

A Report Prepared For
City of Oakland
OPW Environmental Affairs
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Oakland, California 94612

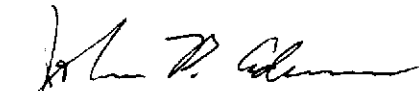
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LIMITED PHASE I ENVIRONMENTAL ASSESSMENT
AND GROUNDWATER MONITORING
670 AND 692 98th AVENUE
OAKLAND, CALIFORNIA

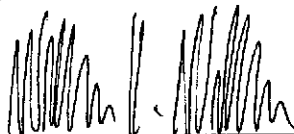
AGI Project No. 15,687.009.04

Aug 1993

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August 11, 1993

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EXECUTIVE SUMMARY

This report presents results of Applied Geotechnology Inc.'s (AGI) Limited Phase I Environmental Assessment (EA) and groundwater monitoring at 670 and 692 98th Avenue in Oakland, California.

SITE DESCRIPTION

The properties exist in a mixed residential, commercial, and industrial area. The relatively level properties are located at the southeast corner of the intersection of 98th and Edes Avenues. The property at 670 98th Avenue is mostly unpaved, fenced, and unoccupied. The property at 692 98th Avenue is paved, fenced, and currently used to store rental equipment.

The depth to groundwater measured during our monitoring was between 8 and 10 feet bgs. The groundwater gradient direction was to the northwest.

SITE HISTORY

Our historical research covered the period from 1925 to the present. The properties were occupied by residences from 1925 through 1933. The residences were removed between 1933 and 1947, and by 1953, fuel stations were constructed on each property. The station at 692 98th Avenue was removed between 1968 and 1973. Between 1977 and 1985, the station at 670 98th Avenue was removed. Since 1985, 670 98th Avenue has remained unoccupied. The property at 692 98th Avenue is currently occupied by U. S. Rentals, an equipment rental company.

Subsurface Consultants, Inc. (SCI) of Oakland, California performed an assessment during 1989 and 1990. The SCI report, dated April 10, 1990, identified petroleum hydrocarbons in soil and groundwater at the properties. Non-halogenated volatile organic compounds (VOCs) were also identified in soil. Solvents were also detected in groundwater. Potential sources for the solvents and non-halogenated VOCs were not previously identified.

CONCLUSIONS

Several potential on- and off-site (within 2,000 feet) sources of solvent contamination in the groundwater at the subject properties were identified during our research. Of the 39 potential sources, we judge that 9 sites have low to moderate potential for being solvent sources, 20 sites have low potential, and 10 sites have very low potential.

Sites with low to moderate potential for being the source of solvents in the groundwater at the subject properties include:

- | | |
|--------------------------------------|----------------------------------|
| ▶ Former fuel station | 670 98th Avenue |
| ▶ Former fuel station | 692 98th Avenue |
| ▶ Action Plating | 10132 Edes Avenue |
| ▶ K&L Plating and Manufacturing | 10306 Pearmain Street |
| ▶ Mortensens | 10122 Pippin Street |
| ▶ Melrose Metal Finishing | 10222 Pearmain Street |
| ▶ Allen ABDOS Company | 718 Douglas Avenue |
| ▶ B&M Foundry | Pearmain Street and 100th Avenue |
| ▶ General Metals Corporation Foundry | Edes and 105th Avenues |

The groundwater gradient direction has been consistently to the northwest. Solvents have been detected by others in all of the monitoring wells at the site. During our groundwater monitoring event we detected solvents in one well and petroleum hydrocarbons in two wells.

1.0 BACKGROUND INFORMATION

1.1 GENERAL

This report presents results of Applied Geotechnology Inc.'s (AGI) Limited Phase I Environmental Assessment (EA) and Groundwater Monitoring at two adjacent properties located at 670 and 692 98th Avenue in Oakland, California. The subject properties are located at the southeast corner of the intersection of 98th and Edes Avenues, as shown on Figure 1, Vicinity Map and Figure 2, Site Plan. For the purposes of discussion in this report, we will assume that Edes Avenue borders the west side of 670 98th Avenue, and 98th Avenue borders the north side of 670 and 692 98th Avenue.

AGI was retained by the City of Oakland to perform this Limited Phase I EA and three consecutive months of groundwater monitoring. Our work was performed in accordance with our Environmental Services Agreement dated December 15, 1992, and our proposal dated April 5, 1993. The City of Oakland Contract Assignment number is C50-1.

An environmental assessment of the subject properties was performed during 1989 and 1990 by Subsurface Consultants, Inc. (SCI) of Oakland, California. Actions performed by SCI included advancement of 21 borings, installation of 6 groundwater monitoring wells, removal of contaminated soil at 670 98th Avenue, sample collection and analysis, and installation of a groundwater recovery trench at the north side of 98th Avenue. Results of the SCI assessment report, dated April 10, 1990, indicated the presence of soil and groundwater petroleum hydrocarbon contamination. Free product was also reported in at least two groundwater monitoring wells. Approximately 1,900 cubic yards of contaminated soil were excavated from around the former UST locations. About 200 cubic yards of reportedly contaminated soil is currently stockpiled at 670 98th Avenue. It is unknown whether contamination remains in the stockpiled soil.

In 1989 and 1990, solvents were reported in samples collected from the groundwater monitoring wells. Contaminant concentrations detected in the samples included 7.1 micrograms per liter (ug/l) of vinyl chloride, 4.9 ug/l of 1,1-dichloroethane (1,1-DCA), 7.9 to 15.3 ug/l of dichloromethane, 1.4 to 67.4 ug/l of tetrachloroethene (PCE), 1.3 to 17.1 ug/l of 1,1,1-trichloroethane (1,1,1-TCA), and 1.0 to 25.1 ug/l of trichloroethene (TCE). Potential sources for solvents in the groundwater were not identified.

Results of analysis for non-halogenated volatile organic compounds (VOCs) reportedly revealed the presence of ethanol and methyl ethyl ketone (MEK) in soil samples collected from various depths at several boring locations. Concentrations in the soil samples ranged up to 54.4 milligrams per kilogram (mg/kg) for ethanol, and 12.90 for MEK. Methyl isobutyl ketone was also detected at 40.71 mg/kg in one soil sample collected from a boring north of the subject properties. Non-halogenated VOCs were not detected in samples collected from the groundwater wells.

1.2 PURPOSE AND SCOPE

The purpose of our Limited Phase I EA was to review past and present uses at the subject property and adjacent sites as a basis for identifying potential sources of solvents present in groundwater at the site. Our scope of services for the EA consisted of:

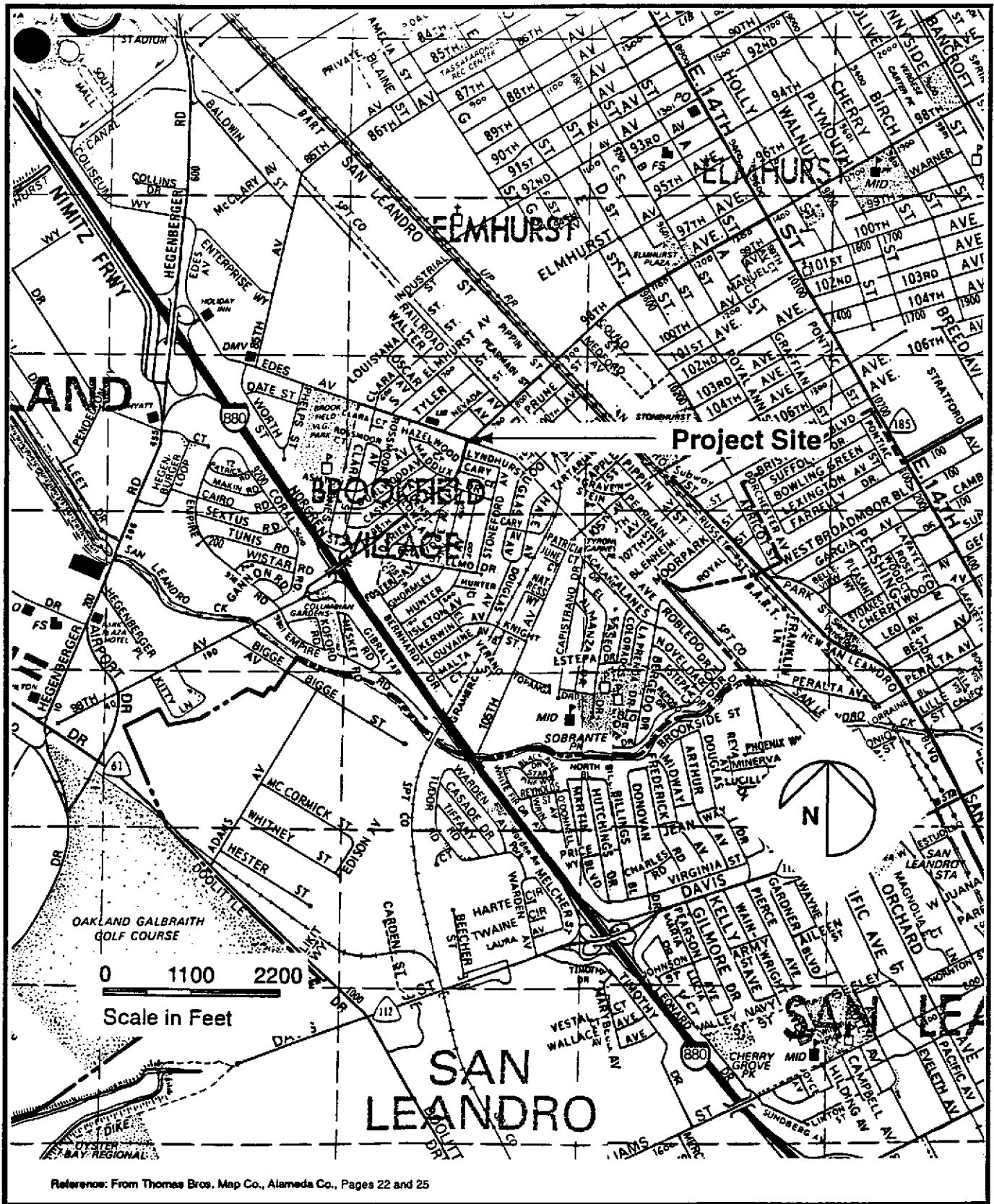
- ▶ Analyzing site and surrounding area history, ownership and geology. This consisted of:
 - Interpreting historical aerial photographs of the subject properties and surrounding areas (within 2,000 feet).
 - Reviewing readily available published information, including geologic literature, topographic and groundwater maps, and Sanborn Fire Insurance Maps.

