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March 15, 1996
92C0414A

Mr. Barney M. Chan
Alameda County Department of Environmental Health
Hazardous Materials Division
1131 Harbor Bay Parkway, Suite 200
Alameda, California 94502

Re: **City of Oakland - Municipal Service Center, 7101 Edgewater Drive, Oakland, California**

Subject: **Progress Report**

Dear Mr. Chan:

On behalf of the City of Oakland, Department of Public Works, Woodward-Clyde Consultants (WCC) is pleased to submit the enclosed Progress Report, **dated March 14, 1996,** for the City of Oakland Municipal Service Center environmental investigation. Environmental work to date has included investigations of soil and groundwater to evaluate the presence of petroleum hydrocarbons, their constituents, and metals. Previous work is summarized and recent activities are also described.

The progress report includes the results of Hydropunch groundwater sampling, a hydrogeologic evaluation of the site, as well as the July 1995 Groundwater Monitoring Report. The November 1995 Groundwater Monitoring Report, dated January 4, 1996, is being sent to you under a separate cover.

If you have any questions, feel free to call Andrew Clark-Clough at the City of Oakland, (510) 238-6361, Al Ridley or George Muehleck at WCC.

Sincerely,

Albert P Ridley, C.E.G.
Project Manager

George Muehleck, R.G.
Senior Project Hydrogeologist

Enclosures: Progress Report

cc: Andrew Clark-Clough, City of Oakland, Office of Public Works
Dan Schoenholz, Port of Oakland, Environmental Department
California Regional Water Quality Control Board, San Francisco Bay Region
Rhodora Del Rosario, Baseline Environmental Consulting
File

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1.0
INTRODUCTION

1.1 SCOPE OF WORK

This report addresses the environmental investigation of the City of Oakland Municipal Service Center (MSC). This ongoing work is being performed by Woodward-Clyde Consultants (WCC) in order to investigate the magnitude, extent and impact of petroleum hydrocarbon constituents and metals in the subsurface soil and groundwater at the site. This report summarizes previous work for which reports have been issued, presents an analysis of the site's hydrogeological setting, and documents in detail more recent activities for which reports have not been previously issued. These activities include:

- The collection groundwater samples at about 30 locations across the site using Hydropunch™ and the chemical laboratory analysis of these samples (Phase II Environmental Site Assessment, 1993),

- An elevation and location survey of onsite monitoring wells, a summary of ground-water elevation data and an estimate of groundwater flow direction and gradient based on August 22, 1995 water level measurements,

- Quarterly monitoring of the five on site groundwater monitoring wells (July 27, 1995)

- Research regarding the status of underground storage tanks (USTs) on the property.

The intent of this and future work is to assess the need, if any, for additional investigation or remediation, in order to be protective of human health and the environment.

1.2 SITE CONTACTS

WCC is providing consulting engineering services for this project to the City of Oakland, Office of Public Works. Table 1 presents the names and addresses of the City of Oakland, Office of Public Works, Environmental Program Supervisor, contacts at WCC, and other

important entities involved with the site, including the Alameda County Department of Environmental Health (the lead regulatory agency for this site) and the California Regional Water Quality Control Board, San Francisco Bay Region.

1.3 SITE DESCRIPTION

The MSC is located at 7101 Edgewater Drive and occupies approximately 17 acres adjacent to San Leandro Bay and Damon Slough (Figure 1). The site is used by various City departments for vehicle and equipment storage, maintenance and fueling. Adjacent land use is light industrial/commercial. The MSC property consists of offices, including the Public Works Building and warehouse structures used for maintenance (including Building 5 discussed below). Areas of the property not occupied by buildings are paved. About 14 USTs, several dry wells/sumps, and an abandoned pressurized underground gasoline pipeline network are located at the site. Figure 2 is a site map which includes the major structural features as well as those items relevant to environmental investigations at the MSC property.

Previous investigations, as described below, indicate that elevated levels of fuel hydrocarbons and related compounds and priority pollutant metals are present in soil and groundwater. Concentrations of benzene, copper, nickel, and lead in groundwater samples exceeded State of California Drinking Water Maximum Contaminant Levels (MCLs).

1.4 PREVIOUS INVESTIGATIONS

Previous geotechnical and environmental investigations are summarized in this report section. Figure 3 includes the various monitoring or sample point locations featured in previous investigations such as soil borings, monitoring wells and hydropunch sample locations. Table 2 is a summary of monitoring well construction and monumentation data.

1.4.1 Geotechnical Investigation (1988)

Geotechnical studies of the site by others date to 1968. In March 1988, Woodward-Clyde Consultants performed a geotechnical study of the settlement associated with Building 5. Analysis of settlement data collected by the City of Oakland showed differential settlement of about 1.5 ft across Building 5, which exhibited severe signs of structural distress. In attempt

to explain the differential settlement of the building and predict future settlement, subsurface conditions were explored. Nine exploratory borings were drilled in and around the Equipment Building (Building 5) to depths of about 40 feet below the existing ground surface. Soil samples were visually identified, classified and subjected to a laboratory testing program, including analysis for moisture content and unit weight, unconfined compressive strength, Atterberg limits, sieve analysis and one-dimensional consolidation tests. The history of filling and reclaiming the lowlands in 1969 and 1970, upon which the MSC was developed, was researched. As discussed in Section 1.5, prior to the development of the site, a dike extended through the western portion of the MSC site, protecting this area from the Bay. Construction of the site included reclaiming the area between two dikes and raising the grade prior to building construction. A report was issued which described these activities (WCC 1988). This report is helpful to current environmental efforts, because it gives important hydrogeological information.

1.4.2 Environmental Site Assessment (1989)

In 1989, Woodward-Clyde performed environmental site assessments for alternative locations for the relocation of Building 5. One location (Alternative 1) was an adjacent parcel of land located northeast of the MSC, and the other (Alternative 2) was the parking area north of the Public Works building. The assessment included a site reconnaissance, review of regulatory records, drilling of four borings and collection and analysis of soil samples, installation of four monitoring wells (MW-1, 2, 3 and 4) and collection and analysis of groundwater samples. Groundwater analysis results for MW-1 and 2 are included in Table 4 of this report. October 1989 groundwater samples from MW-3 and 4 did not contain detectable semi-volatile organic compounds (following EPA Method 8270) or Total Petroleum Hydrocarbons (TPH) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) (following EPA Method 8015/8020). Low concentrations of volatile organic compounds (VOAs) (following EPA Method 8240) were detected in the MW-3 sample: these include acetone at 15 ug/L and carbon disulfide at 2.8 ug/L. VOAs were not detected in the October 1989 MW-4 groundwater sample. Review of records indicates that this parcel was unlikely to have been impacted by activities surrounding the site. This parcel is no longer under investigation. The October 1989 sample from MW-1 was found to contain detectable VOA's, semivolatile organic compounds, and TPH as gasoline and BTEX. The sample from MW-2 was found to contain 2 ug/L of benzene. Alternative site 2 has an extensive refueling system for vehicles,

consisting of a series of pipes located in the driveways between parking spaces. The underground piping and possibly USTs were identified as potential sources impacting groundwater quality. The pipes were connected to USTs so that vehicles could be refueled while parked. Numerous connections existed in the roadways where a hose could be attached to a valve in the pipe to refuel vehicles. Reportedly these pipes no longer contain fuel. The pipes and connections have been paved over. A report was issued which described these activities (WCC 1989).

1.4.3 Environmental Site Assessment (1992)

In 1992, two additional sites (designated Alternative Sites A & B) were investigated as possible locations for the relocation of Building 5. These sites were overlapping, and in the general vicinity of the existing Building 5. Woodward-Clyde performed a preliminary geotechnical investigation and environmental site assessment for the two locations. Three monitoring wells were installed (MW-5, 6 and 7), and groundwater samples collected and analyzed. Results of these analyses are included in Tables 4 and 5. Monitoring Well MW-5 was installed north of Building 5 about 20 feet east of three fiberglass USTs. MW-6 was installed southwest of the building, near gasoline dispensers, and MW-7 was installed south of the building, about 60 feet from two abandoned waste oil tanks at the southeast corner of the building. From the results of the groundwater analysis, it was determined that the groundwater in the vicinity of Building 5 had been impacted with hydrocarbons and metals. A report was issued which described these activities (WCC 1992)

1.4.4 "911" Dispatch Center Geotechnical Investigation

In April, 1995, Harza Consulting Engineers and Geologists collected soil samples from 3 geotechnical soil borings being installed in conjunction with a planned 911 Dispatch Center construction at the MSC site. Three borings were installed, and samples collected from depths of 1.5 and 5 feet below ground surface. The samples were analyzed for petroleum hydrocarbon constituents. No TPH-g, TPH-d or BTEX as detected.

1.5 SITE HYDROGEOLOGY

The site is located on southwesterly sloping land (U.S. Geological Survey, San Leandro Quadrangle and Oakland East Quadrangle, 7.5 minute series). The area is made of man-made fill overlying silty soft, compressible, clay, known as the Bay Mud. These deposits are underlain by alluvial and older bay deposits consisting of silty clay to clean sands. Bedrock is estimated to be about 800 feet below ground surface (bgs). Historically, groundwater at the site has been suspected to flow to the southwest, towards the Bay. Depth to groundwater has ranged from about 4 to 10 feet bgs and is located at about MSL to about 3 feet above MSL in the northern portion of the site and at about MSL to about two feet above MSL in the southern portion of the site. Due to the proximity of San Leandro Bay, tidal fluctuations likely influence groundwater levels at the site.

The MSC site is located over reclaimed tidal marsh and open water areas of San Leandro Bay. Figure 4 depicts the predevelopment tidal/stream channels and shoreline in March 1947 relative to the present MSC site. Other predevelopment aerial photographs (prior to 1970) verify the locations of these tidal/stream channels as well as a dike along the former shoreline. While the marshland was filled and the shore extended bayward, the former tidal/stream channels and berm are considered significant in that their associated sediments may be predominant factors with respect to site hydraulics and transport of affected groundwater. Native sediment over the site were disturbed during development and currently do not exhibit natural hydrogeologic characteristics. Compacted fill also exhibits abnormal hydrogeologic characteristics. Vertical heterogeneities and consolidation of layers may impede infiltration and vertical groundwater flow as well as increase or decrease horizontal groundwater movement.

Aerial photographs verify that monitoring wells MW-1 and MW-6 were constructed in areas that were bayward of the former marsh and shoreline dike. MW-2, MW-3, MW-4, MW-5 and MW-7 were constructed in areas landward of the shoreline dike. The unnatural sediment layering of the fill, the buried marshland and dike, the location of the monitoring wells with respect to the former marsh and shoreline dike, as well as tidal influence of groundwater result in a very complex hydrogeologic regime for the MSC site.

Table 3 is a summary of groundwater elevation data for MSC site monitoring wells MW-1, MW-2, MW-5, MW-6 and MW-7. Unfortunately water levels prior to August 1995 were taken over a several hour period. Since the tide exerts a continued dynamic affect on water levels over the course of a tidal cycle, water level measurements made over a period of more than one hour are considered noncomparable with respect to evaluating groundwater flow direction and gradient. For this reason WCC only considers the August 1995 data useable for evaluation of groundwater flow direction and gradient. Figure 5 is a groundwater elevation contour map using August 1995 water level survey data, which was taken over a half-hour period. This evaluation of groundwater flow direction and gradient indicates that site hydraulics are very complex. In the Building 5 Area (MW-5, MW-6 and MW-7) apparant groundwater flow direction is South 38 degrees West with a gradient of 0.0038 ft/ft. On the west side of the site (MW-1 and MW-2 Area) the apparent groundwater flow direction is North 36 degrees East with a gradient of 0.0042 ft/ft. The reason that the apparant groundwater flow direction is opposite on either side of the site is unclear at this time and requires further evaluation with future water level monitoring. Possible single or combined reasons for this disparity is differential tidal influence and hydraulic interconnection of sediments in the screened portion of the wells, location of the monitoring wells with respect to the former dike and the location of the wells with respect to former tidal/stream channels. It is possible that the former dike could be acting as a groundwater barrier across the MSC site. It is also possible that the former tidal/stream channels may be acting as preferential paths for groundwater flow.

Figure 6 is a geologic cross section location map. Idealized geologic cross sections A-A', B-B' and C-C' are Figures 7, 8 and 9, respectively, which were developed during previous geotechnical investigations at the MSC. The idealized geologic cross sections depict fill and native sediments derived ~~form~~ from soil boring and well logs, as well as the former landsurface, dike and water surface elevations.

The Geotechnical Study (WCC, 1988) reported the approximate location of a former dike and fill areas related to this site. The north and southeastern portions of Building 5 were reported to be located to the east of the dike. The southwestern portion was reported to be located to the west of the dike, on the bayward side. The bayward side of the dike was reported to have larger fill thicknesses than the landward side of the dike. In the northern portion of the site,

the dike is located at depth further to the east than in the southern portion and appears to be east of MW-1.

Figures 8 and 9 present idealized cross sections of the southern portion of the site, near Building 5. Sediments encountered in B10, B11, B12, B13, B14, B15, B16, B17, B18, MW-5, MW-6, and MW-7 indicated that the southern portion of the site, near Building 5, was underlain by about 10 to 15 feet of stiff to very stiff, generally gravelly clay and clayey gravel fill. Fill material consisted of clay lenses, trace gravel, and organic matter, overlying a soft, compressible silty clay (Bay Mud). The Bay Mud, deposited in a marine environment, consisted of variable amounts of organic material and peat and ranged in thickness from 10 to 22 feet. Borings indicated that the Bay Mud was underlain by over-consolidated stiff to very-stiff silty clay (Old Bay Clay) containing layers and lenses of dense sand and gravels. Figures 8 and 9 depict the former 1967 ground surface elevation with the dike topographic feature. Bay Mud fill material was used to fill the southwestern portion of the site and is depicted in the cross sections.

Sediments encountered during construction of MW-1, MW-2, MW-3, and MW-4, in the northern portion of the site, are similar to those sediments encountered in the southern portion of the site. Figure 7 presents an idealized profile and geological cross section of this area. Fill material consisted of sandy silts and clays with some gravels, wood chips, rock fragments, and brick material. The Bay Mud, a clay unit, was encountered underneath the 6 to 11.5 feet thick fill material down to about 18.5 feet bgs (deepest borehole depth). The Bay Mud clay was described as very plastic, very soft, and with some fine to medium sand. The surface of the top of the Bay Mud appears to slope towards the east, in the landward direction. Coarser and more gravelly sediment found at MW-2 and MW-4, above the Bay Mud, may be due to the construction of the dike and subsequent filling in of the landward side of the dike.

