IMFC INGRAM MASON & FAIRBAIRN
A DIVISION OF IMFC CORPORATION

CITICORP CENTER · ONE SANSOME STREET · SUITE 1900 · SAN FRANCISCO, CALIFORNIA 94104
TEL 415-951-4793 · FAX 415-951-4701 · FAX 800-804-IMFC

Alameda County Health Care Services Agency
Department of Environmental Health
Hazardous Material Division
1131 Harbor Bay Parkway
Alameda, California 94502-6577

October 16, 2000

00 OCT 17 PM 2:44
ENVIRONMENTAL PROTECTION

Attention: Mr. Don Hwang

Subject: Collection and Chemical Analysis of Grab Groundwater Samples
2504 MacArthur Boulevard
Oakland, California 94602

Dear Mr. Hwang:

Enclosed we are resubmitting for your records, one copy of the report titled "Collection and Chemical Analysis of Grab Groundwater Samples" dated February 2000, for the site located at 2504 MacArthur Boulevard, Oakland, California. We understand that the case file currently does not contain this report.

Based on the conclusions of this report, as well as the results of a number of investigations and the implementation of a corrective action plan, as documented in various reports, IMFC on behalf of Mr. Michael Marr requests that Low-Risk Site Closure be granted to this site.

If you have any comments or questions, please do not hesitate to call us.

Very truly yours,

Fred Serafin
Director, Environmental Services

Enclosure

cc: Mr. Michael Marr, 3577 Fruitvale Ave, Oakland, CA 94602

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COLLECTION AND CHEMICAL ANALYSIS OF GRAB GROUNDWATER SAMPLES

2504 MacArthur Boulevard
Oakland, California

Prepared for

MARR & ASSOCIATES
3577 Fruitvale Avenue
Oakland, CA 94602

Project No. MAR-102J

February 2000

IMFC

INGRAM MASON & FAIRBAIRN
ONE SANSOME STREET, SUITE 1900
SAN FRANCISCO, CALIFORNIA 94104
TEL (415) 951-4793 (415) 281-9696
FAX (415) 951-4701 (800) 804-IMFC

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COLLECTION AND CHEMICAL ANALYSIS OF GRAB GROUNDWATER SAMPLES

2504 MacArthur Boulevard
Oakland, California

A. GENERAL

This document presents the results of advancing three borings to approximately five feet below groundwater table; collecting and chemically analyzing three grab groundwater samples for the site located at 2504 MacArthur Boulevard, Oakland, California (Site). The locations of the borings are in the southwest and southeast in the downgradient direction of the Site. A Site Location Map is presented in Figure 1, and the boring locations are shown on Figure 2.

This work was performed at the specific request of, and in compliance with the requirements of the Alameda County Department of Environmental Health (County); and guidelines of: 1) the leaking Underground Fuel Tank (LUFT) field manual by the State Water Resources Control Board; 2) Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites, San Francisco Bay Region (RWQCB); and 3) the State Water Resources Control Board's a) Petroleum Underground Storage Tank Cleanup Fund Regulations, b) Petroleum Underground Storage Tank Cleanup Fund Corrective Action Guide, and c) Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304.

B. BACKGROUND

Four underground storage tanks were removed from the Site on June 27, 1994. During the excavation, extensive visible staining in the sidewalls was observed and strong hydrocarbon fuel odor was detected. Soil samples obtained from the tank excavation area confirmed that the subsurface had been moderately to highly impacted by fuel hydrocarbons. Upon removal of the tanks, under the direction of the representative of the County, the tank pits were overexcavated and the contaminated soil was stockpiled at the Site. Subsequently, the contaminated soil was removed from the Site.

A program of subsurface investigation was implemented in July 1995. The services were based on the requirements of the County and RWQCB. It was intended that the investigation would reasonably define the horizontal and vertical extent of the pollutants in and around the location of former underground tanks, and would also initially define the geologic and hydrogeologic parameters needed for determining an effective and feasible remedial action for this site. The investigation consisted of advancing five soil borings at pre-determined locations; converting three soil borings into monitoring wells; chemical analyses of selected soil and groundwater samples; establishing horizontal and vertical control of the wells, and calculating the groundwater potentiometric levels and flow direction; and identifying and recommending appropriate remedial technology.

Evaluation of available data indicated the existence of a contaminated zone, extending to an approximate depth of 15 feet below ground surface (bgs), located in the southwest of the Site, in the vicinity of monitoring well B-1 and MacArthur Boulevard sidewalk. This contaminated zone was very close to the locations of various utilities, sanitary sewer and storm drain; and therefore, constituted a health and safety hazard.

The results of the investigation also indicated that some immediate interim remediation measure should be implemented. The intended purpose of the measure was to establish control, reduce the rate of migration and expansion of the existing plume of hydrocarbon to the adjacent property(ies), and to remove the potential source of groundwater contamination. Several methods for remediation of contaminated soil underneath the Site were evaluated. The examination of the alternatives concluded that excavation and off-site disposal to be an acceptable means for cleaning up the Site because it provided for source removal, thus eliminating many long-term site management concerns. The plan consisted of five general elements which included: 1) soil excavation, 2) confirmatory testing of the excavation limits, 3) lining of excavation with visqueen and backfilling with fresh fill, 4) stockpiling and treatment of excavated soil and 5) disposal of the stockpiled soil. After approval of the workplan by the County, the services were implemented in the field. Also, as part of the plan, a program of quarterly groundwater monitoring was implemented.

During the performance of the initial investigation, groundwater was first encountered at a depth of 34 feet bgs in both borings B-1 and B-3, but immediately started to rise. This indicated the existence of a confined water zone. The regional groundwater flow is generally in a south/southwesterly direction toward the San Francisco Bay. Based on the initial groundwater level measurements in 1995, the site-specific groundwater flow direction was assessed to be in a southerly direction.

Originally, minor concentrations of hydrocarbon pollutants were detected in the groundwater. Although the geology and hydrogeology of the site made the characterization of potential pathways and conduits difficult to estimate, it was assumed that pollutants in the groundwater had not substantially migrated off-site.

Due to the low levels of contaminants detected in the groundwater, a program of quarterly monitoring was implemented to gather additional data for characterization of contamination, and for the future selection of an appropriate treatment technology, if needed.

Chemical analyses of groundwater samples collected from monitoring wells MWB-1, MWB-3, and MWB-5 in November 1996 and June 1997 indicated non-detectable levels of contaminants tested for above the laboratory detection limits.

The groundwater potentiometric level maps for November 1996, February through August 1997 and February, May, and August 1998 showed that site-specific groundwater flow direction over the period remained basically toward the south-southwest with the gradient ranging from 0.018 ft/ft to 0.037 ft/ft.

The Site is located at the heel of gently sloping Oakland Hills. The lithologic sequences of alluvial deposits consist of interbedded strata of silt and clay with some sand to at least 42 feet below ground surface. The analysis of generated data suggests that a confined aquifer is located underneath the Site at an approximate depth of 30 feet. Due to the Site's lithologic makeup, the aquifer's ceiling conditions appear to be relatively tight. Consequently, the potential contamination at the higher horizon (5 to 9 feet below ground surface) has apparently not impacted the groundwater.

Based on the conclusions of the investigations, and in view of the absence of contaminants in the groundwater beneath the Site, in September 30, 1998, IMFC on behalf of the owner requested that this site be granted Low-Risk Site Closure.

On December 9, 1998 the County requested that prior to granting the site closure, three grab groundwater samples be collected from the southwest and southeast areas of the Site, in the

downgradient direction (on both sides of monitoring well (MWB-1), and chemically analyzed. On February 12, 1999, IMFC prepared and submitted a workplan to the County for the additional investigation. Subsequent to further discussions and negotiations with the County, IMFC revised the workplan to incorporate County's views and comments, and re-submitted the revised workplan on February 26, 1999. The County approved the revised workplan on March 23 1999. However, due to some miscommunication, the request for pre-approval (containing the workplan) was not sent to the Cleanup Fund in proper form; therefore, the project was not implemented.

On July 16, 1999, pursuant to several telephone conversations between the representative of the County and IMFC staff, the County verbally requested the implementation of the workplan. Further, on July 22, 1999, the County requested additional sampling and chemical testing, and some modification of drilling operation in order to allow the observation of the aquifer's semi-confined condition beneath the site.