- ▶ Examining federal, state and local databases to identify potential hazardous waste generators and/or sites near the subject properties.
- ▶ Performing visual reconnaissances of the subject property and surrounding area to evaluate present conditions and identify potential sources of soil, surface water, or groundwater contamination on or near the subject properties.

The purpose of our groundwater monitoring was to determine the level of groundwater contamination and calculate the hydraulic gradient at the site. Our scope of services for monitoring consisted of:

- ▶ Performing a level survey of the casing top of each accessible groundwater monitoring well.
- ▶ Monitoring groundwater elevations and hydraulic gradient on a monthly basis for a period of three months.
- ▶ Collecting groundwater samples from the monitoring wells once during the three month period.
- ▶ Purging, storing, and disposing of free product present in the groundwater monitoring wells on a monthly basis during the three month period.
- ▶ Analyzing groundwater samples for total petroleum hydrocarbons as gasoline (TPH-G) and diesel (TPH-D); benzene, ethylbenzene, toluene, and total xylenes (BETX); and halogenated volatile compounds.

Our scope of services did not include subsurface exploration or identifying potential contaminant sources beyond 2,000 feet from the site. Our scope did not include providing geotechnical engineering recommendations, or providing cost estimates for remediation of identified potential contaminants.

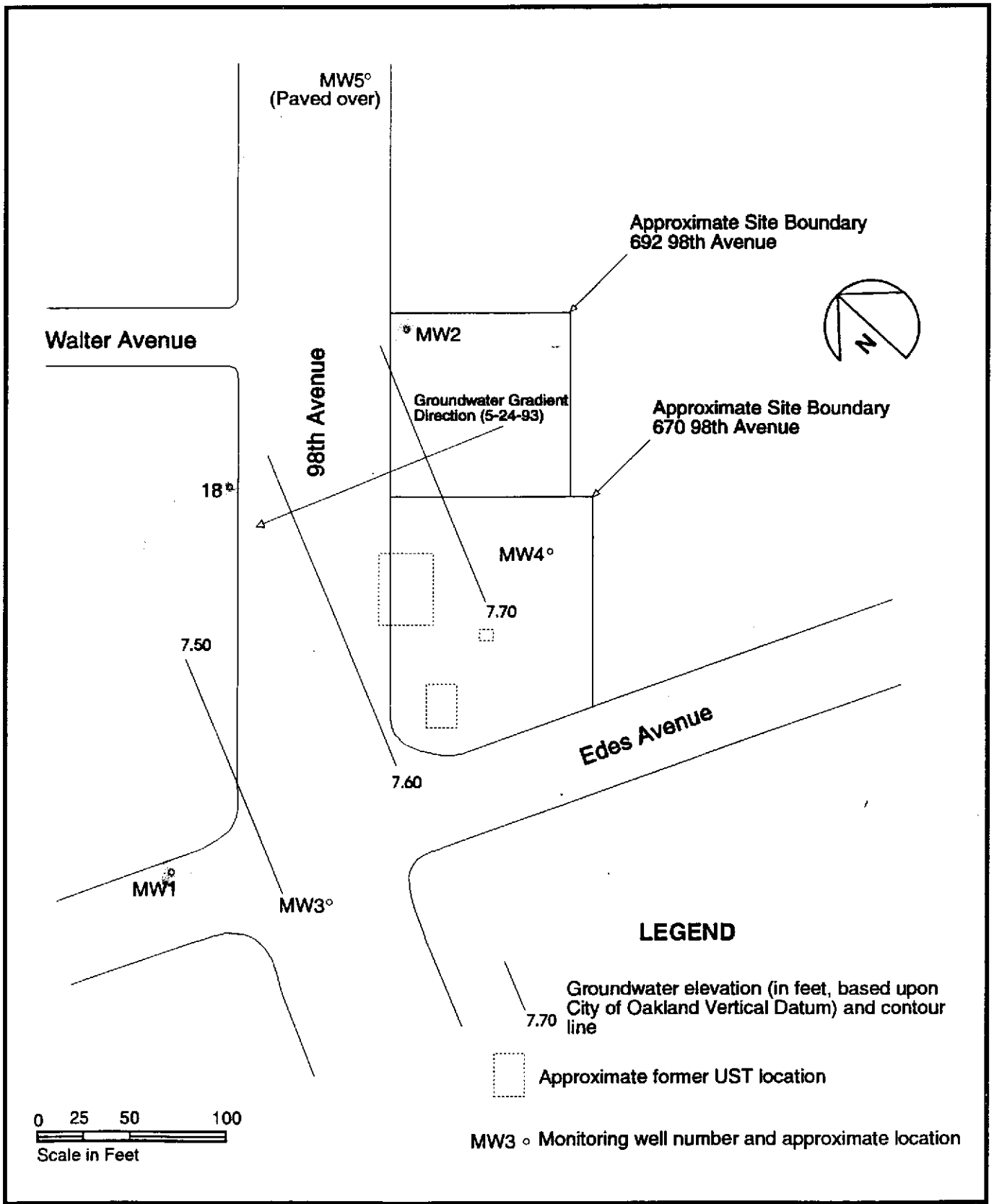


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Vicinity Map
 City of Oakland/670 and 692 98th Avenue
 Oakland, California

FIGURE
1

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15,687.009.04	JBA		9 Jul 93		



FIGURE



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Site Plan
 City of Oakland/670 and 692 98th Avenue
 Oakland, California

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1.3 DATA SOURCES

1.3.1 Databases

We reviewed the following federal, state, and local databases to identify sites that may be contaminant sources within a 2,000 foot radius of the subject property:

National Priorities List (NPL). The U.S. Environmental Protection Agency (EPA) NPL tabulates uncontrolled or abandoned hazardous waste sites identified for priority remedial actions under the Superfund program.

Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS). EPA's CERCLIS list is a comprehensive database and management system that inventories and tracks releases being addressed or potentially needing to be addressed by the Superfund program.

Resource Conservation and Recovery Act (RCRA) Notifiers List. The RCRA Notifiers List includes companies or individuals who use, generate, or transport RCRA classified hazardous substances or wastes. It is divided into categories of Treatment, Storage and Disposal (TSD) facilities, large quantity generators (more than 1,000 kilograms per month), and small quantity generators. It is not a list of contaminated sites or documented hazardous materials releases.

Facility Index System (FINDS). The FINDS list is a compilation of any property or site EPA has investigated, reviewed, or been made aware of in connection with its various regulatory programs. Each record indicates which EPA program office may have files on the specified site or facility.

Toxic Release Inventory (TRI) List. EPA's TRI list includes all facilities which manufacture, process, or import toxic chemicals in quantities in excess of 25,000 pounds per year. It also contains information regarding the estimated release of toxic materials into the environment. The list includes data concerning chemical storage volumes and release volume estimates.

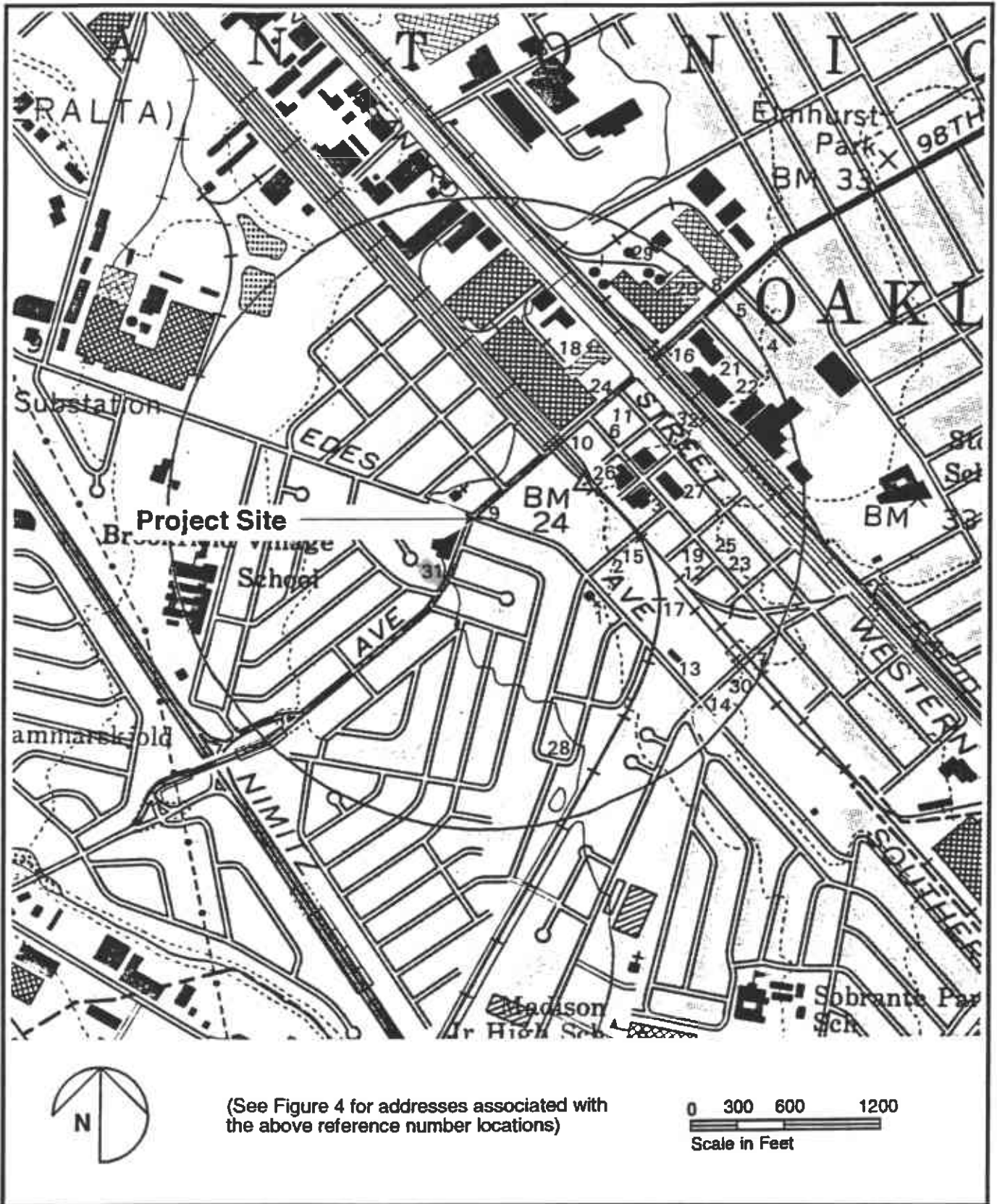
Emergency Response Notification System (ERNS) List. This EPA Region 10 database contains emergency response information for releases occurring after 1975. The list includes the responsible party, location, material released, and estimated quantity.