2.0
PHASE II ENVIRONMENTAL SITE ASSESSMENT (1993)

In the Spring of 1993, an investigation using Hydropunch™ was performed to collect groundwater data from across the entire MSC site. The results of the chemical analyses of the groundwater samples are summarized in Table 6. The first phase (BAT-1 through HP-22) of sampling was conducted in April, 1993. This phase was focused on the former gasoline hydrant network in the parking lots to develop an initial assessment of the extent of affected groundwater. After some experimentation, sampling was conducted using the Hydropunch II sampling tool with good success. The sample production rate and visual observation of groundwater quality, e.g., the presence of petroleum product, accomplished by the use of the Hydropunch II method supports future use as a cost-effective screening tool at the site.

Another phase of Hydropunch sampling was conducted in July 1993 (HP-23 through HP-34). The purpose of this sampling was to better delineate the extent of gasoline in groundwater in the direct vicinity of the fuel hydrant system and to provide a screening-level assessment as to whether gasoline impacted groundwater had migrated across the downgradient perimeter of the site, i.e., adjacent to San Leandro Bay. The sampling was also conducted near the locations of current and former underground storage tanks to provide a screening-level assessment of potential impacts to groundwater due to tank leakage.

The results of the field investigation indicate significant concentrations of gasoline and related BTEX constituents, including the presence of free product, in shallow groundwater quality in the direct vicinity of the gasoline hydrant network at the MSC. As the hydrant network is densest at the "Public Works" parking area occupying the northwest quadrant of the MSC, so is the degree of affected groundwater.

Petroleum hydrocarbons and/or BTEX constituents, including free product, are also present in shallow groundwater in the vicinity of former and current underground fuel storage tanks near Building 5 and north of the Crafts Building. The underground fuel tanks at Building 5 are located far enough from the hydrant network to indicate that affected groundwater is attributable to tank leakage.

At some locations, primarily on the south half of the site, BTEX and TPH constituents were detected at the downgradient site perimeter. The degree of affected groundwater quality was much less than at the suspected source areas, e.g., TPH-gasoline concentrations were much lower and no product was observed, but benzene was detected at 3 out of 5 locations.

The Hydropunch sampling was unable to investigate potential groundwater degradation related to the former waste oil and lube oil underground storage tanks and unlined floor drain sumps near Building 5 due to insufficient sample recovery (the wide range of suspected chemicals required a much larger sample volume for analysis than was the case of gasoline in groundwater investigated elsewhere).

3.0
SITE SURVEY

On June 16, 1995, monitoring wells MW-1, MW-2, MW-5, MW-6 and MW-7 were surveyed for elevation and location by Bates and Bailey, Land Surveyors of Berkeley, California, a state licensed land surveyor. At each well location the following points were surveyed to an accuracy of 0.01 foot:

- The rim of the top of the well casing (with cap off) was surveyed for elevation and location

- The rim of the protective traffic rated box was surveyed for elevation.

The survey drawing is included as Appendix A of this report, and the well casing elevations are included in Table 2. Offsite monitoring wells MW-3 and MW-4 have yet to be surveyed. These wells will be surveyed in late November 1995 and will be included in future water level monitoring at the MSC site. Tables 2 and 3 will be updated, appropriately, to include the survey and water level data.

4.0
QUARTERLY GROUNDWATER MONITORING

In April, 1995 the five onsite monitoring wells (MW-1, 2, 5, 6 and 7) were redeveloped and sampled. The results of the analyses of these groundwater samples were presented in Baseline Environmental Consulting's July 13, 1995 letter report, a copy of which was submitted to the Alameda County Health Services Agency, Department of Environmental Health.

On July 27, 1995 the five wells were sampled again by Baseline. A letter report which documents this round of sampling and analysis is included as Appendix B to this report. This letter report has not been submitted to Alameda County as a separate document.

A summary of the analytical results for each round of sampling since the wells were installed is included as Table 4 (organics) and Table 5 (metals). Elevated levels of petroleum hydrocarbons continue to be detected in MW-5 and MW-6 groundwater samples. The reported results during this quarter are generally consistent with previous results.

Water level measurements (no sampling) were performed on August 22, 1995 by WCC and Baseline personnel. Water levels were measured in monitoring wells MW-1, 2, 5, 6 and 7 with an electronic water level sounder and recorded to the nearest 0.01 foot. Table 3 is a summary of groundwater elevation data since the five wells were installed. Figure 5 is a groundwater elevation contour map for the August 1995 water level survey. Section 1.5 of this report discusses the groundwater elevation and flow direction in detail.

The next quarterly monitoring event will take place in late November 1995.

5.0
UST STATUS

The Office of Public Works has obtained information regarding USTs at the site from the City of Oakland, Office of General Services (OGS), who operate the facility. A memo dated July 27, 1995 from OGS is attached as Appendix C of this report. Appendix C is a City of Oakland Memorandum, dated July 27, 1995, from Okey Ozoh (OGS Municipal Buildings Division) to Andrew Clark-Clough. The memorandum is an update on the current status and future plans for the underground storage tanks at MSC. Table 7 is a underground storage tanks summary taken from the City of Oakland Memorandum.

6.0
LIMITATIONS

The evaluations presented in this report are based on the available data and the professional opinion and experience of Woodward-Clyde. If additional data are collected, the interpretations presented herein may be revised. Woodward-Clyde's services were performed with the standard of care and skill commonly used as state of the practice in the profession. No other representation, expressed or implied, and no warranty or guarantee, is included or intended.

7.0
REFERENCES

Baseline Environmental Consulting, "Groundwater Monitoring Event at the City of Oakland, Municipal Service Center, 7101 Edgewater Drive - April 1995," letter report to the City of Oakland, July 13, 1995.

Woodward-Clyde Consultants, "Geotechnical Engineering Study, Equipment Building, Consolidated Service Center, Oakland, California," prepared for the City of Oakland, March 1988.

Woodward-Clyde Consultants, "Environmental Site Assessment, Oakland Building No. 7, 7101 Edgewater Drive, Oakland, California," prepared for the City of Oakland, December 1989.

Woodward-Clyde Consultants, "Preliminary Geotechnical Evaluation and Environmental Site Assessment, City of Oakland Consolidated Services Center, Alternative Sites A and B, Oakland, California," prepared for the City of Oakland, May 13, 1992.

Woodward-Clyde Consultants, "Focused Work Plan for Phase II Environmental Site Assessment and Remedial Action Plan, City Municipal Service Center Site, 7101 Edgewater Drive, City of Oakland Project No. C11710," prepared for the City of Oakland, April 15, 1993.

TABLE 1

LIST OF CONTACTS
CITY OF OAKLAND
MUNICIPAL SERVICE CENTER

Owner's Representative

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Environmental Consultant

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Lead Implementing Agency

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Hazardous Materials Division
1131 Harbor Bay Parkway, Suite 200
Alameda, CA 94502
Barney M. Chan / Don Hwang
(510) 567-6700

Regional Water Quality Control Board

State of California, Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, CA 94612
(510) 286-1255

TABLE 2

MONITORING WELL CONSTRUCTION AND MONUMENTATION DATA
CITY OF OAKLAND
MUNICIPAL SERVICE CENTER

CONSTRUCTION DETAILS BY DEPTH INTERVAL[a]								REFERENCE POINT ELEVATION[b]	
Well Number	Date Installed	Total Depth[c]	Blank Casing[d]	Screen[e]	Sand Pack[f]	Bentonite Seal	Grout Seal	Top of PVC	Land Surface
MW-1	9/29/89	16.5	0-6'	6-16	5-16.5	4-5	0-4	6.83	7.16
MW-2	9/29/89	16.5	0-6'	6-16	5-16.5	4-5	0-4	7.27	7.70
MW-3	9/29/89	18.5	0-8	8-18	7-8.5	6-7	0-6	NA	NA
MW-4	9/29/89	16.0	0-5.5	5.5-15.5	4.5-16	3.5-4.5	0-3.5	NA	NA
MW-5	12/5/91	15.0	0-4	4-14	3-15	2-3	½-2	8.15	8.45
MW-6	12/5/91	15.0	0-4	4-14	3-15	2-3	½-2	7.93	8.33
MW-7	12/5/91	15.0	0-4	4-14	3-15	2-3	½-2	8.48	8.66

NOTES:
a All values describe construction details of the well in feet below land surface.
b Reference points for MW-1, MW-2, MW-5, MW-6 and MW-7 were surveyed in July, 1995 by Bates and Bailey. MW-3 and MW-4 have yet to be surveyed.
c Depth of boring below land surface.
d All wells are constructed with 2" schedule 40 PVC casing.
e Screen slot openings are 0.02-inch for MW-1 through MW-4. Screen slot openings are 0.01-inch for MW-5 through MW-7.
f Sand pack grade for all monitoring wells is #2 x 12.
NA Not Available - Wells have yet to be surveyed.

TABLE 3

SUMMARY OF GROUNDWATER ELEVATION DATA
CITY OF OAKLAND
MUNICIPAL SERVICE CENTER

Well Identification	Date	Top of Casing Elevation (feet above MSL)	Depth to Water (feet below top of casing)	Water Surface Elevation (feet above MSL)
MW-1	10/4/89[1]	6.83	6.2	0.63
	4/27/93[1]	6.83	4.40	2.43
	4/19/95[1]	6.83	3.65	3.18
	7/27/95[1]	6.83	4.62	2.21
	8/22/95[2]	6.83	5.00	1.83
MW-2	10/4/89[1]	7.27	7.3	-0.03
	4/27/93[1]	7.27	6.49	0.78
	4/19/95[1]	7.27	6.16	1.11
	7/27/95[1]	7.27	6.22	1.05
	8/22/95[2]	7.27	6.60	0.67
MW-5	12/13/91[1]	8.15	7.09	1.06
	4/27/93[1]	8.15	6.37	1.78
	4/19/95[1]	8.15	6.05	2.10
	7/27/95[1]	8.15	6.29	1.86
	8/22/95[2]	8.15	6.40	1.75
MW-6	12/13/91[1]	7.93	8.14	-0.21
	4/27/93[1]	7.93	6.94	0.99
	4/19/95[1]	7.93	6.81	1.12
	7/27/95[1]	7.93	7.09	0.84
	8/22/95[2]	7.93	7.49	0.44
MW-7	12/13/91[1]	8.48	7.99	0.49
	4/27/93[1]	8.48	7.01	1.47
	4/19/95[1]	8.48	6.84	1.64
	7/27/95[1]	8.48	6.87	1.61
	8/22/95[2]	8.48	7.10	1.38

(1) Water levels obtained prior to August 1995 were collected over a several hour period and should not be used to evaluate groundwater gradient and flow direction.

(2) August 22, 1995 water levels were measured over a half-hour period. This data is considered acceptable for evaluating groundwater gradient and flow direction.

TABLE 4

SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS (ORGANICS)
CITY OF OAKLAND
MUNICIPAL SERVICE CENTER

Parameters EPA Method Units		TPH-gasoline 5030/8015M µg/L	TPH-diesel 3510/8015M µg/L	TRPH 418.1 µg/L	Benzene 8020(8240) µg/L	Toluene 8020(8240) µg/L	Ethyl Benzene 8020(8240) µg/L	Xylene 8020(8240) µg/L
Well Identification	Date							
MW-1	10/4/89	540	NA	NA	(120)/65	(46)/26	(43)/14	(78)/22
	4/27/93	<1000	NA	<1000	<1.0	<1.0	<1.0	<1.0
	4/19/95	3200	NA	NA	880	15	23	21
	7/27/95	980	NA	NA	130	3.6	1.4	5.6
MW-2	10/4/89	<30.0	NA	NA	(2.0)/<.3	(<2)/<0.3	(<2)/<0.3	(<2)/<0.3
	4/27/93	<1000	NA	<1000	<1.0	<1.0	<1.0	<1.0
	4/19/95	<50	NA	NA	1.8	<0.5	<0.5	<0.5
	7/27/95	<50	NA	NA	2.3	<0.5	<0.5	<0.5
MW-5	12/31/91	16000/13000	1900	NA	(1800)/1500	(<250)/190	(1000)/970	(3800)/2500
	4/27/93	35000	12000[1]	9000	(2100)	(<1.0)	(1800)	(2700)
	4/19/95	14000	880[1]	4700	(490)	(51)	(610)	(1200)
	7/27/95	22000	590[1]	5000	(1300)	(54)	(1500)	(2400)
MW-6	12/31/91	780	520	NA	110/(95)	2.7/(5.0)	(<2.5)/<5	5.5/(<5.0)
	4/27/93	<1000	<1000	<1000	430/300	4/<5	5/<5	10/<5
	4/19/95	5700/3000	6700[1]/3700	NA	40/310	<0.5/3.1	3.9/2.7	29/100
	7/27/95	6100/6300	3900/2600	NA	430/420	15	200	600
MW-7	12/31/91	<50	<50	NA	<.5/(<5)	<.5/(<5)	<.5/(<5)	<.5/(<5)
	4/27/93	<1000	<1000	<1000	(<1.0)	(<1.0)	(<1.0)	(<1.0)
	4/19/95	<50	<50	<1000	(<2.0)	(<2.0)	(<2.0)	(<2.0)
	7/27/95	<50	<50	<1000	(<2.0)	(<2.0)	(<2.0)	(<2.0)

[1] Does not match diesel standard chromatograph profile.

