

Casimiro and Josephine Damele
3750 Victor Avenue
Oakland CA 94619

18 June 2001

Project No. P257

Letter Report
Groundwater Monitoring
4401 Market Street
Oakland CA

JUN 20 2001

Dear Mr. and Ms. Damele:

This letter report documents groundwater monitoring conducted 30 May 2001 for wells MW1, MW3, MW4, MW5, MW6, and MW7 at/near the subject property. The results of our work are summarized in the following:

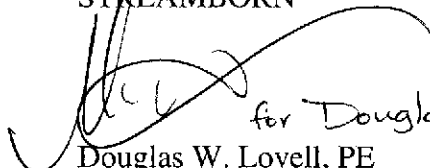
- Table 1 provides a chronology of environmental activities.
- Table 2 summarizes groundwater level data.
- Table 3 summarizes groundwater purging and sampling information since 2001.
- Table 4 summarizes laboratory results.
- Table 5 summarizes results of free product monitoring.
- Figure 1 provides a location map.
- Figure 2 shows well locations.
- Figure 3 shows groundwater elevation and gradient data.
- Attachment 1 contains the standard operating procedure we used.
- Attachment 2 contains the groundwater sampling forms.
- Attachment 3 contains the laboratory report and chain-of-custody form.

We intend to sample the wells next in August 2001.

If you have any questions or comments, please call.

Sincerely,

STREAMBORN



for Douglas Lovell
Douglas W. Lovell, PE
Geoenvironmental Engineer

cc: Don Hwang/Alameda County Department of Environmental Health, Alameda CA

Table 1
Environmental Chronology
4401 Market Street, Oakland CA

| Date | Activities Performed By | Description |
|------------------------|---------------------------|---|
| Unknown | Unknown | <ul style="list-style-type: none"> • Four underground gasoline tanks (one 1,000-gallon and three 500-gallon tanks) were installed. • W.A. Craig (1997b) reported that the structure at the property was constructed in 1943 and used as a gasoline station until the 1970's. |
| 22 June 1990 | Environmental Bio-Systems | <ul style="list-style-type: none"> • The 4 underground gasoline tanks were removed. Removal of the fuel dispensers, product piping, and pump island was not documented. Soil excavated during the tank removal was reused to backfill the excavation. • Soil samples were collected below the tanks and from the excavated soil. Soil samples were analyzed for TPH-gasoline and BTEX. Soil sampling indicated a release of gasoline compounds. |
| 6 September 1990 | W.A. Craig | <ul style="list-style-type: none"> • Two trenches were excavated to a depth of approximately 5 feet in the vicinity of the former dispenser island. • Contaminated soil was observed but no laboratory analyses were performed. Soil excavated during trenching was reused to backfill the trenches. |
| 27 and 28 October 1994 | W.A. Craig | <ul style="list-style-type: none"> • Seven borings were drilled (SB1, SB2, SB3, SB4, MW1, MW2, and MW3); three of which were completed as monitoring wells (MW1, MW2, and MW3). • Free product, presumably gasoline, was observed in one of the borings (SB2) at the southwest corner of the property. • Soil samples were analyzed for TPH-gasoline and BTEX. |
| 8 November 1994 | W.A. Craig | <ul style="list-style-type: none"> • Groundwater monitoring was conducted for wells MW1, MW2, and MW3. • Samples were analyzed for TPH-gasoline and BTEX. |
| 14 February 1995 | W.A. Craig | <ul style="list-style-type: none"> • Groundwater monitoring was conducted for wells MW1, MW2, and MW3. • Samples were analyzed for TPH-gasoline and BTEX. |
| 7 June 1995 | W.A. Craig | <ul style="list-style-type: none"> • Groundwater monitoring was conducted for wells MW1, MW2, and MW3. • Samples were analyzed for TPH-gasoline and BTEX. |
| 29 August 1995 | W.A. Craig | <ul style="list-style-type: none"> • Groundwater monitoring was conducted for wells MW1, MW2, and MW3. • Samples were analyzed for TPH-gasoline and BTEX. |
| 8 December 1995 | W.A. Craig | <ul style="list-style-type: none"> • Groundwater monitoring was conducted for wells MW1, MW2, and MW3. • Samples were analyzed for TPH-gasoline and BTEX. |
| 7 March 1996 | W.A. Craig | <ul style="list-style-type: none"> • Groundwater monitoring was conducted for wells MW1, MW2, and MW3. • Samples were analyzed for TPH-gasoline, BTEX, and MtBE. |
| 19 June 1996 | W.A. Craig | <ul style="list-style-type: none"> • Groundwater monitoring was conducted for wells MW1, MW2, and MW3. • Samples were analyzed for TPH-gasoline, BTEX, and MtBE. |
| 20 December 1996 | W.A. Craig | <ul style="list-style-type: none"> • Groundwater monitoring was conducted for wells MW1, MW2, and MW3. • Samples were analyzed for TPH-gasoline, BTEX, and MtBE. |
| 12 June 1997 | W.A. Craig | <ul style="list-style-type: none"> • Groundwater monitoring was conducted for wells MW1, MW2, and MW3. • Samples were analyzed for TPH-gasoline, BTEX, and MtBE. |
| 31 March 1999 | Streamborn | <ul style="list-style-type: none"> • Groundwater levels measured in wells MW1, MW2, and MW3. |
| April and July 1999 | Streamborn | <ul style="list-style-type: none"> • Nine borings were drilled in Market Street, 44th Street, and at 903 44th Street (B8 through B16). Free product, presumably gasoline, was observed in boring B10. • Soil samples and grab groundwater samples were collected from all 9 borings. Samples were analyzed for TPH-gasoline, BTEX, and fuel oxygenates. |
| 4-5 January 2001 | Streamborn | <ul style="list-style-type: none"> • Four monitoring wells well (MW4, MW5, MW6, and MW7) were installed adjacent to the subject property in 44th Street and at 903 44th Street. • Soil samples were collected and analyzed for TPH-Gasoline, BTEX, and fuel oxygenates. • Level survey was performed. |
| 1 February 2001 | Streamborn | <ul style="list-style-type: none"> • Wells MW4, MW5, MW6, and MW7 were developed. • Groundwater samples were collected from wells MW1, MW3, MW4, MW5, MW6 and MW7. Samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates. • Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7. • Wells MW4, MW5, and MW6 were monitored for free product. |
| 9 March 2001 | Streamborn | <ul style="list-style-type: none"> • Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7. • Wells MW4, MW5, and MW6 were monitored for free product. |
| 23 April 2001 | Streamborn | <ul style="list-style-type: none"> • Water levels were measured in MW1, MW2, MW3, MW4, MW5, MW6, and MW7. • Wells MW4, MW5, and MW6 were monitored for free product. |
| 30 May 2001 | Streamborn | <ul style="list-style-type: none"> • Water levels were measured in MW1, MW3, MW4, MW5, MW6, and MW7. • Wells MW4, MW5, and MW6 were monitored for free product. |

General Notes

- (a) TPH = Total petroleum hydrocarbons.
- (b) BTEX = Benzene, toluene, ethylbenzene, and xylenes.
- (c) MtBE = Methyl tertiary butyl ether.

Table 2
Groundwater Levels
4401 Market Street
Oakland CA

| Location | | MW1 | | MW2 | | MW3 | | MW4 | | MW5 | | MW6 | | MW7 | | Groundwater Gradient | |
|-----------------------------------|----------------------|------------------------------|---------------------------|------------------------------|---------------------------|------------------------------|---------------------------|------------------------------|---------------------------|------------------------------|---------------------------|------------------------------|---------------------------|------------------------------|---------------------------|----------------------|-----------|
| Ground Surface | | Elev = 998.74 | | Elev = 998.07 | | Elev = 999.64 | | Elev = 998.18 | | Elev = 997.78 | | Elev = 998.02 | | Elev = 999.12 | | | |
| Measuring Point | | TOC N Side, Elev = 998.22 | | TOC N Side, Elev = 997.73 | | TOC N Side, Elev = 998.90 | | TOC N Side, Elev = 997.87 | | TOC N Side, Elev = 997.33 | | TOC N Side, Elev = 997.50 | | TOC N Side, Elev = 998.69 | | | |
| Measured By | Intercepted Interval | Depth 9 to 25 | Elev 973.7 to 989.7 | Depth 9 to 25 | Elev 973.1 to 989.1 | Depth 9 to 25 | Elev 974.6 to 990.6 | Depth 9 to 25 | Elev 973.2 to 989.2 | Depth 9 to 25 | Elev 972.8 to 988.8 | Depth 9 to 25 | Elev 973.0 to 989.0 | Depth 9 to 25 | Elev 974.1 to 990.1 | Direction | Magnitude |
| W.A. Craig | 14 February 1995 | 12.65 | 985.57 | 12.12 | 985.61 | 13.45 | 985.45 | * | * | * | * | * | * | * | * | | |
| W.A. Craig | 7 June 1995 | 14.62 | 983.60 | 14.38 | 983.35 | 14.64 | 984.26 | * | * | * | * | * | * | * | * | | |
| W.A. Craig | 29 August 1995 | 15.04 | 983.18 | 14.40 | 983.33 | 14.94 | 983.96 | * | * | * | * | * | * | * | * | | |
| W.A. Craig | 8 December 1995 | 15.94 | 982.28 | 15.22 | 982.51 | 15.82 | 983.08 | * | * | * | * | * | * | * | * | | |
| W.A. Craig | 7 March 1996 | 12.36 | 985.86 | 12.04 | 985.69 | 12.89 | 986.01 | * | * | * | * | * | * | * | * | | |
| W.A. Craig | 19 June 1996 | 13.70 | 984.52 | 13.38 | 984.35 | 13.94 | 984.96 | * | * | * | * | * | * | * | * | | |
| W.A. Craig | 20 December 1996 | 12.35 | 985.87 | 12.22 | 985.51 | 12.86 | 986.04 | * | * | * | * | * | * | * | * | | |
| W.A. Craig | 12 June 1997 | 14.64 | 983.58 | 14.08 | 983.65 | 14.50 | 984.4 | * | * | * | * | * | * | * | * | | |
| Streamborn | 31 March 1999 | 13.03 | 985.19 | 12.58 | 985.15 | 13.34 | 985.56 | * | * | * | * | * | * | * | * | | |
| Streamborn | 1 February 2001 | 13.77 | 984.45 | 13.21 | 984.52 | 14.01 | 984.89 | 13.22 | 984.65 | 13.14 | 984.19 | 13.31 | 984.19 | 14.76 | 983.93 | | |
| Streamborn | 9 March 2001 | 12.54 | 985.68 | 12.30 | 985.43 | 13.32 | 985.58 | 12.28 | 985.59 | 11.70 | 985.63 | 12.54 | 984.96 | 13.94 | 984.75 | | |
| Streamborn | 23 April 2001 | 14.01 | 984.21 | 13.36 | 984.37 | 14.15 | 984.75 | 13.05 | 984.82 | 13.30 | 984.03 | 13.39 | 984.11 | 14.63 | 984.06 | | |
| Streamborn | 30 May 2001 | 14.74 | 983.48 | NM | NM | 14.67 | 984.23 | 13.93 | 983.94 | 14.14 | 983.19 | 14.17 | 983.33 | 15.79 | 982.90 | N 222° E | 0.01 |
| Total Depth (Last Measurement) | | 24.56 | | 24.52 | | 24.59 | | 24.56 | | 24.99 | | 24.85 | | 24.56 | | | |

General Notes

- (a) Measurements cited in units of feet (site-specific datum).
- (b) Measurements by W.A. Craig (Napa CA) and Streamborn (Berkeley CA).
- (c) TOC = top of PVC casing. N = north. Measuring points are the top of PVC casing, north side.
- (d) Depth to water and total depth measured relative to the top of PVC casing.
- (e) Depth of intercepted interval measured relative to the ground surface, and corresponds to the sand pack interval.
- (f) NM = not measured.
- (g) Elevations referenced to assumed (site-specific) datum: Top of concrete, southeastern edge of eastern garage door, assumed elevation = 1000.00 feet. Elevation survey performed 5 January 2001 by Streamborn (Berkeley CA).