California State Water Resources Control Board Underground Storage Tank (UST) List. This list inventories registered USTs, including owner, address, and number of registered tanks.

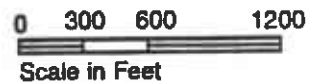
San Francisco Bay Regional Water Quality Control Board (RWQCB) Leaking Underground Storage Tank (LUST) List. This list inventories reported leaking USTs, including location, tank status, and cleanup status.

RWQCB North Bay Toxics (NBT) List. This list includes names and locations of contaminated sites and includes a tabulation of affected media (soil, water, air), contaminants, and waste management practices. The list excludes fuel, RCRA, and landfill sites regulated by the RWQCB.

Results of the database search are discussed in Section 3.3.3. Sites identified which are located within the search radius are shown on Figures 3 and 4.



(See Figure 4 for addresses associated with the above reference number locations)



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Approximate Location Map
City of Oakland/670 and 692 98th Avenue
Oakland, California

FIGURE

3

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Ref. No.	Facility Name	Street Address	List/Map Source
1	Action Plating	10132 Edes Avenue	RCRA, FINDS, CERCLIS
2	Allen ABDOS Company	718 Douglas Avenue	FINDS, LUST
3	B&M Foundry	Pearmain & 100th	Sanborn Map
3	National Egg Case Company	Pearmain & 100th	Sanborn Map
4	Bal's Tree Service	9911 Gould Street	UST
5	Beretta Property	9838 Gould Street	UST, NBT, LUST
6	Call Ben Company	9828 Pearmain Street	FINDS
7	Chemicals & Supplies Company	751 105th Avenue	FINDS, DTSC
7	Holchem Inc.	751 105th Avenue	FINDS
8	CHK Manufacturing	960 98th Avenue	FINDS
9	City of Oakland	98th & Edes	LUST*
10	City of Oakland	816 98th Avenue	LUST
11	City of Oakland	9801 San Leandro Blvd	LUST
11	Thrifty Oil Station No. 61	9801 San Leandro Blvd	UST
12	Cornnuts, Inc.	10229 Pearmain Street	FINDS
13	Custom Coating Company	10441 Edes Avenue	DTSC
13	Southwestern Petroleum Corp.	10441 Edes Avenue	FINDS
14	Edes Industrial Park	701 105th Avenue	RCRA, FINDS
15	Edmund C. Olson	740 Douglas Avenue	UST
16	Fleischmann's Yeast, Inc.	921 98th Avenue	RCRA, FINDS, LUST
16	Nabisco Brands, Inc.	921 98th Avenue	RCRA, FINDS
17	General Metals Corp. Foundry	105th & Edes	Sanborn Map
18	Gerber Products Company	800 98th Avenue	Sanborn Map
19	Golden Gate Die Casting	10201 Pearmain Street	DTSC
20	Granny Goose Foods, Inc.	916 98th Avenue	UST
21	Granny Goose Foods - Vehicle	9846 Medford Avenue	UST
22	HTI Tank Wash	9957 Medford Avenue	CAL-EPA
23	K&L Plating	10306 Pearmain Street	RCRA, FINDS
23	Unocal Station No. 2720	10306 Pearmain Street	FINDS
24	Marine Engine Works	851 98th Avenue	Sanborn Map
25	Melrose Metal Finishing	10222 Pearmain Street	RCRA, FINDS, LUST
26	Miller Machine Company	9929 Pearmain Street	DTSC
27	Mortensens	10122 Pippin Street	UST
28	Pickle Factory	443 Hale Avenue	Sanborn Map
29	Standard Brands of California	900 98th Avenue	Sanborn Map
30	Stern Company	742 105th Avenue	FINDS
31	unidentified fuel station	619 98th Avenue	UST
32	Wells Fargo Bank	9999 San Leandro St.	LUST

Notes: See Figure 3 for map locations.
 * - includes 670 and 692 98th Avenue.



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Potential Contaminant Sources
 City of Oakland/670 and 692 98th Avenue
 Oakland, California

FIGURE

4

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1.3.2 Other Sources

Other information sources included the following:

- ▶ May 24, and July 8 reconnaissances to provide data on current conditions at the subject properties and adjacent sites.
- ▶ Topographic and geology maps.
- ▶ Files maintained by the RWQCB.
- ▶ Aerial photographs from Pacific Aerial Surveys of Oakland, California.
- ▶ Sanborn Fire Insurance Maps.
- ▶ A report by Environmental Risk Information & Imaging Services of Alexandria, Virginia.

The results of our reconnaissances and reviews are presented in subsequent sections of this report.

1.4 SITE FEATURES

1.4.1 Setting

The subject properties are approximately 3 miles east of San Francisco Bay and about 1.5 miles southeast of San Leandro Bay. Interstate 880 is located about 1/2 mile to the west. The properties are generally flat with a slight overall slope to the north, toward 98th Avenue. The average site elevation is about 18 feet, based upon the City of Oakland Vertical Datum.

1.4.2 Site Description

The property at 670 98th Avenue is currently unoccupied, mostly unpaved, and fenced. The north part of the property is covered by stockpiled soil (reportedly containing petroleum hydrocarbons) to a depth of about 1 foot. Some debris is present, including one 55-gallon storage drum with unidentified contents. The adjacent property at 692 98th Avenue is currently paved, and used for storage of rental equipment.

1.4.3 Nearby Land Use

The subject properties are within the City of Oakland and are situated in a mixed residential, commercial, and industrial area. Development in the area includes single-family residences, apartment buildings, churches, rental yards, light industrial manufacturing facilities, service stations, restaurants, office buildings, railroad right-of-ways, and retail stores. The properties are bounded on the south and east by commercial sites, on the north by 98th Avenue, and on the west by Edes Avenue.

2.0 HISTORICAL LAND USE

2.1 GENERAL

The history of the properties from about 1925 to the present was investigated by AGI professional staff. The earliest pertinent information discovered was dated 1925. AGI also reviewed historical aerial photographs and Sanborn Fire Insurance maps to evaluate historical land use. The following sections summarize historical activities on the subject properties and adjacent sites.

2.2 SITE HISTORY

Our interpretation of historical land use of the subject properties, based upon available information, is summarized below:

- ▶ The property at 670 98th Avenue was apparently occupied by a residence for several years prior to 1925. Prior residential occupation was indicated by a 1925 Sanborn Fire Insurance Map notation showing a "dilapidated building" on the property.
- ▶ A 1925 map shows 670 98th Avenue as containing a residence and what appears to be two outbuildings. A residence was also indicated at 692 98th Avenue. A 1933 map shows the residences were still present.
- ▶ A 1926 map indicates stores were present on three properties at the east side of Edes Avenue, north of 98th Avenue.
- ▶ A 1947 aerial photograph shows the subject properties were unoccupied. Residences and commercial buildings to the north were still present.
- ▶ Between 1947 and 1953, fuel stations were constructed at 670 98th Avenue, 692 98th Avenue, and at 619 98th Avenue. Two residences were present to the west of the subject properties, across Edes Avenue.
- ▶ By 1968, the two residences to the west were removed and replaced by an office building. Widening of 98th Avenue also occurred between 1963 and 1968.
- ▶ Between 1968 and 1973, the adjacent fuel station at 692 98th Avenue was removed, and the property remained unoccupied through 1985. No records were discovered regarding UST removal from this property. A 1973 aerial photograph shows what appears to be a large quantity of storage drums on a site approximately 600 feet to the southeast, adjacent to a Southern Pacific Railroad right-of-way.
- ▶ A 1977 aerial photograph shows discolored soil along the railroad tracks adjacent to the site containing apparent storage drums.
- ▶ By 1985, the fuel station and USTs at 670 98th Avenue were removed and the property has since remained unoccupied. Apparent drums at the site to the southeast were no longer present. A 1985 aerial photograph shows an area of discolored soil in an empty lot to the north across 98th Avenue, west of Walter Avenue.
- ▶ Between 1988 and 1992, the office building across Edes Avenue to the west of the subject properties was removed; the site remains unoccupied.
- ▶ Stores currently remain to the north and northwest along Edes Avenue. The fuel station at 619 98th Avenue is still present, but is closed.

- ▶ A Phase II Environmental Assessment was performed by SCI during 1989 and 1990, in conjunction with a widening project at the south side of 98th Avenue. Several borings were drilled, and 6 groundwater monitoring wells were installed as part of the assessment. Hydrocarbon and solvent contamination was detected in groundwater samples from the monitoring wells. Free product was reportedly present in monitoring wells MW1 and 18. About 1,900 cubic yards of contaminated soil were removed from around the former UST locations, and disposed of off-site. A trench was installed along the north side of 98th Avenue to allow future extraction and remediation of contaminated water. Groundwater remediation has not been performed.

2.3 REGIONAL HISTORY

The area surrounding the subject properties has historically been a mixed residential, commercial, and industrial area. Over the years, the density of residential, commercial, and light industrial properties has increased. Many of the industrial properties currently appear to be unused, though most of the structures remain. Large industrial facilities such as Glass Pak, Inc. at 9401 San Leandro Street (formerly the Gerber Foods Plant location) still operate, but many of the heavy industrial facilities, such as the B&M Foundry at the northeast corner of the intersection of 100th Avenue and Pearmain Street, General Metals Corporation Foundry at the northeast corner of the intersection of 105th and Edes Avenues, and plating companies to the east of the subject properties, are no longer in operation.

3.0 SITE RECONNAISSANCE

3.1 ENVIRONMENTAL SETTING

3.1.1 Physiographic Setting

The site lies in the California Coast Range section of the Pacific Border physiographic province on a broad alluvial plain between the Berkeley Hills to the northeast, and San Francisco Bay to the west and south.

3.1.2 Geologic Setting

According to a geologic map by Helley, LaJoie, Spangle, and Blair (1979), the site is underlain by recent alluvium, which in turn overlies older alluvial deposits. The recent alluvium is typically unconsolidated, moderately sorted, well bedded, and comprises moderately permeable fine sand, silt, and clayey silt with occasional thin beds of coarse sand and minor amounts of organic matter. The thickness of the recent alluvium ranges up to about 12 feet. The recent alluvium overlies older, more coarse-grained alluvial deposits on the alluvial plain marginal to the San Francisco Bay.