TABLE 5

SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS (METALS)
CITY OF OAKLAND
MUNICIPAL SERVICE CENTER

		Lead	Cadmium	Chromium	Nickel	Zinc
MW-1	10/4/89	NA	NA	NA	NA	NA
	4/27/93	<3	NA	NA	NA	NA
	4/19/95	<10	NA	NA	NA	NA
	7/27/95	<10	NA	NA	NA	NA
MW-2	10/4/89	NA	NA	NA	NA	NA
	4/27/93	83	NA	NA	NA	NA
	4/19/95	100	NA	NA	NA	NA
	7/27/95	70	NA	NA	NA	NA
MW-5	12/31/91	173	NA	22.6	<40	201
	4/27/93	<3	<5	30	<20	<20
	4/19/95	<10	<5	<10	<10	20
	7/27/95	<10	<5	<10	<10	<10
MW-6	12/31/91	1040	NA	42.2	126	837
	4/27/93	<3	NA	NA	NA	NA
	4/19/95	410/390	NA	NA	NA	NA
	7/27/95	<1/<10	NA	NA	NA	NA
MW-7	12/31/91	11.4	NA	10.6	270	101
	4/27/93	<3	9	190	300	50
	4/19/95	<10	69	70	80	40
	7/27/95	<10	<5	<10	80	110

Samples analyzed by EPA Method 3010A M/6010
All values are in units of µg/L
NA = not analyzed for particular constituent

TABLE 6

SUMMARY OF HYDROPUNCH SAMPLE ANALYTICAL RESULTS
CITY OF OAKLAND
MUNICIPAL SERVICES CENTER

All results in µg/L ppb

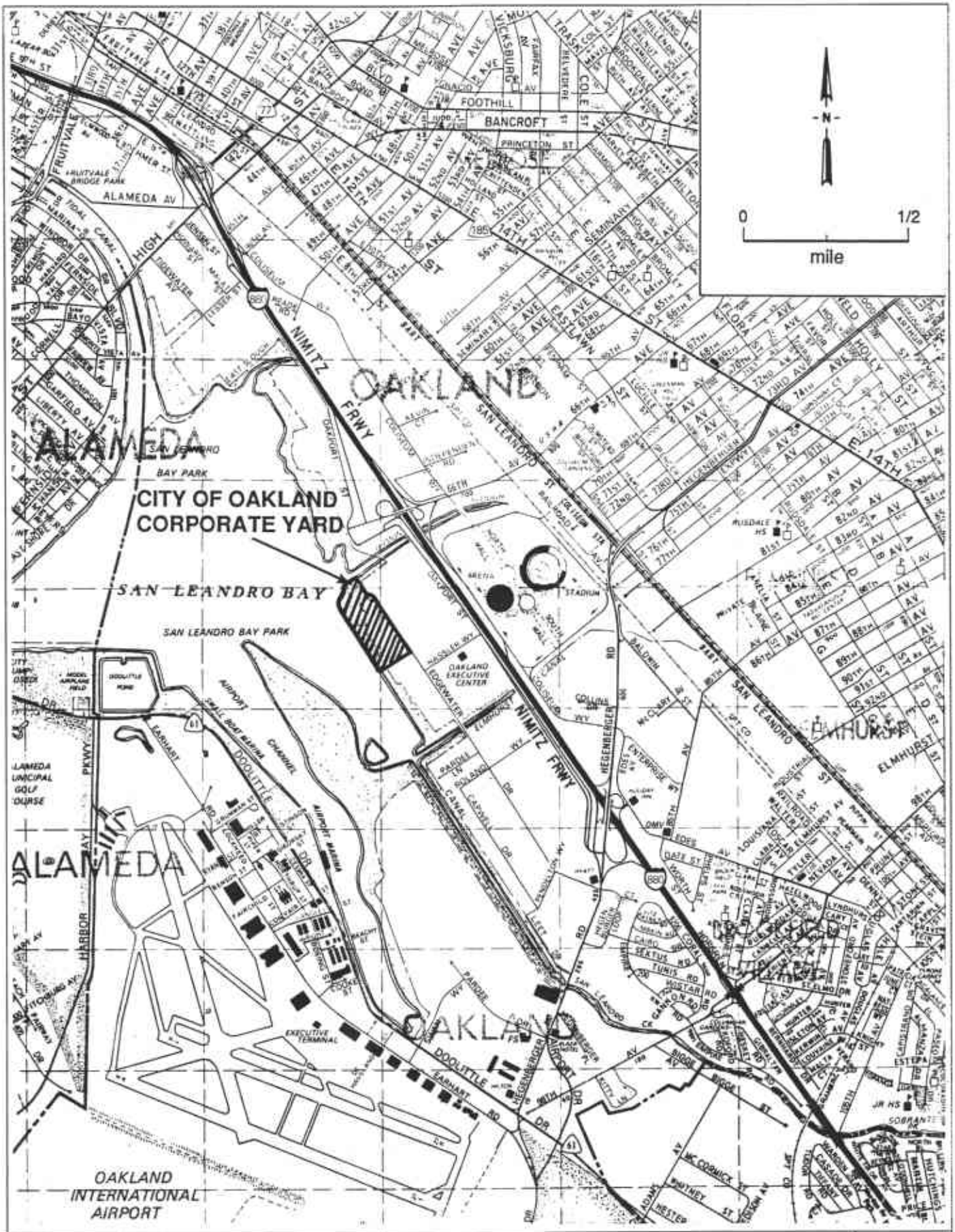
Sample I.D.	Date Sampled	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	Notes
BAT-1	4/22/93	< 1,000	< 1	< 1	2	< 1	
BAT-2	4/22/93	< 5,000	< 1	< 1	< 1	< 1	
BAT-3	4/23/93	< 5,000	2,000	1,800	190	1,000	Odor, tarry substance, sheen
BAT-4	4/23/93	< 1,000	50	20	6	40	No odor
BAT-5	4/23/93	< 5,000	110	10	150	25	Odor, tarry substance, sheen
BAT-6	4/23/93	< 1,000	< 1	< 1	< 1	< 1	No odor
HP-7	4/26/93	20,000	6,000	1,500	800	3,200	Odor
HP-8	4/26/93	4,000	3,200	60	40	280	
HP-9	4/26/93	1,000	30	30	20	100	
HP-10	4/26/93	3.4×10^8	116,000	160,000	250,000	1,100,000	Brown/black product
HP-11	4/26/93	3,000	14	< 1	60	300	
HP-12	4/26/93	2,000	10	< 1	45	2,230	Sheen
HP-13	4/27/93	< 1,000	< 1	< 1	< 1	< 1	
HP-14	4/27/93	3,000	900	< 5	150	180	
HP-15	4/27/93	1,800,000	120	450	230	7,000	Free product
HP-16	4/27/93	8,000/2,000	280/40	220/100	115/30	570/190	
HP-17	4/27/93	3,000	600	< 5	5	20	
HP-18							No sample collected
HP-19	4/28/93	60,000	10	15	200	580	Odor
HP-20	4/28/93	20,000	< 5	15	20	20	Sheen
HP-21	4/28/93	< 1,000/< 1,000	200/250	< 5/10	< 5/10	< 5/10	
HP-22	4/28/93	< 1,000	15	160	< 1	< 1	
HP-23	6/28/93	480	6	29	5	15	No odor
HP-24							Dry
HP-25							Hit U.G. obstacle @ 3'
HP-26	6/28/93	340	10	12	3	8	No odor
HP-27							Dry
HP-28							Not sampled
HP-29	6/29/93	< 50	< 0.3	< 0.3	< 0.3	< 0.3	
HP-30	6/29/93	5,600	1,390	16	18	30	
HP-31	6/29/93	7,900	8,500	250	180	380	No odor
HP-32	6/29/93	1,300/610	180/30	8/< 0.3	< 0.3/< 0.3	8/< 0.3	
HP-33	6/30/93	1,700	3	30	30	34	
HP-34	6/30/93	< 50	< 0.3	1	< 0.3	< 0.3	

TABLE 7

UNDERGROUND STORAGE TANK SUMMARY
CITY OF OAKLAND
MUNICIPAL SERVICE CENTER

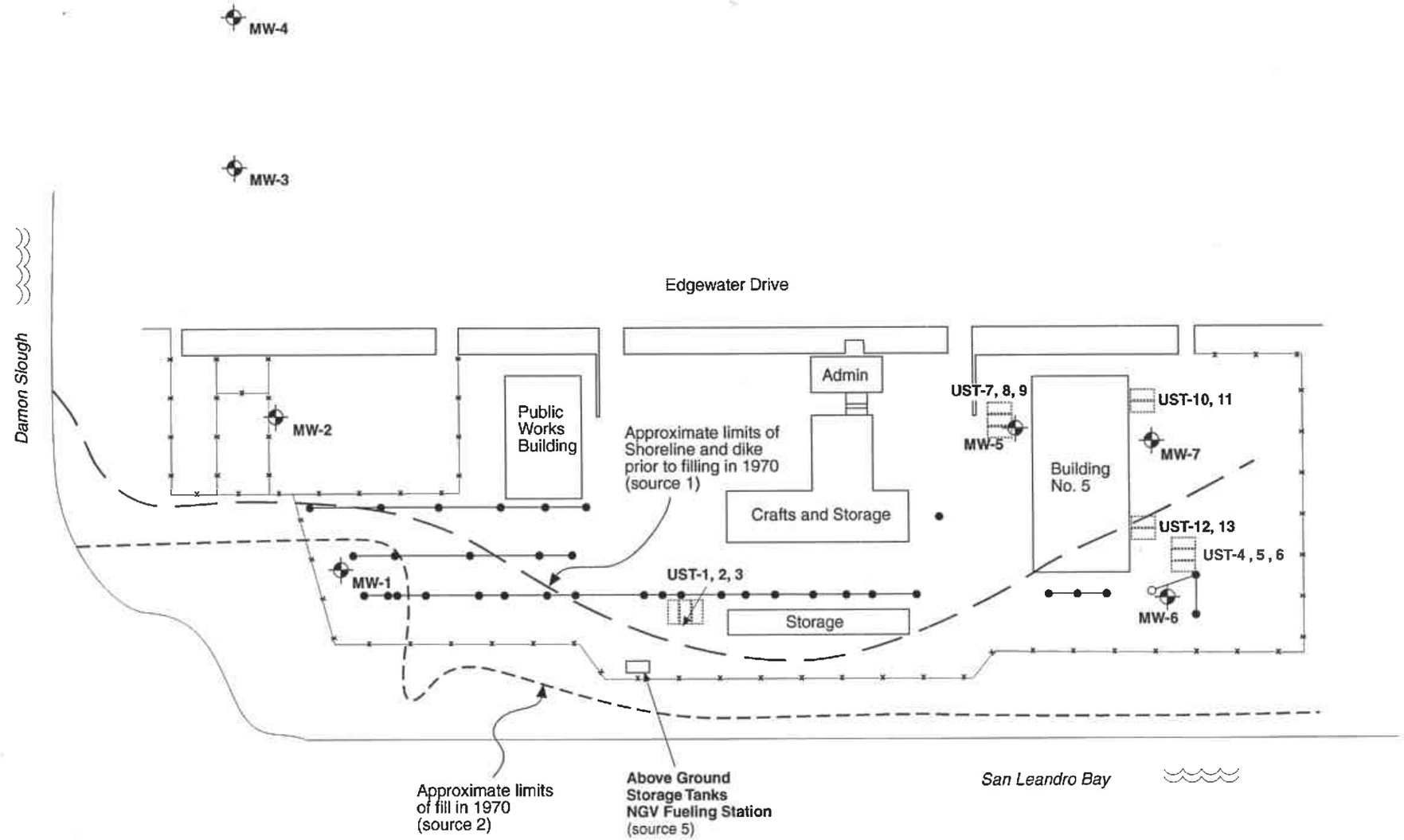
Tank ID	Approximate Year Installed	Tank Size Gallons	Contents	Current Operating Status	Owner
			UNDERGROUND FUELING SYSTEM - MAY HAVE BEEN ABANDONED ?		
1	1970	5,000	Diesel	Not used	Unknown
2	1970	5,000	Leaded	Not used	Unknown
3	1970	5,000	Unleaded	Not used	Unknown
			UNDERGROUND FUELING SYSTEM - MAY HAVE BEEN REMOVED AND NO RECORDS ?		
4	Unknown	8,000	Unknown	Removed	Unknown
5	Unknown	Unknown	Unknown	Not used	Unknown
6	1979	12,000	Unleaded	Not used	City Oakland
			UNDERGROUND FUELING SYSTEM - HAVE RECORDS AND ARE IN COMPLIANCE		
7	1985	12,000	Leaded	Operating	City Oakland ?
8	1985	20,000	Unleaded	Operating	City Oakland ?
9	1985	20,000	Diesel	Operating	City Oakland
			UNDERGROUND FUELING SYSTEM : must be permitted/closed		
10	1960	1,000	Lube oil	Not used	Unknown
11	1960	500	Waste oil	Not used	Unknown
12	1960	1,000	Lube oil	Not used	Unknown
13	1960	500	Waste oil	Not used	Unknown
			UNDERGROUND FUELING SYSTEM - MAY HAVE BEEN REMOVED AND NO RECORD		
14	1973	500	Waste, latex joint sealer	Not used	Unknown

Source: City of Oakland Memorandum, dated July 27, 1995, Okey Ozoh (OGS Municipal Buildings Division) to Andrew Clark-Clough (OPW Environmental Affairs Division).