Table 3
Groundwater Purging and Sampling Information since 2001
4401 Market Street
Oakland CA

| Location | Sample Date | Sample Type | Dissolved Oxygen (mg/L) | pH | Specific Conductance ($\mu\text{mho}/\text{cm}^2$ at field temperature) | Temperature (degrees C) | ORP (mV) | Turbidity and Color | Purge Method | Purge Duration (minutes) | Volume Purged (gallons) | Purged Dry ? | Standing Water Casing Volumes Removed |
|----------|-------------|---------------|-------------------------|-----|--|-------------------------|----------|---------------------|------------------|--------------------------|-------------------------|--------------|---------------------------------------|
| MW1 | 1 Feb 2001 | Grab (bailer) | 3.1 | 6.7 | 530 | 18.3 | -210 | Clear, none | Submersible pump | 9 | ± 5 | Yes | ± 3 |
| | 30 May 2001 | Grab (bailer) | 1.0 | 6.8 | 560 | 24.2 | 30 | Clear, none | Submersible pump | 40 | ± 5 | Yes | ± 3 |
| MW3 | 1 Feb 2001 | Grab (bailer) | 5.0 | 6.7 | 370 | 17.4 | -230 | Clear, none | Submersible pump | 4 | ± 5 | No | ± 3 |
| | 30 May 2001 | Grab (bailer) | 5.8 | 7.0 | 390 | 23.6 | 60 | Clear, none | Submersible pump | 26 | ± 5 | Yes | ± 3 |
| MW4 | 1 Feb 2001 | Grab (bailer) | 5.2 | 6.8 | 580 | 18.2 | -210 | Cloudy, grey | Submersible pump | 47 | ± 15 | Yes | ± 9 |
| | 30 May 2001 | Grab (bailer) | 1.5 | 6.8 | 700 | 22.8 | 20 | Clear, none | Submersible pump | 23 | ± 6 | Yes | ± 3 |
| MW5 | 1 Feb 2001 | Grab (bailer) | 0.8 | 6.7 | 640 | 18.1 | -250 | Turbid, brown | Submersible pump | 18 | ± 20 | No | ± 10 |
| | 30 May 2001 | Grab (bailer) | 1.23 | 7.0 | 630 | 19.6 | 20 | Clear, none | Submersible pump | 4 | ± 6 | No | ± 3 |
| MW6 | 1 Feb 2001 | Grab (bailer) | 2.8 | 6.7 | 510 | 18.7 | -360 | Opaque, Brown | Submersible pump | 23 | ± 20 | No | ± 11 |
| | 30 May 2001 | Grab (bailer) | 2.9 | 6.8 | 470 | 24.2 | 80 | Turbid, brown | Submersible pump | 5 | ± 6 | No | ± 3 |
| MW7 | 1 Feb 2001 | Grab (bailer) | 3.0 | 6.8 | 430 | 16.1 | -200 | Cloudy, Brown | Submersible pump | 25 | ± 17 | No | ± 11 |
| | 30 May 2001 | Grab (bailer) | 3.1 | 6.8 | 500 | 23.6 | 60 | Clear, none | Submersible pump | ± 5 | ± 5 | No | ± 3 |

General Notes

- (a) Purging and sampling performed by Streamborn (Berkeley CA).
- (b) ORP = oxidation/reduction potential.
- (c) NM = Not Measured.

Table 4
Groundwater Analytical Data from Monitoring Wells
4401 Market Street, Oakland CA

| Location | Sample Date | Sampled By | TPH-Gasoline (µg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethylbenzene (µg/L) | Xylenes (µg/L) | MtBE (µg/L) | Tert-Butylalcohol (µg/L) | Other Fuel Oxygenates (EPA Method 8260) (µg/L) |
|-------------|------------------|------------|---------------------|----------------|----------------|---------------------|----------------|-------------------|--------------------------|--|
| MW1 | 8 November 1994 | W.A. Craig | 54 | <0.5 | <0.5 | <0.5 | 1.2 | NA | NA | NA |
| | 14 February 1995 | W.A. Craig | 71 | <0.5 | <0.5 | <0.5 | 0.97 | NA | NA | NA |
| | 7 June 1995 | W.A. Craig | 540 | 0.6 | <0.5 | 1.7 | 1.3 | NA | NA | NA |
| | 29 August 1995 | W.A. Craig | 440 | <0.5 | <0.5 | 1.3 | 1.1 | NA | NA | NA |
| | 8 December 1995 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | NA | NA | NA |
| | 7 March 1996 | W.A. Craig | 77 | <0.5 | <0.5 | <0.5 | <0.5 | 44 ⁽¹⁾ | NA | NA |
| | 19 June 1996 | W.A. Craig | 500 | <0.5 | <0.5 | 0.85 | 0.36 | 84 ⁽¹⁾ | NA | NA |
| | 20 December 1996 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 28 ⁽¹⁾ | NA | NA |
| | 12 June 1997 | W.A. Craig | 190 | <0.5 | <0.5 | <0.5 | <0.5 | 12 ⁽¹⁾ | NA | NA |
| | 1 February 2001 | Streamborn | <50 | <0.5 | <0.5 | <0.5 | 1.1 | <5.0 | <5.0 | <5.0 to <10 |
| 30 May 2001 | Streamborn | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 | <5.0 | <5.0 | |
| MW2 | 8 November 1994 | W.A. Craig | 20,000 | 1,400 | 960 | 980 | 4,600 | NA | NA | NA |
| | 14 February 1995 | W.A. Craig | 8,600 | 380 | 210 | 410 | 2,000 | NA | NA | NA |
| | 7 June 1995 | W.A. Craig | 6,200 | 500 | 78 | 270 | 1,200 | NA | NA | NA |
| | 29 August 1995 | W.A. Craig | 4,100 | 330 | 61 | 210 | 980 | NA | NA | NA |
| | 8 December 1995 | W.A. Craig | 9,400 | 360 | 190 | 440 | 2,000 | NA | NA | NA |
| | 7 March 1996 | W.A. Craig | 12,000 | 790 | 170 | 440 | 2,000 | 18 ⁽¹⁾ | NA | NA |
| | 19 June 1996 | W.A. Craig | 9,000 | 520 | 82 | 350 | 1,500 | <5.0 | NA | NA |
| | 20 December 1996 | W.A. Craig | 13,000 | 830 | 180 | 410 | 2,200 | <16 | NA | NA |
| | 12 June 1997 | W.A. Craig | 5,100 | 320 | 32 | 190 | 880 | <36 | NA | NA |
| MW3 | 8 November 1994 | W.A. Craig | <50 | 0.71 | 0.84 | 1.2 | 5.8 | NA | NA | NA |
| | 14 February 1995 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | NA | NA | NA |
| | 7 June 1995 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | 1.6 | NA | NA | NA |
| | 29 August 1995 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | NA | NA | NA |
| | 8 December 1995 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | NA | NA | NA |
| | 7 March 1996 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 | NA | NA |
| | 19 June 1996 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 | NA | NA |
| | 20 December 1996 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 | NA | NA |
| | 12 June 1997 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 | NA | NA |
| | 1 February 2001 | Streamborn | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 | <5.0 | <5.0 to <10 |
| 30 May 2001 | Streamborn | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 | <5.0 | <5.0 to <10 | |
| MW4 | 1 February 2001 | Streamborn | 1,500 | 58 | 1.3 | 83 | 320 | <5.0 | 16 | <5.0 to <10 |
| | 30 May 2001 | Streamborn | 1,000 | 19 | <0.5 | 50 | 3.4 | <5.0 | 23 | <5.0 to <10 |
| MW5 | 1 February 2001 | Streamborn | 1,200 | 57 | 1.8 | 45 | 160 | <5.0 | <5.0 | <5.0 to <10 |
| | 30 May 2001 | Streamborn | 570 | 20 | <0.5 | 26 | 22 | <5.0 | <5.0 | <5.0 to <10 |
| MW6 | 1 February 2001 | Streamborn | 260 | 8.0 | <0.5 | 22 | 23 | <5.0 | <5.0 | <5.0 to <10 |
| | 30 May 2001 | Streamborn | 53 ⁽²⁾ | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 | <5.0 | <5.0 to <10 |
| MW7 | 1 February 2001 | Streamborn | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 | <5.0 | <5.0 to <10 |
| | 30 May 2001 | Streamborn | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 | <5.0 | <5.0 to <10 |

General Notes

(a) TPH = Total petroleum hydrocarbons. MtBE = Methyl tertiary Butyl Ether. NA = Not analyzed.

(d) W.A. Craig analytical performed by McCampbell Analytical (Pacheco CA). Streamborn analytical performed by ChromaLab (Pleasanton CA).

Footnote

(1) MtBE analyses prior to 2001 were performed by EPA method 8020; the MtBE detections likely represent "false positives."

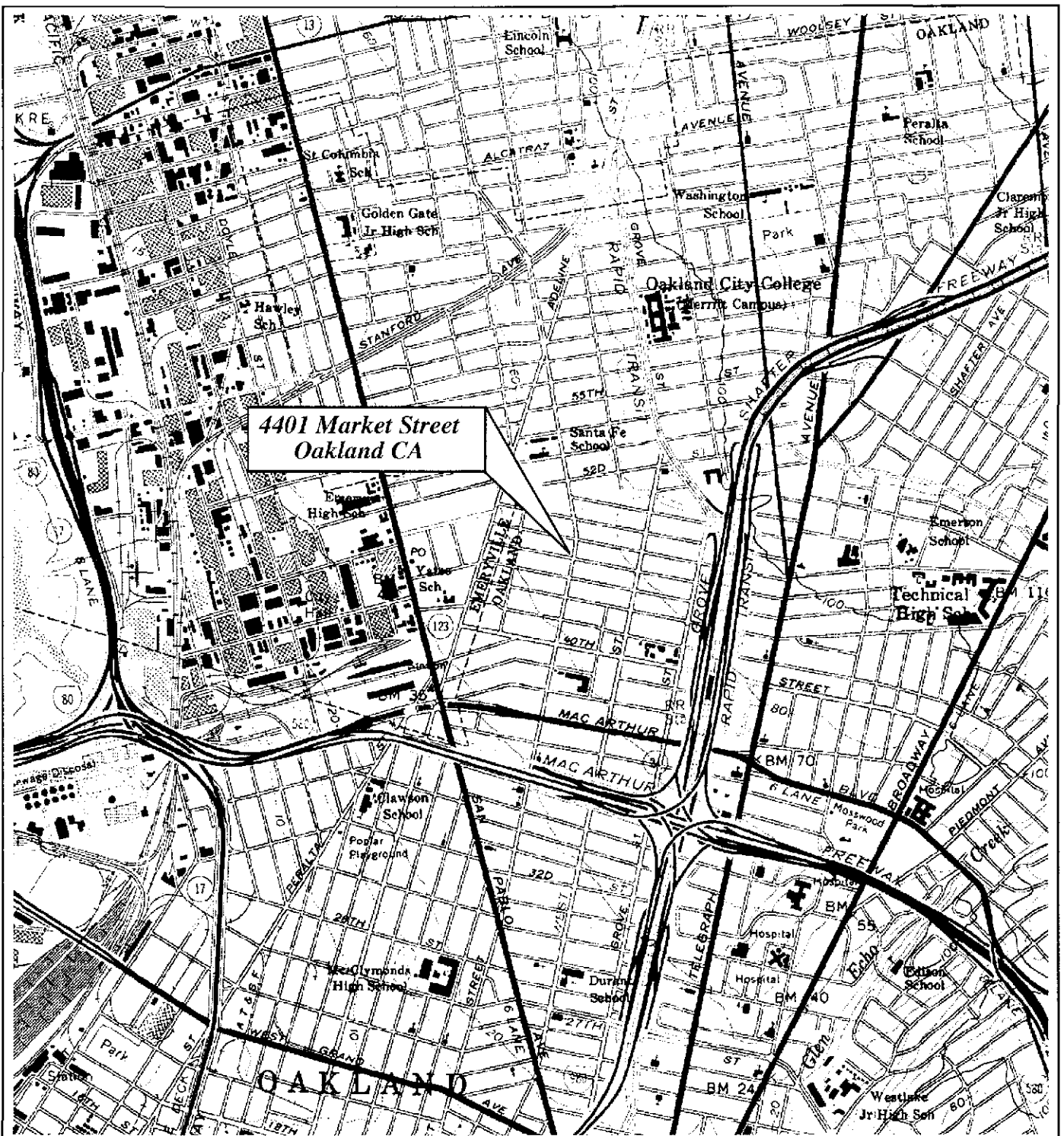
(2) The laboratory reported that the sample result did not match the standard.

