

GOOD CHEVROLET

1630 Park Street • Phone 510/522-9221
ALAMEDA, CA 94501

ENVIRONMENTAL
PROTECTION
00 JAN 13 PM 3:03

January 12, 2000

- calc SSTL w/ risk of 10^{-5}
- Also quantify other water parameters
be req, Fe^{+3} , SO_4^{-2} , NO_3^{-} alkalinity

Ms. Eva Chu
Alameda County Health Care Services
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94501

RE: Good Chevrolet – 1630 Park Street, Alameda, CA

Dear Ms. Chu:

Enclosed is a proposal prepared by Geo Plexus, Inc. After you have had an opportunity to review the proposal, please give me a call.

Thank you,

GOOD CHEVROLET

JoAnn Stewart

JKS:js

Enclosure



ENVIRONMENTAL
PROTECTION
00 JAN 13 PM 3:03

December 21, 1999

Ms. Jo Ann Stewart
General Manager
Good Chevrolet
1630 Park Street
Alameda, California 94501

**Subject: Revised Passive Remedial Action Work Plan for Good Chevrolet,
1630 Park Street, Alameda, CA**

- Reference:**
- (a) Telephone Conversations with Ms. Eva Chu with Alameda County Department of Environmental Health to Implement a Passive Remedial Action Treatment Program in-lieu-of the Directed Extended/Unlimited Ground Water Monitoring Program, May and June, 1999**
 - (b) Alameda County Department of Environmental Health Risk Assessment Review Letter Directing Extended Ground Water Monitoring, dated March 16, 1999**
 - (c) Preliminary Remedial Risk Assessment for Good Chevrolet, 1630 Park Street, Alameda, CA dated December 18, 1998**
 - (d) Alameda County Department of Environmental Health Request for Soil Gas Vapor Investigation and Health Risk Assessment in-lieu-of Proposed Remedial Action**
 - (e) Phase III Remedial Investigation Report, Good Chevrolet, 1630 Park Street, Alameda, CA dated April 30, 1997**

Dear Ms. Stewart:

Geo Plexus, Incorporated is pleased to present this Revised Passive Remedial Action Work Plan for the subject property (which was originally proposed in April, 1977) to implement a passive bioremediation program to achieve site remediation and closure through the regulatory agencies.

References (a) through (e) provide a chronology of the activities following a reduction of previous directions for remedial action through vapor extraction technologies and compliance with Regional Water Quality Control Board guidelines with respect to performing Risk Based Corrective Action Evaluations for Site Closures.

SITE DATA REVIEW

The project site is an automobile dealership and service center located at 1630 Park Street in the City of Alameda, in Alameda County, California as indicated on Figure 1.

A 300 gallon waste oil storage tank and a 500 gallon underground gasoline storage tank were reportedly removed from the property by Petroleum Engineering, Inc. in October, 1986. A subsurface investigation including installation of three ground water monitoring wells (see Figure 2) was performed by Groundwater Technology, Inc. in January, 1987 (Groundwater Technology, Inc. Report Dated April 29, 1987).

The three monitoring wells were monitored to evaluate the ground water conditions and to establish the direction(s) of ground water flow at the project site. The monitoring determined that the direction of flow beneath the site varies from a northwesterly direction to a northeasterly direction throughout the year. The quarterly sampling has also detected Total Petroleum Hydrocarbons as gasoline and Volatile Aromatic Compounds at various concentrations throughout the year.

A supplemental investigation was performed by Geo Plexus which included advancing 7 soil borings across the parking area of the property (see Figure 2). This investigation identified high concentrations of Total Petroleum Hydrocarbons as gasoline and Volatile Aromatic Compounds (Benzene, Toluene, Ethyl Benzene, and Xylene) in the immediate vicinity of the former underground storage tanks at depths of 5-12 feet below the ground surface. The borings identified concentrations of Total Petroleum Hydrocarbons as gasoline as high as 15,000 parts per million (ppm) decreasing to 1,000 ppm within 30-feet from the former tanks (lateral direction) and decreasing to 1,800 ppm at the down-gradient property boundary.

Two additional ground water monitoring wells were installed by Geo Plexus in April, 1994 to further characterize the down-gradient water conditions. The findings of the initial ground water samples indicated a significant increase in concentrations of Total Petroleum Hydrocarbons as gasoline and Volatile Aromatic Compounds down-gradient of the property.

The ground water levels recorded to date reflect fluctuations ranging from 3 to 13 feet below the ground surface and indicate that ground water generally flows in a northwest direction.

A Remedial Investigation was performed by Geo Plexus in April, 1997 which included advancing eight (8) subsurface exploratory geo-probes at locations which were immediately "up-", "down", and "cross-gradient" from the former underground storage tanks (see Figure 3). Grab ground water samples were also obtained from the probes for analytical testing.