SCI reported the subject properties to be underlain by successively deeper layers of clay (upper), sand and gravel, and clay (lower). The upper clay is about 12 feet thick. The sand and gravel extends to about 22 feet bgs. The lower clay underlies the sand and gravel, and likely extends below the depth explored (30 feet bgs).

3.1.3 Hydrogeologic Setting

Information regarding groundwater in the area was obtained from groundwater monitoring wells installed by SCI (approximate locations shown on Figure 2) and a level survey performed by Chaudhary and Associates of Napa, California. The depth to groundwater measured at the site during the three month monitoring period was between 8 and 10 feet bgs. This corresponds to an elevation of about 7 to 9 feet based upon the City of Oakland Vertical Datum. The groundwater gradient direction calculated from data obtained during our monitoring is to the northwest. The calculated gradient direction is consistent with past monitoring results by SCI.

3.1.4 Hydrology And Surface Water Drainage

Surface drainage at the properties is generally to the north, toward 98th Avenue. Surface water from the properties typically enters the storm sewer system via catch basins in the area.

3.2 SITE OBSERVATIONS

We performed reconnaissances of the properties and surrounding areas on May 24 and July 8, 1993. The property at 670 98th Avenue is fenced, and mostly unpaved. Gardening wastes and other debris were scattered across the site on April 15, but were mostly removed by May 24. No surface indications of contamination were observed. Excavated soil that reportedly contains petroleum hydrocarbons was present in a stockpile on the north part of the property. The property at 692 98th Avenue is fenced and paved. It is currently part of a larger site used for rental equipment storage.

3.3 POTENTIAL CONTAMINANT SOURCES

3.3.1 General

Based upon our site reconnaissances and other pertinent information, we identified potential environmental hazards or chemical contamination sources on or near the subject properties. These are described in the following paragraphs.

3.3.2 Potential On-site Sources

No current USTs or current sources of solvents were positively identified on the properties. Gasoline USTs and a waste oil UST were formerly present at 670 98th Avenue. No records were discovered regarding the contents of the waste oil UST. However, it was common for waste oil USTs to have been used to store spent solvents from cleaning baths. The locations, contents, and number of the USTs at 692 98th Avenue is unknown. No information was discovered regarding whether the USTs remain at the property or were removed. Records indicate that petroleum hydrocarbon contaminated soil associated with a UST removal event was remediated by others to clean up levels of about 1,000 mg/kg. Excavated soil which is stockpiled on the north part of 670 98th Avenue may contain diesel, oil, or grease.

3.3.3 Potential Off-site Sources

Potential off-site sources of contamination within the radius of interest (2,000 feet) were identified from data sources listed in Section 1.3, and two site reconnaissances. Potential off-site contaminant sources include the following:

- ▶ The RCRA Notifiers, CERCLIS, and FINDS lists identified 6, 1, and 15 sites within the radius of interest. Some of the sites are contained in both lists. The presence of these facilities on the lists does not indicate that they are contaminated sites or have documented releases. The identified sites include the following (replicate sites are listed only once):

Action Plating	10132 Edes Avenue
Allen ABDOS Co.	718 Douglas Avenue
Cal-Ben Co.	9828 Pearmain Street
Chemicals & Supplies Co.	751 105th Avenue
CHK Manufacturing	960 98th Avenue
Cornnuts, Inc.	10229 Pearmain Street
Edes Industrial Park	701 105th Avenue
Fleischmann's Yeast, Inc.	921 98th Avenue
Holchem, Inc.	751 105th Avenue
K&L Plating and Manufacturing	10306 Pearmain Street
Melrose Metal Finishing	10222 Pearmain Street
Nabisco Brands, Inc.	921 98th Avenue
Southwestern Petroleum Corp.	10441 Edes Avenue
Stern Co.	742 105th Avenue
UNOCAL Station No. 2720	10306 Pearmain Street

- ▶ The California State Water Resources Control Board UST list identified 8 sites with registered USTs within the radius of interest. They include the following:

Mortensens	10122 Pippin Street
Granny Goose Foods - Vehicle	9846 Medford Avenue
Granny Goose Foods, Inc.	916 98th Avenue
Nabisco Brands, Inc.	921 98th Avenue
Thrifty Oil Station No. 61	9801 San Leandro Blvd.
Bal's Tree Service	9911 Gould Street
Unidentified gas station	619 98th Avenue
Edmund C. Olson	740 Douglas Avenue

Of the UST sites listed, only the Mortensens site was identified as containing a non-petroleum UST. The contents of the UST at this site were not identified.

- ▶ The San Francisco Bay RWQCB LUST list identified 9 sites with leaking USTs within the radius of interest. They include the following:

ABDO Allen Co.	718 Douglas Avenue
Beretta Property	9838 Gould Street
City of Oakland	670 98th Avenue
City of Oakland	692 98th Avenue
City of Oakland	816 98th Avenue
City of Oakland	9801 San Leandro Blvd.
Fleischmann's Yeast, Inc	921 98th Avenue
Melrose Metal Finishing	10222 Pearmain Street
Wells Fargo Bank	9999 San Leandro Street

- ▶ The RWQCB NBT list identified one site with reported evidence of gasoline contamination. The site is identified below:

Beretta Property	9838 Gould Street
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- ▶ Six sites were identified from information obtained from the California State Department of Toxic Substances Control (DTSC) and California Environmental Protection Agency. The first four have been designated as sites requiring "no further action" by the DTSC. Information regarding the HTI Tank Wash site indicated only storage of hazardous waste. Information regarding the Fleischmann's site indicated two releases of high pH. The sites include the following:

Custom Coating Co.	10441 Edes Avenue
Chemicals & Supplies Co.	751 105th Avenue
Golden Gate Die Casting	10201 Pearmain Street
Miller Machine Co.	9929 Pearmain Street
HTI Tank Wash	9957 Medford Avenue, Building 11
Fleischmann's Yeast, Inc.	921 98th Avenue

- ▶ Seven sites not included on the above lists were identified on Sanborn Fire Insurance Maps (1925-1951) of the area. The sites are considered potential contamination sources based upon either the type of industry or specific map notations regarding site structures. The sites include the following:

National Egg Case Co.	Pearmain at Pear Street (now 100th Avenue)
B & M Foundry	Pearmain at Pear Street (now 100th Avenue)
General Metals Corp. Foundry	105th Avenue at Edes Avenue
Gerber Products Co.	800 98th Avenue (approximate address)
Marine Engine Works	851 98th Avenue (approximate address)
Standard Brands of California	900 98th Avenue (approximate address)
Pickle Factory	443 Hale Avenue (approximate address)

- ▶ Two sites not included on the above lists were identified from aerial photographs as containing discolored areas which may indicate spills of hazardous materials. The sites include the following:

Southern Pacific right-of-way	600 feet east of the properties
Empty Lot	150 feet north of the properties

- ▶ Two sites with above ground storage tanks were identified during our site reconnaissances. The sites include the following:

U.S. Rentals	700 98th Avenue
Unidentified site	Pippin at Pear Street

Specific potential off-site contaminant sources within about 1000 feet of the subject properties include the following:

- ▶ Action Plating, located upgradient from the subject properties at 10132 Edes Avenue, consists of a metals plating facility which used cyanide-based solutions in its plating processes. The facility is currently abandoned. Records indicate improper storage of approximately 20,000 gallons of plating waste. Hazardous wastes reported at the site include spent cyanide-based plating bath solutions from electroplating operations, residues from the bottom of the plating baths, spent stripping and cleaning bath solutions, acids, bases, flammables, and oxidizers. The solutions used for cleaning at electroplating operations commonly include of solvents. No records of reported releases at the facility were discovered.
- ▶ The Allen ABDOS Company (also termed the ABDO Allen Co.), located upgradient from the subject properties at 718 Douglas Avenue, is a construction company facility which contains or formerly contained one or more leaking USTs. The substance(s) leaked was(were) not identified in the information reviewed. However, based upon our site reconnaissance, during which we observed several large construction vehicles and equipment at the facility, it is likely that the UST system was used to store fuel for construction operations. No information regarding the current clean up status for the facility was discovered.
- ▶ Cal-Ben Company, located upgradient from the subject properties at 9828 Pearmain Street, was listed on the FINDS list. Our site reconnaissance revealed no indications of surface releases or USTs.
- ▶ An unidentified fuel station, located downgradient of the subject properties at 619 98th Avenue, consists of a building, drive slab, and pump island in a fenced lot. We observed no surface indications that USTs or associated piping at the site have been removed. No information regarding clean up status was discovered.
- ▶ A City of Oakland owned site located upgradient of the subject properties at 816 98th Avenue, was listed on the RWQCB LUST list. Information we reviewed indicated two former leaking gasoline USTs were removed from the site during 1989 or 1990. Approximately 200 cubic yards of contaminated soil was removed and remediated on-site to a clean up level of about 100 mg/kg. Groundwater investigation included the installation of three monitoring wells. Analytical results for samples collected from the monitoring wells indicated no hydrocarbon or solvent contamination. Our site reconnaissance revealed the site contains a warehouse storage facility on the south side and a small parking area on the north side.
- ▶ The Beretta property at 9838 Gould Street (cross gradient from the site) contains a leaking gasoline UST. A letter, dated October 2 1991, requiring a site groundwater investigation was in the RWQCB file. However, no information regarding whether the investigation has been performed was included.
- ▶ Miller Machine Company at 9929 Pearmain Street (upgradient from the subject properties) stores (or stored) toxic and hazardous substances for use in operations. The facility is categorized by the California DTSC as requiring no further remedial or investigative action.

- ▶ Gerber Products Company and Marine Engine Works are former facilities located approximately at 800 and 851 98th Avenue, respectively (cross gradient from the subject properties). No records were discovered regarding subsurface investigations at the facilities. However, Sanborn Fire Insurance Maps of the area for the period between 1925 and 1951 indicated the presence of at least three gas and oil tanks on the Gerber site, and one gas and oil tank on the Marine Engine Works site. No information regarding solvent use was discovered; but it was common practice to use solvents as parts cleaning solutions at facilities such as these.
- ▶ Discolored soil was noted on aerial photographs as being located along the Southern Pacific Railroad right-of-way approximately 600 feet east of the subject properties, and approximately 150 feet north of the properties in an empty lot across 98th Avenue. According to Sanborn Fire Insurance Maps, the latter property previously contained a "tank house". The discoloration may indicate spills of hazardous materials. However, no information was discovered regarding these potential spills or the contents or use of the "tank house".
- ▶ Above ground storage tanks were observed at two locations. U. S. Rentals, whose site currently includes 692 98th Avenue, has two tanks used to store fuel for rental equipment. Two above ground storage tanks with unidentified contents were also observed on a site located at the northwest corner of the intersection of Pippin and Prune Streets. No information was discovered regarding releases from these tanks.