Table 5
Free Product Monitoring
4401 Market Street
Oakland CA

| Date | MW4 (feet) | MW5 (feet) | MW6 (feet) |
|-----------------|---------------|---------------|---------------|
| 1 February 2001 | <0.1 | <0.1 | <0.1 |
| 9 March 2001 | <0.1 | <0.1 | <0.1 |
| 23 April 2001 | <0.1 | <0.1 | <0.1 |
| 30 May 2001 | <0.1 | <0.1 | <0.1 |

General Notes

- (a) Monitoring performed by Streamborn (Berkeley CA).
- (b) Free product monitoring conducted by Streamborn using a Water Mark Interface meter.



Basemap: U.S. Geological Survey, 7.5 Minute Quadrangle, Oakland West CA, 1959 (Photorevised 1980).

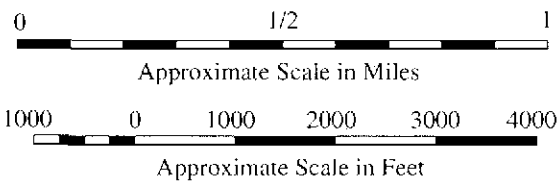


Figure 1
Location Map
4401 Market Street
Oakland CA

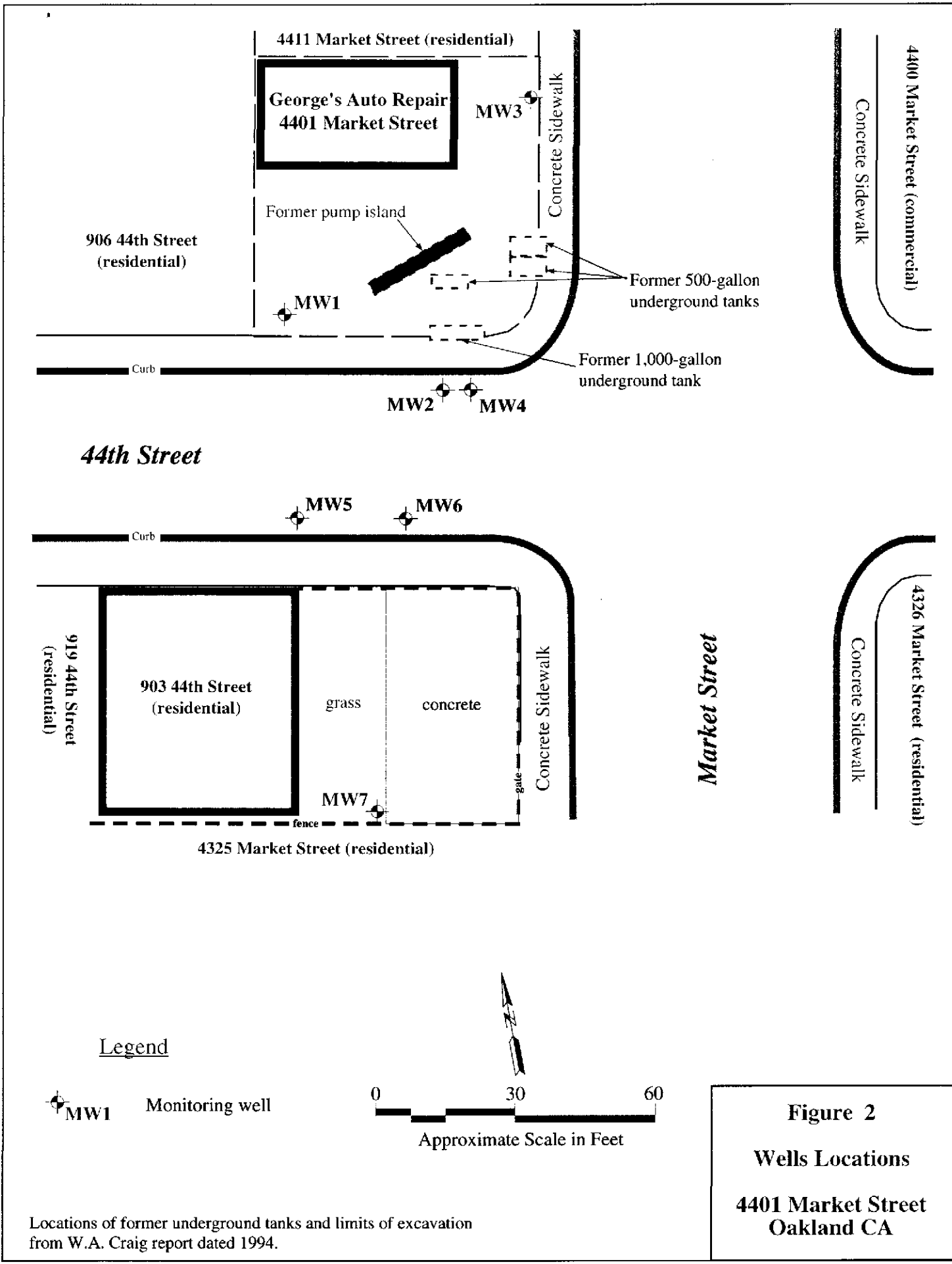
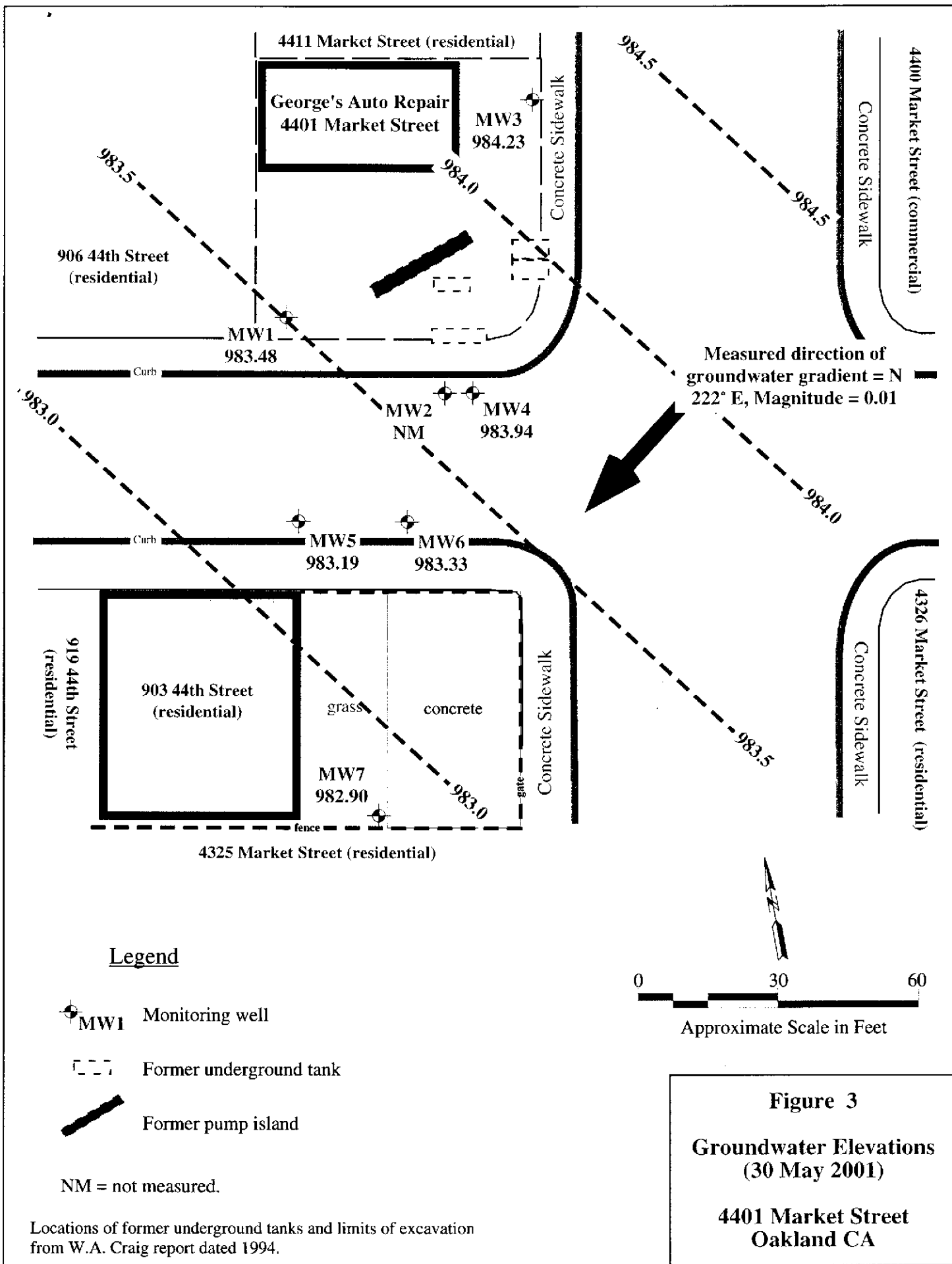


Figure 2
Wells Locations
4401 Market Street
Oakland CA

Locations of former underground tanks and limits of excavation from W.A. Craig report dated 1994.



STANDARD OPERATING PROCEDURE (SOP) 4A WELL PURGING AND SAMPLING

1.0 INTRODUCTION AND SUMMARY

This SOP describes procedures to purge and sample wells that have been properly installed and developed. Typically, this SOP will be used for sampling monitoring wells with 2- or 4-inch diameter casing. The sampling described herein is appropriate for a variety of groundwater analyses, including: total and dissolved metals, volatile and semi-volatile organic compounds, and general minerals. For newly installed and developed well, the purging and sampling described in this SOP is typically performed at least 7 days after well development to allow ambient groundwater conditions to re-establish in the vicinity of the well.

The procedures described in this SOP should be modified for domestic wells or wells with dedicated sampling equipment. The procedures should also be modified if product is observed in the well.