Upon cost pre-approval of the project by the Cleanup Fund in November 1999, the fieldwork was eventually implemented on December 13, 1999.

C. SCOPE OF SERVICES/METHODOLOGY

To comply with the request of the County, and to confirm that groundwater contamination has not migrated off-site, three soil borings were advanced to approximately five (5) feet below groundwater and collected grab samples. The services were performed in accordance with all applicable local, state and federal environmental, safety and construction laws and regulations.

The drilling and sampling activities included the following:

- Preparation of a workplan and Site Health and Safety Plan;
- Obtaining necessary permits;

- Collection and chemical analyses of groundwater samples;
- Analysis of laboratory/field data and Preparation of this report.

Details of each task for this project included the following:

Task 100. Interaction with Regulatory Agencies and Preparation of Workplan

IMFC interacted with the County and incorporated their comments and suggestions into the scope and progress of the investigation. IMFC prepared a detailed site specific technical workplan after extensive discussions with the County, and provided necessary information needed for closure of the Site.

Task 200. Health and Safety Plan

As required by 29 CFR 1910.120, a site specific Health and Safety Plan was prepared to cover the work including but not limited to data acquisition, and phases such as maintenance, monitoring, abandonment and/or removal, and waste disposal.

Task 300. Permits

IMFC obtained permit for drilling and sampling at the Site from the Alameda County Public Works Agency, Water Resources Section (Appendix A).

Task 400. Implementation of Workplan

After approval of the workplan by the County, the services were implemented in the field. The drilling and sampling protocol was as follows:

- Notifying Underground Service Alert (USA). Retaining the services of a professional underground locator to determine the existence and location of any underground utilities or obstructions in the vicinity of proposed borings locations.

- Retaining the services of a licensed drilling company to drill soil borings at selected locations.

- Screening the cuttings in the field by a photoionization detector (PID).

- collecting groundwater samples for chemical analyses. The samples were collected by disposable bailers. After collection, all samples were labeled and placed in an iced cooler for transport under chain-of-custody to the analytical laboratory.

- Analyses of groundwater samples consisted of:
    1. Total Purgeable Petroleum Hydrocarbons as Gasoline (TPH-G) by GCFID (LUFT Method) following sample purge and trap by EPA Method 5030;
    2. Volatile hydrocarbon constituents: Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX) by EPA Method 8020 / 602; and
    3. Methyl Tertiary Butyl Ether (MTBE) by EPA Method 8020 / 602, and confirmed by EPA Method 8260.
    4. Dissolved lead, chromium, nickel, zinc, and cadmium of sample collected from monitoring well MWB-5.

- Preparation of this report, based on field observations, laboratory data, and evaluation of generated data.

D. PERFORMANCE OF SERVICES

All fieldwork was performed in accordance with the requirements of RWQCB. IMFC's Sampling Protocol (Appendix B) was followed for all sampling activities. Underground Service Alert (USA) and California Utility Survey of Oakland located the underground utility lines in the work area prior to December 13, 1999.

Gregg Drilling and Testing, Inc. of Martinez advanced three Geoprobe® borings into the substrata to about 5 feet below the groundwater table at pre-determined locations. Grab groundwater samples were collected by disposable bailers. In boring SB-3 advancement of the Geoprobe® was stopped at a depth of about 18 feet below ground surface for a period of approximately two hours, in order to observe the integrity of the aquifer's ceiling.

Static depth-to-water (DTW) levels were measured in the existing three groundwater monitoring wells at the Site. The DTW level in each monitoring well was measured to the nearest 0.01-foot using an electronic water-level sounder, cleaned with TSP and water before each use. Subsequent to measuring the DTW data, IMFC collected water samples from each of the three monitoring wells for chemical testing. Table 1 presents the cumulative DTW levels, wellhead and groundwater elevations at the Site since 1995 and includes the December 13, 1999 measurement.

D-1. Groundwater Sampling

On December 13, 1999, IMFC collected groundwater samples from the three groundwater monitoring wells (MWB-1, MWB-3, and MWB-5) and the three Geoprobe® borings at the Site. The groundwater monitoring wells have been constructed in the first-encountered water-bearing zone beneath the Site. Before obtaining the groundwater samples, each well was purged until the electrical conductivity, pH, and temperature values of the groundwater were stabilized. During the purging process for each well, IMFC periodically measured and recorded these parameters. Each well was purged of at least three well volumes.

Before sample collection, the water level in each well was allowed to recover to at least 80% of the initial water level. A sample of the formation water was also collected from the water in each of the Geoprobe® borings using a new disposable Teflon® bailer. The water samples were then gently decanted into laboratory-cleaned, 40-milliliter (ml) glass vials and sealed with Teflon®-lined

caps. All containers were inspected for air bubbles to check for head-space, which would allow volatilization to occur.

The samples were labeled in the field with the date, project location, and sample identification, and immediately chilled in an ice chest for transport under Chain-of-Custody to the Sequoia Analytical laboratory in Walnut Creek, California. No evidence of measurable floating product, hydrocarbon vapor or perceptible odors were noted in the water samples collected from the wells. Appendix C contains the Monitoring Well Sampling Data Sheets, which indicates well development data, and stabilization measurements.

Purged water from the wells was temporarily stored on-site in labeled 55-gallon metal drums approved by the Department of Transportation.

D-2. Chemical Analysis and Quality Control Data

On December 13, 1999, IMFC submitted the groundwater samples collected from the three groundwater monitoring wells and three Geoprobe® borings at the Site to Sequoia Analytical. Each of the water samples was analyzed for TPH-G, BTEX and MTBE. Further, the sample collected from monitoring well MWB-5 was tested for dissolved lead, chromium, nickel, zinc, and cadmium.

The laboratory chemical analyses indicated that none of the groundwater samples from the three monitoring wells contained any analyte above the laboratory detection limits. Samples collected from Geoprobe® borings SB-2 and SB-3 contained trace concentrations of benzene, toluene, total xylenes, and MTBE. Sample collected from the Geoprobe® boring SB-1 indicated existence of purgeable hydrocarbons at 3.9 parts per million (ppm) , benzene at 71 parts per billion (ppb), ethylbenzene at 74 ppb, and total xylenes at 23 ppb.

Concentrations of dissolved lead, chromium, nickel, zinc, and cadmium detected in groundwater sample collected from monitoring well MWB-5 were all significantly less than regulatory thresholds, and therefore, they are considered as background and naturally occurring.

Table 2 summarizes the results of chemical analyses and Appendix D contains a copy of the original laboratory analytical reports and the Chain-of-Custody Records.

Quality Assurance/Quality Control Review (QA/QC) procedures for the collection and chemical analysis of groundwater samples have been promulgated by the EPA in the document SW-846. These procedures are designed to confirm the reliability of the test results. The following section offers a review of the QA/QC procedures that were followed in the field, and the QA/QC data supplied by the testing laboratory.

(1) **Field Sampling** - The soil samples were collected in accordance with IMFC's internal sampling protocol. To prevent contamination between discrete sampling points, the sampler was cold cleaned with non-hazardous inorganic detergent and rinsed with deionized water. The integrity of the sample was maintained by properly sealing, labeling, and storing the samples until receipt by the testing laboratory.

(2) **Laboratory Analysis** - To evaluate the validity of the test results, the following QA/QC parameters were reviewed:

- Sample holding times
- Matrix spike/matrix spike duplicate (MS/MSD) recovery data

The laboratory report indicates that for all the samples, the analytical procedures, including extraction and analysis, were performed within the sample holding times specified by the EPA for the various analyses.

Matrix spike/matrix spike duplicate (MS/MSD) data was supplied by Sequoia Analytical for all the chemical analyses requested. The SW-846 manual specifies that MS/MSD analyses be performed on a subset of the samples being analyzed. In the MS/MSD procedure, the selected sample is spiked with a compound that is identical to the compound being analyzed for. The selected sample is then split, to create a duplicate, and both parts are analyzed. The recovery percentages of both spikes should fall within limits specified either by SW-846 or the laboratory, as allowed by SW-846. The relative percent difference (RPD) of the recoveries of the spike and duplicate are calculated and are used to assess the precision of the analytical procedure. The MS/MSD data was reported as percentage recovery of spike and duplicate. The RPDs were calculated in each case and were compared with the RPD limits set by SW-846 or the limits set by the lab for spike recoveries from water and soil matrices. The RPD for each analysis was reviewed. All RPDs fell within the allowable limits, and are considered acceptable.

