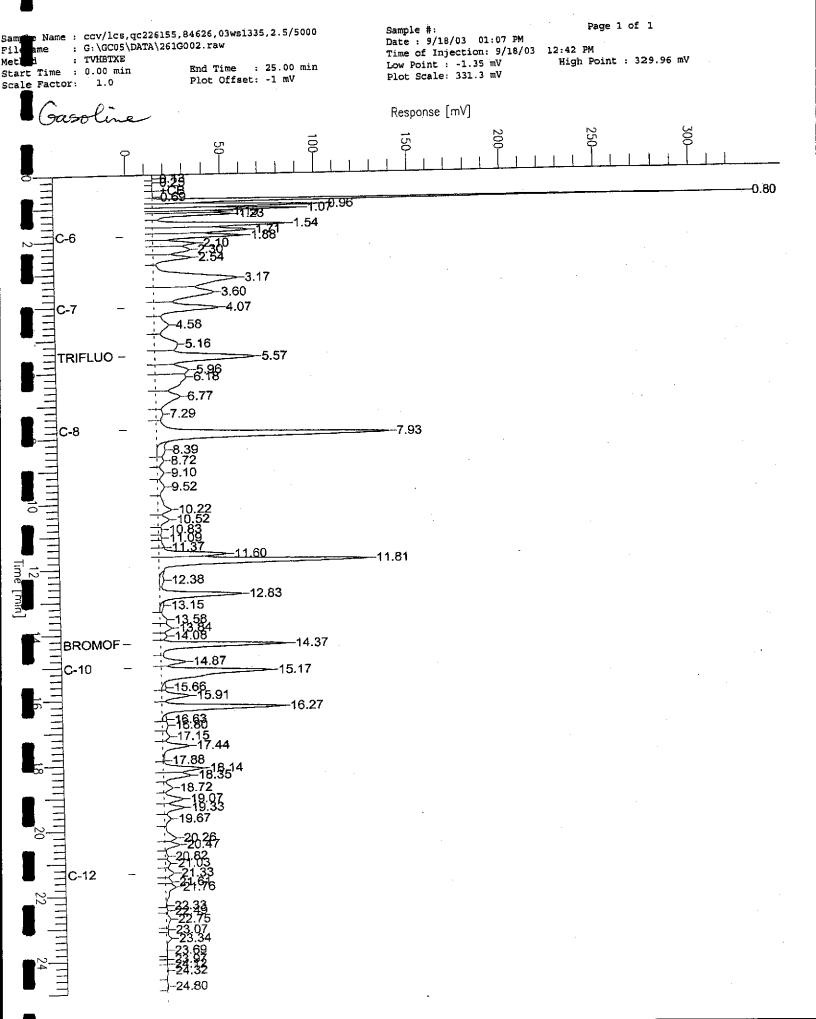
H= Heavier hydrocarbons contributed to the quantitation

Y= Sample exhibits chromatographic pattern which does not resemble standard

D= Not Detected

RL= Reporting Limit Page 3 of 3

Chromatogram





Total Volatile Hydrocarbons 15101 Freedom Avenue Location: 167647 EPA 5030B Prep: SOMA Environmental Engineering Inc. lient: 8015B Analysis: Project#: 2552 1.000 Diln Fac: LCS ype: 84626 Batch#: QC226155 ab ID: 09/18/03 Analyzed: Water Matrix: ug/L Units:

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,067	107	80-120

Surrogat	:e	%REC	Limits		
Trifluorotoluene	(FID)	100	57-150		
Promofluorobenzene		116	65-144		



8	Benzene, Toluene, E	thylbenzene	
1 1 b #:	167647	Location:	15101 Freedom Avenue
	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Gient:		Analysis:	EPA 8021B
Project#:	LCS	Diln Fac:	1.000
Tipe:	QC226156	Batch#: Analyzed:	84626
inb ID: Matrix:	Water		09/18/03
<u>Un</u> its:	ug/L		

	Spiked	Result	%REC	Limits
Analyte	10.00	9.752	98	78-123
Benzene	10.00	8.989	90	79-120
luene hylbenzene	10.00	9.156	92	80-120
	20.00	19.27	96	76-120
m,p-Xylenes	10.00	9,470	95	80-121
~ Xylene	10.00			

	Surrogate	%REC	Limits	
7	rifluorotoluene (PID)	67	54-149	
	comofluorobenzene (PID)	90	58-143	



1			Total Volati	le Hydrocarbons	
1 b #:	16764	7		Location:	15101 Freedom Avenue
ient:	SOMA	Environmental	Engineering Inc.	. Prep:	EPA 5030B
Project#:				Analysis:	8015B
Field ID:	2002	ZZZZZZZZZZZ		Batch#:	84626
ISS Lab ID	١.	167650-002		Sampled:	09/17/03
Matrix:	•	Water		Received:	09/17/03
Wallix: Units:		ug/L		Analyzed:	09/18/03
ln Fac:		1.000			