Typical well sampling and purging activities include decontaminating the purging and sampling equipment, purging the stagnant water from the well casing and filter pack by pumping or bailing, measuring field parameters and evacuated volume of groundwater during purging, terminating the purging process when field parameters stabilize, collecting groundwater samples by pumping or bailing, and labeling and preserving the collected samples.

2.0 EQUIPMENT AND MATERIALS

- Buckets and bristle brushes for decontamination
- Low residue, organic free soap such as Liquinox or Alconox
- If sampling is to be performed for metals, dilute (10%) reagent-grade nitric acid (for decontamination)
- Tap water (for decontamination)
- Distilled water (for decontamination and quality control blank samples)
- Cooler with ice (do not use blue ice or dry ice)
- Ziplock bags of size to accommodate sample containers
- Steel, 55-gallon, open-top drums, DOT 17H
- Field organic vapor monitor. The make, model, and calibration information of the field organic vapor monitor (including compound and concentration of calibration gas) should be documented.
- Laboratory-cleaned containers of proper type and size for the analytical parameters (refer to Table 1)
- Reagent-grade chemicals for sample preservation, as required for the analytical parameters (refer to Table 1)
- If dissolved metals analyses are required, 45-micron cellulose acetate filters and filtering device. Alternate filter type and size (cellulose nitrate, Teflon, or glass-fiber pre-filters) may be required as specified in the Quality Assurance Project Plan or Sampling Plan. The make, type, and size of filter, including disposable filters, should be documented.

- Glass beaker, ± 250 milliliter for measurement of field parameters. A similar flow-through cell may also be used.
- Water level meter
- pH, temperature, and specific conductivity instruments, including pH and specific conductivity standards approximating or spanning the natural groundwater parameters. As specified in the Quality Assurance Project Plan or Sampling Plan, oxidation-reduction potential (ORP) or dissolved oxygen meters may also be required.
- Purging equipment consisting of one of the following:
 - Bailer: Steel, PVC, Teflon, or stainless steel. Dedicated or new bailer rope.
 - Bladder Pump: Plastic or Teflon bladder. 4-inch or 6-inch diameter by ± 4 -foot long decontamination chambers.
 - Submersible Electric Pump: Normally used where relatively large quantities of purge water are expected from wells with quick recharge. Pump should have flow control valve and foot valve. 6-inch diameter by ± 4 -foot long decontamination chambers.
 - Surface Centrifugal Pump: Limited to water lift of approximately 20 feet. Dedicated or new flexible plastic suction hose. Foot valve. Flow control valve.
- Sampling device consisting of one of the following:
 - Bailer: Teflon or stainless steel. Dedicated or new bailer rope. If samples are collected for volatile organic compound analysis, bailer should also be fitted with bottom-emptying device.
 - Bladder Pump: Teflon bladder. Dedicated or new Teflon or Tygon tubing for sample discharge line. 4-inch or 6-inch diameter by ± 4 -foot long decontamination chambers.

As specified in the Site Safety Plan, additional safety and personnel decontamination equipment and materials may be needed.

3.0 TYPICAL PROCEDURES

The following procedures are intended to cover the majority of purging and sampling conditions. However, normal field practice requires re-evaluation of these procedures and implementation of alternate procedures upon encountering unusual or unexpected conditions. Deviations from the following procedures may be expected and should be documented.

1. Remove top cap and perform field organic vapor monitoring of well casing
2. Measure static water level and total depth and compare to historic measurements. Remeasure if discrepancies are noted with historic data. Document observations of product, if appropriate. Calculate volume of standing water in casing.
3. Decontaminate purging and sampling equipment (see section DECONTAMINATION in this SOP)
4. Begin purging and if possible, adjust purge rate to expose as little of the screened interval as possible (subject to reasonable time constraints). Record the following observations at the beginning of purge, periodically during purge, and during sampling:

- Purge volume and time
 - pH, temperature, and specific conductivity
 - Turbidity (clarity and color)
 - Approximate drawdown and well yield during purge
 - Whether well was purged dry
 - Other observations (such as presence of product) as appropriate
5. Terminate purging when one of the following conditions is observed:
- Quick Recharge Wells: Well shows stabilized field parameters and at least 3 casing volumes of standing water have been removed - ready for sampling. If field parameters have not stabilized after removal of 5 casing volumes of standing water, terminate purging anyway. Wells should be allowed to recover to at least 1/2 the original standing water depth prior to sampling.
- Slow Recharge Wells: Wells that are initially purged dry, and do not recover to 1/2 the original standing water depth within 4 hours, should be purged dry again and then sampled when sufficient recovery has occurred to submerge the sampling bailer or pump. Generally, 3 feet of recovery may be considered sufficient recovery for normal bailer or pump submergence.
6. If recharge has submerged the entire screened interval, sample from mid-depth of screened interval. Otherwise, sample from mid-depth of water column at time of sampling.
7. If dissolved metals analyses are to be performed, filter sample. Also if dissolved metals analyses are to be performed and the sample is moderately turbid or very turbid, collect companion filtered and unfiltered samples.
8. For parameters other than dissolved metals, do not filter sample. Fill sample containers directly and preserve according to the requirements of Table 1. Containers should generally filled to capacity. 40 milliliter glass vials should be filled from the bottom using a sample discharge tube (bottom-emptying device for bailer or discharge tube of bladder pump). 40 milliliter vials should not have headspace.
9. Label sample containers, place in ziplock bag, and place on ice in cooler.
10. Log samples onto chain-of-custody form and maintain sample custody until shipped to laboratory.
11. Containerize purge water, excess sample, and decontamination wastewater in steel drum(s). Label drum(s) with hazardous waste label, contents, and well number from which waste originated.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL

Quality control samples should consist of the following:

- Duplicate samples at a frequency of 1 per 10 natural samples
- Cross-contamination blank (also known as a sampler rinsate blank) at a frequency of 1 per 10 natural samples. Cross-contamination blanks are prepared by passing deionized water over and through decontaminated sampling equipment (including sample filter if used).

- If analyses require collection of samples in 40 milliliter vials, travel blanks should also be included at a frequency of 1 per day of sampling.
- Optional quality control samples include standard reference materials and natural matrix spikes.

Meters for measurement of field parameters should be calibrated at least once per day. Calibration standards should generally approximate or span natural groundwater characteristics. Recalibration may be appropriate if unusual measurements are noticed. Calibration activities should be documented on the instrument calibration log.

5.0 DOCUMENTATION

The following information should be collected prior to sampling and taken into the field for reference:

- Well completion schematic
- Summary of historic water level, total depth, and field parameter measurements

Observations, measurements, and other documentation of the purging and sampling effort should be recorded on the following:

- Daily Report
- Field Notebook
- Instrument Calibration Log
- Well Purge and Sample Log
- Chain-of-Custody

Documentation should include any deviations from this SOP, as well as documentation of the containerization and disposition/disposal of investigation-derived waste.

6.0 DECONTAMINATION

Prior to entering the site, purging and sampling equipment should be decontaminated by steam cleaning, pressure washing, or equivalent.

Prior to sampling each well, down-well equipment and equipment that will contact the sample (except sample containers) should be decontaminated according to the following procedure:

- Steam clean or pressure wash (optional unless oily contamination covers equipment)
- Wash with soap
- Rinse with tap water
- Double rinse with distilled water

If metals are included in the analytical parameters, the decontamination procedures should include:

- Steam clean or pressure wash (optional unless oily contamination covers equipment)
- Wash with soap

- Rinse with tap water
- Rinse with dilute nitric acid (skip for pumps containing metal parts)
- Rinse with tap water
- Double rinse with distilled water

Suction or discharge hoses from purge pumps need external decontamination only. Purge or sampling pumps should be decontaminated by filling the decontamination chamber with the aforementioned solutions and pumping the solutions from the chamber to the waste drum.

Prior to leaving the site, purging and sampling equipment should be steam cleaned, pressure washed, or equivalent.

7.0 INVESTIGATION-DERIVED WASTE

Purge water, excess sample, and decontamination wastewater should be containerized in steel drums. Drums should be labeled with hazardous waste labels, including: Generator's name and accumulation date. Wastes from different wells may be combined, but wastes that are anticipated to contain chemical should not be mixed with waste that are not thought to be contaminated.

8.0 SAFETY

Primary chemical hazards during well purging and sampling are associated with dermal exposure. Acids used for decontamination and sample preservation may also present chemical hazards. Primary protection against dermal exposure includes splash protection and gloves. Special chemical hazards may be associated with the presence of product, if discovered during sampling. Water quality samples are not generally considered representative in the presence of product. Accordingly, it may be appropriate to abandon sampling efforts if product is discovered.

Other specific site safety guidance is provided in the Site Safety Plan.

9.0 REFERENCES

- Aller, L., T.W. Bennett, G. Hackett, R.J. Petty, J.H. Lehr, H. Sedoris, and D.M. Nielsen, 1989. Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells. National Water Well Association, Dublin, OH. 1989.
- U.S. Environmental Protection Agency, 1989a. A Compendium of Superfund Field Operations Methods, EPA/540/P-87/001, OSWER Directive 9355.0-14. USEPA, Office of Emergency and Remedial Response, Washington, DC. December 1989.
- U.S. Environmental Protection Agency, 1989b. USEPA Method Study #39, Method 504, 1,2-Dibromoethane (EDB) and 1,2-Dibromo-3-Chloropropane (DBCP) in Water, Pb 89-119 580/AS. National Technical Information Service, Springfield VA. 1989.

Table 1
Sampling and Preservation for Groundwater Samples

| Parameter | Analytical Method | Container | Preservation | Maximum Holding Time |
|---|--|--|---|---|
| Purgeable Halocarbons by GC | EPA 8010 | Three 40-ml glass vials | HCl to pH<2, cool to 4 degrees Celsius | 14 days after collection |
| Purgeable Aromatics by GC | EPA 8020 | Three 40-ml glass vials | HCl to pH<2, cool to 4 degrees Celsius | 14 days after collection |
| Organochlorine Pesticides and PCB's | EPA 8080 | Two 1-liter amber glass | Cool to 4 degrees Celsius | Extract 7 days after collection Analyze 40 days after extraction |
| Organophosphorus Pesticides | EPA 8140 | Two 1-liter amber glass | Cool to 4 degrees Celsius | Extract 7 days after collection Analyze 40 days after extraction |
| Chlorinated Herbicides (Phenoxy Herbicides) | EPA 8150 | Two 1-liter amber glass | Cool to 4 degrees Celsius | Extract 7 days after collection Analyze 40 days after extraction |
| Volatile Organic Compounds by GC/MS | EPA 8240 or 8260 | Three 40-ml glass vials | HCl to pH<2, Cool to 4 degrees Celsius | 14 days after collection |
| Fuel Oxygenates (MTBE, TAME, ETBE, DIPE) | EPA SW846 8260 Modified | Three 40-ml glass vials | Cool to 4 degrees Celsius | 14 days after collection |
| Semi-Volatile Organic Compounds by GC/MS (Base/Neutral/Acid Extractable Organics) | EPA 8270 | Two 1-liter amber glass | Cool to 4 degrees Celsius | Extract 7 days after collection Analyze 40 days after extraction |
| Dibromoethane (EDB) and 1,2-Dibromo-3-Chloropropane (DBCP) | EPA 504 | Two 1-liter amber glass | Cool to 4 degrees Celsius | Extract 7 days after collection Analyze 40 days after extraction |
| Total Petroleum Hydrocarbons Gasoline/BTEX | Extract by EPA 5030, analyze by EPA 8015 | Three 40-ml glass vials | HCl to pH<2, cool to 4 degrees Celsius | Extract 7 days after collection Analyze 7 days after extraction |
| Total Petroleum Hydrocarbons Diesel, Kerosene, or Motor Oil | Extract by EPA 3510, analyze by EPA 8015 | One 1-liter amber glass | HCl to pH<2, cool to 4 degrees Celsius | Extract 7 days after collection Analyze 7 days after extraction |
| Oil & Grease | SM 503 | One 1-liter glass with aluminum foil-lined cap | H ₂ SO ₄ to pH<2, cool to 4 degrees Celsius | 28 days after collection |
| Total Metals | EPA 7000 Series | One 1/2 liter poly | HNO ₃ to pH<2, cool to 4 degrees Celsius | 6 months after collection (28 days for mercury) |
| Dissolved Metals | EPA 7000 Series | One 1/2 liter poly | HNO ₃ to pH<2, cool to 4 degrees Celsius | 6 months after collection (28 days for mercury) |
| General Minerals | Various | Two 1-liter poly | Cool to 4 degrees Celsius | 7 days after collection |