Project No. 92C0414A	City of Oakland Municipal Services Center	VICINITY MAP	Figure 1
Woodward-Clyde Consultants			

92C0414A-2900/091195/vone



LEGEND

- MW-1 — Approximate Monitoring Well Location
- Valve Box
- Fueling Stations and Pipeline
- Approximate UST Location (Sources: 3 and 4)

UST 1	5,000-gallon	Diesel
UST 2	5,000-gallon	Leaded Gasoline
UST 3	5,000-gallon	Unleaded Gasonline
UST 4	8,000-gallon	Unknown contents
UST 5	Unknown Volume	and Contents
UST 6	12,000-gallon	Unleaded Gasoline
UST 7	12,000-gallon	Leaded Gasoline
UST 8	20,000-gallon	Unleaded Gasoline
UST 9	20,000-gallon	Diesel
UST 10	1,000-gallon	Lube Oil
UST 11	500-gallon	Waste Oil
UST 12	1,000-gallon	Lube Oil
UST 13	500-gallon	Waste Oil
UST 14	500-gallon	Waste Latex and Joint Sealer (location unknown)

Sources:

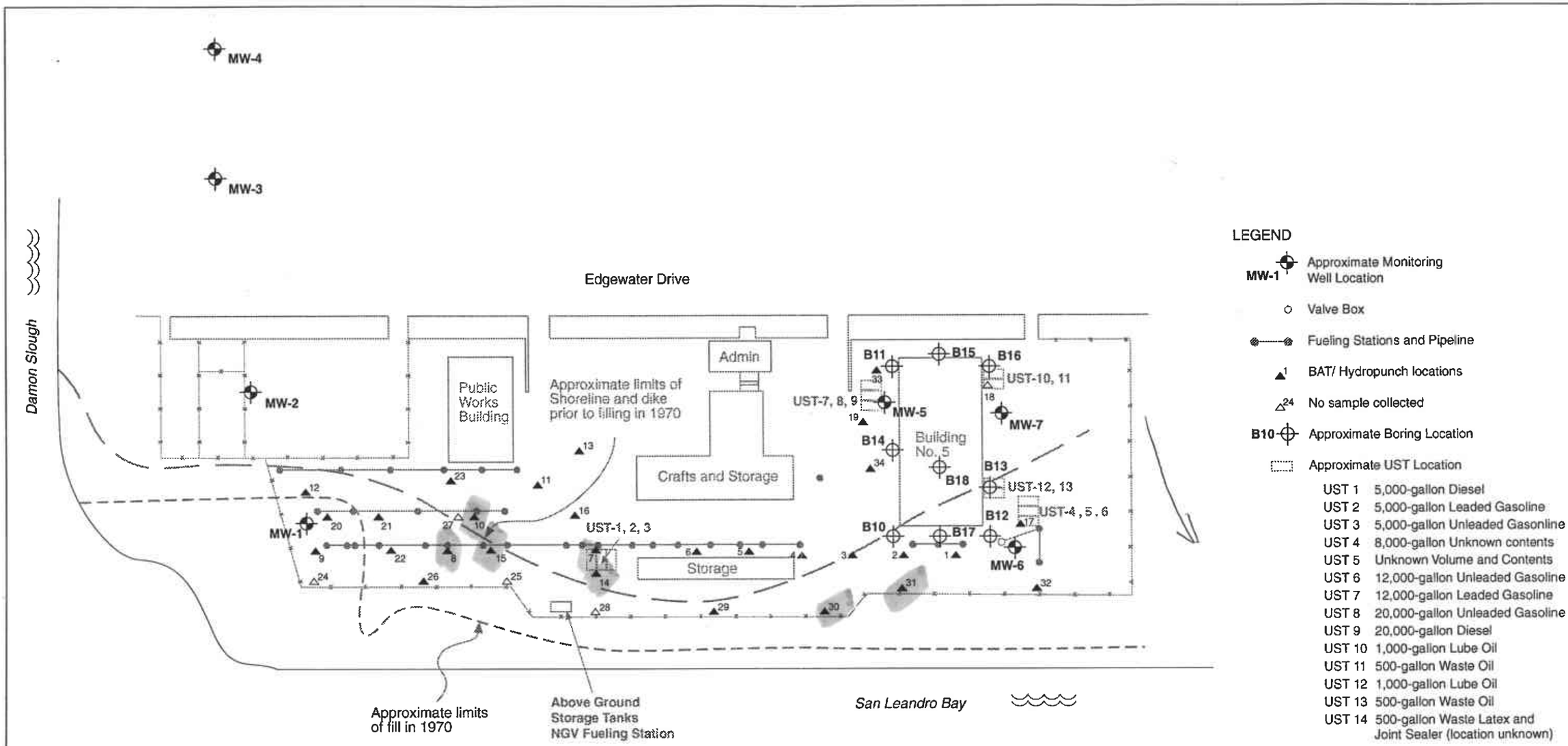
1. Site Plan, Oakland Operations Center, 6/28/67
2. Survey No. 7766, Service Center Site, 1/23/70
3. Fig. 3 Preliminary GeoTech/ESA WCC 1992
4. Kaiser Engineers Site Plan & Legend Schedule
5. A-2 Site Improvement Plan–City of Oakland, NGV Fueling Station

Elevations based on City of Oakland Banchmark "BM 26 NE 6 eastside SW area bridge south of Hassler, EL.=9.48 (used for surface settlement only)."

0 100 200
feet

Project No. 92C0414A	City of Oakland Municipal Service Center	SITE PLAN	Figure 2
Woodward-Clyde Consultants			

92C0414A-2900/112195/vone, gos, vone



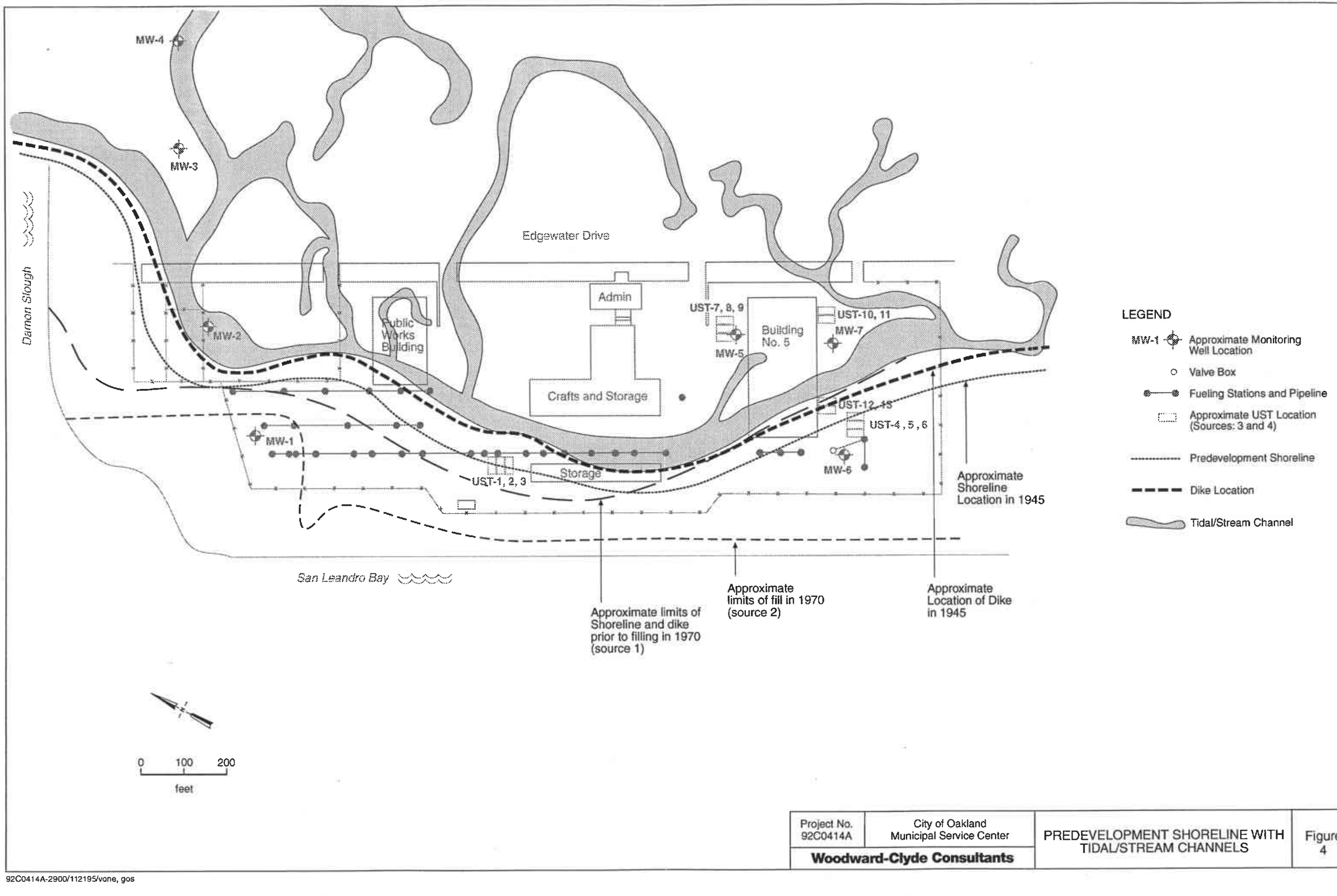
LEGEND

- MW-1 — Approximate Monitoring Well Location
- Valve Box
- Fueling Stations and Pipeline
- ▲1 — BAT/ Hydropunch locations
- △24 — No sample collected
- B10 — Approximate Boring Location
- Approximate UST Location

UST 1	5,000-gallon Diesel
UST 2	5,000-gallon Leaded Gasoline
UST 3	5,000-gallon Unleaded Gasonline
UST 4	8,000-gallon Unknown contents
UST 5	Unknown Volume and Contents
UST 6	12,000-gallon Unleaded Gasoline
UST 7	12,000-gallon Leaded Gasoline
UST 8	20,000-gallon Unleaded Gasoline
UST 9	20,000-gallon Diesel
UST 10	1,000-gallon Lube Oil
UST 11	500-gallon Waste Oil
UST 12	1,000-gallon Lube Oil
UST 13	500-gallon Waste Oil
UST 14	500-gallon Waste Latex and Joint Sealer (location unknown)

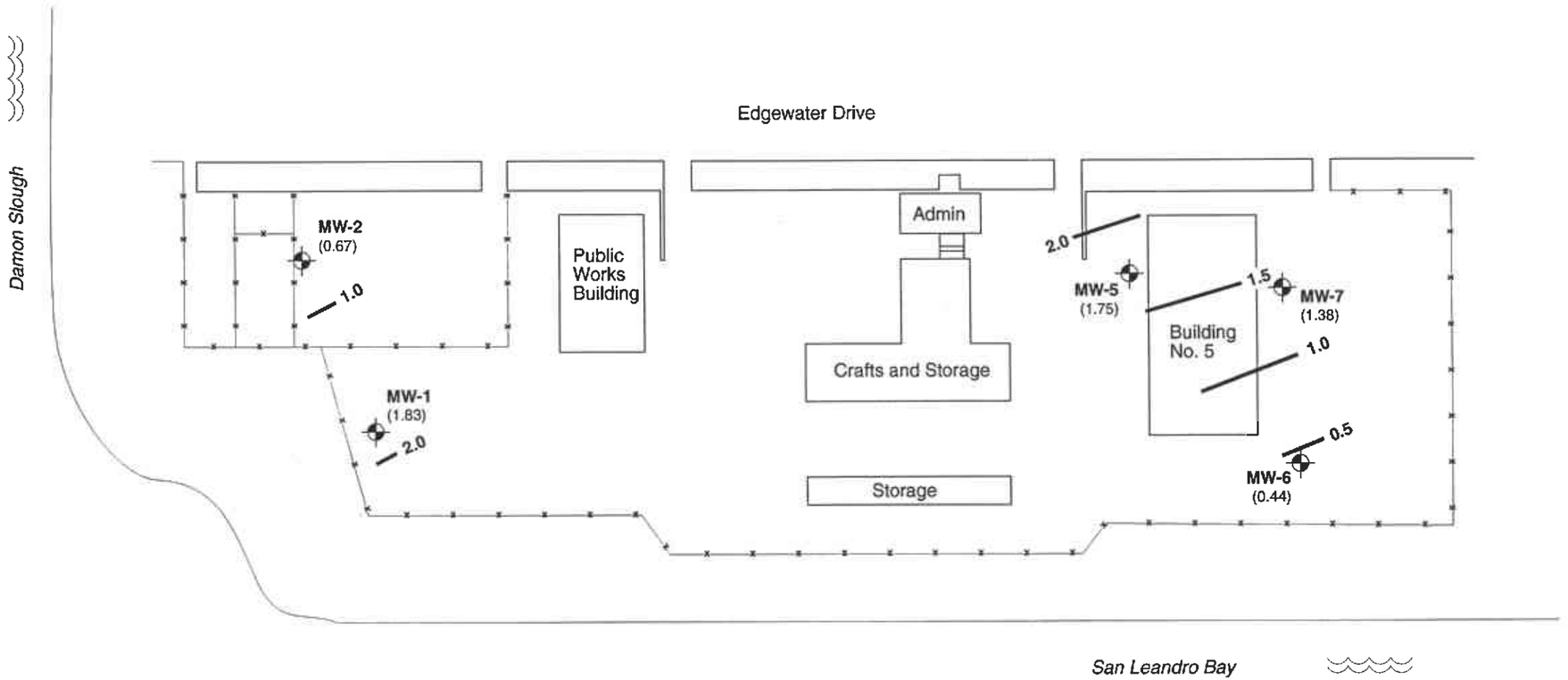
Project No. 92C0414A	City of Oakland Municipal Service Center	INVESTIGATION LOCATIONS	Figure 3
Woodward-Clyde Consultants			

92C0414A-2900/111795/vone, gos



Project No. 92C0414A	City of Oakland Municipal Service Center	PREDEVELOPMENT SHORELINE WITH TIDAL/STREAM CHANNELS	Figure 4
Woodward-Clyde Consultants			

92C0414A-2900/112195/vone, gos



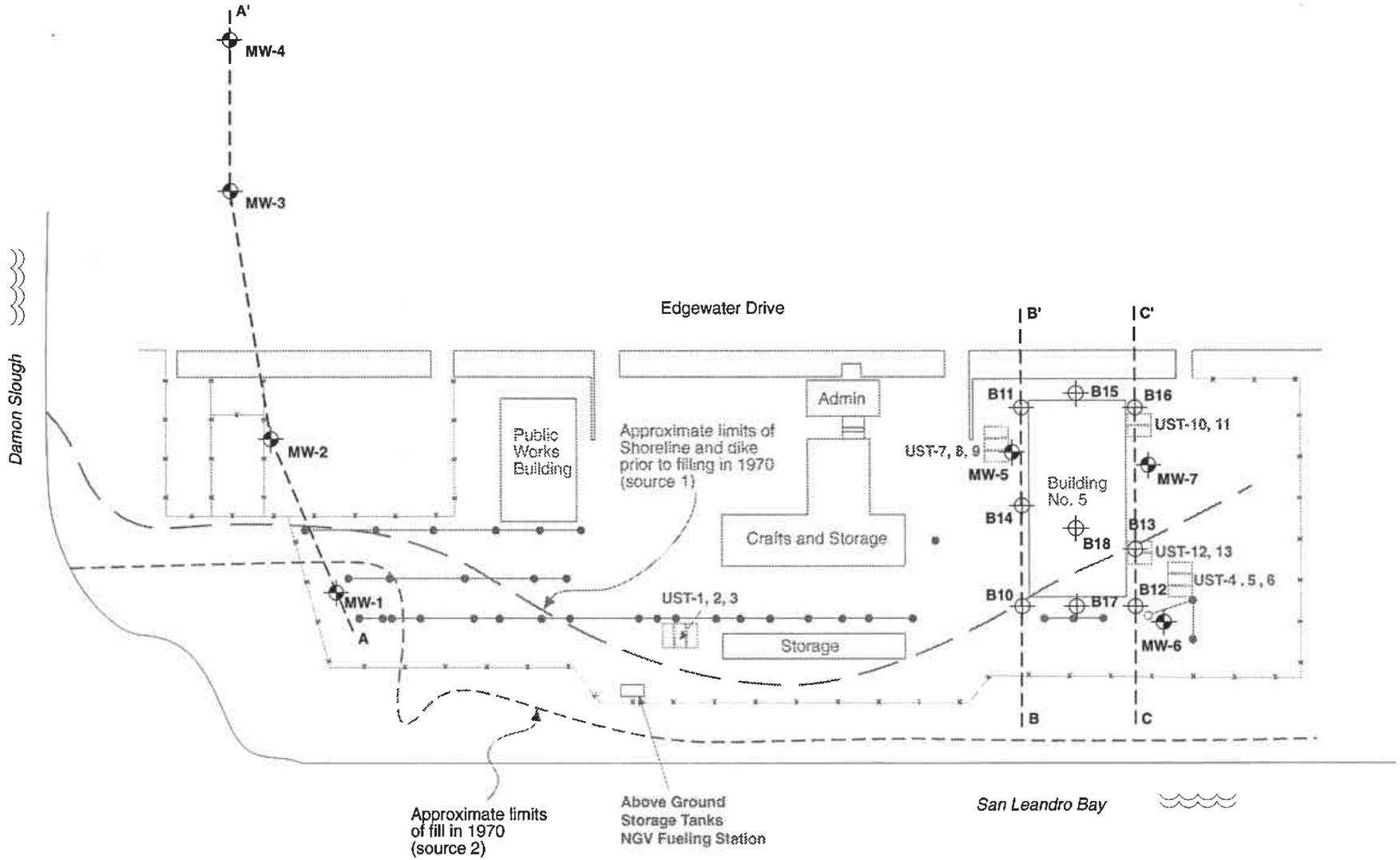
LEGEND

MW-1 (1.05) Approximate Monitoring Well Location. Elevation of groundwater in feet, MSL in parentheses.