D-3. Discussion

The results of laboratory chemical analyses on water samples collected from monitoring wells MWB-1, MWB-3, and MWB-5 indicated non-detectable levels of contaminants tested for above the laboratory detection limits.

The result of sample collected from Geoprobe® boring SB-1 indicated relatively high concentration of hydrocarbons. However, it should be noted that advancement of the Geoprobe® was stopped in this boring at a depth of about 18 feet below ground surface in a dry zone for a period of approximately two hours. During this period the confined groundwater permeated up into the boring and reached a depth of 8.9 feet below ground surface (bgs) before stabilizing. During previous investigations at the Site, a moderately contaminated zone located

at an approximate depth of 7 to 15 feet bgs had been encountered. It appears that groundwater coming in contact with the existing contaminated lenses within the soil column had mobilized the pollutants and impacted the sample. Moreover, smearing of PVC well casing during the advancement through the impacted zone could have contributed to the existence of the pollutants in the sample. Monitoring well MWB-1, located approximately 8 feet upgradient of the Geoprobe® boring SB-1, which was sampled on the same day, did not detect any contaminants. Further, previous sampling episodes of this monitoring well have consistently demonstrated that groundwater underneath the Site has not been impacted to the level that may need remediation.

E. CONCLUSIONS AND RECOMMENDATIONS

At the request of the Alameda County Department of Environmental Health, a program of groundwater investigation was conducted at the site located at 2504 MacArthur Boulevard, Oakland, California. The program consisted of advancing three borings to approximately five feet below groundwater table; collecting and chemically analyzing three grab groundwater samples, and sampling and chemically analyzing three on-site monitoring wells.

Chemical analyses of groundwater samples collected from the three on-site monitoring wells indicated non-detectable levels of contaminants tested for above the laboratory detection limits. The absence of pollutants in groundwater signifies that apparently due to the removal of most of the contaminated soil, and relatively tight substrata formations, the remaining contaminants at the higher horizons have basically remained within the top 15 feet underneath the Site, and not migrated down to reach the groundwater table.

Based on the measurement of depth to groundwater in the three on-site monitoring wells, the groundwater flow direction was determined to be in the southerly direction. Figure 3 schematically shows the groundwater potentiometric level and the flow direction.

This southerly flow direction appears to be reasonably consistent with general regional groundwater flow direction and corroborates the previous groundwater measurements and the determination of the flow direction at the Site.

The chemical analysis of water samples collected from two Geoprobe® borings indicated trace concentrations of benzene, toluene, total xylenes, and MTBE. The chemical analysis of water sample collected from the third Geoprobe® boring indicated relatively high concentration of hydrocarbons. However, it is surmised that smearing of PVC well casings during the advancement of the Geoprobe® through the shallow impacted zone, and the contact of permeating confined groundwater with the existing contaminated lenses within the soil column have contributed to the detection of the pollutants in the grab samples. Current and previous chemical testing of samples from on-site monitoring wells have shown that groundwater underneath the Site has not been impacted to the level that may need remediation.

As discussed in a previous report, the concentration levels of soil contaminants that have remained underneath the Site are believed to be relatively low to moderate, and are located within a limited horizon. Therefore, it is anticipated that it should not require any actively engineered remediation. It is believed that passive bioremediation would eventually eliminate the remaining soil pollutants. Passive bioremediation processes may act to naturally reduce and eventually eliminate the low levels of petroleum hydrocarbon components present in the remaining contaminated mass underneath the Site. Natural ubiquitous microbial populations in the soil could degrade the petroleum hydrocarbons to carbon dioxide and water, resulting in completion of cleanup.

Based upon the results of generated data during the performance of this work, as well as the information available to IMFC from previous investigations, and guidelines established by the

California Regional Water Quality Control Board, IMFC recommends that this site be granted Low-Risk Site Closure.

F. LIMITATIONS

The data, information, interpretations, and recommendations contained in this technical report are presented solely as bases and guides to the existing environmental conditions of the site located at 2504 MacArthur Boulevard, Oakland, Alameda County, California. The conclusions and professional opinions presented herein were developed by IMFC in accordance with generally accepted engineering principles and practices. As with all geotechnical and environmental reports, the opinions expressed here are subject to revisions in light of new information, new governmental regulations or new interpretations of existing regulations, which may be developed in the future, and no warranties are expressed or implied.

Soil deposits may vary in type, strength, permeability, and many other important properties between points of observation and exploration. Additionally, changes can occur in groundwater and soil moisture conditions due to seasonal variations, or for other reasons. Furthermore, the distribution of chemical concentrations in the soil and groundwater can vary spatially and over time. The chemical analysis results presented herein are illustrative of only the sampling locations at the time of sampling. Therefore, it must be recognized that IMFC does not and cannot have complete knowledge of the subsurface conditions underlying the subject site. The opinions presented are based upon the findings at the points of exploration and upon interpretative data, including interpolation and extrapolation of information obtained at points of observation.

The services provided represent professional opinions, formulated within specific budget limits, upon which client can base actions to reduce the potential for exposure to liability for the consequence of the occurrence of hazardous waste.

This report has not been prepared for use by parties other than Mr. Michael Marr. It may not contain sufficient information for the purposes of other parties or other uses. If any changes are made in the project as described in this report, the conclusions and recommendations contained herein should not be considered valid, unless the changes are reviewed by IMFC, and the conclusions and recommendations are modified or approved in writing.

Well Date	Wellhead * Elevation	Depth to Water	Elevation of Groundwater	Field Observations
MW-B1				
07/11/95	198.19	9.70	188.49	None
11/06/96		8.60	189.59	None
12/12/96		7.40	190.79	None
01/23/97		5.20	192.99	None
02/27/97		5.95	192.24	None
03/26/97		6.03	192.16	None
04/25/97		6.21	191.98	None
05/23/97		7.01	191.18	None
06/27/97		7.06	191.13	None
07/22/97		7.66	190.53	None
08/22/97		8.20	189.99	None
11/25/97		7.05	191.14	None
02/24/98		5.00	193.19	None
05/22/98		6.82	191.27	None
08/20/98		7.90	190.29	None
12/13/99		**7.40**	**190.79**	**None**
MW-B3				
07/11/95	201.41	9.22	192.19	None
11/06/96		11.38	190.03	None
12/12/96		9.28	192.13	None
01/23/97		8.05	193.36	None
02/27/97		8.40	193.01	None
03/26/97		8.49	192.92	None
04/25/97		8.72	192.69	None
05/23/97		9.18	192.23	None
06/27/97		9.32	192.09	None
07/22/97		10.26	191.15	None
08/22/97		10.27	191.14	None
11/25/97		9.15	192.26	None
02/24/98		7.23	194.18	None
05/22/98		8.41	193.00	None
08/20/98		9.80	191.61	None
12/13/99		**10.05**	**191.36**	**None**

Well Date	Wellhead * Elevation	Depth to Water	Elevation of Groundwater	Field Observations
MW-B5				
07/11/95	201.39	9.26	192.13	None
11/06/96		10.28	191.11	None
12/12/96		9.58	191.81	None
01/23/97		8.28	193.11	None
02/27/97		8.40	192.99	None
03/26/97		8.53	192.86	None
04/25/97		8.88	192.51	None
05/23/97		9.51	191.88	None
06/27/97		9.73	191.66	None
07/22/97		10.20	191.19	None
08/22/97		10.23	191.16	None
11/25/97		9.15	192.24	None
02/24/98		7.78	193.61	None
05/22/98		8.02	193.37	None
08/20/98		9.96	191.43	None
12/13/99		**10.10**	**191.29**	**None**

* Wellhead Elevations based on a site survey by Brian Kangas Foulk Consulting Engineers of Walnut Creek, California, dated July 14, 1995.