MONITORING WELL PURGE DATA

| | |
|--|---------------------------|
| Project Name/Number: 4401 Market Street | Logged By: Matthew Hall |
| Property Location: Oakland CA | Date: 30 May 2001 |
| Well Number: MW1 | Sample Type: Grab |
| Purging Equipment: Submersible pump | Depth to Water: 14.74 |
| Sampling Equipment: Bailer | Total Depth: 24.55 |
| Measuring Point: Top of casing, north side | Odor: |
| Free Product: | Sample Number: MW1-30-May |
| Comments: | |

Note obstructions, well damage, or other compromising features under comments. Record depth in feet.

| | | | | | | | | |
|--------------------|---|-----------------------|---|--|---|--------------------------------|-----|--------------------------------|
| Total Depth (feet) | - | Depth to Water (feet) | x | 0.04 gallons/foot for 1-inch well 0.16 gallons/foot for 2-inch well 0.65 gallons/foot for 4-inch well 1.47 gallons/foot for 6-inch well | = | Single Casing Volume (gallons) | | Three Casing Volumes (gallons) |
| 24.55 | - | 14.74 | ≠ | 9.81 x 0.16 | = | 1.56 | x 3 | 4.7 |

| Purge Volume (gallons) | Time | Dissolved Oxygen (mg/L) | pH | Specific Conductivity (μ S/cm) | Temp ($^{\circ}$ C) | ORP (mV) | Turbidity | Color | Purged Dry? | Comments |
|------------------------|------|-------------------------|------|-------------------------------------|----------------------|----------|-----------|-------|-------------|----------------|
| 0 | 3:20 | 1.35 | 6.79 | 538 | 23.8 | 69.9 | CLEAR | NONE | YES | Start purge |
| 2.5 | 3:40 | 4.98 | 7.00 | 547 | 23.6 | 64.4 | clear | None | yes | |
| 5.0 | 4:00 | 1.01 | 6.79 | 561 | 24.2 | 34.8 | Clear | None | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | Collect sample |

Note observations of odor, sheen, and other signs of contamination under comments. Record turbidity as clear, translucent, opaque, cloudy, or turbid.

MONITORING WELL PURGE DATA

| | |
|--|---------------------------|
| Project Name/Number: 4401 Market Street | Logged By: Matthew Hall |
| Property Location: Oakland CA | Date: 30 May 2001 |
| Well Number: MW3 | Sample Type: Grab |
| Purging Equipment: Submersible pump | Depth to Water: 14.67 |
| Sampling Equipment: Bailer | Total Depth: 27.59 |
| Measuring Point: Top of casing, north side | Odor: ND |
| Free Product: NO | Sample Number: MW3-30-May |
| Comments: | |

Note obstructions, well damage, or other compromising features under comments. Record depth in feet.

| | | | | | | | | |
|--------------------|---|-----------------------|---|--|---|--------------------------------|-----|--------------------------------|
| Total Depth (feet) | - | Depth to Water (feet) | x | 0.04 gallons/foot for 1-inch well 0.16 gallons/foot for 2-inch well 0.65 gallons/foot for 4-inch well 1.47 gallons/foot for 6-inch well | = | Single Casing Volume (gallons) | | Three Casing Volumes (gallons) |
| 24.59 | - | 14.67 | x | 9.92 x 0.16 | = | 1.58 | x 3 | 4.8 |

| Purge Volume (gallons) | Time | Dissolved Oxygen (mg/L) | pH | Specific Conductivity ($\mu\text{S}/\text{cm}$) | Temp ($^{\circ}\text{C}$) | ORP (mV) | Turbidity | Color | Purged Dry? | Comments |
|------------------------|------|-------------------------|------|---|-----------------------------|----------|-----------|-------|-------------|----------------|
| 0 | 2:15 | 6.3 | 7.01 | 415 | 21.6 | 88.5 | CLEAR | NONE | YES | Start purge |
| 2.5 | 2:20 | 6.2 | 6.92 | 353 | 21.4 | 86.4 | CLEAR | NONE | YES | |
| 5 | 2:41 | 5.8 | 6.97 | 386 | 23.6 | 59.2 | CLEAR | NONE | YES | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | Collect sample |

Note observations of odor, sheen, and other signs of contamination under comments. Record turbidity as clear, translucent, opaque, cloudy, or turbid.

MONITORING WELL PURGE DATA

| | |
|--|---------------------------|
| Project Name/Number: 4401 Market Street | Logged By: Matthew Hall |
| Property Location: Oakland CA | Date: 30 May 2001 |
| Well Number: MW4 | Sample Type: Grab |
| Purging Equipment: Submersible pump | Depth to Water: 13.93 |
| Sampling Equipment: Bailer | Total Depth: 24.53 |
| Measuring Point: Top of casing, north side | Odor: PETROL |
| Free Product: Minnie | Sample Number: MW4-30-May |
| Comments: | |

Note obstructions, well damage, or other compromising features under comments. Record depth in feet.

| | | | | | | | | |
|--------------------|---|-----------------------|---|--|---|--------------------------------|-----|--------------------------------|
| Total Depth (feet) | - | Depth to Water (feet) | x | 0.04 gallons/foot for 1-inch well 0.16 gallons/foot for 2-inch well 0.65 gallons/foot for 4-inch well 1.47 gallons/foot for 6-inch well | = | Single Casing Volume (gallons) | | Three Casing Volumes (gallons) |
| 24.53 | - | 13.93 | ≠ | 10.6 x 0.16 | = | 1.7 | x 3 | 5.1 |

| Purge Volume (gallons) | Time | Dissolved Oxygen (mg/L) | pH | Specific Conductivity (μS/cm) | Temp (°C) | ORP (mV) | Turbidity | Color | Purged Dry? | Comments |
|------------------------|-------|-------------------------|------|-------------------------------|-----------|----------|-----------|-------|-------------|----------------|
| 0 | 11:53 | 1.94 | 6.86 | 713 | 22.6 | 54.8 | CLEAR | NONE | NO | Start purge |
| 3 | 11:59 | 1.30 | 6.87 | 686 | 22.6 | 31.7 | CLEAR | NONE | YES | |
| 6 | 12:15 | 1.48 | 6.82 | 700 | 22.8 | 17.8 | CLEAR | NONE | YES | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | Collect sample |

Note observations of odor, sheen, and other signs of contamination under comments. Record turbidity as clear, translucent, opaque, cloudy, or turbid.

MONITORING WELL PURGE DATA

| | |
|--|---------------------------|
| Project Name/Number: 4401 Market Street | Logged By: Matthew Hall |
| Property Location: Oakland CA | Date: 30 May 2001 |
| Well Number: MW5 | Sample Type: Grab |
| Purging Equipment: Submersible pump | Depth to Water: 14.14 |
| Sampling Equipment: Bailer | Total Depth: 24.88 |
| Measuring Point: Top of casing, north side | Odor: Petroleum |
| Free Product: No | Sample Number: MW5-30-May |
| Comments: | |

Note obstructions, well damage, or other compromising features under comments. Record depth in feet.

| | | | | | | | | |
|--------------------|---|-----------------------|---|--|---|--------------------------------|-----|--------------------------------|
| Total Depth (feet) | - | Depth to Water (feet) | x | 0.04 gallons/foot for 1-inch well 0.16 gallons/foot for 2-inch well 0.65 gallons/foot for 4-inch well 1.47 gallons/foot for 6-inch well | = | Single Casing Volume (gallons) | | Three Casing Volumes (gallons) |
| 24.88 | - | 14.14 | x | 0.16 | = | 1.71 | x 3 | 5.15 |

| Purge Volume (gallons) | Time | Dissolved Oxygen (mg/L) | pH | Specific Conductivity ($\mu\text{S}/\text{cm}$) | Temp ($^{\circ}\text{C}$) | ORP (mV) | Turbidity | Color | Purged Dry? | Comments |
|------------------------|-------|-------------------------|------|---|-----------------------------|----------|-----------|-------|-------------|----------------|
| 0 | 10:12 | 1.57 | 7.02 | 611 | 19.1 | 48.5 | Clear | None | NO | Start purge |
| 3 | 10:14 | 1.55 | 7.06 | 634 | 19.3 | -7.0 | Clear | None | NO | |
| 6 | 10:16 | 1.23 | 6.97 | 629 | 19.6 | 20.7 | Clear | None | NO | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | Collect sample |

Note observations of odor, sheen, and other signs of contamination under comments. Record turbidity as clear, translucent, opaque, cloudy, or turbid.

MONITORING WELL PURGE DATA

| | |
|--|---------------------------|
| Project Name/Number: 4401 Market Street | Logged By: Matthew Hall |
| Property Location: Oakland CA | Date: 30 May 2001 |
| Well Number: MW6 | Sample Type: Grab |
| Purging Equipment: Submersible pump | Depth to Water: 14.17 |
| Sampling Equipment: Bailer | Total Depth: 24.82 |
| Measuring Point: Top of casing, north side | Odor: NO |
| Free Product: Minute | Sample Number: MW6-30-May |
| Comments: | |

Note obstructions, well damage, or other compromising features under comments. Record depth in feet.

| | | | | | | | | |
|--------------------|---|-----------------------|---|--|---|--------------------------------|-----|--------------------------------|
| Total Depth (feet) | - | Depth to Water (feet) | x | 0.04 gallons/foot for 1-inch well 0.16 gallons/foot for 2-inch well 0.65 gallons/foot for 4-inch well 1.47 gallons/foot for 6-inch well | = | Single Casing Volume (gallons) | | Three Casing Volumes (gallons) |
| 24.82 | - | 14.17 | = | 10.65 x | = | 1.70 | x 3 | 5.1 |

| Purge Volume (gallons) | Time | Dissolved Oxygen (mg/L) | pH | Specific Conductivity (μ S/cm) | Temp ($^{\circ}$ C) | ORP (mV) | Turbidity | Color | Purged Dry? | Comments |
|------------------------|-------|-------------------------|------|-------------------------------------|----------------------|----------|-----------|-------|-------------|----------------|
| 0 | 11:10 | 2.21 | 6.89 | 476 | 22.4 | 38.5 | CLEAR | NONE | NO | Start purge |
| 3 | 11:12 | 1.98 | 6.93 | 558 | 22.7 | 63.8 | TURBID | BROWN | NO | |
| 6 | 11:15 | 2.93 | 6.83 | 476 | 24.2 | 90.3 | " | " | " | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | Collect sample |

Note observations of odor, sheen, and other signs of contamination under comments. Record turbidity as clear, translucent, opaque, cloudy, or turbid.