Five locations between 1,000 feet and 2,000 feet from the site present potential point sources for solvents in groundwater at the site. These include the following:

- ▶ K&L Plating and Manufacturing (also the site of former Unocal Station No. 2720), located at 10306 Pearmain Street (upgradient from the subject properties), was listed on the RCRA Notifiers large quantity generator list as a facility out of compliance with RCRA generator requirements. The list cited violations at the facility. Wastes generated at the facility include arsenic compounds and corrosive solids. No information was discovered regarding remedial action at the facility.
- ▶ Mortensens, located at 10122 Pippin Street (upgradient from the subject properties), contains a UST that may have contained solvents. No information was discovered regarding facility operations or UST contents.
- ▶ B&M Foundry (also the former site of National Egg Case Company) was an iron and aluminum foundry at the southeast corner of the intersection of Pearmain Street and Pear Street (now 100th Avenue), and upgradient from the subject properties. Sanborn Fire Insurance Maps indicated a fuel tank was located at the south end of the property. It is possible that solvents were used in cleaning processes for materials produced at the site. No records of spills at the B&M Foundry were discovered.
- ▶ General Metals Corporation Foundry (located upgradient from the subject properties) consisted of an approximate 5-1/2 acre property bounded on the west by Edes Avenue, on the south by 105th Avenue, and on the north and east by Southern Pacific Railroad right-of-ways. Records of this facility were discovered on Sanborn Fire Insurance Maps of the area for the period between 1925 and 1951. Maps indicated the facility was used as a foundry for high purity structural steel. An apparent heating oil tank was identified at the west side of the property. An area measuring approximately 20 feet by 150 feet, located at the north side of the facility adjacent to the west Southern Pacific Railroad track, was labeled "cleaning". Although solvent use at the facility was not confirmed, solvents may have been used in this area to clean steel products prior to shipping. The cleaning area is located approximately 1,000 feet southeast of the subject property.

- ▶ Standard Brands of California is a paint manufacturing company which formerly operated a facility on the north side of 98th Avenue, to the east of San Leandro Street (cross gradient from the subject properties). Solvents are commonly used in paint manufacturing and cleaning processes at such facilities. No records of spills at the facility were discovered.

4.0 GROUNDWATER MONITORING

4.1 GENERAL

AGI was retained by the City of Oakland to perform three monthly monitoring events at the site and to provide data regarding groundwater elevation, gradient, and contaminant levels.

4.2 GROUNDWATER ELEVATION AND GRADIENT MONITORING

A level survey of the accessible well casing tops was performed on June 24, 1993 by Chaudhary and Associates of Napa, California to provide elevation data for calculating the groundwater gradient direction at the site. A City of Oakland monument on 98th Avenue approximately 300 feet west of the site was used as a reference for calculating casing top elevations. Depth to groundwater measurements from the casing tops were used to calculate groundwater elevations. The calculated gradient direction remained consistent during the three month monitoring period. Elevations of groundwater in the wells are presented on Table 1. The groundwater gradient direction based upon depth to groundwater measurements taken on May 24, 1993 is indicated on Figure 2.

4.3 APRIL 15, 1993 AND MAY 24, 1993 SAMPLING EVENTS

The wells were inspected and found to be in satisfactory condition with regard to providing useable monitoring data, with the exception of MW5, which had been paved over. Access to MW4 was obstructed by debris on April 15, 1993. The debris was later removed allowing MW4 to be sampled on May 24, 1993. The following procedures were employed during the monitoring and sampling events:

- ▶ Initial Measurement: Prior to purging the wells, the depths to groundwater in the wells were measured to the nearest 0.01 foot from the casing tops using a calibrated electronic water level meter. Depth to groundwater measurements are listed on Table 1.
- ▶ Well Purging: The wells were purged using a centrifugal suction pump. Approximately four well casing volumes were extracted prior to sampling. The temperature, pH, and electrical conductivity of the water were monitored and recorded during well purging. The field measurements were performed with an electronic meter calibrated using a single point conductivity standard calibration, three-point pH calibration, and standard electronic thermometer. The wells were considered purged when these indicator parameters stabilized.
- ▶ Groundwater Sampling: Samples were obtained from each well using a clean Teflon bailer. The bailer was slowly lowered into the water column and emptied carefully to limit degassing the sample.
- ▶ Sample Containers: Water samples were placed in approved, pre-cleaned containers provided by the analytical laboratory. Samples were placed on ice in a chilled cooler immediately following collection, and kept refrigerated until delivery to the analytical laboratory.
- ▶ Sample Custody: Each sample was labeled with the project name, job number, sample number and date, and sampler's initials. Chain-of-custody documentation was maintained for all samples collected; a copy is attached.

TABLE 1
Groundwater Elevations
City of Oakland
670 and 692 98th Avenue
Oakland, California

Well No.	T.O.C. Elevation (feet)	Measurement Date	Depth to Groundwater from T.O.C. (feet)	Groundwater Elevation* (feet)
MW1	16.19	04-15-93 05-24-93 06-24-93	8.47(0.01) 8.93(0.02) 8.86(0.005)	7.73* 7.28* 7.33
MW2	16.52	04-15-93 05-24-93 06-24-93	8.31 8.73 8.63	8.21 7.79 7.89
MW3	16.56	04-15-93 05-24-93 06-24-93	8.65 9.10 9.02	7.91 7.46 7.54
MW4	17.71	04-15-93 05-24-93 06-24-93	N/A 9.88 9.78	N/A 7.83 7.93
18	15.97	04-15-93 05-24-93 06-24-93	8.06 8.49 8.40	7.91 7.48 7.57

Notes:

T.O.C. - Top of well casing.

Elevations based upon City of Oakland vertical datum.

N/A - Not available (well not accessible during monitoring event).

(0.01) - Free product thickness measured at groundwater surface.

* - Groundwater elevations adjusted for the presence of free product.

- Decontamination Procedures: All groundwater sampling equipment was thoroughly cleaned prior to and following sampling in accordance with the following procedures:

- Step 1: Rinse and pre-clean in potable water.
- Step 2: Wash in solution of laboratory grade, non-phosphate based soap and potable water.
- Step 3: Rinse in potable water.
- Step 4: Rinse with isopropyl alcohol.
- Step 5: Rinse with potable water.
- Step 6: Rinse in distilled or deionized water.

All solutions were renewed frequently. Sponges and nylon scrubbers were used during Steps 1 through 3. Water and cleaning solutions generated during well purging and decontamination procedures were contained on-site in DOT approved 55-gallon drums, pending disposal.

4.4 CHEMICAL ANALYSIS RESULTS

Chemical analysis of the samples was performed by CKY, Inc. of Pleasanton, California, a California Department of Health Services certified analytical laboratory. The sample from MW1 was not analyzed due to the presence of free product. The other samples were analyzed for total petroleum hydrocarbons as diesel fuel (TPH-D) and gasoline (TPH-G) using a modified EPA Method 8015; benzene, ethylbenzene, toluene, and total xylenes (BETX) using EPA Method 8020; and purgeable halocarbons using EPA Method 601.

Results of hydrocarbon analysis indicate the sample from monitoring well 18 contained 10 milligrams per liter (mg/l) of diesel-range hydrocarbons, 7 mg/l of gasoline-range hydrocarbons, 440 ug/l of benzene, 340 ug/l of ethylbenzene, 180 ug/l of toluene, and 1,600 ug/l of total xylenes. Results of purgeable halocarbon analysis indicate solvent concentrations are below the laboratory reporting limit for all samples collected except MW2, which contained 14 ug/l of trichloroethene (TCE). Analytical results are summarized in Table 2, and copies of the analytical laboratory reports are attached.

Table 2
Summary of Chemical Analyses - Water (Monitoring Wells)
 670 and 692 98th Avenue
 Oakland, California

Sample ID	Date Sampled	EPA Test Method						
		BETX 5030/8020				8015M	8015M	601
		Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Total Xylenes (ug/l)	TPH-G (mg/l)	TPH-D (mg/l)	Halogenated Volatiles (ug/l)
MW1	04/15/93	NA	NA	NA	NA	NA	NA	NA
MW2	04/15/93	ND	ND	ND	ND	ND	ND	TCE - NA
MW3	04/15/93	ND	ND	ND	ND	ND	ND	ND
MW4	05/24/93	ND	ND	ND	ND	ND	ND	ND
MW5	04/15/93	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	04/15/93	440	340	190	1,600	1	10	ND
Trip Blank	04/15/93	ND	ND	ND	ND	ND	ND	ND
Laboratory Reporting Limit		1	1	1	1	1.0	1.0	1, 5

~~Free product~~

Notes:

TPH-G - Total petroleum hydrocarbons quantified as gasoline.

TPH-D - Total petroleum hydrocarbons quantified as diesel fuel (Note: for sample 18, not identified as diesel).

ug/l - Micrograms per liter is equivalent to parts per billion (ppb).

mg/l - Milligrams per liter is equivalent to parts per million (ppm).

NA - Not analyzed due to presence of free product.

ND - Not detected above the reporting limit.

N/A - Not accessible due to pavement placed over monitoring well cover.

Laboratory reporting limit for Method 601 is compound-specific, generally at 1 ug/l, not more than 5 ug/l.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 GENERAL

Several potential on- and off-site sources of the solvent contamination at the subject properties were identified during our research. None of these sites were specifically identified on the reviewed lists as storing or being contaminated with solvents.

Our research indicates that 39 identified potential sources of solvent contamination in the groundwater at the subject properties exist or existed within 2,000 feet. Of these, we judge that 9 sites (2 on-site and 7 off-site) have low to moderate potential for being solvent sources, 20 sites have low potential, and 10 sites have very low potential. Our conclusions regarding the amount of potential are based upon the location and proximity of the sites to the subject properties, assumed or known use of solvents, assumed or known UST contents, and documented unsafe handling practices.