Elevations based on City of Oakland Banchmark "BM 26 NE 6 eastside SW area bridge south of Hassler, EL.=9.48 (used for surface settlement only)"

Project No. 92C0414A	City of Oakland Municipal Service Center	GROUNDWATER ELEVATION CONTOUR MAP AUGUST 22, 1995	Figure 5
Woodward-Clyde Consultants			

92C0414A-2900/111095/vone



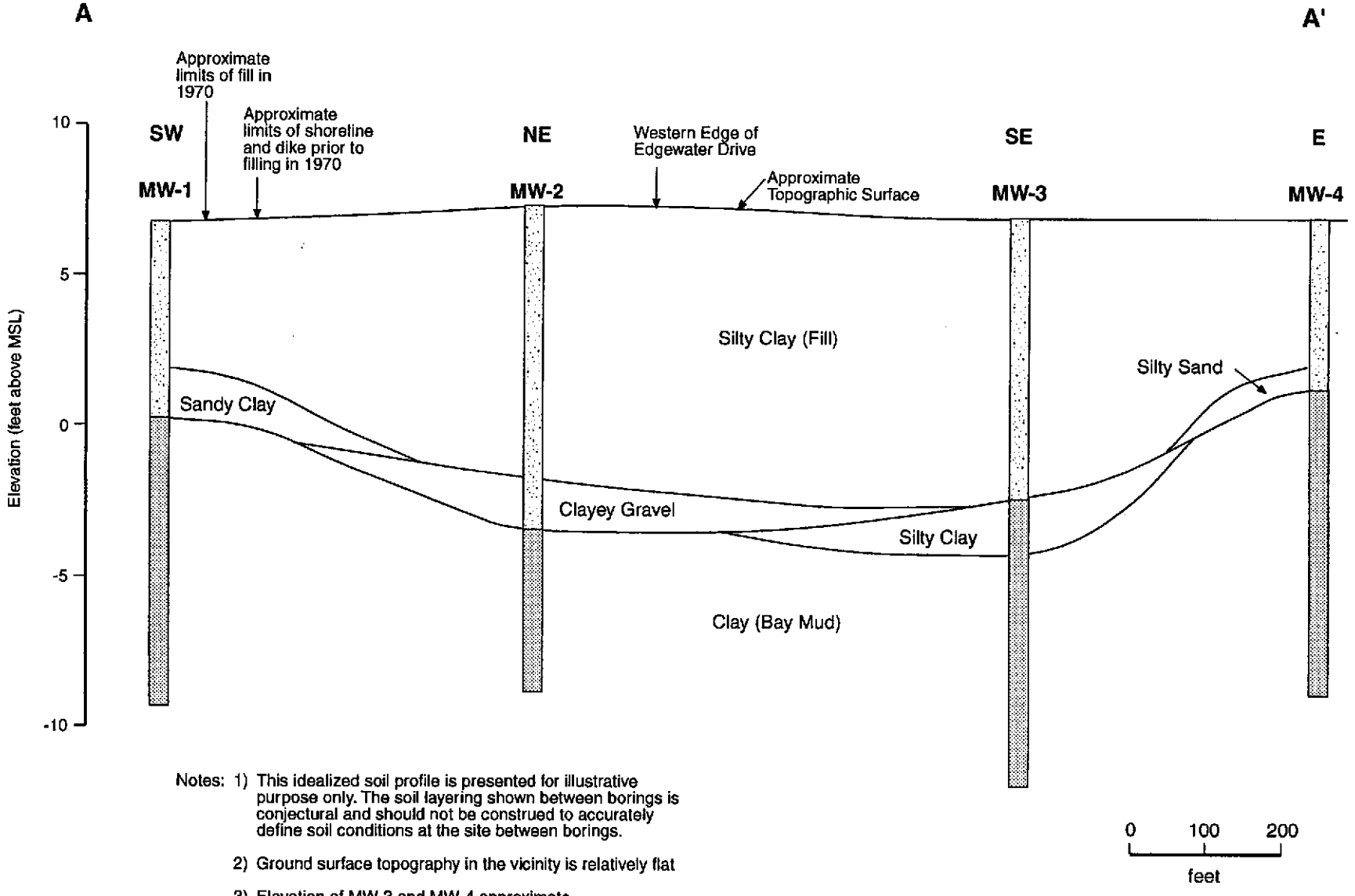
LEGEND

- MW-1 — Approximate Monitoring Well Location
- Valve Box
- Fueling Stations and Pipeline
- A – A' — Geologic Cross-Section Location
- B10 — Approximate Boring Location
- Approximate UST Location

UST 1	5,000-gallon Diesel
UST 2	5,000-gallon Leaded Gasoline
UST 3	5,000-gallon Unleaded Gasonline
UST 4	8,000-gallon Unknown contents
UST 5	Unknown Volume and Contents
UST 6	12,000-gallon Unleaded Gasoline
UST 7	12,000-gallon Leaded Gasoline
UST 8	20,000-gallon Unleaded Gasoline
UST 9	20,000-gallon Diesel
UST 10	1,000-gallon Lube Oil
UST 11	500-gallon Waste Oil
UST 12	1,000-gallon Lube Oil
UST 13	500-gallon Waste Oil
UST 14	500-gallon Waste Latex and Joint Sealer (location unknown)

Project No. 92C0414A	City of Oakland Municipal Service Center	LOCATION OF GEOLOGIC CROSS-SECTIONS	Figure 6
Woodward-Clyde Consultants			

92C0414A-2900/112195/vone, gos, vone



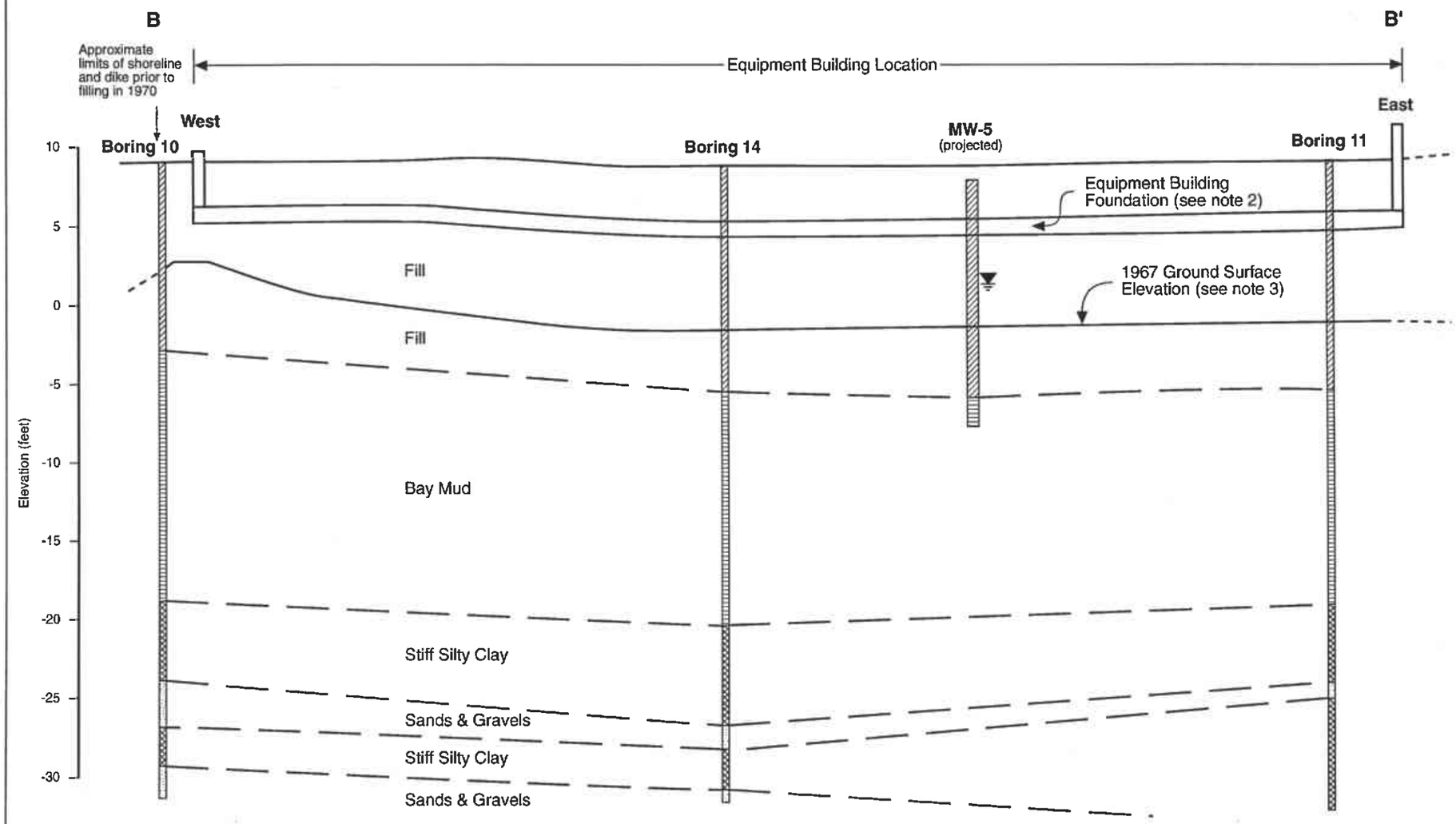
Notes: 1) This idealized soil profile is presented for illustrative purpose only. The soil layering shown between borings is conjectural and should not be construed to accurately define soil conditions at the site between borings.

2) Ground surface topography in the vicinity is relatively flat

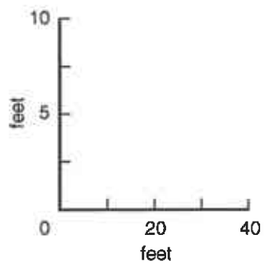
3) Elevation of MW-3 and MW-4 approximate

Project No. 92C0414A	City of Oakland Municipal Service Center	IDEALIZED GEOLOGIC CROSS SECTION A – A' NORTHERN PORTION	Figure 7
Woodward-Clyde Consultants			

92C0414A-2900/111795/vone, gos



Notes:
1) This idealized soil profile is presented for illustrative purpose only. The soil layering shown between borings is conjectural and should not be construed to accurately define soil conditions at the site between borings.
2) Building foundation elevations based on building perimeter survey performed by the City of Oakland on 11-24-87 (Book 1685, pages 12–15).
3) 1967 ground surface elevation based on site survey performed by the City of Oakland on 11-9-67 (Book 332).
4) Water level at MW-5 measured at time of drilling (1992).



Project No. 92C0414A	City of Oakland Municipal Service Center	IDEALIZED GEOLOGIC CROSS SECTION B – B'	Figure 8
Woodward-Clyde Consultants			

92C0414A-2900/111795/vone, gos

C

C'

Equipment Building Location

Western Edge of Edgewater Drive

Approximate limits of shoreline and dike prior to filling in 1970

West

East

MW-6 (projected)

Boring 12

Boring 13

MW-7 (projected)

Boring 16

Equipment Building Foundation (see note 2)

Fill

Fill

1967 Ground Surface Elevation (see note 3)

Bay Mud Fill

Fill

Bay Mud

Bay Mud

Stiff Silty Clay

Stiff Silty Clay

Clayey Sand

Elevation (feet)

10
5
0
-5
-10
-15
-20
-25
-30

Notes:

1) This idealized soil profile is presented for illustrative purpose only. The soil layering shown between borings is conjectural and should not be construed to accurately define soil conditions at the site between borings.

2) Building foundation elevations based on building perimeter survey performed by the City of Oakland on 11-24-87 (Book 1685, pages 12–15).

3) 1967 ground surface elevation based on site survey performed by the City of Oakland on 11-9-67 (Book 332).

4) Water level at MW-6 and MW-7 measured at time of drilling (1992).

10
5
feet
0
20
40
feet

Project No. 92C0414A	City of Oakland Municipal Service Center	IDEALIZED GEOLOGIC CROSS SECTION C – C'	Figure 9
Woodward-Clyde Consultants			

92C0414A-2900/111795/vone, gos

APPENDIX A
SITE SURVEY DRAWINGS

APPENDIX B
JULY 1995 GROUNDWATER MONITORING RESULTS

BASELINE

ENVIRONMENTAL CONSULTING

10 August 1995
93333-B0

Ms. Jo Beth Folger
Woodward-Clyde Consultant
500 12th Street, Suite 100
Oakland, CA 94607-4014

Subject: Groundwater Monitoring Event at the City of Oakland, Municipal Service Center, 7101 Edgewater Drive - July 1995

Dear Ms. Folger:

This letter documents the groundwater monitoring activities performed by BASELINE at the Municipal Service Center (MSC) in July 1995 (Figure 1). All field work was performed by a BASELINE geologist. Detailed sampling procedures and laboratory analytical results are described below.