MONITORING WELL PURGE DATA

| | |
|--|--|
| Project Name/Number: 4401 Market Street | Logged By: Matthew Hall |
| Property Location: Oakland CA | Date: 30 May 2001 |
| Well Number: MW7 | Sample Type: Grab |
| Purging Equipment: Submersible pump | Depth to Water: 24.43 15.79 |
| Sampling Equipment: Bailer | Total Depth: 24.43 |
| Measuring Point: Top of casing, north side | Odor: |
| Free Product: No | Sample Number: MW7-30-May |
| Comments: | |

Note obstructions, well damage, or other compromising features under comments. Record depth in feet.

| | | | | | | | | |
|--------------------|---|-----------------------|---|--|---|--------------------------------|-----|--------------------------------|
| Total Depth (feet) | - | Depth to Water (feet) | x | 0.04 gallons/foot for 1-inch well 0.16 gallons/foot for 2-inch well 0.65 gallons/foot for 4-inch well 1.47 gallons/foot for 6-inch well | = | Single Casing Volume (gallons) | | Three Casing Volumes (gallons) |
| 24.43 | - | 15.79 | x | 8.64 x 0.16 | = | 1.4 | x 3 | 4.1 |

| Purge Volume (gallons) | Time | Dissolved Oxygen (mg/L) | pH | Specific Conductivity (μ S/cm) | Temp ($^{\circ}$ C) | ORP (mV) | Turbidity | Color | Purged Dry? | Comments |
|------------------------|------|-------------------------|------|-------------------------------------|----------------------|----------|-----------|-------|-------------|----------------|
| 0 | 1:15 | NM | 6.87 | 500 | 22.8 | 74.6 | CLEAR | NONE | NO | Start purge |
| 2.5 | 1:17 | 4.74 | 6.96 | 511 | 23.2 | 42.4 | CLEAR | NONE | NO | |
| 5 | 1:20 | 3.12 | 6.82 | 504 | 23.6 | 61.2 | CLEAR | NONE | NO | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | Collect sample |

Note observations of odor, sheen, and other signs of contamination under comments. Record turbidity as clear, translucent, opaque, cloudy, or turbid.

Streamborn Consulting Services

900 Sante Fe Avenue
Albany, CA 94706

Attn.: Matthew Hall

Project: P257
4401 Market Street

Attached is our report for your samples received on Thursday May 31, 2001
This report has been reviewed and approved for release. Reproduction of this report
is permitted only in its entirety.

Please note that any unused portion of the samples will be discarded after July 15, 2001
unless you have requested otherwise. We appreciate the opportunity to be of service to you.
If you have any questions, please call me at (925) 484-1919. You can also contact me via email.
My email address is: vvancil@chromalab.com

Sincerely,



Vincent Vancil

Fuel Oxygenates by 8260B

Streamborn Consulting Services

✉ 900 Sante Fe Avenue
Albany, CA 94706

Attn: Matthew Hall

Phone: (510) 528-4234 Fax: (510) 528-2613

Project #: P257

Project: 4401 Market Street

Samples Reported

| Sample ID | Matrix | Date Sampled | Lab # |
|------------|--------|------------------|-------|
| MW1-30-MAY | Water | 05/30/2001 16:00 | 1 |
| MW3-30-MAY | Water | 05/30/2001 15:00 | 2 |
| MW4-30-MAY | Water | 05/30/2001 12:20 | 3 |
| MW5-30-MAY | Water | 05/30/2001 10:45 | 4 |
| MW6-30-MAY | Water | 05/30/2001 11:40 | 5 |
| MW7-30-MAY | Water | 05/30/2001 13:50 | 6 |

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-06-0002

To: Streamborn Consulting Services
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 5030B

Fuel Oxygenates by 8260B

| | |
|-------------------------------------|--|
| Sample ID: MW1-30-MAY | Lab Sample ID: 2001-06-0002-001 |
| Project: P257 4401 Market Street | Received: 05/31/2001 18:19 |
| Sampled: 05/30/2001 16:00 | Extracted: 06/04/2001 20:39 |
| Matrix: Water | QC-Batch: 2001/06/04-02.27 |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|--------------------------------|--------|-----------|-------|----------|------------------|------|
| tert-Butyl alcohol (TBA) | ND | 5.0 | ug/L | 1.00 | 06/04/2001 20:39 | |
| Methyl tert-butyl ether (MTBE) | ND | 5.0 | ug/L | 1.00 | 06/04/2001 20:39 | |
| Di-isopropyl Ether (DIPE) | ND | 10 | ug/L | 1.00 | 06/04/2001 20:39 | |
| Ethyl tert-butyl ether (ETBE) | ND | 5.0 | ug/L | 1.00 | 06/04/2001 20:39 | |
| tert-Amyl methyl ether (TAME) | ND | 5.0 | ug/L | 1.00 | 06/04/2001 20:39 | |
| Surrogate(s) | | | | | | |
| 1,2-Dichloroethane-d4 | 103.6 | 76-114 | % | 1.00 | 06/04/2001 20:39 | |

1220 Quarry Lane * Pleasanton, CA 94566-4756
Telephone: (925) 484-1919 * Facsimile: (925) 484-1096

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-06-0002

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 5030B

Fuel Oxygenates by 8260B

| | |
|-------------------------------------|--|
| Sample ID: MW3-30-MAY | Lab Sample ID: 2001-06-0002-002 |
| Project: P257 4401 Market Street | Received: 05/31/2001 18:19 |
| Sampled: 05/30/2001 15:00 | Extracted: 06/04/2001 21:08 |
| Matrix: Water | QC-Batch: 2001/06/04-02.27 |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|--------------------------------|--------|-----------|-------|----------|------------------|------|
| tert-Butyl alcohol (TBA) | ND | 5.0 | ug/L | 1.00 | 06/04/2001 21:08 | |
| Methyl tert-butyl ether (MTBE) | ND | 5.0 | ug/L | 1.00 | 06/04/2001 21:08 | |
| Di-isopropyl Ether (DIPE) | ND | 10 | ug/L | 1.00 | 06/04/2001 21:08 | |
| Ethyl tert-butyl ether (ETBE) | ND | 5.0 | ug/L | 1.00 | 06/04/2001 21:08 | |
| tert-Amyl methyl ether (TAME) | ND | 5.0 | ug/L | 1.00 | 06/04/2001 21:08 | |
| Surrogate(s) | | | | | | |
| 1,2-Dichloroethane-d4 | 107.5 | 76-114 | % | 1.00 | 06/04/2001 21:08 | |

1220 Quarry Lane * Pleasanton, CA 94566-4756
Telephone: (925) 484-1919 * Facsimile: (925) 484-1096

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 5030B

Fuel Oxygenates by 8260B

| | |
|-------------------------------------|--|
| Sample ID: MW4-30-MAY | Lab Sample ID: 2001-06-0002-003 |
| Project: P257 4401 Market Street | Received: 05/31/2001 18:19 |
| Sampled: 05/30/2001 12:20 | Extracted: 06/04/2001 21:38 |
| Matrix: Water | QC-Batch: 2001/06/04-02.27 |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|--------------------------------|--------|-----------|-------|----------|------------------|------|
| tert-Butyl alcohol (TBA) | 23 | 5.0 | ug/L | 1.00 | 06/04/2001 21:38 | |
| Methyl tert-butyl ether (MTBE) | ND | 5.0 | ug/L | 1.00 | 06/04/2001 21:38 | |
| Di-isopropyl Ether (DIPE) | ND | 10 | ug/L | 1.00 | 06/04/2001 21:38 | |
| Ethyl tert-butyl ether (ETBE) | ND | 5.0 | ug/L | 1.00 | 06/04/2001 21:38 | |
| tert-Amyl methyl ether (TAME) | ND | 5.0 | ug/L | 1.00 | 06/04/2001 21:38 | |
| Surrogate(s) | | | | | | |
| 1,2-Dichloroethane-d4 | 113.7 | 76-114 | % | 1.00 | 06/04/2001 21:38 | |

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-06-0002

To: **Streamborn Consulting Services**
Attn.: **Matthew Hall**

Test Method: 8260B
Prep Method: 5030B

Fuel Oxygenates by 8260B

| | |
|-------------------------------------|--|
| Sample ID: MW5-30-MAY | Lab Sample ID: 2001-06-0002-004 |
| Project: P257 4401 Market Street | Received: 05/31/2001 18:19 |
| Sampled: 05/30/2001 10:45 | Extracted: 06/11/2001 12:55 |
| Matrix: Water | QC-Batch: 2001/06/11-01.27 |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|--------------------------------|--------|-----------|-------|----------|------------------|------|
| tert-Butyl alcohol (TBA) | ND | 5.0 | ug/L | 1.00 | 06/11/2001 12:55 | |
| Methyl tert-butyl ether (MTBE) | ND | 5.0 | ug/L | 1.00 | 06/11/2001 12:55 | |
| Di-isopropyl Ether (DIPE) | ND | 10 | ug/L | 1.00 | 06/11/2001 12:55 | |
| Ethyl tert-butyl ether (ETBE) | ND | 5.0 | ug/L | 1.00 | 06/11/2001 12:55 | |
| tert-Amyl methyl ether (TAME) | ND | 5.0 | ug/L | 1.00 | 06/11/2001 12:55 | |
| Surrogate(s) | | | | | | |
| 1,2-Dichloroethane-d4 | 98.3 | 76-114 | % | 1.00 | 06/11/2001 12:55 | |

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To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 5030B

Fuel Oxygenates by 8260B

| | |
|---|--|
| Sample ID: MW6-30-MAY | Lab Sample ID: 2001-06-0002-005 |
| Project: P257 4401 Market Street | Received: 05/31/2001 18:19 |
| Sampled: 05/30/2001 11:40 | Extracted: 06/11/2001 14:35 |
| Matrix: Water | QC-Batch: 2001/06/11-01.27 |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|--------------------------------|--------|-----------|-------|----------|------------------|------|
| tert-Butyl alcohol (TBA) | ND | 5.0 | ug/L | 1.00 | 06/11/2001 14:35 | |
| Methyl tert-butyl ether (MTBE) | ND | 5.0 | ug/L | 1.00 | 06/11/2001 14:35 | |
| Di-isopropyl Ether (DIPE) | ND | 10 | ug/L | 1.00 | 06/11/2001 14:35 | |
| Ethyl tert-butyl ether (ETBE) | ND | 5.0 | ug/L | 1.00 | 06/11/2001 14:35 | |
| tert-Amyl methyl ether (TAME) | ND | 5.0 | ug/L | 1.00 | 06/11/2001 14:35 | |
| Surrogate(s) | | | | | | |
| 1,2-Dichloroethane-d4 | 96.8 | 76-114 | % | 1.00 | 06/11/2001 14:35 | |

To: **Streamborn Consulting Services**
Attn.: **Matthew Hall**

Test Method: 8260B
Prep Method: 5030B

Fuel Oxygenates by 8260B

| | |
|--|--|
| Sample ID: MW7-30-MAY | Lab Sample ID: 2001-06-0002-006 |
| Project: P257 4401 Market Street | Received: 05/31/2001 18:19 |
| Sampled: 05/30/2001 13:50 | Extracted: 06/11/2001 15:05 |
| Matrix: Water | QC-Batch: 2001/06/11-01.27 |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|--------------------------------|--------|-----------|-------|----------|------------------|------|
| tert-Butyl alcohol (TBA) | ND | 5.0 | ug/L | 1.00 | 06/11/2001 15:05 | |
| Methyl tert-butyl ether (MTBE) | ND | 5.0 | ug/L | 1.00 | 06/11/2001 15:05 | |
| Di-isopropyl Ether (DIPE) | ND | 10 | ug/L | 1.00 | 06/11/2001 15:05 | |
| Ethyl tert-butyl ether (ETBE) | ND | 5.0 | ug/L | 1.00 | 06/11/2001 15:05 | |
| tert-Amyl methyl ether (TAME) | ND | 5.0 | ug/L | 1.00 | 06/11/2001 15:05 | |
| Surrogate(s) | | | | | | |
| 1,2-Dichloroethane-d4 | 101.5 | 76-114 | % | 1.00 | 06/11/2001 15:05 | |