Sites with low to moderate potential for being sources of solvents in the groundwater at the subject properties include:

- | | |
|--------------------------------------|----------------------------------|
| ▶ Former fuel station | 670 98th Avenue |
| ▶ Former fuel station | 692 98th Avenue |
| ▶ Action Plating | 10132 Edes Avenue |
| ▶ K&L Plating and Manufacturing | 10306 Pearmain Street |
| ▶ Mortensens | 10122 Pippin Street |
| ▶ Allen ABDOS Company | 718 Douglas Avenue |
| ▶ B&M Foundry | Pearmain Street and 100th Avenue |
| ▶ General Metals Corporation Foundry | 105th and Edes Avenues |

The groundwater gradient direction during our monitoring, and that of others, has been consistently to the northwest. Solvents have been detected by others in all of the monitoring wells at the site. During our groundwater monitoring event, we detected solvents in only one well (MW2) and petroleum hydrocarbons in two wells (MW1 and 18).

Specific conclusions are presented in sections 5.2, 5.3, and 5.4.

5.2 ON-SITE SOURCES OF CONTAMINATION

AGI identified no current on-site source of solvent contamination during this assessment. The former waste oil UST at 670 98th Avenue may have been used to store spent solvents. The waste oil UST was located downgradient from a monitoring well (MW4) containing solvents. For these reasons, we judge that the former waste oil UST has a low to moderate potential for being a source of solvents in the groundwater at the subject properties.

AGI was unable to confirm the locations, contents, and number of USTs at 692 98th Avenue. In addition, we were unable to verify if the USTs have been removed. It was common for fuel stations to have waste oil tanks. If a waste oil tank was present at the property, it may have been a source of solvents. Based upon the site location and common use of waste oil tanks at fuel stations, we judge that the potential for this property to be a source of solvents in the groundwater at the subject properties is low to moderate.

Petroleum fuel USTs were present at both properties. Hydrocarbons have been reported in soil and groundwater at and downgradient from both properties.

5.3 OFF-SITE SOURCES OF CONTAMINATION

During this assessment, we identified several potential off-site contaminant sources within 2,000 feet of the subject properties. Specific conclusions regarding each source are presented in the following paragraphs.

- ▶ A total of 15 sites are included on the RCRA Notifiers, CERCLIS, and FINDS lists. There is no evidence of releases of hazardous substances from these sites. We judge the potential is very low for ten of these sites to be sources of solvent contamination in the groundwater at the subject properties. Three other sites (Allen ABDOS Co. at 718 Douglas Avenue, Fleischmann's Yeast, Inc. at 921 98th Avenue, and Melrose Metal Finishing at 10222 Pearmain Street) also have former or current leaking USTs and are discussed later. Two other sites had documented unsafe storage practices and are discussed below:
 - Action Plating, located at 10132 Edes Avenue (upgradient from the subject properties), consists of an abandoned metals plating facility which used cyanide-based solutions in its plating processes. The solutions used for cleaning at electroplating operations commonly include solvents. Based upon the upgradient location, the documented improper waste storage practices, and the possible use of solvents, we judge the potential for this site to be a source of solvents in groundwater at the subject properties is moderate.
 - K&L Plating and Manufacturing, located at 10306 Pearmain Street (upgradient from the subject properties), was listed on the RCRA Notifiers large quantity generator list as a facility out of compliance with RCRA generator requirements. Although not included in the list of reported wastes at the facility, solvents are commonly used for cleaning at this type of facility. Based upon the upgradient location, large quantity generator status, the documented non-compliant activities, and possible use of solvents, we judge the potential for this site to be a source of solvents in groundwater at the subject properties is moderate.
- ▶ The California State Water Resources Control Board UST list identified eight sites. Two of these sites (Nabisco Brands, Inc. at 921 98th Avenue, and Thrifty Oil Station No. 61 at 9801 San Leandro Street) were also on the San Francisco RWQCB LUST list and are discussed later. No documented releases of contaminants have occurred at the other six sites. Five of these six sites store (or formerly stored) petroleum hydrocarbons. We judge that the potential for these five sites to be the source of solvents in the groundwater at the subject properties is low. One site stored an unlisted material and is discussed below:
 - The UST at Mortensens, located at 10122 Pippin Street (upgradient from the properties), may have contained solvents. No information was discovered regarding facility operations, or the UST contents/volume. Based upon the upgradient location, and possible storage of solvents, we judge the potential for this site to be a source of solvents in groundwater at the subject properties is low.
- ▶ The San Francisco RWQCB LUST list includes the two subject properties and seven other sites. Four of these seven sites are cross gradient and more than 1,000 feet from the subject properties (Beretta Property at 9838 Gould Street, Thrifty Oil Station No. 61 at 9801 San Leandro Street, Fleischmann's Yeast, Inc. at 921 98th Avenue, and Wells Fargo Bank at 9999 San Leandro Street). We judge that there is low potential of groundwater contamination at the subject properties from these four sites. The other three sites are located upgradient from the properties and are discussed below:
 - The contents of the LUST at the Allen ABDOS Company, located at 718 Douglas Avenue were not identified. During our site reconnaissance, we noted that the site contains construction equipment, suggesting that the LUST stored fuel. However, this is uncon-

firmed. Based upon the upgradient location, and the unconfirmed contents of the LUST, we judge the potential for this site to be a source of solvents in groundwater at the subject properties is low.

- The City of Oakland owned site located at 816 98th Avenue formerly contained two gasoline USTs. Because there is no documented use of solvents at this site, we judge the potential for this site to be a source of solvents in groundwater at the subject properties is low.
- Melrose Metal Finishing at 10222 Pearmain Street (upgradient from the subject properties) contains (or contained) one or more gasoline USTs. Although no information was discovered regarding site operations, solvents are commonly used in finishing processes at such facilities. Based upon the upgradient location, and the possible use of solvents, we judge the potential for this site to be a source of solvents in groundwater at the subject properties is low to moderate.
- ▶ The California DTSC and Cal EPA lists include 6 sites. Four of these sites are upgradient from the subject properties, and categorized by the California DTSC as requiring no further remedial or investigative action. We judge the potential for these four sites to be sources of solvents in groundwater at the subject properties is low. The two other sites are cross gradient and more than 1,000 feet from the subject properties (HTI Tank Wash at 9957 Medford Avenue, and Fleischmann's Yeast, Inc. at 921 98th Avenue). We judge the potential for these two sites to be sources of solvents in groundwater at the subject properties is low.
- ▶ We identified possible contaminant sources at six other sites upgradient or cross gradient from the subject properties, and not reported on the reviewed federal, state and local databases.
 - B&M Foundry, located at Pearmain Street and 100th Avenue, was an iron and aluminum foundry. It was common for solvents to be used in cleaning processes for materials produced at such facilities. Based upon the upgradient location, the apparent large size of operations, and the lack of inclusion on the reviewed lists, we judge the potential for the site to be a source of solvents in groundwater at the subject properties is low.
 - General Metals Corporation Foundry was located at 105th and Edes Avenues. Maps indicate a large area at the north end of the site was used for cleaning processes. It was common use solvents for cleaning at these types of facilities. Based upon the upgradient location, the existence of the cleaning area, and the large size of the facility, we judge the potential for this site to be a source of solvents in groundwater at the subject properties is moderate.
 - Marine Engine Works is a former engine repair facility located at approximately 851 98th Avenue. Although no information regarding facility operations was discovered, it was common to use solvents as parts cleaning solutions at this type of facilities. Based upon the cross gradient location, former use of the site, and the lack of inclusion on the reviewed lists, we judge the potential for the site to be a source of solvents in groundwater at the subject properties is low.

- Standard Brands of California, located at approximately 900 98th Avenue, was a paint manufacturing company. Solvents are commonly used in paint manufacturing and cleaning processes at such facilities. Based upon the cross gradient location, former use of the site, and the lack of inclusion on the reviewed lists, we judge the potential for the site to be a source of solvents in groundwater at the subject properties is low.
- Aerial photograph review indicated discolored soil along the Southern Pacific Railroad right-of-way approximately 600 feet east of the properties (upgradient), and approximately 150 feet north of the properties in an empty lot across 98th Avenue (downgradient). The discolored soil may indicate former spills of hazardous liquids. Sanborn Fire Insurance Maps showed the latter property previously contained a "tank house". No information was discovered regarding these potential spills or the contents or use of the "tank house". Based upon the locations, the apparent sizes of the spills, and the lack of inclusion on the reviewed lists, we judge the potential for the sites to be a source of solvents in groundwater at the subject properties is low.

5.4 GROUNDWATER MONITORING

Results of groundwater gradient monitoring during the three month monitoring period indicate a northwest gradient direction at the site. This gradient direction is consistent with results of previous gradient monitoring performed by others, and with the expected general gradient direction for the area around the subject properties.

Results of groundwater sample analysis indicate a general reduction of hydrocarbon and solvent concentrations in groundwater at the site. Free product remains in MW1, but at a lesser thickness than that reported by others during previous monitoring events. Petroleum hydrocarbons were detected in only two of the wells (MW1 and 18). Solvents previously present in all site groundwater monitoring wells were detected in only one well (MW2).

6.0 LIMITATIONS

This section provides information on the use and limitations of this report. The following paragraphs are offered to help you reduce the potential for misinterpretation, incorrect assumptions, or other costly inconveniences.

This report was prepared for exclusive use by the City of Oakland for this project only. Our scope of services was developed in conjunction with your involvement to achieve specific project objectives, with the intent of establishing an appropriate balance between level of effort and uncertainty. Providing the report to others not party to this mutual scope determination, or using it for other projects or purposes, can result in misunderstandings or incorrect assumptions. AGI cannot be responsible for interpretation or extrapolation of data contained herein, except as stated in our conclusions and recommendations.

Our conclusions and recommendations are based upon data described herein and our experience and professional judgement. The data were either made available to AGI or reasonably obtained within the practical constraints of our scope of services. Nothing can be done to eliminate all unknowns; however, we can help you take steps to lessen their impact. If you become aware of data we did not consider, or have any questions concerning our conclusions and recommendations, please advise us immediately.

There is no such thing as perfect due diligence and no practical study or procedure can or should be expected to discover all potential contamination. However, we believe this environmental assessment, in conjunction with any recommended additional studies, does represent due diligence as determined in accordance with the professional standard of care. This standard is the current level of care and skill ordinarily exercised by members of the engineering profession practicing under similar conditions in the project area. AGI cannot be responsible if due diligence standards change or if you are required to meet a higher standard.