TABLE 2

SUMMARY OF GROUNDWATER ANALYSES DATA

Well No.	TPH-G *(mg/l)*	Benzene *(ug/l)*	Toluene *(ug/l)*	Ethyl Benzene *(ug/l)*	Total Xylenes *(ug/l)*	MTBE *(ug/l)*
MW B-1	ND	ND	ND	ND	ND	ND
MW B-3	ND	ND	ND	ND	ND	ND
MW B-5*	ND	ND	ND	ND	ND	ND
SB-1	3.9	71	ND	74	23	ND
SB-2	ND	0.63	ND	ND	ND	ND
SB-3	ND	0.59	0.88	ND	1.5	5.3

* Analysis for dissolved metal for sample from MWB-5 detected the following in mg/l:

Cadmium, ND; Chromium, 0.022; Nickel, 0.078; Lead, 0.054; Zinc, 0.16

NOTES

TPH-G Total Petroleum Hydrocarbons as Gasoline
mg/l Milligrams per liter (parts per million, ppm)
ug/l Micrograms per liter (parts per billion, ppb)
ND Not detected above laboratory detection limits

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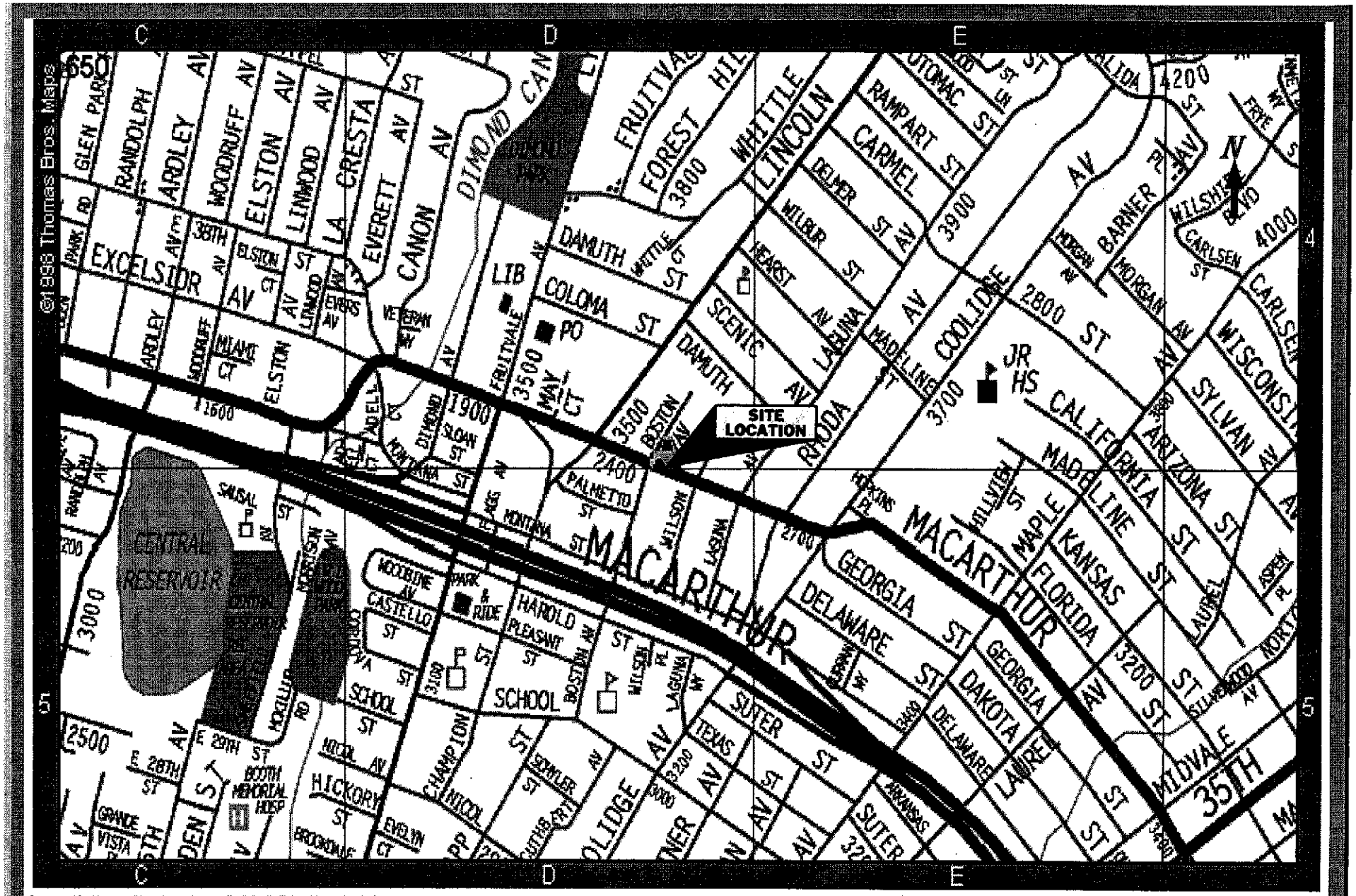