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 5030B

Batch QC Report
Fuel Oxygenates by 8260B

| | | |
|--------------------------|--------------|------------------------------------|
| Method Blank | Water | QC Batch # 2001/06/04-02.27 |
| MB: 2001/06/04-02.27-010 | | Date Extracted: 06/04/2001 15:47 |

| Compound | Result | Rep.Limit | Units | Analyzed | Flag |
|--------------------------------|--------|-----------|-------|------------------|------|
| tert-Butyl alcohol (TBA) | ND | 5.0 | ug/L | 06/04/2001 15:47 | |
| Methyl tert-butyl ether (MTBE) | ND | 1.0 | ug/L | 06/04/2001 15:47 | |
| Di-isopropyl Ether (DIPE) | ND | 1.0 | ug/L | 06/04/2001 15:47 | |
| Ethyl tert-butyl ether (ETBE) | ND | 1.0 | ug/L | 06/04/2001 15:47 | |
| tert-Amyl methyl ether (TAME) | ND | 1.0 | ug/L | 06/04/2001 15:47 | |
| Surrogate(s) | | | | | |
| 1,2-Dichloroethane-d4 | 101.4 | 76-114 | % | 06/04/2001 15:47 | |

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-06-0002

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 5030B

Batch QC Report Fuel Oxygenates by 8260B

| | | |
|--------------------------|--------------|------------------------------------|
| Method Blank | Water | QC Batch # 2001/06/11-01.27 |
| MB: 2001/06/11-01.27-004 | | Date Extracted: 06/11/2001 12:26 |

| Compound | Result | Rep.Limit | Units | Analyzed | Flag |
|--------------------------------|--------|-----------|-------|------------------|------|
| tert-Butyl alcohol (TBA) | ND | 5.0 | ug/L | 06/11/2001 12:26 | |
| Methyl tert-butyl ether (MTBE) | ND | 5.0 | ug/L | 06/11/2001 12:26 | |
| Di-isopropyl Ether (DIPE) | ND | 10.0 | ug/L | 06/11/2001 12:26 | |
| Ethyl tert-butyl ether (ETBE) | ND | 5.0 | ug/L | 06/11/2001 12:26 | |
| tert-Amyl methyl ether (TAME) | ND | 5.0 | ug/L | 06/11/2001 12:26 | |
| Surrogate(s) | | | | | |
| 1,2-Dichloroethane-d4 | 108.6 | 76-114 | % | 06/11/2001 12:26 | |

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To: **Streamborn Consulting Services**
Attn: Matthew Hall

Test Method: 8260B
Prep Method: 5030B

Batch QC Report

Fuel Oxygenates by 8260B

| Laboratory Control Spike (LCS/LCSD) | Water | QC Batch # 2001/06/04-02.27 |
|-------------------------------------|-----------------------------|-----------------------------|
| LCS: 2001/06/04-02.27-007 | Extracted: 06/04/2001 14:04 | Analyzed 06/04/2001 14:04 |
| LCSD: 2001/06/04-02.27-008 | Extracted: 06/04/2001 14:34 | Analyzed 06/04/2001 14:34 |

| Compound | Conc. [ug/L] | | Exp.Conc. [ug/L] | | Recovery [%] | | RPD | Ctrl. Limits [%] | | Flags | |
|--|--------------|------|------------------|------|--------------|-------|-----|------------------|-----|-------|------|
| | LCS | LCSD | LCS | LCSD | LCS | LCSD | | Recovery | RPD | LCS | LCSD |
| Methyl tert-butyl ether | 27.5 | 27.3 | 25.0 | 25.0 | 110.0 | 109.2 | 0.7 | 65-165 | 20 | | |
| Surrogate(s) 1,2-Dichloroethane-d4 | 537 | 558 | 500 | 500 | 107.4 | 111.6 | | 76-114 | | | |

To: Streamborn Consulting Services
 Attn: Matthew Hall

Test Method: 8260B
 Prep Method: 5030B

Batch QC Report

Fuel Oxygenates by 8260B

| | | |
|--|-----------------------------|------------------------------------|
| Laboratory Control Spike (LCS/LCSD) | Water | QC Batch # 2001/06/11-01.27 |
| LCS: 2001/06/11-01.27-002 | Extracted: 06/11/2001 11:17 | Analyzed 06/11/2001 11:17 |
| LCSD: 2001/06/11-01.27-003 | Extracted: 06/11/2001 11:56 | Analyzed 06/11/2001 11:56 |

| Compound | Conc. [ug/L] | | Exp.Conc. [ug/L] | | Recovery [%] | | RPD | Ctrl. Limits [%] | | Flags | |
|--|----------------|------|--------------------|------|--------------|-------|-----|------------------|-----|-------|------|
| | LCS | LCSD | LCS | LCSD | LCS | LCSD | | Recovery | RPD | LCS | LCSD |
| Methyl tert-butyl ether | 26.1 | 27.1 | 25.0 | 25.0 | 104.4 | 108.4 | 3.8 | 65-165 | 20 | | |
| Surrogate(s) 1,2-Dichloroethane-d4 | 522 | 520 | 500 | 500 | 104.4 | 104.0 | | 76-114 | | | |

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-06-0002

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 5030B

Batch QC Report

Fuel Oxygenates by 8260B

| | | |
|----------------------------------|-----------------------------|--|
| Matrix Spike (MS / MSD) | Water | QC Batch # 2001/06/11-01.27 |
| Sample ID: MW5-30-MAY | | Lab Sample ID: 2001-06-0002-004 |
| MS: 2001/06/11-01.27-006 | Extracted: 06/11/2001 13:36 | Analyzed: 06/11/2001 13:36 Dilution: 1.0 |
| MSD: 2001/06/11-01.27-007 | Extracted: 06/11/2001 14:06 | Analyzed: 06/11/2001 14:06 Dilution: 1.0 |

| Compound | Conc. [ug/L] | | | Exp. Conc. [ug/L] | | Recovery [%] | | RPD [%] | Ctrl. Limits [%] | | Flags | |
|--|--------------|------|--------|-------------------|------|--------------|-------|---------|------------------|-----|-------|-----|
| | MS | MSD | Sample | MS | MSD | MS | MSD | | Recovery | RPD | MS | MSD |
| Methyl tert-butyl ether | 25.1 | 25.1 | ND | 25.0 | 25.0 | 100.4 | 100.4 | 0.0 | 65-165 | 20 | | |
| Surrogate(s) 1,2-Dichloroethane-d4 | 473 | 468 | | 500 | 500 | 94.6 | 93.6 | | 76-114 | | | |

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STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-06-0002

Gas/BTEX

Streamborn Consulting Services

✉ 900 Sante Fe Avenue
Albany, CA 94706

Attn: Matthew Hall

Phone: (510) 528-4234 Fax: (510) 528-2613

Project #: P257

Project: 4401 Market Street

Samples Reported

| Sample ID | Matrix | Date Sampled | Lab # |
|------------|--------|------------------|-------|
| MW1-30-MAY | Water | 05/30/2001 16:00 | 1 |
| MW3-30-MAY | Water | 05/30/2001 15:00 | 2 |
| MW4-30-MAY | Water | 05/30/2001 12:20 | 3 |
| MW5-30-MAY | Water | 05/30/2001 10:45 | 4 |
| MW6-30-MAY | Water | 05/30/2001 11:40 | 5 |
| MW7-30-MAY | Water | 05/30/2001 13:50 | 6 |

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Telephone: (925) 484-1919 * Facsimile: (925) 484-1096

To: Streamborn Consulting Services

Test Method: 8020
8015M

Attn.: Matthew Hall

Prep Method: 5030

Gas/BTEX

| | |
|-------------------------------------|---------------------------------|
| Sample ID: MW1-30-MAY | Lab Sample ID: 2001-06-0002-001 |
| Project: P257 4401 Market Street | Received: 05/31/2001 18:19 |
| Sampled: 05/30/2001 16:00 | Extracted: 06/06/2001 15:44 |
| Matrix: Water | QC-Batch: 2001/06/06-01.03 |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|--------------------------|--------|-----------|-------|----------|------------------|------|
| Gasoline | ND | 50 | ug/L | 1.00 | 06/06/2001 15:44 | |
| Benzene | ND | 0.50 | ug/L | 1.00 | 06/06/2001 15:44 | |
| Toluene | ND | 0.50 | ug/L | 1.00 | 06/06/2001 15:44 | |
| Ethyl benzene | ND | 0.50 | ug/L | 1.00 | 06/06/2001 15:44 | |
| Xylene(s) | ND | 0.50 | ug/L | 1.00 | 06/06/2001 15:44 | |
| Surrogate(s) | | | | | | |
| 4-Bromofluorobenzene | 121.5 | 50-150 | % | 1.00 | 06/06/2001 15:44 | |
| 4-Bromofluorobenzene-FID | 122.5 | 50-150 | % | 1.00 | 06/06/2001 15:44 | |

To: **Streamborn Consulting Services**

Test Method: 8020
8015M

Attn.: Matthew Hall

Prep Method: 5030

Gas/BTEX

| | |
|-------------------------------------|--|
| Sample ID: MW3-30-MAY | Lab Sample ID: 2001-06-0002-002 |
| Project: P257 4401 Market Street | Received: 05/31/2001 18:19 |
| Sampled: 05/30/2001 15:00 | Extracted: 06/06/2001 16:15 |
| Matrix: Water | QC-Batch: 2001/06/06-01.03 |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|--------------------------|--------|-----------|-------|----------|------------------|------|
| Gasoline | ND | 50 | ug/L | 1.00 | 06/06/2001 16:15 | |
| Benzene | ND | 0.50 | ug/L | 1.00 | 06/06/2001 16:15 | |
| Toluene | ND | 0.50 | ug/L | 1.00 | 06/06/2001 16:15 | |
| Ethyl benzene | ND | 0.50 | ug/L | 1.00 | 06/06/2001 16:15 | |
| Xylene(s) | ND | 0.50 | ug/L | 1.00 | 06/06/2001 16:15 | |
| Surrogate(s) | | | | | | |
| Trifluorotoluene | 121.8 | 58-124 | % | 1.00 | 06/06/2001 16:15 | |
| 4-Bromofluorobenzene-FID | 94.3 | 50-150 | % | 1.00 | 06/06/2001 16:15 | |

To: **Streamborn Consulting Services**

Test Method: 8020
8015M

Attn.: Matthew Hall

Prep Method: 5030

Gas/BTEX

| | |
|-------------------------------------|--|
| Sample ID: MW4-30-MAY | Lab Sample ID: 2001-06-0002-003 |
| Project: P257 4401 Market Street | Received: 05/31/2001 18:19 |
| Sampled: 05/30/2001 12:20 | Extracted: 06/06/2001 16:46 |
| Matrix: Water | QC-Batch: 2001/06/06-01.03 |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|--------------------------|--------|-----------|-------|----------|------------------|------|
| Gasoline | 1000 | 50 | ug/L | 1.00 | 06/06/2001 16:46 | |
| Benzene | 19 | 0.50 | ug/L | 1.00 | 06/06/2001 16:46 | |
| Toluene | ND | 0.50 | ug/L | 1.00 | 06/06/2001 16:46 | |
| Ethyl benzene | 50 | 0.50 | ug/L | 1.00 | 06/06/2001 16:46 | |
| Xylene(s) | 3.4 | 0.50 | ug/L | 1.00 | 06/06/2001 16:46 | |
| Surrogate(s) | | | | | | |
| 4-Bromofluorobenzene | 114.9 | 50-150 | % | 1.00 | 06/06/2001 16:46 | |
| 4-Bromofluorobenzene-FID | 104.2 | 50-150 | % | 1.00 | 06/06/2001 16:46 | |