7.0 REFERENCES

- Aerial Photograph AV-11-05-22, March 24, 1947.
- Aerial Photograph AV-119-14-33, August 17, 1953.
- Aerial Photograph AV-119-14-34, August 17, 1953.
- Aerial Photograph AV-550-09-24, July 25, 1963.
- Aerial Photograph AV-844-14-35, 1968.
- Aerial Photograph AV-1100-06-33, April 24, 1973.
- Aerial Photograph AV-1377-06-32, July 7, 1977.
- Aerial Photograph AV-2640-06-33, May 15, 1985.
- Aerial Photograph AV-3268-06-34, March 30, 1988.
- Aerial Photograph AV-4230-0113-38, April 20, 1992.
- Alameda County Flood Control and Water Conservation District, *Geohydrology and Groundwater - Quality Overview, East Bay Plain Area, Alameda County, California*, 1988, Report 205(j)
- Environmental Risk Information & Imaging Services, *ERIIS Report for 672 15th Street, Oakland, California*, May 27, 1993, ERIIS Report Number 23017
- Helley, E. J., LaJoie, K. R., Spangle, W. E., and Blair, M. L., *Flatland Deposits of the San Francisco Bay Region, California - Their Geology and Engineering Properties, and Their Importance to Comprehensive Planning*, 1979, USGS Professional Paper 943, Plate 3.
- Sanborn Fire Insurance Maps, Oakland, Volume 6, 1926-1951.
- Sanborn Fire Insurance Maps, Oakland, Volume 7, 1925-1933.
- State Water Resources Control Board, California Environmental Protection Agency, *Report on Releases of Hazardous Substances From Underground Storage Tanks*, 1992, 92-2CWP

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City of Oakland
OPW Environmental Affairs
1333 Broadway, Suite 330
Oakland, California 94612

Attn: Ms. Julie A. Carver
Environmental Program Supervisor

JBA/WKW/jba



CKY incorporated Environmental Services

Date: 04/21/93
N9304-14

Applied Geotechnology, Inc.
100 Hegenberger Road, Ste. 210
Oakland, CA 94621

Attn: Mr. John Adams

Subject: Laboratory Report
Project: City of Oakland-98th \$ Edes

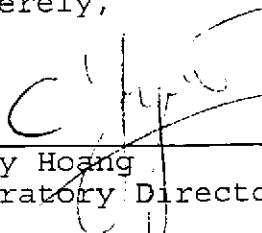
Enclosed is the laboratory report for samples received on 04/15/93. The samples were received in coolers with ice and intact; the chain-of-custody forms were properly filled out. The data reported includes:

<u>Method</u>	<u>No. of Analysis</u>
EPA 8010	4 Water
EPA 8020	4 Water
M8015 (Gas)	4 Water
M8015 (Diesel)	3 Water

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely,



Danny Hoang
Laboratory Director

EPA METHOD Mod. 8015
TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

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=====
CLIENT:      Applied Geotech          DATE REC'D:    04/15/93
PROJECT:     Oakland 98th & Edes     DATE EXTRACTED: 04/16/93
CONTROL NO:  N9304-14              DATE ANALYZED: 04/16/93
MATRIX:     Water
=====
  
```

SAMPLE ID:	CONTROL NO:	RESULTS (mg/L)	H-C RANGE	%SURROGATE	
				1-4DCB	Di-ni-Oct
Blank	N9304-11	ND	N.A.	109	106
MW3	N9304-11-1	ND	N.A.	100	103
MW2	N9304-11-2	ND	N.A.	99	100
18	N9304-11-3	*10	C6-C12	104	103

* NOT A DIESEL PATTERN

DETECTION LIMIT: 1.0 mg/L

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=====
CLIENT:      Applied Geotech          DATE REC'D:   04/15/93
PROJECT:     Oakland 98th & Edes     DATE ANALYZED: 04/19/93
SAMPLE ID:   Blank                   MATRIX TYPE:   Water
CONTROL NO:  N9304-14
=====
  
```

<u>PARAMETERS (601)</u>	<u>RESULTS (ug/L)</u>	<u>DETECTION LIMIT (ug/L)</u>
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl Chloride	ND	5
Bromomethane	ND	5
Chloroethane	ND	5
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Methylene Chloride	ND	1
Trans-1,2-Dichloroethene	ND	1
cis 1,2 -dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloroethane	ND	1
Trichloroethene	ND	1
1,2-Dichloropropane	ND	1
Bromodichloromethane	ND	1
2-Chloroethylvinylether	ND	1
Trans-1,3-Dichloropropene	ND	1
Cis-1,3-Dichloropropene	ND	1
1,1,2-Trichloroethane	ND	1
Tetrachloroethene	ND	1
Dibromochloromethane	ND	1
Chlorobenzene	ND	1
Bromoform	ND	1
1,1,2,2-Tetrachloroethane	ND	1
M-Dichlorobenzene	ND	1
P-Dichlorobenzene	ND	1
O-Dichlorobenzene	ND	1

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=====
CLIENT:      Applied Geotech          DATE REC'D:    04/15/93
PROJECT:     Oakland 98th & Edes     DATE ANALYZED: 04/19/93
CONTROL NO:  N9304-14                MATRIX TYPE:   Water
=====
  
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<u>PARAMETERS (601)</u>	<u>N9304-14-1</u> <u>MW3</u>	<u>N9304-14-2</u> <u>MW2</u>	<u>DET. LIMIT</u> <u>(ug/L)</u>
Dichlorodifluoromethane	ND	ND	5
Chloromethane	ND	ND	5
Vinyl Chloride	ND	ND	5
Bromomethane	ND	ND	5
Chloroethane	ND	ND	5
Trichlorofluoromethane	ND	ND	1
1,1-Dichloroethene	ND	ND	1
Methylene Chloride	ND	ND	1
Trans-1,2-Dichloroethene	ND	ND	1
cis 1,2 -dichloroethene	ND	ND	1
1,1-Dichloroethane	ND	ND	1
Chloroform	ND	ND	1
1,1,1-Trichloroethane	ND	ND	1
Carbon Tetrachloride	ND	ND	1
1,2-Dichloroethane	ND	ND	1
Trichloroethene	ND	14	1
1,2-Dichloropropane	ND	ND	1
Bromodichloromethane	ND	ND	1
2-Chloroethylvinylether	ND	ND	1
Trans-1,3-Dichloropropene	ND	ND	1
Cis-1,3-Dichloropropene	ND	ND	1
1,1,2-Trichloroethane	ND	ND	1
Tetrachloroethene	ND	ND	1
Dibromochloromethane	ND	ND	1
Chlorobenzene	ND	ND	1
Bromoform	ND	ND	1
1,1,2,2-Tetrachloroethane	ND	ND	1
M-Dichlorobenzene	ND	ND	1
P-Dichlorobenzene	ND	ND	1
O-Dichlorobenzene	ND	ND	1

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EPA METHODS - 601

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=====
CLIENT:      Applied Geotech          DATE REC'D:    04/11593
PROJECT:     Oakland 98th & Edes     DATE ANALYZED: 04/19/93
CONTROL NO:  N9304-14              MATRIX TYPE:   Water
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<u>PARAMETERS (601)</u>	<u>N9304-14-3</u> <u>18</u>	<u>N9304-14-4</u> <u>Trip Blk</u>	<u>DET. LIMIT</u> <u>(ug/L)</u>
Dichlorodifluoromethane	ND	ND	5
Chloromethane	ND	ND	5
Vinyl Chloride	ND	ND	5
Bromomethane	ND	ND	5
Chloroethane	ND	ND	5
Trichlorofluoromethane	ND	ND	1
1,1-Dichloroethene	ND	ND	1
Methylene Chloride	ND	ND	1
Trans-1,2-Dichloroethene	ND	ND	1
cis 1,2 -dichloroethene	ND	ND	1
1,1-Dichloroethane	ND	ND	1
Chloroform	ND	ND	1
1,1,1-Trichloroethane	ND	ND	1
Carbon Tetrachloride	ND	ND	1
1,2-Dichloroethane	ND	ND	1
Trichloroethene	ND	ND	1
1,2-Dichloropropane	ND	ND	1
Bromodichloromethane	ND	ND	1
2-Chloroethylvinylether	ND	ND	1
Trans-1,3-Dichloropropene	ND	ND	1
Cis-1,3-Dichloropropene	ND	ND	1
1,1,2-Trichloroethane	ND	ND	1
Tetrachloroethene	ND	ND	1
Dibromochloromethane	ND	ND	1
Chlorobenzene	ND	ND	1
Bromoform	ND	ND	1
1,1,2,2-Tetrachloroethane	ND	ND	1
M-Dichlorobenzene	ND	ND	1
P-Dichlorobenzene	ND	ND	1
O-Dichlorobenzene	ND	ND	1

EPA METHOD 5030/Mod. 8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE & TRAP