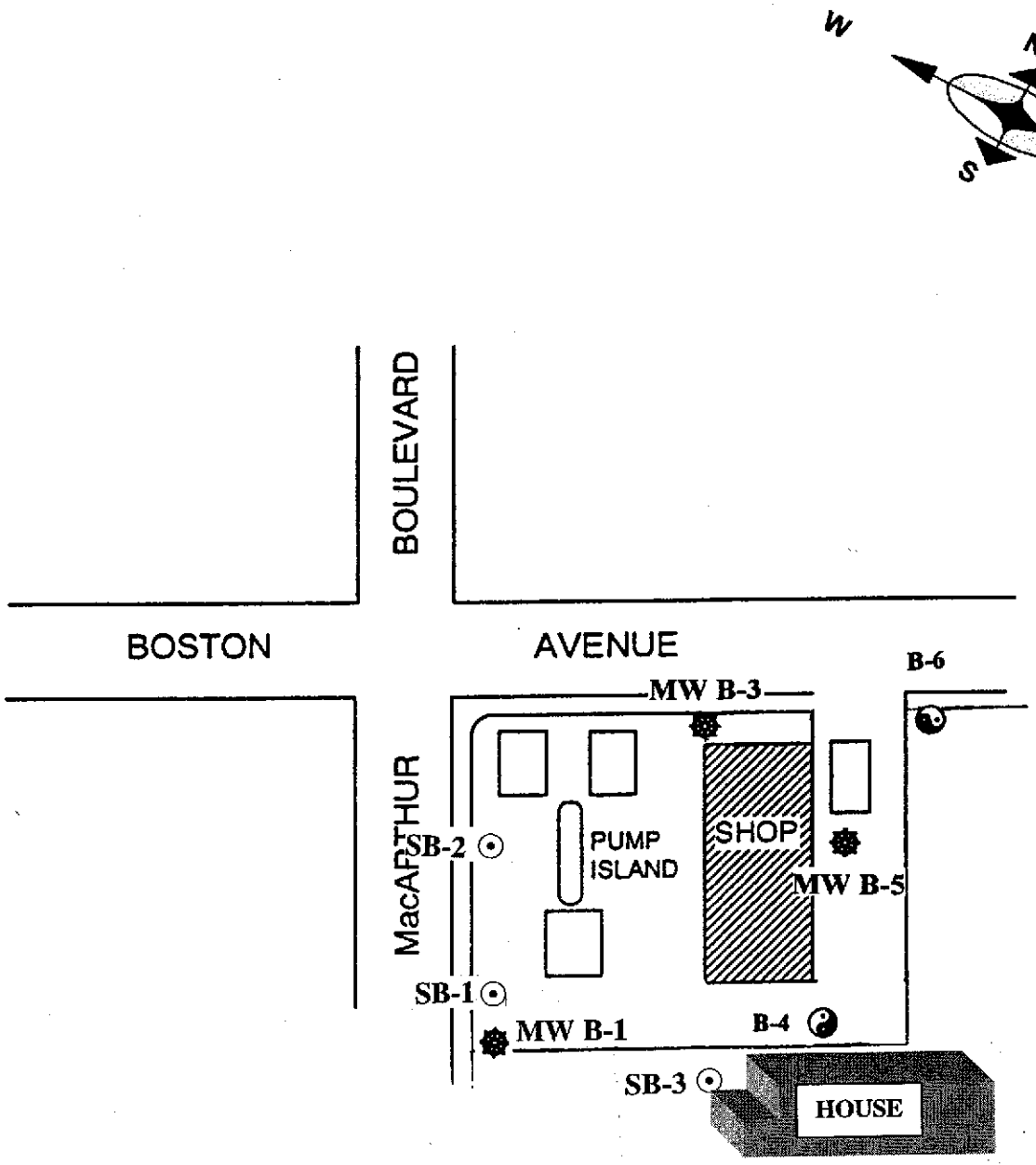
IMFC

MARR AND ASSOCIATES

2504 MacArthur Boulevard
Oakland, California

SITE LOCATION MAP

PROJECT NO.	DATE	FIGURE NO.
MAR-102J	*FEBRUARY 1998*	*1*



Revised 2/26/1999

Not to Scale

LEGEND

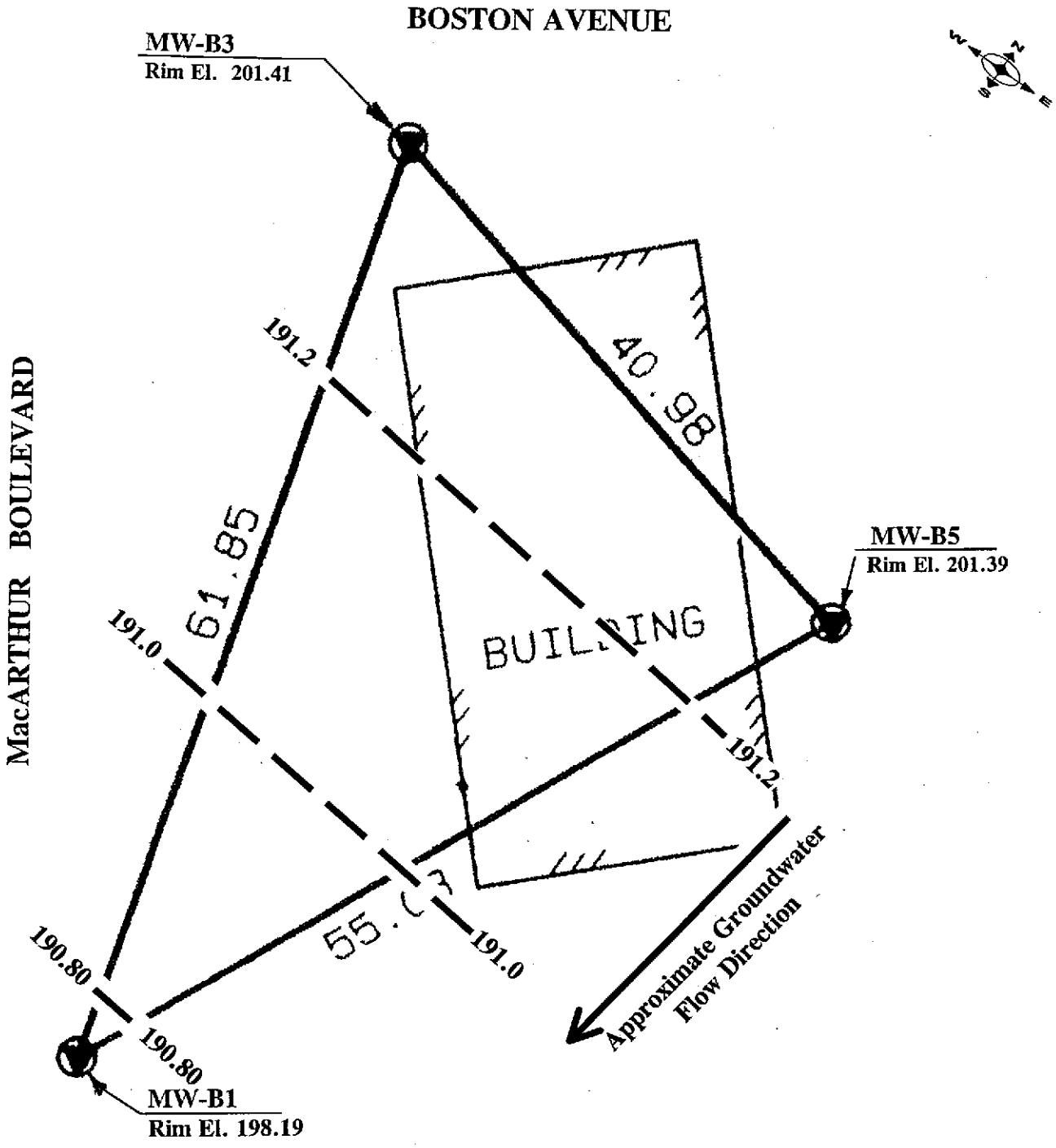
- Approximate Location of Soil Borings
- Approximate Location of Monitoring Wells
- Approximate Location of Former Tanks
- Approximate Location of Proposed Borings

IMFC

MARR AND ASSOCIATES
2504 MacArthur Blvd.
Oakland, California

SITE SKETCH
AND PROPOSED LOCATION S OF BORINGS

PROJECT NO.	DATE	FIGURE NO.
MAR-102J	*February 2000*	*2*



LEGEND

---191--- Groundwater Contours & Elevations

10 0 10 20

GRAPHIC SCALE (FEET)

IMFC

MARR & ASSOCIATES

2504 MacArthur Boulevard
Oakland, California

GROUNDWATER POTENTIOMETRIC LEVEL
December 1999

PROJECT NO.	DATE	FIGURE NO.
MAR-102J	*February 2000*	*3*

APPENDIX A

IMFC

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
951 TURNER COURT, SUITE 300, HAYWARD, CA 94545-2651
PHONE (510) 670-6346 MARLON MAGALLANES/CINDY HUTCHINSON
FAX (510) 670-5262

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 2504 MacArthur Blvd.
Oakland, CA 94602

CLIENT
Name Marr & Associates
Address 3527 Fruitvale Ave. Phone (510) 482-1536
City Oakland, CA Zip 94602

APPLICANT
Name IMEC
Address One Sansome St. #600 Phone (415) 951-4795 Fax (415) 957-4701
City San Francisco Zip 94104

TYPE OF PROJECT
Well Construction
- Cathodic Protection ☐
- Water Supply ☐
- Monitoring ☐

Geotechnical Investigation ✓
- General
- Contamination ☐
- Well Destruction ☐

PROPOSED WATER SUPPLY WELL USE
- New Domestic ☐
- Municipal ☐
- Industrial ☐
- Replacement Domestic ☐
- Irrigation ☐
- Other Sampling ✓

DRILLING METHOD:
- Mud Rotary ☐
- Air Rotary ☐
- Auger ☐
- Cable ☐
- Other Geoprobe

DRILLER'S LICENSE NO. 485165 (Gregg Drilling)

WELL PROJECTS
- Drill Hole Diameter ____ in. Maximum Depth ____ ft.
- Casing Diameter ____ in. Number ____
- Surface Seal Depth ____ ft.

GEOTECHNICAL PROJECTS
- Number of Borings 3
- Hole Diameter 1 in. Maximum Depth 35 ft.

ESTIMATED STARTING DATE Dec. 13, 1999
ESTIMATED COMPLETION DATE Dec. 13, 1999

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

APPLICANT'S SIGNATURE [signature] DATE 12/2/99

FOR OFFICE USE
PERMIT NUMBER 99WR-690
WELL NUMBER
APN

PERMIT CONDITIONS
Circled Permit Requirements Apply

(A) GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

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

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

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

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

F. WELL DESTRUCTION
See attached.

G. SPECIAL CONDITIONS

APPROVED Frank L. Cedd DATE 12-2-99

** TOTAL PAGE.02 **

** TOTAL PAGE.02 **

APPENDIX B

IMFC

IMFC

SAMPLING PROTOCOL

SAMPLING (GENERAL)

1. Any materials supplied by the client will reduce the cost of our work. These may include tap water, 55-gallon drums, and DI-water. Arrangements will be made before the start of the project.

2. Chemical sampling procedures and sample storage will be conducted under the direction of our consulting laboratory or a consulting analytical chemist.

3. All equipment used during the sampling process will be thoroughly steam-cleaned prior to its use.

4. All samples will be stored in an ice chest and packed in blue ice or ice in such a manner as to prevent sample immersion in melted ice.

5. All samples will be delivered to the consulting laboratory as soon as possible after collection.

6. All sample containers will be opened only by the consulting laboratory which performs the chemical testing.

SOIL SAMPLES

1. Soil samples will be attempted at 5-foot intervals or more frequently as determined in the field.

2. Sample container cleaning blanks may be taken of the steam-cleaned brass liners for quality control purposes at the rate of one per boring.