Groundwater Sampling

Groundwater samples were collected from the five groundwater monitoring wells shown on Figure 2 on 27 July 1995. Sample bottles were provided by the analytical laboratory. Groundwater sampling forms are provided in Attachment A. Sampling procedures were performed as follows:

- Monitored vapor in well casing using an HNu instrument upon opening well cap.
- Measured product/water level and total depth of well from top of casing using dual-interface probe; decontaminated probe by washing in TSP solution and rinsing with DI water.
- Purged monitoring well using double diaphragm pump and new disposable hose; the purge water was discharged into a 55-gallon drum.
- Measured temperature, pH, and conductivity of the purged water.
- Purged a minimum of 3.5 well volumes until parameters had stabilized.
- Collected groundwater samples using new disposable PVC bailers after the water level had recovered to at least 97 percent of original level.
- Filled sample bottles for volatile organic analyses using volatile organic compound attachments to minimize turbulence and to prevent air bubbles; filled other sample bottles directly from bottom of bailer.

5900 Hollis Street, Suite D • Emeryville, CA 94608 • (510) 420-8686 • FAX: (510) 420-1707
Emeryville Petaluma San Francisco

- Collected duplicate sample from MW-6 (labeled sample MW-6A).
- Submitted trip blank with samples (labeled MW-500).
- Stored labeled sample bottles in plastic cooler with blue ice; samples were picked up by Chromalab laboratory using chain-of-custody procedures.
- Labeled and secured 55-gallon drums containing purge and decontamination water.

Petroleum odor was identified during purging of MW-1, MW-5, and MW-6. Sulfur odor was identified in MW-2.

Analytical Results

The analyses performed on each sample is summarized in Table 1. The samples were analyzed by Chromalab, Inc., a State-certified laboratory located in Pleasanton. Analytical results for groundwater monitoring events performed in April and July 1995 are summarized in Tables 2 and 3. The laboratory report for this groundwater monitoring event is provided in Attachment B.

Please contact us at your convenience if you have any questions regarding these groundwater monitoring activities.

Sincerely,

Rhodora Del Rosario
Civil Engineer

William K. Scott
Geologist
Reg. Geologist No. 6104

RPD:WKS:cr
Attachments

TABLE 1

LABORATORY ANALYSES PERFORMED ON GROUNDWATER SAMPLES
Oakland Municipal Service Center
April and July 1995

	TOTAL PETROLEUM HYDROCARBONS			VOLATILE ORGANIC COMPOUNDS		METALS[1]				
Location	Gasoline (5030/8015)	Diesel (3510/8015)	TRPH[2] (418.1)	BTEX[3] (8020)	VOC[4] (8240)	Cadmium (6010)	Chromium (6010)	Lead (6010)	Nickel (6010)	Zinc (6010)
MW-1	✓	--	--	✓	--	--	--	✓	--	--
MW-2	✓	--	--	✓	--	--	--	✓	--	--
MW-5	✓	✓	✓	--	✓	✓	✓	✓	✓	✓
MW-6	✓	✓	--	✓	--	--	--	✓	--	--
MW-6A	✓	✓	--	✓	--	--	--	✓	--	--
MW-7	✓	✓	✓	--	✓	✓	✓	✓	✓	✓
Trip Blank	✓	--	--	✓	--	--	--	--	--	--

Notes: -- = Not analyzed.
Number shown in parenthesis indicates the EPA method used for analysis.

[1] All samples for metals analyses were filtered in the laboratory.
[2] TRPH = Total recoverable petroleum hydrocarbons.
[3] BTEX = Benzene, toluene, ethylbenzene, and xylenes.
[4] VOC = Volatile organic compounds.

TABLE 2

METAL CONCENTRATIONS IN GROUNDWATER
Oakland Municipal Service Center

(mg/L)

Sample	Date	Cadmium	Chromium	Lead	Nickel	Zinc
MW-1	4/19/95	--	--	<0.01	--	--
	7/27/95	--	--	<0.01	--	--
MW-2	4/19/95	--	--	0.10	--	--
	7/27/95	--	--	0.07	--	--
MW-5	4/19/95	<0.005	<0.01	<0.01	<0.01	0.02
	7/27/95	<0.005	<0.01	<0.01	<0.01	<0.01
MW-6	4/19/95	--	--	0.41	--	--
	7/27/95	--	--	<0.01	--	--
MW-6A	4/19/95	--	--	0.39	--	--
	7/27/95	--	--	<0.01	--	--
MW-7	4/19/95	0.069	0.071	<0.01	0.08	0.04
	7/27/95	<0.005	<0.01	<0.01	0.08	0.11

Notes: Groundwater samples were filtered by the laboratory prior to analysis.
Analyzed by EPA method 6010.
<x.x = Metal not identified above the laboratory reporting limit of x.x.
Laboratory report is provided in Attachment B.
Sampling locations are shown on Figure 2.
-- = No analyses performed.
6A = Duplicate sample of MW-6.

TABLE 3

PETROLEUM AND ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER
Oakland Municipal Service Center

(mg/L)

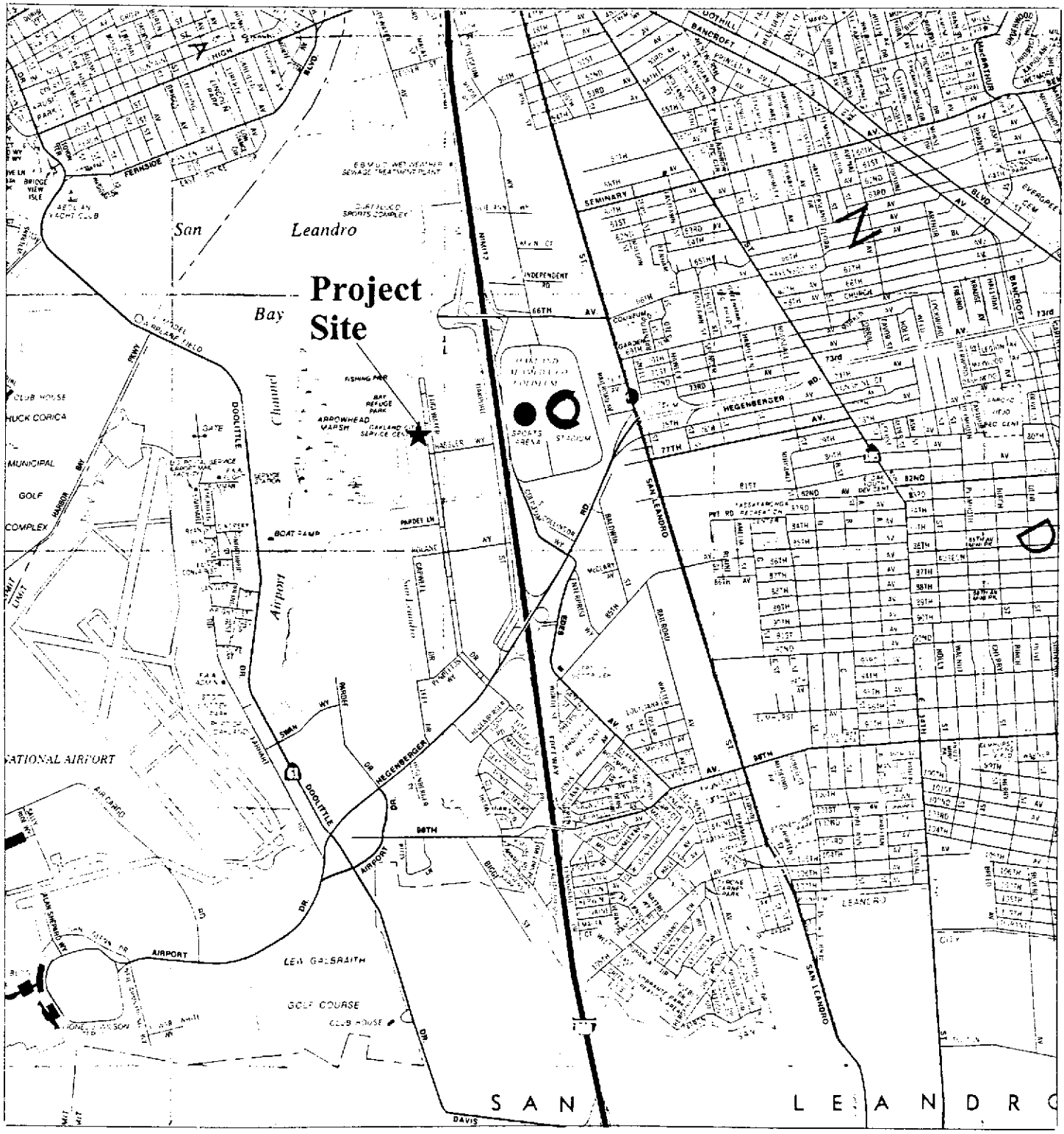
Sample	Date	TPH as Gasoline[1]	TPH as Diesel[2]	TRPH[3]	Benzene[4]	Toluene[4]	Ethyl-benzene[4]	Xylenes[4]
MW-1	4/19/95	3.2	--	--	0.88	0.015	0.023	0.021
	7/27/95	0.98	--	--	0.13	0.0036	0.0014	0.0056
MW-2	4/19/95	<0.05		--	0.0018	<0.0005	<0.0005	<0.0005
	7/27/95	<0.05	--	--	0.0023	<0.0005	<0.0005	<0.0005
MW-5	4/19/95	14	0.88[5]	4.7	0.49	0.051	0.61	1.2
	7/27/95	22	0.05[6]	5.0	1.3[7]	0.054[7]	1.5[7]	2.4[7]
MW-6	4/19/95	5.7	6.7[5]	--	0.04	<0.0008	0.0039	0.029
	7/27/95	6.1	3.9	--	0.43	0.015	0.2	0.6
MW-6A	4/19/95	3.0	3.7[5]	--	0.31	0.0031	0.0027	0.1
	7/27/95	6.3	2.6	--	0.42	0.015	0.2	0.6
MW-7	4/19/95	<0.05	<0.05	<1.0	<0.002	<0.002	<0.002	<0.002
	7/27/95	<0.05	<0.05	<1.0	<0.002[8]	<0.002[8]	<0.002[8]	<0.002[8]
MW-500	4/19/95	<0.05	--	--	<0.0005	<0.0005	<0.0005	<0.0005
	7/27/95	<0.05	--	--	<0.0005	<0.0005	<0.0005	<0.0005

Notes: TPH = Total Petroleum Hydrocarbons.
TRPH = Total Recoverable Petroleum Hydrocarbons.
-- = Compound not analyzed.
<x.x = Compound not identified above the laboratory reporting limit of x.x
Laboratory report is provided in Attachment B.
Sampling locations are shown on Figure 2.
500 = Trip blank sample.

1 Analyzed by EPA Method 5030/8015M.
2 Analyzed by EPA Method 3510/8015M.
3 Analyzed by EPA Method 418.1.
4 Analyzed by EPA Method 8020.
5 Laboratory report indicated sample chromatogram did not resemble chromatogram of any of the petroleum standards. Quantification listed in the table was based on the laboratory's diesel standard.
6 Unknown hydrocarbon in the diesel range was identified by the laboratory at a concentration of 0.59 mg/L.
7 This sample was also analyzed for volatile organic compounds using EPA Method 8240. Only BTEX was identified above the reporting limits.
8 This sample was analyzed for volatile organic compounds using EPA Method 8240. No compounds were identified above the laboratory reporting limits.

REGIONAL LOCATION

Figure 1



City of Oakland
Municipal Service Center
Oakland, California

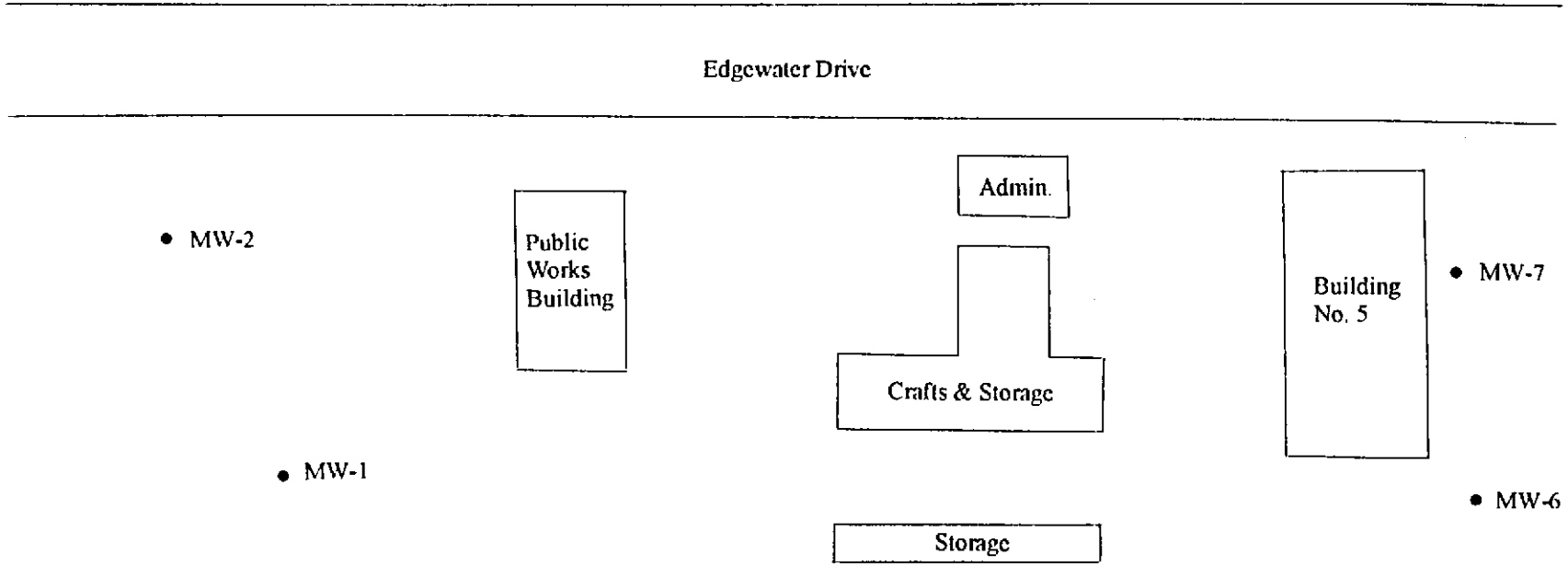
0 3000 Feet

BASELINE

93333-BO 6/2/95

SITE LAYOUT

Figure 2



Legend

MW-5 • Monitoring Well Locations

City of Oakland
Municipal Service Center
Oakland, California

0 200 Feet

Source: City of Oakland, MSC Parking Plan, 6/27/74; Bates & Bailey Survey Map, 7/14/95.