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-06-0002

To: **Streamborn Consulting Services**

Test Method: 8020
8015M

Attn.: Matthew Hall

Prep Method: 5030

Gas/BTEX

| | |
|-------------------------------------|--|
| Sample ID: MW5-30-MAY | Lab Sample ID: 2001-06-0002-004 |
| Project: P257 4401 Market Street | Received: 05/31/2001 18:19 |
| Sampled: 05/30/2001 10:45 | Extracted: 06/06/2001 17:18 |
| Matrix: Water | QC-Batch: 2001/06/06-01.03 |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|--------------------------|--------|-----------|-------|----------|------------------|------|
| Gasoline | 570 | 50 | ug/L | 1.00 | 06/06/2001 17:18 | |
| Benzene | 20 | 0.50 | ug/L | 1.00 | 06/06/2001 17:18 | |
| Toluene | ND | 0.50 | ug/L | 1.00 | 06/06/2001 17:18 | |
| Ethyl benzene | 26 | 0.50 | ug/L | 1.00 | 06/06/2001 17:18 | |
| Xylene(s) | 22 | 0.50 | ug/L | 1.00 | 06/06/2001 17:18 | |
| Surrogate(s) | | | | | | |
| 4-Bromofluorobenzene | 117.0 | 50-150 | % | 1.00 | 06/06/2001 17:18 | |
| 4-Bromofluorobenzene-FID | 103.5 | 50-150 | % | 1.00 | 06/06/2001 17:18 | |

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To: Streamborn Consulting Services

Test Method: 8020
8015M

Attn.: Matthew Hall

Prep Method: 5030

Gas/BTEX

| | |
|-------------------------------------|--|
| Sample ID: MW6-30-MAY | Lab Sample ID: 2001-06-0002-005 |
| Project: P257 4401 Market Street | Received: 05/31/2001 18:19 |
| Sampled: 05/30/2001 11:40 | Extracted: 06/06/2001 17:49 |
| Matrix: Water | QC-Batch: 2001/06/06-01.03 |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|--------------------------|--------|-----------|-------|----------|------------------|------|
| Gasoline | 53 | 50 | ug/L | 1.00 | 06/06/2001 17:49 | 9 |
| Benzene | ND | 0.50 | ug/L | 1.00 | 06/06/2001 17:49 | |
| Toluene | ND | 0.50 | ug/L | 1.00 | 06/06/2001 17:49 | |
| Ethyl benzene | ND | 0.50 | ug/L | 1.00 | 06/06/2001 17:49 | |
| Xylene(s) | ND | 0.50 | ug/L | 1.00 | 06/06/2001 17:49 | |
| Surrogate(s) | | | | | | |
| 4-Bromofluorobenzene | 118.3 | 50-150 | % | 1.00 | 06/06/2001 17:49 | |
| 4-Bromofluorobenzene-FID | 97.6 | 50-150 | % | 1.00 | 06/06/2001 17:49 | |

To: **Streamborn Consulting Services**

Test Method: 8020
8015M

Attn.: Matthew Hall

Prep Method: 5030

Gas/BTEX

| | |
|-------------------------------------|--|
| Sample ID: MW7-30-MAY | Lab Sample ID: 2001-06-0002-006 |
| Project: P257 4401 Market Street | Received: 05/31/2001 18:19 |
| Sampled: 05/30/2001 13:50 | Extracted: 06/06/2001 18:21 |
| Matrix: Water | QC-Batch: 2001/06/06-01.03 |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|--------------------------|--------|-----------|-------|----------|------------------|------|
| Gasoline | ND | 50 | ug/L | 1.00 | 06/06/2001 18:21 | |
| Benzene | ND | 0.50 | ug/L | 1.00 | 06/06/2001 18:21 | |
| Toluene | ND | 0.50 | ug/L | 1.00 | 06/06/2001 18:21 | |
| Ethyl benzene | ND | 0.50 | ug/L | 1.00 | 06/06/2001 18:21 | |
| Xylene(s) | ND | 0.50 | ug/L | 1.00 | 06/06/2001 18:21 | |
| Surrogate(s) | | | | | | |
| 4-Bromofluorobenzene | 120.6 | 50-150 | % | 1.00 | 06/06/2001 18:21 | |
| 4-Bromofluorobenzene-FID | 100.9 | 50-150 | % | 1.00 | 06/06/2001 18:21 | |

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-06-0002

To: Streamborn Consulting Services

Test Method: 8015M
8020

Attn.: Matthew Hall

Prep Method: 5030

Batch QC Report Gas/BTEX

| | | |
|--------------------------|--------------|------------------------------------|
| Method Blank | Water | QC Batch # 2001/06/06-01.03 |
| MB: 2001/06/06-01.03-003 | | Date Extracted: 06/06/2001 08:14 |

| Compound | Result | Rep.Limit | Units | Analyzed | Flag |
|--------------------------|--------|-----------|-------|------------------|------|
| Gasoline | ND | 50 | ug/L | 06/06/2001 08:14 | |
| Benzene | ND | 0.5 | ug/L | 06/06/2001 08:14 | |
| Toluene | ND | 0.5 | ug/L | 06/06/2001 08:14 | |
| Ethyl benzene | ND | 0.5 | ug/L | 06/06/2001 08:14 | |
| Xylene(s) | ND | 0.5 | ug/L | 06/06/2001 08:14 | |
| Surrogate(s) | | | | | |
| 4-Bromofluorobenzene | 125.6 | 50-150 | % | 06/06/2001 08:14 | |
| 4-Bromofluorobenzene-FID | 110.7 | 50-150 | % | 06/06/2001 08:14 | |

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STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-06-0002

To: Streamborn Consulting Services

Test Method: 8020

Attn: Matthew Hall

Prep Method: 5030

Batch QC Report

Gas/BTEX

| Laboratory Control Spike (LCS/LCSD) | | Water | | QC Batch # 2001/06/06-01.03 | |
|-------------------------------------|----------------------|------------|------------------|-----------------------------|------------------|
| LCS: | 2001/06/06-01.03-004 | Extracted: | 06/06/2001 08:45 | Analyzed | 06/06/2001 08:45 |
| LCSD: | 2001/06/06-01.03-005 | Extracted: | 06/06/2001 09:16 | Analyzed | 06/06/2001 09:16 |

| Compound | Conc. [ug/L] | | Exp. Conc. [ug/L] | | Recovery [%] | | RPD | Ctrl. Limits [%] | | Flags | |
|---------------------|--------------|------|-------------------|-------|--------------|-------|-----|------------------|-----|-------|------|
| | LCS | LCSD | LCS | LCSD | LCS | LCSD | | Recovery | RPD | LCS | LCSD |
| Benzene | 102 | 102 | 100.0 | 100.0 | 102.0 | 102.0 | 0.0 | 77-123 | 20 | | |
| Toluene | 98.9 | 100 | 100.0 | 100.0 | 98.9 | 100.0 | 1.1 | 78-122 | 20 | | |
| Ethyl benzene | 101 | 102 | 100.0 | 100.0 | 101.0 | 102.0 | 1.0 | 70-130 | 20 | | |
| Xylene(s) | 296 | 304 | 300 | 300 | 98.7 | 101.3 | 2.6 | 75-125 | 20 | | |
| Surrogate(s) | | | | | | | | | | | |
| Trifluorotoluene | 486 | 494 | 500 | 500 | 97.2 | 98.8 | | 58-124 | | | |

1220 Quarry Lane * Pleasanton, CA 94566-4756
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To: **Streamborn Consulting Services**

Test Method: 8015M
8020

Attn: Matthew Hall

Prep Method: 5030

Batch QC Report

Gas/BTEX

| Laboratory Control Spike (LCS/LCSD) | Water | QC Batch # 2001/06/06-01.03 |
|-------------------------------------|-----------------------------|-----------------------------|
| LCS: 2001/06/06-01.03-006 | Extracted: 06/06/2001 09:47 | Analyzed 06/06/2001 09:47 |
| LCSD: 2001/06/06-01.03-007 | Extracted: 06/06/2001 10:17 | Analyzed 06/06/2001 10:17 |

| Compound | Conc. [ug/L] | | Exp.Conc. [ug/L] | | Recovery [%] | | RPD | Ctrl. Limits [%] | | Flags | |
|--|--------------|------|------------------|------|--------------|-------|-----|------------------|-----|-------|------|
| | LCS | LCSD | LCS | LCSD | LCS | LCSD | | Recovery | RPD | LCS | LCSD |
| Gasoline | 442 | 458 | 500 | 500 | 88.4 | 91.6 | 3.6 | 75-125 | 20 | | |
| Surrogate(s) 4-Bromofluorobenzene-FI | 494 | 508 | 500 | 500 | 98.8 | 101.6 | | 50-150 | | | |

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-06-0002

To: Streamborn Consulting Services
Attn.: Matthew Hall

Test Method: 8020
Prep Method: 5030

Batch QC Report Gas/BTEX

| | | |
|--------------------------------|-----------------------------|--|
| Matrix Spike (MS / MSD) | Water | QC Batch # 2001/06/06-01.03 |
| Sample ID: MW3-30-MAY | | Lab Sample ID: 2001-06-0002-002 |
| MS: 2001/06/06-01.03-022 | Extracted: 06/06/2001 18:52 | Analyzed: 06/06/2001 18:52 Dilution: 1.0 |
| MSD: 2001/06/06-01.03-023 | Extracted: 06/06/2001 19:24 | Analyzed: 06/06/2001 19:24 Dilution: 1.0 |

| Compound | Conc. [ug/L] | | | Exp. Conc. [ug/L] | | Recovery [%] | | RPD [%] | Ctrl. Limits [%] | | Flags | |
|---------------------|--------------|-----|--------|-------------------|-------|--------------|-------|---------|------------------|-----|-------|-----|
| | MS | MSD | Sample | MS | MSD | MS | MSD | | Recovery | RPD | MS | MSD |
| Benzene | 113 | 110 | ND | 100.0 | 100.0 | 113.0 | 110.0 | 2.7 | 65-135 | 20 | | |
| Toluene | 109 | 108 | ND | 100.0 | 100.0 | 109.0 | 108.0 | 0.9 | 65-135 | 20 | | |
| Ethyl benzene | 108 | 109 | ND | 100.0 | 100.0 | 108.0 | 109.0 | 0.9 | 65-135 | 20 | | |
| Xylene(s) | 322 | 325 | ND | 300 | 300 | 107.3 | 108.3 | 0.9 | 65-135 | 20 | | |
| Surrogate(s) | | | | | | | | | | | | |
| Trifluorotoluene | 116.8 | 569 | | 500 | 500 | 116.8 | 113.8 | | 58-124 | | | |

1220 Quarry Lane * Pleasanton, CA 94566-4756
Telephone: (925) 484-1919 * Facsimile: (925) 484-1096

To: **Streamborn Consulting Services**

Test Method: 8015M
8020

Attn: Matthew Hall

Prep Method: 5030

Legend & Notes

Gas/BTEX

Analyte Flags

g

Hydrocarbon reported in the gasoline range does not match our gasoline standard.