3. All soil sampling equipment will be disassembled and thoroughly steam-cleaned prior to each usage.

4. The ends of all soil sample liners will be covered with aluminum foil and an air-tight cap which will be wrapped with aluminized tape and properly labeled. All soil samples will be immediately stored in an ice chest and packed with blue ice or ice in such a manner as to prevent immersion in melted ice.

5. All excess soils will be place in 55-gallon drums for proper disposal.

6. The center of each soil liner will be extracted at the consulting laboratory for appropriate analysis.

WATER SAMPLES

1. At least 3 to 5 well bore volumes will be purged from each well prior to sampling for volatile organic compounds. Purging will be accomplished using a bladder or centrifugal pump, a Honda jet pump with foot valve, or by hand-bailing with a clean teflon bailer. During evacuation, pH, conductivity, and temperature will be monitored and recorded. All samples will be retrieved with a steam-cleaned teflon bailer. Cleaning blanks of the teflon bailer will be taken between each well to be sampled if the client so desires.

2. Samples will not be taken until the pH, conductivity, and temperature measurements have stabilized during well purging.

3. All sampling equipment, including gloves and tape measures will be properly decontaminated between each well.

4. All samples will be place in the appropriate cleaned containers provided by the project laboratory. The type of container necessary is contingent upon the analysis needed.

SAMPLE RECORDS AND CUSTODY

1. Records will be maintained for all samples collected by Ingram Mason & Fairbairn.

2. A positive chain-of-custody record will be maintained by Ingram Mason & Fairbairn for future reference.

3. All records will be maintained under strict confidence by Ingram Mason & Fairbairn and will be released only by written authorization of the client.

APPENDIX C

IMFC

IMFC

INGRAM MASON & FAIRBAIRN
A Division of IMFC Corporation
ONE SANSOME STREET, SUITE 1900
SAN FRANCISCO, CALIFORNIA 94104
TEL (415) 951-4793 (415) 281 - 9696
FAX (415) 951-4701 (800) 804-IMFC

WATER LEVEL RECORDS

DATE: 12-13-99 PROJECT NO.: MAR-102J

LOCATION: 2504 MacArthur Blvd., TECHNICIAN: Will H.

WELL NO.	WATER LEVEL	TIME	BOTTOM OF WELL
MWB-1	7.4	8:00A	
MWB-3	10.05	8:10A	
MWB-5	10.1	8:15A	

COMMENTS: .....

.....

IMFC

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FAX (415) 951-4701 (800) 804-IMFC

WELL DEVELOPMENT SHEET

DATE: 12-13-99 PROJECT NO: MAR102-J

LOCATION: 2504 MacArthur Blvd, Dakland EMPLOYEE: Will H.

WELL NO:	TIME START PUMPING, etc.	TIME STOP PUMPING, etc.	GALLONS REMOVED	B.O.W.	WATER LEVEL AT START	WATER LEVEL AT FINISH
MWB-1	8:20A	8:40		40.3	7.40	19.3
MWB-3	8:50	9:15		35.0	10.05	17.4
MWB-5	9:50	10:10		23.0	10.1	*

COMMENT: well water condition:

* Purged dry in four minutes - Tried 15 minutes later - Well went dry in 2 minutes

IMFC

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GROUND-WATER SAMPLING FORM

Job Number: MAR-102 J
Location: 2504 MacArthur
Date: 12/13/99

Well Number: MWB-3
Well Type: ☑ Monitor ☐ Extraction ☐ Other:
Well Material: ☑ PVC ☐ Steel ☐ Other
Sampled By: Will H.

WELL PURGING

PURGE VOLUME

Casing Diameter(D in inches):
☒ 2" ☐ 4" ☐ 6" ☐ Other

Total Depth of Well (BOW) 35.0
Water Level 10.05
Well Volumes To Be Purged: 3

Well Volume Factors:

Well Casing ID (inches)	(Vol. Factor)
2.0	0.1632
3.0	0.3672
4.0	0.6528
4.5	0.826
6.0	1.469

Purge Volume:

35.0 (total depth) − 10.05 (water level) × 0.1632 (Well Vol. Fac.) × 3 (# of vol. to purge) = 12.2 gallons (calculated purge volume)

PURGE TIME
____ Start ____ Stop ____ Elapsed

PURGE RATE
Initial____gpm Final____gpm

ACTUAL VOL. PURGED
____gallons

PURGE METHOD
☐ Jet Pump ☐ Bailer ☑ Dedicated Pump ☐ Other

WELL SAMPLING PARAMETERS:

Gallons Removed	Time	Temp. C	pH	Cond. (umhos/cm)	Turbidity (NTU)	Other
0	8:50		7.6	890		
9	9:05		7.4	860		
12	9:15		7.1	680		

SAMPLING METHOD:
Time Sampled: 9:15 AM
☑ Bailer ☐ Bladder Pump ☐ Other

COMMENTS:

Samples collected	No. of	Container	Preservatives
EPA 8240			
EPA 8270			
EPA 8010			
TPH (Gas) + BTEX	6	VOA	HCL
METALS			

IMFC

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GROUND-WATER SAMPLING FORM

Job Number: MAR-102 J
Location: 2504 MacArthur Blvd.
Date: 12/13/99

Well Number: MWB-5
Well Type: ☑ Monitor ☐ Extraction ☐ Other:
Well Material: ☑ PVC ☐ Steel ☐ Other
Sampled By: Will H.

WELL PURGING

PURGE VOLUME

Casing Diameter(D in inches):
☑ 2" ☐ 4" ☐ 6" ☐ Other
Total Depth of Well (BOW) 23.0
Water Level 10.1
Well Volumes To Be Purged: 3

Well Volume Factors:

Well Casing ID (inches)	(Vol. Factor)
2.0	0.1632
3.0	0.3672
4.0	0.6528
4.5	0.826
6.0	1.469

Purge Volume:
23.0 (total depth) - 10.1 (water level) x 0.1632 (Well Vol. Fac.) x 3 (# of vol. to purge) = 6.3 (calculated purge volume) gallons

PURGE TIME: ____ Start ____ Stop ____ Elapsed

PURGE RATE: Initial ____ gpm Final ____ gpm

ACTUAL VOL. PURGED: ____ gallons

PURGE METHOD
☐ Jet Pump ☐ Bailer ☑ Dedicated Pump ☐ Other

WELL SAMPLING PARAMETERS:

Gallons Removed	Time	Temp. C	pH	Cond. (umhos/cm)	Turbidity (NTU)	Other
0	9:50		7.1	1360		
6	10:10		7.2	1020		

SAMPLING METHOD:
Time Sampled: 10:15
☑ Bailer ☐ Bladder Pump ☐ Other

Samples collected	No. of	Container	Preservatives
EPA 8240			
EPA 8270			
EPA 8010			
TPH (Gas) + BTEX	6	VOA	HCL
METALS			

COMMENTS:

Well purged dry in 4 minutes.

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GROUND-WATER SAMPLING FORM

Job Number: MAR-102J
Location: 2504 MacArthur
Date: 12/13/99

Well Number: MWB-1
Well Type: ☑ Monitor ☐ Extraction ☐ Other:
Well Material: ☑ PVC ☐ Steel ☐ Other
Sampled By: Will

WELL PURGING

PURGE VOLUME

Casing Diameter(D in inches):
☑ 2" ☐ 4" ☐ 6" ☐ Other

Total Depth of Well (BOW) 40.3 ft.
Water Level 7.40
Well Volumes To Be Purged: 3

Well Volume Factors:

Well Casing ID (inches)	(Vol. Factor)
2.0	0.1632
3.0	0.3672
4.0	0.6528
4.5	0.826
6.0	1.469

Purge Volume:

40.3 (total depth) - 7.40 (water level) x 0.1632 (Well Vol. Fac.) x 3 (# of vol. to purge) = 16.1 gallons (calculated purge volume)

PURGE TIME
9:20 Start 9:40 Stop 20 Min Elapsed

PURGE RATE
Initial ____ gpm Final ____ gpm

ACTUAL VOL. PURGED
____ gallons

PURGE METHOD
☐ Jet Pump ☐ Bailer ☑ Dedicated Pump ☐ Other

WELL SAMPLING PARAMETERS:

Gallons Removed	Time	Temp. C	pH	Cond. (umhos/cm)	Turbidity (NTU)	Other
0	8:00		7.3	740		
10	8:30		7.3	710		
16	8:40		7.1	680		