BASELINE

93333-BO 8/10/95

ATTACHMENT A

GROUNDWATER SAMPLING FORMS

GROUNDWATER SAMPLING

Project no.:	93333-BO	Well no.:	MW-1	Date:	7/27/95
Project name:	WWC-Oakland MSC	Depth of well from TOC (feet):	15.8		
Location:	7101 Edgewater	Well diameter (inch):	2		
	Oakland, CA	Screened interval from TOC (feet):	6-15.8		
Recorded by:	WKS	TOC elevation (feet):	6.83 (City of Oakland Datum)		
Weather:	Sunny, warm	Water level from TOC (feet):	4.62	Time:	8:30
Precip in past		Product level from TOC (feet):	None	Time:	8:30
5 days (inch):	0	Water level measurement:	Dual-interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(15.8 ft) - (4.62 ft)] × (0.083 ft)² × 3.14 × 7.48 =
Well depth Water level Well radius

1.8 gallons in one well volume
9.0 gallons in 5 well volumes
9.5 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:	8:35	24.0	7.01/10.01	10,000
Before Purging:	8:37	24.0	7.01/10.01	7,500
After Purging:	13:00	26.5	6.97/9.87	7,000

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
8:39	Start pumping				Very slightly turbid with silt
8:42	22.4	6.90	11,000	1.0	Petroleum odor
8:54	22.0	6.92	11,000	5.0	Clear/petroleum odor
9:05	22.0	7.14	11,000	7.5	Clear/petroleum odor
9:10	21.9	7.12	11,000	9.5	Clear/petroleum odor

Pumping rate:	0.30 gallons/minute	HNu reading in wellhead (ppm):	10
Water level after purging/after sampling (feet):	4.78/5.20	Time:	2:50 PM
Appearance of sample:	Slightly turbid	Time:	3:00 PM
Duplicate/blank number:	N/A	Time:	
Purge method:	Double diaphragm pump with new disposable hose		
Sampling equipment:	New disposable PVC bailer	VOC attachment:	Used for VOAs
Sample containers:	2 VOAs; 1 500-ml plastic bottle		
Sample analyses:	TPH as gasoline, BTEX, lead	Laboratory:	Chromalab
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	Drum MW-2

93333JUL.XLW (8/10/95)

GROUNDWATER SAMPLING

Project no.:	93333-BO	Well no.:	MW-2	Date:	7/27/95
Project name:	WWC-Oakland MSC	Depth of well from TOC (feet):	15.7		
Location:	7101 Edgewater	Well diameter (inch):	2		
	Oakland, CA	Screened interval from TOC (feet):	6-15.7		
Recorded by:	WKS	TOC elevation (feet):	7.27 (City of Oakland Datum)		
Weather:	Sunny, warm	Water level from TOC (feet):	6.22	Time:	9:30
Precip in past		Product level from TOC (feet):	None	Time:	9:30
5 days (inch):	0	Water level measurement:	Dual-interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(15.7 ft) - (6.22 ft)] × (0.083 ft)² × 3.14 × 7.48 =
Well depth Water level Well radius

1.5 gallons in one well volume
7.7 gallons in 5 well volumes
6.0 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:	8:35	24.0	7.01/10.01	10,000
Before Purging:	8:37	24.0	7.01/10.01	7,500
After Purging:	13:00	26.5	6.97/9.87	7,000

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
9:35	Start pumping				
9:39	21.4	6.13	19,000	1.0	Very slightly turbid/sulphur odor
9:44	21.2	6.30	21,000	4.5	Clear/sulphur odor
9:50	21.6	6.35	21,000	6.5	Clear/sulphur odor
9:55	21.3	6.37	20,000	8.0	Clear/sulphur odor

Pumping rate:	0.40 gallons/minute	HNu reading in wellhead (ppm):	20
Water level after purging/after sampling (feet):	6.22/6.31 rising	Time:	10:28 AM
Appearance of sample:	Slightly turbid	Time:	10:30 AM
Duplicate/blank number:	N/A	Time:	
Purge method:	Double diaphragm pump with new disposable hose		
Sampling equipment:	New disposable PVC bailer	VOC attachment:	Used for VOAs
Sample containers:	2 VOAs; 1 500-ml plastic bottle		
Sample analyses:	TPH as gasoline, BTEX, lead	Laboratory:	Chromalab
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	Drum MW-2

93333JUL.XLW (8/10/95)

GROUNDWATER SAMPLING

Project no.:	93333-BO	Well no.:	MW-5 Date: 7/27/95
Project name:	WWC-Oakland MSC	Depth of well from TOC (feet):	14.30 (measured)
Location:	7101 Edgewater	Well diameter (inch):	2
	Oakland, CA	Screened interval from TOC (feet):	4-14.30
Recorded by:	WKS	TOC elevation (feet):	8.15 (City of Oakland Datum)
Weather:	Sunny, warm	Water level from TOC (feet):	6.29 Time: 12:11
Precip in past		Product level from TOC (feet):	None Time: 12:11
5 days (inch):	0	Water level measurement:	Dual-interface probe

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(14.3 ft) - (6.29 ft)] × (0.083 ft)² × 3.14 × 7.48 =
Well depth Water level Well radius

1.3 gallons in one well volume
6.5 gallons in 5 well volumes
7.0 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:	8:35	24.0	7.01/10.01	10,000
Before Purging:	8:37	24.0	7.01/10.01	7,500
After Purging:	13:00	26.5	6.97/9.87	7,000

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
12:36	Start pumping				
12:42	24.3	6.55	9,000	2.5	Clear/strong petroleum odor
12:47	23.9	6.51	10,000	4.0	Clear/strong petroleum odor
12:50	23.5	6.45	9,000	5.0	Clear/strong petroleum odor
12:57	23.8	6.50	9,000	7.0	Clear/strong petroleum odor

Pumping rate:	0.33 gallons/minute	HNu reading in wellhead (ppm):	20
Water level after purging/after sampling (feet):	6.29/6.33 rising	Time:	13:25
Appearance of sample:	Clear	Time:	13:30
Duplicate/blank number:	N/A	Time:	
Purge method:	Double diaphragm pump with new disposable hose		
Sampling equipment:	New disposable PVC bailer	VOC attachment:	Used for VOAs
Sample containers:	4 VOAs; 3 1-liter amber glass bottles; 2 500-ml plastic bottles		
Sample analyses:	TPH-g & -d, TRPH, 8240, metals	Laboratory:	Chromalab
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	Drum MW-5

93333JUL.XLW (8/10/95)

GROUNDWATER SAMPLING

Project no.:	93333-BO	Well no.:	MW-6	Date:	7/27/95
Project name:	WWC-Oakland MSC	Depth of well from TOC (feet):	14.27		
Location:	7101 Edgewater	Well diameter (inch):	2		
	Oakland, CA	Screened interval from TOC (feet):	4-14.27		
Recorded by:	WKS	TOC elevation (feet):	7.93 (City of Oakland Datum)		
Weather:	Sunny, warm	Water level from TOC (feet):	7.09	Time:	11:30
Precip in past		Product level from TOC (feet):	None	Time:	11:30
5 days (inch):	0	Water level measurement:	Dual-interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(14.27 ft) - (7.09 ft)] × (0.083 ft)² × 3.14 × 7.48 =
Well depth Water level Well radius

1.2 gallons in one well volume
5.8 gallons in 5 well volumes
6 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:	8:35	24.0	7.01/10.01	10,000
Before Purging:	8:37	24.0	7.01/10.01	7,500
After Purging:	13:00	26.5	6.97/9.87	7,000

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
11:35	Start pumping				Sheen on purge water
11:38	23.2	7.34	5,500	1	Clear/slight petroleum odor
11:42	22.0	7.33	4,500	2.5	Clear/slight petroleum odor
11:52	21.6	7.33	4,000	5.0	Clear/slight petroleum odor
11:58	22.2	7.36	4,000	6.0	Clear/slight petroleum odor

Pumping rate:	0.26 gallons/minute	HNu reading in wellhead (ppm):	20
Water level after purging prior to sampling (feet):	7.09/7.42 rising	Time:	13:58
Appearance of sample:	Slightly turbid	Time:	14:00
Duplicate/blank number:	MW6-A	Time:	14:15
Purge method:	Double diaphragm pump with new disposable hose		
Sampling equipment:	New disposable PVC bailer	VOC attachment:	Used for VOAs
Sample containers:	2 VOAs; 1 2-liter amber glass bottle; 2 500-ml plastic bottles		
Sample analyses:	TPH as gas & diesel, BTEX, lead	Laboratory:	Chromalab
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	Drum MW5

93333JUL.XLW (8/10/95)

GROUNDWATER SAMPLING

Project no.:	93333-BO	Well no.:	MW-7	Date:	7/27/95
Project name:	WWC-Oakland MSC	Depth of well from TOC (feet):	14.3 (measured)		
Location:	7101 Edgewater	Well diameter (inch):	2		
	Oakland, CA	Screened interval from TOC (feet):	4-14.3		
Recorded by:	WKS	TOC elevation (feet):	8.48 (City of Oakland Datum)		
Weather:	Sunny, warm	Water level from TOC (feet):	6.87	Time:	11:50
Precip in past		Product level from TOC (feet):	None	Time:	11:50
5 days (inch):	0	Water level measurement:	Dual-interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(14.3 ft) - (6.87 ft)] × (0.083 ft)² × 3.14 × 7.48 =

Well depth Water level Well radius

1.2 gallons in one well volume

6.0 gallons in 5 well volumes

7.0 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:	8:35	24.0	7.01/10.01	10,000
Before Purging:	8:37	24.0	7.01/10.01	7,500
After Purging:	13:00	26.5	6.97/9.87	7,000

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
12:04	Start pumping				
12:07	23.9	6.07	6,000	1	Clear
12:13	23.9	6.01	11,000	3	Clear
12:23	23.6	5.93	13,000	5	Clear
12:33	23.2	5.90	13,000	7	Clear

Pumping rate:	0.20 gallons/minute	HNu reading in wellhead (ppm):	5
Water level after purging prior to sampling (feet):	6.87/7.12	Time:	14:30
Appearance of sample:	Clear	Time:	2:30 PM
Duplicate/blank number:	N/A	Time:	
Purge method:	Double diaphragm pump with new disposable hose		
Sampling equipment:	New disposable PVC bailer	VOC attachment:	Used for VOAs
Sample containers:	2 VOAs; 3 1-liter amber glass bottles; 2 500-ml plastic bottle		
Sample analyses:	TPH-g & -d, TRPH, 8240, metals	Laboratory:	Chromalab
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	Drum MW-5

93333JUL.XLW (8/10/95)

ATTACHMENT B

LABORATORY REPORTS

CHROMALAB, INC.

Environmental Services (SDB)

August 1, 1995 *Submission #:* 9507331

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: WWC OAKLAND MSC *Project#:* 93333-0
Received: July 27, 1995

re: 2 samples for Total Recoverable Petroleum Hydrocarbons analysis.
Method: EPA 418.1

Sampled: July 27, 1995 *Matrix:* WATER *Extracted:* July 31, 1995
Run: 7855-C *Analyzed:* July 31, 1995

Spl #	Sample ID	TRPH (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE RESULT (%)
97233	MW-7	N.D.	1.0	N.D.	106
97236	MW-5	5.0	1.0	N.D.	106

Carolyn House
Extractions Supervisor

Ali Kharrazi
Organic Manager

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

August 2, 1995 *Submission #:* 9507331

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: WWC OAKLAND MSC *Project#:* 93333-0
Received: July 27, 1995

re: 4 samples for Lead analysis.
Method: EPA 3010A M/6010

Sampled: July 27, 1995 *Matrix:* WATER *Extracted:* August 1, 1995
Run: 7860-D *Analyzed:* August 1, 1995

Spl #	Sample ID	LEAD (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE RESULT (%)
97230	MW-1	N.D.	0.01	N.D.	101
97231	MW-2	0.07	0.01	N.D.	101
97232	MW-6	N.D.	0.01	N.D.	101
97234	MW-6A	N.D.	0.01	N.D.	101

Doina Danet
Chemist

John S. Labash
Inorganic Supervisor

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CHROMALAB, INC.

Environmental Services (SDB)

August 2, 1995 *Submission #:* 9507331

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: WWC OAKLAND MSC *Project#:* 93333-0
Received: July 27, 1995

re: 2 samples for Cadmium, Chromium, Lead, Nickel, and Zinc analysis.
Method: EPA 3010A M/6010

Sampled: July 27, 1995 *Matrix:* WATER *Extracted:* August 1, 1995
Run: 7860-D *Analyzed:* August 1, 1995

Spl #	Sample ID	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Nickel (mg/L)	Zinc (mg/L)
97233	MW-7	N.D.	N.D.	N.D.	0.08	0.11
97236	MW-5	N.D.	N.D.	N.D.	N.D.	N.D.
Reporting Limits		0.005	0.01	0.01	0.01	0.01
Blank Result		N.D.	N.D.	N.D.	N.D.	N.D.
Blank Spike Result (%)		97	100	101	99	100

Doina Danet
Chemist

John S. Labash
Inorganic Supervisor

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CHROMALAB, INC.

Environmental Services (SDB)

August 3, 1995 *Submission #:* 9507331

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: WWC OAKLAND MSC *Project#:* 93333-0
Received: July 27, 1995

re: 4 samples for Diesel analysis.
Method: EPA 3510/8015M

Sampled: July 27, 1995 *Matrix:* WATER *Extracted:* July 28, 1995
Run: 7836-D *Analyzed:* July 29, 1995

Spl #	Sample ID	DIESEL (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE RESULT (%)
97232	MW-6	3900	50	N.D.	60
97233	MW-7	N.D.	50	N.D.	60
97234	MW-6A	2600	50	N.D.	60
97236	MW-5	N.D.	50	N.D.	60

For above sample: Unknown hydrocarbons in the Diesel range, conc.= 590ug/L.

Alex Tam
Chemist

Ali Kharrazi
Organic Manager

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CHROMALAB, INC.