Tibe:

MS

Lab ID:

QC226242

	MCC Pacult	Spiked	Result	%REC	Limits
Analyte	10.75	2 ብሰብ	2.211	110	76-120
asoline C7-C12	19.75	2,000	2,111		

	Surrogate	%REC	Limits	
ĥ	rifluorotoluene (FID)	116	57-150	ì
	romofluorobenzene (FID)	141	65-144	

Type:

MSD

Lab ID:

		Spiked	Result	%REC	Limits	KGND	10.1 m
	Analyte		2,204	109	76-120	0	20
Wasoline C	C7-C12	2,000	2,201				

	Surrogate	%RE(C Limits	Cooper
ļ	rifluorotoluene (FID)	110	57-150	
	Bromofluorobenzene (FID)	136	65-144	L



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue EPA 5030B Location: 167647 Lab #: Prep: Analysis: SOMA Environmental Engineering Inc. Client: Project#: Marix: Units: EPA 8260B 84647 2552 Batch#: Water 09/17/03 Received: ug/L 1.000 Diln Fac:

Field ID:

TWB-3 SAMPLE Sampled: Analyzed:

09/17/03 09/18/03

Type: La ID:

167647-001

tert-Butyl Alcohol (TBA) M BE I bpropyl Ether (DIPE) E hyl tert-Butyl Ether (ETBE) Methyl tert-Amyl Ether (TAME) 1_2-Dichloroethane	Resul ND ND ND ND ND ND ND	TE RE 10 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.
1_2-Dichloroethane 1_2-Dibromoethane	ND	0.5

	%REC	Limits
Dibromofluoromethane	97	80-121
162-Dichloroethane-d4	91	77-129
Tluene-d8	104	80-120
H omofluorobenzene	103_	80-123

TWB-4A SAMPLE

Sampled: Analyzed:

09/16/03 09/18/03

167647-002

		4444 Te440000000000000000000000000000000	3.1
Analyte	NTD	- 1 - 0 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	10
ert-Butyl Alcohol (TBA)	ИD	1 0	0.5
MTDD		1.8	0.5
Toonwood Rther (DIPE)	ND	•	0.5
THINGS FAYE-BUEVE BUILDE (BEDD)	ND		0.5
thyl tert-Amyl Ether (TAME)	ND		0.5
1,2-Dichloroethane	ND		0.5
1,2-Dichiofocchane	ND		U.5

	0000000 A A A A A A A A A A A A A A A A	Yellow the
Surrogate	TRACE	LITALLED
There floor omethane	95	80-121
bromofluoromethane		77-129 l
1,2-Dichloroethane-d4	88	
E-1 30	101	80-120
Toluene-d8	106	80-123
romofluorobenzene	<u> 106 </u>	60-123



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue EPA 5030B Location: 167647 Lab #: SOMA Environmental Engineering Inc. Prep: Analysis: Client: EPA 8260B 84647 oject#: trix: 2552 Batch#: Water 09/17/03 Received: ug/L 1.000 Units: Diln Fac:

Field ID: Type: ID:

TWB-5 SAMPLE

167647-003

Sampled: Analyzed: 09/16/03 09/19/03

Result Analyte 10 ND tert-Butyl Alcohol (TBA) 0.5 ND BE Propropyl Ether (DIPE)
Hyl tert-Butyl Ether (ETBE)
Methyl tert-Amyl Ether (TAME) 0.5 ND 0.5 ND 0.5 ND 2.0 2-Dichloroethane 0.5 ND 2-Dibromoethane

%REC Limits Surrogate 80-121 Dibromofluoromethane 97 77-129 88 2-Dichloroethane-d4 80-120 101 bluene-d8 108 80-123 comof<u>luorobenzene</u>

ld ID:

TWB-6 SAMPLE 167647-004

Sampled: Analyzed: 09/17/03 09/19/03

Lab ID: Result Analyte 10 ert-Butyl Alcohol (TBA) ND 0.5 ND MTBE Isopropyl Ether (DIPE)
thyl tert-Butyl Ether (ETBE)
ethyl tert-Amyl Ether (TAME) ND 0.5 ND 0.5 ND 0.5 ,2-Dichloroethane ND 0.5 ND 1,2-Dibromoethane

Surrogate Surrogate	<u> %REC</u> 96	1.1m1 cs 80-121	
1,2-Dichloroethane-d4	89	77-129	,
Toluene-d8	102 109	80-120 80-123	
romofluorobenzene	109	60-123	



Gasoline Oxygenates by GC/MS 15101 Freedom Avenue EPA 5030B Location: Lab #: 167647 SOMA Environmental Engineering Inc. Prep: Client: Analysis: Batch#: EPA 8260B oject#: trix: 2552 84647 Water 09/17/03 ug/L 1.000 Received: Units: Diln Fac:

Type: Lab ID: BLANK QC226252 Analyzed:

09/18/03

Analyte	Res	ult RL
tert-Butyl Alcohol (TBA)	ND	0.5
MTBE Dopropyl Ether (DIPE)	ND	0.5
mopropyl Ether (DIPE) hyl tert-Butyl Ether (ETBE) thyl tert-Amyl Ether (TAME)	ND. ND	0.5
1.2-Dichloroethane	ND	0.5
1.2-Dibromoethane	ND_	

Surrogate	%REC	lisimatis	
bibromofluoromethane	93	80-121	
1,2-Dichloroethane-d4	87	77-129	
Dluene-d8	101	80-120	·
omofluorobenzene	110	<u>80-123</u>	
			

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Lab ID:

Analyte	Result
tert-Butyl Alcohol (TBA)	NA
MERE	NA
sopropyl Ether (DIPE) hyl tert-Butyl Ether (ETBE)	NA
hvl tert-Butyl Ether (ETBE)	NA
Methyl tert-Amyl Ether (TAME)	NA .
1,2-Dichloroethane	NA
2-Dibromoethane	NA

			- 4-2
	Surrogate	ne:	1, 9, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4,
Ϊ́́Τ	Dibromofluoromethane	NA	
	2-Dichloroethane-d4	NA	
-11	bluene-d8	NA	1
11	romofluorobenzene	NA	
	Collocation		



	Gasoline Oxyg	enates by GO	:/MS
1 b #: (ient: Project#:	167647 SOMA Environmental Engineering Inc. 2552	Location: Prep: Analysis:	15101 Freedom Avenue EPA 5030B EPA 8260B
Matrix: Waits: Diln Fac:	Water ug/L 1.000	Batch#: Analyzed:	84647 09/18/03

Type:

BS

Lab ID:

QC226248

Analyte	Spiked		Result	%RE(: Limits
tert-Butyl Alcohol (TBA)		NA	45 05	96	69-124
MTBE	50.00		47.95	96	69-124
opropyl Ether (DIPE)		NA			
copropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)		NA			
Methyl tert-Amyl Ether (TAME)		NA			

***	Surrogate	%REC	Limits
I	ibromofluoromethane	95	80-121
14	2-Dichloroethane-d4	88	77-129
11	oluene-d8	103	80-120
I	romofluorobenzene	95	80-123

Type:

BSD

Lab ID:

Analyte	Sniked	Result	%RE(limits	RPD	Lim
tert-Butyl Alcohol (TBA)	NA					
MTBE	50.00	46.61	93	69-124	3	20
sopropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)	NA					
Ethyl tert-Butyl Ether (ETBE)	NA		·			
Methyl tert-Amyl Ether (TAME)	NA NA					

Surrogate	%RBC	Limits
Dibromofluoromethane	94	80-121
, 2-Dichloroethane-d4	85	77-129
oluene-d8	100	80-120
Bromofluorobenzene	97	80-123



		Gasoline Oxyg	enates by GC	:/MS
IPo #: Client: Project#:	167647 SOMA Environmental 2552	Engineering Inc.	Location: Prep: Analysis:	15101 Freedom Avenue EPA 5030B EPA 8260B
Matrix: Units: Diln Fac:	Water ug/L		Batch#: Analyzed:	84647 09/18/03

Type:

BS

Lab ID:

QC226250

	Spiked	Result	%REC	Limits
Analyte tert-Butyl Alcohol (TBA)	250.0	226.5	91	70-130
		AN		i
MTBE	50.00	57.09	114	70-130
opropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)	50.00	52.83	106	70-130
Ethyl tert-Butyl Ether (EIBE)	50.00	46.51	93	70-130
Methyl tert-Amyl Ether (TAME)	30.00			

***	Surrogate	Res	ult
I	Dibromofluoromethane	NA	
	2-Dichloroethane-d4	AN	
Н	oluene-d8	NA	
	Bromofluorobenzene	NA	

Type:

BSD

Lab ID:

	Spiked	Result	%REC	Limits	RPD	Lim
Analyte tert-Butyl Alcohol (TBA)	250.0	217.3	87	70-130	4	20
MTBE		NA				20
sopropyl Ether (DIPE)	50.00	57.79	116	70-130	7	20 20
sopropyl Ether (DIPE) Ethyl tert-Butyl Ether (ETBE)	50.00	53.52	107	70-130 70-130	⊥	20
Methyl tert-Amyl Ether (TAME)	50.00	47.88	96	70-130		

Surrogate	Result	
Dibromofluoromethane	NA	
2,2-Dichloroethane-d4	NA	1
oluene-d8	NA	
Bromofluorobenzene	NA	