SAMPLING METHOD:
Time Sampled: 9:05
☑ Bailer ☐ Bladder Pump ☐ Other

COMMENTS:

Samples collected	No. of	Container	Preservatives
EPA 8240			
EPA 8270			
EPA 8010			
TPH (Gas) + BTEX	6	VOA	HCL
METALS			

APPENDIX D

IMFC

Sequoia Analytical

404 N. Wiget Lane
Walnut Creek, CA 94598
(925) 988-9600
FAX (925) 988-9673

Ingram, Mason, & Fairbairn	Project: Marr & Associates	
Citicorp Center - One Sansome Street # 100	Project Number: MAR-102J	**Reported:**
San Francisco CA, 94104	Project Manager: Fred Serafin	04-Jan-00 11:35

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled
MW B-1	W912264-01	Water	13-Dec-99 10:00
MW B-3	W912264-02	Water	13-Dec-99 09:15
MW B-5	W912264-03	Water	13-Dec-99 10:15
SB-1	W912264-04	Water	13-Dec-99 13:55
SB-2	W912264-05	Water	13-Dec-99 11:00
SB-3	W912264-06	Water	13-Dec-99 11:35

Alan B. Kemp, Laboratory Director

Sequoia Analytical

404 N. Wiget Lane
Walnut Creek, CA 94598
(925) 988-9600
FAX (925) 988-9673

Ingram, Mason, & Fairbairn	Project: Marr & Associates	
Citicorp Center - One Sansome Street # 100	Project Number: MAR-102J	**Reported:**
San Francisco CA, 94104	Project Manager: Fred Serafin	04-Jan-00 11:35

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW B-1 (W912264-01) Water Sampled: 13-Dec-99 10:00 Received: 13-Dec-99 15:25									
Purgeable Hydrocarbons	ND	50	ug/l	1	9L14002	14-Dec-99	14-Dec-99	EPA	
Benzene	ND	0.50	"	"	"	"	"	8015M/8020	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*108 %*	*70-130*		"	"	"	"	
MW B-3 (W912264-02) Water Sampled: 13-Dec-99 09:15 Received: 13-Dec-99 15:25									
Purgeable Hydrocarbons	ND	50	ug/l	1	9L14002	14-Dec-99	14-Dec-99	EPA	
Benzene	ND	0.50	"	"	"	"	"	8015M/8020	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*116 %*	*70-130*		"	"	"	"	
MW B-5 (W912264-03) Water Sampled: 13-Dec-99 10:15 Received: 13-Dec-99 15:25									
Purgeable Hydrocarbons	ND	50	ug/l	1	9L16003	16-Dec-99	16-Dec-99	EPA	
Benzene	ND	0.50	"	"	"	"	"	8015M/8020	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*101 %*	*70-130*		"	"	"	"	

Alan B. Kemp, Laboratory Director

Sequoia Analytical

404 N. Wiget Lane
Walnut Creek, CA 94598
(925) 988-9600
FAX (925) 988-9673

Ingram, Mason, & Fairbairn	Project: Marr & Associates	
Citicorp Center - One Sansome Street # 100	Project Number: MAR-102J	**Reported:**
San Francisco CA, 94104	Project Manager: Fred Serafin	04-Jan-00 11:35

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-1 (W912264-04) Water Sampled: 13-Dec-99 13:55 Received: 13-Dec-99 15:25									**P-01**
Purgeable Hydrocarbons	**3900**	1000	ug/l	20	9L14002	14-Dec-99	14-Dec-99	EPA	
Benzene	**71**	10	"	"	"	"	"	8015M/8020	
Toluene	ND	10	"	"	"	"	"	"	
Ethylbenzene	**74**	10	"	"	"	"	"	"	
Xylenes (total)	**23**	10	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	50	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*94.7 %*		*70-130*	"	"	"	"	
SB-2 (W912264-05) Water Sampled: 13-Dec-99 11:00 Received: 13-Dec-99 15:25									
Purgeable Hydrocarbons	ND	50	ug/l	1	9L14002	14-Dec-99	14-Dec-99	EPA	
Benzene	**0.63**	0.50	"	"	"	"	"	8015M/8020	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*116 %*		*70-130*	"	"	"	"	
SB-3 (W912264-06) Water Sampled: 13-Dec-99 11:35 Received: 13-Dec-99 15:25									
Purgeable Hydrocarbons	ND	50	ug/l	1	9L14002	14-Dec-99	14-Dec-99	EPA	
Benzene	**0.59**	0.50	"	"	"	"	"	8015M/8020	
Toluene	**0.88**	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	**1.5**	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	**5.3**	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*122 %*		*70-130*	"	"	"	"	

Alan B. Kemp, Laboratory Director

Sequoia Analytical

404 N. Wiget Lane
Walnut Creek, CA 94598
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FAX (925) 988-9673

Ingram, Mason, & Fairbairn	Project: Marr & Associates	
Citicorp Center - One Sansome Street # 100	Project Number: MAR-102J	**Reported:**
San Francisco CA, 94104	Project Manager: Fred Serafin	04-Jan-00 11:35

MTBE Confirmation by EPA Method 8260A

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-3 (W912264-06) Water Sampled: 13-Dec-99 11:35 Received: 13-Dec-99 15:25									
Methyl tert-butyl ether	ND	2.0	ug/l	1	9L16028	15-Dec-99	15-Dec-99	EPA 8260A	
Surrogate: Dibromofluoromethane		*104 %*	*50-150*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*98.0 %*	*50-150*		"	"	"	"	

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Ingram, Mason, & Fairbairn	Project: Marr & Associates	
Citicorp Center - One Sansome Street # 100	Project Number: MAR-102J	**Reported:**
San Francisco CA, 94104	Project Manager: Fred Serafin	04-Jan-00 11:35

Dissolved Metals by EPA 200 Series Methods

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW B-5 (W912264-03) Water Sampled: 13-Dec-99 10:15 Received: 13-Dec-99 15:25									
Cadmium	ND	0.010	mg/l	1	9L21020	21-Dec-99	30-Dec-99	EPA 200.7	
Chromium	**0.022**	0.010	"	"	"	"	"	"	
Nickel	**0.078**	0.010	"	"	"	"	"	"	
Lead	**0.054**	0.020	"	"	"	"	"	"	
Zinc	**0.16**	0.010	"	"	"	"	"	"	

Alan B. Kemp, Laboratory Director

Sequoia Analytical

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Walnut Creek, CA 94598
(925) 988-9600
FAX (925) 988-9673

Ingram, Mason, & Fairbairn	Project: Marr & Associates	
Citicorp Center - One Sansome Street # 100	Project Number: MAR-102J	**Reported:**
San Francisco CA, 94104	Project Manager: Fred Serafin	04-Jan-00 11:35

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 9L14002: Prepared 14-Dec-99 Using EPA 5030B [P/T]										
Blank (9L14002-BLK1)										
Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Methyl tert-butyl ether	ND	2.5	"							
Surrogate: a,a,a-Trifluorotoluene	*34.7*		"	*30.0*		*116*	*70-130*			
LCS (9L14002-BS1)										
Benzene	19.7	0.50	ug/l	20.0		98.5	70-130			
Toluene	20.6	0.50	"	20.0		103	70-130			
Ethylbenzene	20.9	0.50	"	20.0		104	70-130			
Xylenes (total)	63.9	0.50	"	60.0		107	70-130			
Surrogate: a,a,a-Trifluorotoluene	*29.8*		"	*30.0*		*99.3*	*70-130*			
LCS Dup (9L14002-BSD1)										
Benzene	21.6	0.50	ug/l	20.0		108	70-130	9.20	20	
Toluene	22.4	0.50	"	20.0		112	70-130	8.37	20	
Ethylbenzene	22.5	0.50	"	20.0		113	70-130	7.37	20	
Xylenes (total)	66.9	0.50	"	60.0		112	70-130	4.59	20	
Surrogate: a,a,a-Trifluorotoluene	*34.2*		"	*30.0*		*114*	*70-130*			
Batch 9L16003: Prepared 16-Dec-99 Using EPA 5030B [P/T]										
Blank (9L16003-BLK1)										
Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Methyl tert-butyl ether	ND	2.5	"							
Surrogate: a,a,a-Trifluorotoluene	*32.5*		"	*30.0*		*108*	*70-130*			