Environmental Services (SDB)

August 3, 1995 *Submission #:* 9507331

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: WWC OAKLAND MSC *Project#:* 93333-0
Received: July 27, 1995

re: 5 samples for Gasoline and BTEX analysis.
Method: EPA 5030/8015M/602/8020

Sampled: July 27, 1995 *Matrix:* WATER
Run: 7832-2 *Analyzed:* July 31, 1995

Spl #	Sample ID	Gasoline (mg/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
97230	MW-1	0.98	130	3.6	1.4	5.6
97231	MW-2	N.D.	2.3	N.D.	N.D.	N.D.
97232	MW-6	6.1	430	15	200	600
	For above sample:	*GAS DET.LIMIT=0.25mg/L,BTEX DET.LIMIT=2.5ug/L*				
97234	MW-6A	6.3	420	15	200	600
	For above sample:	*GAS DET.LIMIT=0.25mg/L,BTEX DET.LIMIT=2.5ug/L*				
97235	MW-500	N.D.	N.D.	N.D.	N.D.	N.D.
Reporting Limits		0.05	0.5	0.5	0.5	0.5
Blank Result		N.D.	N.D.	N.D.	N.D.	N.D.
Blank Spike Result (%)		101	96	91	101	93

Jack Kelly
Chemist

Ali Kharrazi
Organic Manager

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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

August 3, 1995 *Submission #:* 9507331

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: WWC OAKLAND MSC *Project#:* 93333-0
Received: July 27, 1995

re: 2 samples for Gasoline analysis.
Method: EPA 5030/8015M

Sampled: July 27, 1995 *Matrix:* WATER
Run: 7851-1 *Analyzed:* August 1, 1995

Spl #	Sample ID	GASOLINE (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE RESULT (%)
97233	MW-7	N.D.	0.05	N.D.	88
97236	MW-5	22	0.05	N.D.	88

Jack Kelly
Chemist

Ali Kharrazi
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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

August 3, 1995 *Submission #:* 9507331

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott
Project: WWC OAKLAND MSC *Project#:* 93333-0
Received: July 27, 1995
re: One sample for Volatile Organic Compounds analysis.
Method: EPA 8240/8260
SampleID: **MW-7**
Sample #: 97233 *Matrix:* WATER
Sampled: July 27, 1995 *Run:* 7900-A *Analyzed:* August 2, 1995

Analyte	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE RESULT (%)
ACETONE	N.D.	4.0	N.D.	--
BENZENE	N.D.	2.0	N.D.	125
BROMODICHLOROMETHANE	N.D.	2.0	N.D.	--
BROMOFORM	N.D.	2.0	N.D.	--
BROMOMETHANE	N.D.	2.0	N.D.	--
METHYL ETHYL KETONE	N.D.	2.0	N.D.	--
CARBON TETRACHLORIDE	N.D.	2.0	N.D.	--
CHLOROBENZENE	N.D.	2.0	N.D.	110
CHLOROETHANE	N.D.	2.0	N.D.	--
2-CHLOROETHYLVINYL ETHER	N.D.	2.0	N.D.	--
CHLOROFORM	N.D.	2.0	N.D.	--
CHLOROMETHANE	N.D.	2.0	N.D.	--
DIBROMOCHLOROMETHANE	N.D.	2.0	N.D.	--
1,1-DICHLOROETHANE	N.D.	2.0	N.D.	--
1,2-DICHLOROETHANE	N.D.	2.0	N.D.	--
1,1-DICHLOROETHENE	N.D.	2.0	N.D.	104
CIS-1,2-DICHLOROETHENE	N.D.	2.0	N.D.	--
TRANS-1,2-DICHLOROETHENE	N.D.	2.0	N.D.	--
1,2-DICHLOROPROPANE	N.D.	2.0	N.D.	--
CIS-1,3-DICHLOROPROPENE	N.D.	2.0	N.D.	--
TRANS-1,3-DICHLOROPROPENE	N.D.	2.0	N.D.	--
ETHYLBENZENE	N.D.	2.0	N.D.	--
2-HEXANONE	N.D.	2.0	N.D.	--
METHYLENE CHLORIDE	N.D.	2.0	N.D.	--
METHYL ISOBUTYL KETONE	N.D.	2.0	N.D.	--
STYRENE	N.D.	2.0	N.D.	--
1,1,2,2-TETRACHLOROETHANE	N.D.	2.0	N.D.	--
TETRACHLOROETHENE	N.D.	2.0	N.D.	--
TOLUENE	N.D.	2.0	N.D.	101
1,1,1-TRICHLOROETHANE	N.D.	2.0	N.D.	--
1,1,2-TRICHLOROETHANE	N.D.	2.0	N.D.	--
TRICHLOROETHENE	N.D.	2.0	N.D.	106
TRICHLOROFLUOROMETHANE	N.D.	2.0	N.D.	--
VINYL ACETATE	N.D.	2.0	N.D.	--
VINYL CHLORIDE	N.D.	2.0	N.D.	--
TOTAL XYLENES	N.D.	2.0	N.D.	--

Aaron McMichael
Chemist

Ali Kharrazi
Organic Manager

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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

August 3, 1995 *Submission #:* 9507331

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott
Project: WWC OAKLAND MSC *Project#:* 93333-0
Received: July 27, 1995
re: One sample for Volatile Organic Compounds analysis.
Method: EPA 8240/8260
SampleID: **MW-5**
Sample #: 97236 *Matrix:* WATER
Sampled: July 27, 1995 *Run:* 7900-A *Analyzed:* August 2, 1995

Analyte	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE RESULT (%)
ACETONE	N.D.	4.0	N.D.	--
BENZENE	1300	40	N.D.	125
BROMODICHLOROMETHANE	N.D.	2.0	N.D.	--
BROMOFORM	N.D.	2.0	N.D.	--
BROMOMETHANE	N.D.	2.0	N.D.	--
METHYL ETHYL KETONE	N.D.	2.0	N.D.	--
CARBON TETRACHLORIDE	N.D.	2.0	N.D.	--
CHLOROBENZENE	N.D.	2.0	N.D.	110
CHLOROETHANE	N.D.	2.0	N.D.	--
2-CHLOROETHYLVINYL ETHER	N.D.	2.0	N.D.	--
CHLOROFORM	N.D.	2.0	N.D.	--
CHLOROMETHANE	N.D.	2.0	N.D.	--
DIBROMOCHLOROMETHANE	N.D.	2.0	N.D.	--
1,1-DICHLOROETHANE	N.D.	2.0	N.D.	--
1,2-DICHLOROETHANE	N.D.	2.0	N.D.	--
1,1-DICHLOROETHENE	N.D.	2.0	N.D.	104
CIS-1,2-DICHLOROETHENE	N.D.	2.0	N.D.	--
TRANS-1,2-DICHLOROETHENE	N.D.	2.0	N.D.	--
1,2-DICHLOROPROPANE	N.D.	2.0	N.D.	--
CIS-1,3-DICHLOROPROPENE	N.D.	2.0	N.D.	--
TRANS-1,3-DICHLOROPROPENE	N.D.	2.0	N.D.	--
ETHYLBENZENE	1500	40	N.D.	--
2-HEXANONE	N.D.	2.0	N.D.	--
METHYLENE CHLORIDE	N.D.	2.0	N.D.	--
METHYL ISOBUTYL KETONE	N.D.	2.0	N.D.	--
STYRENE	N.D.	2.0	N.D.	--
1,1,2,2-TETRACHLOROETHANE	N.D.	2.0	N.D.	--
TETRACHLOROETHENE	N.D.	2.0	N.D.	--
TOLUENE	54	2.0	N.D.	101
1,1,1-TRICHLOROETHANE	N.D.	2.0	N.D.	--
1,1,2-TRICHLOROETHANE	N.D.	2.0	N.D.	--
TRICHLOROETHENE	N.D.	2.0	N.D.	106
TRICHLOROFLUOROMETHANE	N.D.	2.0	N.D.	--
VINYL ACETATE	N.D.	2.0	N.D.	--
VINYL CHLORIDE	N.D.	2.0	N.D.	--
TOTAL XYLENES	2400	40	N.D.	--

Aaron McMichael
Chemist

Ali Kharrazi
Organic Manager

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.
SAMPLE RECEIPT CHECKLIST

Client Name BASELINE

Project 93333-B0

Reference/Subm # 2311/9507331

Checklist completed by: [signature] 7/28/95 (Signature / Date)

Date/Time Received 7/27/95 (Date) 1702 (Time)

Received by PSalis

Carrier name

Logged in by KM 7/27/95 (Initials / Date)

Matrix H2O

Shipping container in good condition?		NA___	Yes___ No___
Custody seals present on shipping container?	Intact___ Broken___		Yes___ No___
Custody seals on sample bottles?	Intact___ Broken___		Yes___ No___
Chain of custody present?			Yes✓ No___
Chain of custody signed when relinquished and received?			Yes✓ No___
Chain of custody agrees with sample labels?			Yes✓ No___
Samples in proper container/bottle?			Yes✓ No___
Samples intact?			Yes✓ No___
Sufficient sample volume for indicated test?			Yes✓ No___
VOA vials have zero headspace?		NA___	Yes✓ No___
Trip Blank received?		NA___	Yes✓ No___
All samples received within holding time?			Yes✓ No___

Container temperature?_____

pH upon receipt _____ pH adjusted_____ Check performed by:_____ NA___

Any NO response must be detailed in the comments section below. If items are not applicable, they should be marked NA.

Client contacted?_____ Date contacted?_____

Person contacted?_____ Contacted by?_____

Regarding?_____

Comments:_____

Corrective Action:_____

SMPLRECD.CK

331/97230 - 236

SUBM #: 9507331 REP: PM
CLIENT: BASELINE
DUE: 08/03/95
REF #:23111

23111

BASELINE
5900 Hollis Street, Suite D
Emeryville, CA 94608
(510) 420-8686

Turn-around Time: Standard
Lab: Chromo lab
BASELINE Contact Person: Bill Scott

Project No.: 93333-80

Project Name and Location: WWC Oakland MSC 7101 EDGEWATER DRIVE

Samplers: (Signature) William K Scott

Sample ID No. Station	Date	Time	Media	Depth	No. of Containers	TPH as gasoline 8015 / TEH	TPH as Gasoline 8015 (TPH with BTX&E) 8020	TPH as Diesel 8015 / Oil & Grease	TRPH 418.1 / ~~Motor Oil~~	~~PNAs~~	Filtered by lab 6010 ~~Title 22 Metals~~ Dissolved Cd, Cr, Ni, Zn	~~Total~~ Lead EPA 7421	Volatile organic compounds 8240					Remarks/ Composite	Detection Limits
MW-1	7-27-95	15:00	Water		3		X					X							
MW-2	↓	10:30	↓		3		X					X							
MW-6	↓	14:00	↓		5		X	X				X							
MW-7	↓	14:30	↓		9	X		X	X		X	X	X						
MW-6A	↓	14:15	↓		5		X	X				X							
MW-500	↓	8:00	↓		2		X												
MW-5		13:30			9	X		X	X		X	X	X						

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time	Conditions of Samples Upon Arrival at Laboratory:
William K Scott	7-27-95/15:41	Melinda Bury	7-27-95/15:41	
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time	Remarks:
Melinda Bury	7-27-95/17:02	[illegible]	7/27/95 17:02	
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time	

APPENDIX C
CITY OF OAKLAND MEMORANDUM

C I T Y O F O A K L A N D

Memorandum

TO: OPW Environmental Affairs Division
ATTN: Andrew Clark-Clough
FROM: OGS Municipal Buildings Division
DATE: July 27-1995

RE: STATUS OF UNDERGROUND TANKS AT MUNICIPAL SERVICE CENTER

THE PURPOSE OF THIS LETTER IS TO UPDATE YOU ON THE CURRENT STATUS AND THE FUTURE PLANS OF THESE UNDERGROUND STORAGE TANKS AT MSC.

Attached is the list of underground storage tanks at the Municipal service center. The status of these tanks are based on information from our records and a site investigation I performed for confirmation of the current status.

Based on the site investigation, and lack of records, the exact location cannot be determined for some of the tanks. I did group the tanks into five categories.

1. **Fuel tanks that might have been abandoned**

2. **Fuel tanks that might have been removed and have no records.**

3. **Fuel tanks that have records and are in compliance.**

4. **Waste oil tanks that might have been abandoned**

5. **Waste latex tank that does not exist, or may have been removed, and does not have records.**

Office of General Services, Municipal Buildings Division has completed the bid process for an underground storage tank term contractor. The final stage of the contract is in progress, and once its completed we do have an option to conduct further investigation to determine the content and exact location of these tanks. A comprehensive plan may also be required for further site investigation and remedial process.

If you have any questions please feel free to call me at 615-5514.

Okey Ozoh.
Okey Ozoh
Architectural Assistance

UNDERGROUND STORAGE TANKS SUMMERY
MUNICIPAL SERVICE CENTER
7101 EDGEWATER DRIVE OAKLAND

TANK ID	APPROXIMATE YEAR INSTALLED	TANK SIZE GALLONS	CONTENTS	CURRENT OPERATING STATUS	OWNER
UNDERGROUND FUELING SYSTEM - MAY HAVE BEEN ABANDONED					
1.....	1970	5,000	Diesel	Not used	Unknown
2.....	1970	5,000	Leaded	Not used	Unknown
3.....	1970	5,000	Unleaded	Not used	Unknown
UNDERGROUND FUELING SYSTEM - MAY HAVE BEEN REMOVED AND NO RECORDS					
4.....	Unknown	8,000	Unknown	Removed	Unknown
5.....	Unknown	Unknown	Unknown	Not used	Unknown
6.....	1979	12,000	Unleaded	Not used	City Oakland
UNDERGROUND FUELING SYSTEM - HAVE RECORDS AND ARE IN COMPLIANCE					
7.....	1985	12,000	Leaded	Operating	City Oakland
8.....	1985	20,000	Unleaded	Operating	City Oakland
9.....	1985	20,000	Diesel	Operating	City Oakland
UNDERGROUND FUELING SYSTEM					
10.....	1960	1,000	Lube oil	Not used	Unknown
11.....	1960	500	Waste oil	Not used	Unknown
12.....	1960	1,000	Lube oil	Not used	Unknown
13.....	1960	500	Waste oil	Not used	Unknown
UNDERGROUND FUELING SYSTEM - MAY HAVE BEEN REMOVED AND NO RECORD					
14.....	1973	500	Waste, latex joint sealer	Not used	Unknown

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To AL RIDLEY	From ANDREW
Co. Woodward-Clyde	Co. OAKLAND
Dept. 874-3125	Phone # 238-7286
Fax # 874-3268	Fax # 238-6361