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=====
CLIENT:      Applied Geotech          DATE REC'D:   04/15/93
PROJECT:     Oakland 98th & Edes     DATE ANALYZED: 04/19/93
CONTROL NO:  N9304-14                MATRIX:       Water
=====
  
```

<u>SAMPLE ID:</u>	<u>CONTROL NO:</u>	<u>RESULTS</u> <u>(mg/L)</u>	<u>DET. LIMIT</u> <u>(mg/L)</u>	<u>% SURRO</u> <u>RECOVERY</u>
Blank	N9304-14	ND	1.0	79
MW3	N9304-14-1	ND	1.0	76
MW2	N9304-14-2	ND	1.0	90
18	N9304-14-3	7	1.0	78
Trip Blank	N9304-14-4	ND	1.0	99

QUALITY CONTROL DATA

CLIENT: Applied Geotech
 PROJECT: Oakland 98th & Edes
 CONTROL NO: N9304-14
 DATE EXTRACTED: 04/16/93
 DATE ANALYZED: 04/16/93

METHOD: EPA M8015D
 MATRIX: Water

SAMPLE ID: N9304-11-1

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (mg/L)	<u>AMOUNT SPIKED</u> (mg/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
Diesel	ND	100	103	94	9

QUALITY CONTROL DATA

CLIENT: Applied Geotech
 PROJECT: Oakland 98th & Edes
 CONTROL NO: N9304-14 DATE ANALYZED: 04/19/93

METHOD EPA 601
 MATRIX: Water

SAMPLE ID: N9304-14-2

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (mg/L)	<u>AMOUNT SPIKED</u> (mg/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
1,1-DCE	ND	50	84	112	29
TCE	ND	50	116	100	15
Chlorobenzene	ND	50	100	138	32

QUALITY CONTROL DATA

CLIENT: Applied Geotech
PROJECT: Oakland 98th & Edes
CONTROL NO: N9304-14 DATE ANALYZED: 04/19/93

METHOD EPA M8015G
MATRIX: Water

SAMPLE ID: N9304-14-2

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (mg/L)	<u>AMOUNT SPIKED</u> (mg/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
Gasoline	ND	2.0	95	110	15



QUALITY CONTROL DATA

CLIENT: Applied Geotech
 PROJECT: Oakland 98th & Edes DATE ANALYZED: 04/19/93
 CONTROL NO: N9304-14

=====
 METHOD EPA 8020
 MATRIX: Soil

SAMPLE ID: N9304-14-2

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (ug/L)	<u>AMOUNT SPIKED</u> (ug/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
Benzene	ND	10	100	85	16
Toluene	ND	10	120	100	18
Ethyl Benzene	ND	10	130	100	26
Xylene	ND	20	120	100	18

=====



Applied Geotechnology Inc.
Geotechnical Engineering
Geology & Hydrogeology

CHAIN OF CUSTODY

N930414

Date 4-15-93 Page 1 of 1

Project Manager: JOHN ADAMS
Project Name: City of Oakland - 98th + Edos
Project Number: 15687-009
Site Location: OAKLAND
Phone: 568-9475 Sampled By: JBA

Laboratory Number: R-3

SAMPLE DISPOSAL INSTRUCTIONS
 Lab Disposal Return Pickup (will call)

					ANALYSIS REQUEST																											
SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TCL Metals (23)	Priority Pollutant Metals (13)	EPTOX Metals (8) Total	EP TOX Metals (8) EP EXT	TCLP Metals	EP TOX Pesticides (5)	TCLP - Volatiles	8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 OC Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015M Fuel Fingerprint	TOC 9060	TOX 9020	% Moisture		NUMBER OF CONTAINERS		
1 MW3	4-15-93	1118	WATER									X																		X	X	5
2 MW2	4-15-93	1205										X																		X	X	5
3 18	4-15-93	1240										X																		X	X	5
4 TRIP BLANK	4-9-93	-										X																		X		4

LAB INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
Lab Name: <u>CKY INC.</u>		Total Number of Containers:		Signature: <u>[Signature]</u> Time: <u>1615</u>		Signature:		Signature:	
Lab Address: <u>PLEASANTON</u>		Chain of Custody Seals: Y/N/NA		Printed Name: <u>JOHN B ADAMS</u> Date: <u>4-15-93</u>		Printed Name:		Printed Name:	
Via: <u>HAND</u>		Intact?: Y/N/N		Company: <u>AGI</u>		Company:		Company:	
TAT: <input type="checkbox"/> 24hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 72 hr. <input checked="" type="checkbox"/> 1 wk. (STD) <input type="checkbox"/> 2 wks. (normal)		Received in Good Cond./Cold:		RECEIVED BY: 1.		RECEIVED BY: 2.		RECEIVED BY: 3.	
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH DATA				Signature: <u>[Signature]</u> Time: <u>1615</u>		Signature:		Signature:	
Special Instructions:				Printed Name: <u>Ray Partido</u> Date: <u>4/15/93</u>		Printed Name:		Printed Name:	
				Company: <u>CKY</u>		Company:		Company:	



CKY incorporated Environmental Services

Date: 05/26/93
N9305-87

Applied Geotechnology Inc.
100 Hegenberger Road #210
Oakland, CA 94621

Attn: Mr. John Adams

Subject: Laboratory Report
Project: City of Oakland-98th & Edes

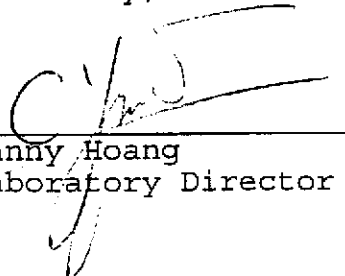
Enclosed is the laboratory report for samples received on 05/24/93. The samples were received in coolers with ice and intact; the chain-of-custody forms were properly filled out. The data reported includes:

<u>Method</u>	<u>No. of Analysis</u>
EPA 8010	1 Water
M8015 (Diesel/Gas)	1 Water
EPA 8020	1 Water

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely,



Danny Hoang
Laboratory Director

EPA METHOD Mod. 8015
TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

=====

CLIENT:	AGI	DATE REC'D:	05/24/93
PROJECT:	98th & Edes	DATE EXTRACTED:	05/25/93
CONTROL NO:	N9305-87	DATE ANALYZED:	05/25/93
MATRIX:	Water		

=====

<u>SAMPLE ID:</u>	<u>CONTROL NO:</u>	<u>RESULTS</u> (mg/L)	<u>H-C RANGE</u>	<u>%SURROGATE</u>	
				<u>1-4DCB</u>	<u>Di-n-Octo</u>
Blank	N9305-87	ND	N.A.	104	96
MW4	N9305-87-1	ND	N.A.	105	94

DETECTION LIMIT: 1.0 mg/L

=====

EPA METHOD 5030/Mod. 8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE & TRAP

=====

CLIENT:	AGI	DATE REC'D:	05/24/93
PROJECT:	98th & Edes	DATE ANALYZED:	05/26/93
CONTROL NO:	N905-87	MATRIX:	Water

=====

<u>SAMPLE ID:</u>	<u>CONTROL NO:</u>	<u>RESULTS</u> <u>(mg/L)</u>	<u>DET. LIMIT</u> <u>(mg/L)</u>	<u>% SURRO</u> <u>RECOVERY</u>
Blank	N9305-87	ND	1.0	98
MW4	N9305-87-1	ND	1.0	ND

=====

EPA METHOD - 8020
BTEX

=====
CLIENT: AGI DATE REC'D: 05/24/93
PROJECT: 98th & Edes DATE ANALYZED: 05/26/93
CONTROL NO: N9305-87 MATRIX TYPE: Water
=====

<u>SAMPLE ID:</u>	<u>CONTROL NO:</u>	<u>RESULTS (ug/L)</u>				<u>% SURRO</u>
		<u>Benz</u>	<u>Tol</u>	<u>Et Benz</u>	<u>Xyls</u>	<u>RECOVERY</u>
Blank	N9305-87	ND	ND	ND	ND	84
MW4	N9305-87-1	ND	ND	ND	ND	89
<u>DETECTION LIMIT</u>		1	1	1	1	

=====

EPA METHODS - 601

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=====
CLIENT:      AGI                      DATE REC'D:   05/24/93
PROJECT:     98th & Edes              DATE ANALYZED: 05/26/93
SAMPLE ID:   Blank                    MATRIX TYPE:   Water
CONTROL NO:  N9305-87
=====
  
```

<u>PARAMETERS (601)</u>	<u>RESULTS (ug/L)</u>	<u>DETECTION LIMIT (ug/L)</u>
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl Chloride	ND	5
Bromomethane	ND	5
Chloroethane	ND	5
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Methylene Chloride	ND	1
Trans-1,2-Dichloroethene	ND	1
cis 1,2 -dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloroethane	ND	1
Trichloroethene	ND	1
1,2-Dichloropropane	ND	1
Bromodichloromethane	ND	1
2-Chloroethylvinylether	ND	1
Trans-1,3-Dichloropropene	ND	1
Cis-1,3-Dichloropropene	ND	1
1,1,2-Trichloroethane	ND	1
Tetrachloroethene	ND	1
Dibromochloromethane	ND	1
Chlorobenzene	ND	1
Bromoform	ND	1
1,1,2,2-Tetrachloroethane	ND	1
M-Dichlorobenzene	ND	1
P-Dichlorobenzene	ND	1
O-Dichlorobenzene	ND	1

EPA METHODS - 601

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=====
CLIENT:      AGI                      DATE REC'D:    05/24/93
PROJECT:     98th & Edes              DATE ANALYZED: 05/26/93
SAMPLE ID:   MW4                      MATRIX TYPE:   Water
CONTROL NO:  N9305-87-1
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<u>PARAMETERS (601)</u>	<u>RESULTS (ug/L)</u>	<u>DETECTION LIMIT (ug/L)</u>
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl Chloride	ND	5
Bromomethane	ND	5
Chloroethane	ND	5
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Methylene Chloride	ND	1
Trans-1,2-Dichloroethene	ND	1
cis 1,2 -dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloroethane	ND	1
Trichloroethene	ND	1
1,2-Dichloropropane	ND	1
Bromodichloromethane	ND	1
2-Chloroethylvinylether	ND	1
Trans-1,3-Dichloropropene	ND	1
Cis-1,3-Dichloropropene	ND	1
1,1,2-Trichloroethane	ND	1
Tetrachloroethene	ND	1
Dibromochloromethane	ND	1
Chlorobenzene	ND	1
Bromoform	ND	1
1,1,2,2-Tetrachloroethane	ND	1
M-Dichlorobenzene	ND	1
P-Dichlorobenzene	ND	1
O-Dichlorobenzene	ND	1

QUALITY CONTROL DATA

CLIENT: AGI
PROJECT: 98th & Edes
CONTROL NO: N9305-87
DATE EXTRACTED: 05/25/93
DATE ANALYZED: 05/25/93

METHOD: EPA M8015D
MATRIX: Water

SAMPLE ID: N9305-87-1

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (mg/L)	<u>AMOUNT SPIKED</u> (mg/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
Diesel	ND	100	82	86	5

QUALITY CONTROL DATA

CLIENT: AGI DATE EXTC'D: N/A
 PROJECT: 98th & Edes DATE ANALYZED: 05/27/93
 CONTROL NO: N9305-87

=====
 METHOD EPA 8020
 MATRIX: Water

SAMPLE ID: Blank

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (ug/L)	<u>AMOUNT SPIKED</u> (ug/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
Benzene	ND	20	100	95	5
Toluene	ND	20	70	65	7
Ethyl Benzene	ND	20	95	90	5
Xylene	ND	40	90	85	6

=====

QUALITY CONTROL DATA

CLIENT: AGI
 PROJECT: 98th & Edes DATE EXTRACTED: N/A
 CONTROL NO: N9305-87 DATE ANALYZED: 05/27/93

METHOD EPA 601
 MATRIX: Water

SAMPLE ID: N9305-09-1

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (ug/L)	<u>AMOUNT SPIKED</u> (ug/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
1,1-DCE	ND	50	102	90	13
TCE	ND	50	114	118	3
Chlorobenzene	ND	50	104	116	11



QUALITY CONTROL DATA

CLIENT: AGI
PROJECT: 98th & Edes DATE EXTRACTED: N/A
CONTROL NO: N9305-87 DATE ANALYZED: 05/26/93

METHOD EPA M8015G
MATRIX: Water

SAMPLE ID: Blank

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (mg/L)	<u>AMOUNT SPIKED</u> (mg/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
Gas	ND	2.0	95	110	15