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Ingram, Mason, & Fairbairn	Project: Marr & Associates	
Citicorp Center - One Sansome Street # 100	Project Number: MAR-102J	**Reported:**
San Francisco CA, 94104	Project Manager: Fred Serafin	04-Jan-00 11:35

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 9L16003: Prepared 16-Dec-99 Using EPA 5030B [P/T]										
LCS (9L16003-BS1)										
Benzene	19.1	0.50	ug/l	20.0		95.5	70-130			
Toluene	19.5	0.50	"	20.0		97.5	70-130			
Ethylbenzene	20.4	0.50	"	20.0		102	70-130			
Xylenes (total)	61.6	0.50	"	60.0		103	70-130			
Surrogate: a,a,a-Trifluorotoluene	*30.0*		"	*30.0*		*100*	*70-130*			
Matrix Spike (9L16003-MS1)					**Source: W912272-05**					
Benzene	19.2	0.50	ug/l	20.0	ND	96.0	70-130			
Toluene	19.6	0.50	"	20.0	ND	98.0	70-130			
Ethylbenzene	18.3	0.50	"	20.0	ND	91.5	70-130			
Xylenes (total)	62.1	0.50	"	60.0	ND	103	70-130			
Surrogate: a,a,a-Trifluorotoluene	*28.8*		"	*30.0*		*96.0*	*70-130*			
Matrix Spike Dup (9L16003-MSD1)					**Source: W912272-05**					
Benzene	18.6	0.50	ug/l	20.0	ND	93.0	70-130	3.17	20	
Toluene	19.0	0.50	"	20.0	ND	95.0	70-130	3.11	20	
Ethylbenzene	16.9	0.50	"	20.0	ND	84.5	70-130	7.95	20	
Xylenes (total)	60.0	0.50	"	60.0	ND	100	70-130	3.44	20	
Surrogate: a,a,a-Trifluorotoluene	*29.9*		"	*30.0*		*99.7*	*70-130*			

Alan B. Kemp, Laboratory Director

Sequoia Analytical

404 N. Wiget Lane
Walnut Creek, CA 94598
(925) 988-9600
FAX (925) 988-9673

Ingram, Mason, & Fairbairn	Project: Marr & Associates	
Citicorp Center - One Sansome Street # 100	Project Number: MAR-102J	**Reported:**
San Francisco CA, 94104	Project Manager: Fred Serafin	04-Jan-00 11:35

MTBE Confirmation by EPA Method 8260A - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 9L16028: Prepared 15-Dec-99 Using EPA 5030B [P/T]										
Blank (9L16028-BLK1)										
Methyl tert-butyl ether	ND	2.0	ug/l							
Surrogate: Dibromofluoromethane	*44.0*		"	*50.0*		*88.0*	*50-150*			
Surrogate: 1,2-Dichloroethane-d4	*49.0*		"	*50.0*		*98.0*	*50-150*			
LCS (9L16028-BS1)										
Methyl tert-butyl ether	47.9	2.0	ug/l	50.0		95.8	70-130			
Surrogate: Dibromofluoromethane	*46.0*		"	*50.0*		*92.0*	*50-150*			
Surrogate: 1,2-Dichloroethane-d4	*49.0*		"	*50.0*		*98.0*	*50-150*			
LCS Dup (9L16028-BSD1)										
Methyl tert-butyl ether	42.8	2.0	ug/l	50.0		85.6	70-130	11.2	25	
Surrogate: Dibromofluoromethane	*46.0*		"	*50.0*		*92.0*	*50-150*			
Surrogate: 1,2-Dichloroethane-d4	*47.0*		"	*50.0*		*94.0*	*50-150*			

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404 N. Wiget Lane
Walnut Creek, CA 94598
(925) 988-9600
FAX (925) 988-9673

Ingram, Mason, & Fairbairn	Project: Marr & Associates	
Citicorp Center - One Sansome Street # 100	Project Number: MAR-102J	**Reported:**
San Francisco CA, 94104	Project Manager: Fred Serafin	04-Jan-00 11:35

Dissolved Metals by EPA 200 Series Methods - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 9L21020: Prepared 21-Dec-99 Using 200.7										
Blank (9L21020-BLK1)										
Cadmium	ND	0.010	mg/l							
Chromium	ND	0.010	"							
Lead	ND	0.020	"							
Nickel	ND	0.010	"							
Zinc	ND	0.010	"							
LCS (9L21020-BS1)										
Cadmium	1.09	0.010	mg/l	1.00		109	80-120			
Chromium	1.07	0.010	"	1.00		107	80-120			
Lead	1.13	0.020	"	1.00		113	80-120			
Nickel	1.08	0.010	"	1.00		108	80-120			
Zinc	1.19	0.010	"	1.00		119	80-120			
Matrix Spike (9L21020-MS1)					**Source: W912275-01**					
Cadmium	1.09	0.010	mg/l	1.00	ND	109	80-120			
Chromium	1.06	0.010	"	1.00	0.020	104	80-120			
Lead	1.11	0.020	"	1.00	0.040	107	80-120			
Nickel	1.09	0.010	"	1.00	0.048	104	80-120			
Zinc	1.08	0.010	"	1.00	0.046	103	80-120			
Matrix Spike Dup (9L21020-MSD1)					**Source: W912275-01**					
Cadmium	1.08	0.010	mg/l	1.00	ND	108	80-120	0.922	20	
Chromium	1.05	0.010	"	1.00	0.020	103	80-120	0.948	20	
Lead	1.10	0.020	"	1.00	0.040	106	80-120	0.905	20	
Nickel	1.09	0.010	"	1.00	0.048	104	80-120	0	20	
Zinc	1.08	0.010	"	1.00	0.046	103	80-120	0	20	

Alan B. Kemp, Laboratory Director

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404 N. Wiget Lane
Walnut Creek, CA 94598
(925) 988-9600
FAX (925) 988-9673

Ingram, Mason, & Fairbairn	Project: Marr & Associates	
Citicorp Center - One Sansome Street # 100	Project Number: MAR-102J	**Reported:**
San Francisco CA, 94104	Project Manager: Fred Serafin	04-Jan-00 11:35

Notes and Definitions

P-01	Chromatogram Pattern: Gasoline C6-C12
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Alan B. Kemp, Laboratory Director

IMFC

INGRAM-MASON & FAIRBAIRN
A DIVISION OF IMFC CORPORATION

41 SUTTER STREET, SUITE 1537
SAN FRANCISCO, CA 94104

TEL (415) 281-9696
FAX (800) 804-IMFC

CHAIN OF CUSTODY FORM

Project: Mace & Associates
Job Number: MAR-1022
Project Manager: Fred Seratin
Date: 12/13/1999

W912264

Laboratory: Sequoia Analytical
Turnaround Time: Standard (10 working days)
Results To: Fred Seratin
Samplers: Will Henningsen

ITEM NO.	SAMPLE NUMBER	DATE AND TIME SAMPLED: Date	DATE AND TIME SAMPLED: Time	MATRIX	# CONTAINERS & PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	HCl			ANALYSIS REQUESTED / TYPE OF CONTAINER:	TPH G*/ BTEX**	MTBE***	Dissolved Metals****				COMMENTS
1	MW B-1+	12/13/99	9:45 10:05+					6				X	X			01/A-I		*EPA 5030
2	MW B-3	12/13/99	9:15					6				X	X			02/A-F		**EPA 8020/602
3	MW B-5	12/13/99	10:15		1			6				X	X	X		03/A-G		***EPA 8020/602
4	SB-1	12/13/99	10:55					6				X	X			04/A-F		confirm with
5	SB-2	12/13/99	11:03					6				X	X			05 ↓		EPA 8260
6	SB-3	12/13/99	11:35					6				X	X			06 ↓		****Pb, Cr, Ni, Zn, Cd
7																		1 hr round trip
8																		travel time.
9																		5 hrs at
10																		site
11																		+Use 10:05 samples as
12																		primary test sample

MISCELLANEOUS	
Number of Coolers	Type of Coolant

COMMENTS:

Page __ of __

CHAIN OF CUSTODY RECORD		
Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
F. R. [signature] 12/13/99 14:00	Will H[signature]	12/13/99 14:00
Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Will H[signature] 12/13/99 15:25	[signature]	12/13 15:25
Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Dispatched by: (signature & affiliation) Date/Time	Received for lab by:	Date/Time