The findings of the investigation indicated that gasoline contaminated soil remain in-place at the project site and is confined to depths ranging from 7- to 11-feet below the ground surface and is of limited extent.

The concentrations of Benzene in the soil exceed the ASTM RBCA Tier-1 RBSL's for contaminant leaching to ground water and gas migration to indoor air. Similarly, the concentrations of Benzene in the ground water exceed the Tier-1 RBSL's for ground water ingestion and gas migration to indoor air; however, the concentrations are below the Tier-1 RBSL's for gas migration to outdoor air. It was concluded that the site conditions did not warrant active ground water remediation and a passive remedial technology was recommended.

Alameda County personnel subsequently provided directives that remedial action was not deemed appropriate and that the site could be considered for closure as a "low risk site" under the revised Regional Water Quality Control Board guidelines. As such it was directed that soil gas probes should be advanced to obtain data for a human health risk evaluation.

GROUND WATER DATA REVIEW

Ground water elevations recorded suggest that the ground water flow is to the northwest as indicated on Figure 4. The ground water gradient for November, 1998 was determined to be 0.013 ft/ft (also see Figure 4). The direction of ground water was consistent with previously observed flow directions.

Table 1 summarizes the historic analytical test results for the monitoring well samples:

TABLE 1

SUMMARY OF GROUND WATER ANALYTICAL TEST DATA

<u>Date Sample</u>	<u>Total Petroleum Hydrocarbons</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl-Benzene</u>	<u>Total Xylenes</u>	<u>MTBE</u>
<u>Monitoring Well MW-1</u>						
1-21-87 ⁽¹⁾	21,020	1,148	8,627	1,792	6,012	
1-11-89 ⁽¹⁾	1,400	74	10	13	5	
7-12-89 ⁽¹⁾	1,200	470	49	45	33	
4-09-91 ⁽²⁾	850	260	10	15	12	
7-14-92 ⁽³⁾	13,000	2,300	1,200	1,200	1,200	
10-7-92 ⁽³⁾	3,600	1,600	80	120	120	
1-11-93 ⁽³⁾	1,200	410	16	23	19	
4-23-93 ⁽³⁾	2,200	720	180	82	150	
7-08-93 ⁽³⁾	3,200	1,200	110	97	100	
10-15-93 ⁽³⁾	3,700	1,400	43	94	36	
1-25-94 ⁽³⁾	1,600	680	16	41	35	
4-28-94 ⁽³⁾	6,100	1,900	380	250	340	
7-27-94 ⁽³⁾	6,000	1,800	510	220	450	
10-27-94 ⁽³⁾	3,000	1,100	79	82	87	
1-26-95 ⁽³⁾	1,600	660	100	82	87	
4-13-95 ⁽³⁾	3,800	1,200	270	120	260	
7-21-95 ⁽³⁾	5,200	1,500	450	190	400	
10-25-95 ⁽³⁾	5,900	1,800	450	210	400	
1-21-97 ⁽³⁾	3,100	1,100	87	160	180	ND<7.3
11-12-98 ⁽³⁾	1,000	280	3.0	3.3	7.9	ND<30
<u>Monitoring Well MW-2</u>						
1-21-87 ⁽¹⁾	5,018	386	1,981	285	1,432	
1-11-89 ⁽¹⁾	10,000	3,000	410	240	190	
7-12-89 ⁽¹⁾	7,600	2,700	540	250	320	
4-09-91 ⁽²⁾	4,900	910	210	130	200	
7-14-92 ⁽³⁾	13,000	4,400	1,500	610	1,100	

TABLE 1 (cont'd)

SUMMARY OF GROUND WATER ANALYTICAL TEST DATA

<u>Date Sample</u>	<u>Total Petroleum Hydrocarbons</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl-Benzene</u>	<u>Total Xylenes</u>	<u>MTBE</u>
<u>Monitoring Well MW-2 (cont'd)</u>						
10-7-92 ⁽³⁾	11,000	5,200	1,500	500	1,200	
1-11-93 ⁽³⁾	17,000	940	1,100	480	930	
4-23-93 ⁽³⁾	52,000	13,000	8,400	1,700	5,300	
7-08-93 ⁽³⁾	6,400	2,500	470	280	530	
10-15-93 ⁽³⁾	17,000	3,900	870	500	940	
1-25-94 ⁽³⁾	16,000	5,400	1,140	640	1,500	
4-28-94 ⁽³⁾	15,000	4,000	910	480	1,200	
7-27-94 ⁽³⁾	18,000	6,000	760	630	1,600	
10-27-94 ⁽³⁾	9,500	2,700	230	320	640	
1-26-95 ⁽³⁾	5,900	1,900	290	230	500	
4-13-95 ⁽³⁾	10,000	3,300	620	360	930	
7-21-95 ⁽³⁾	9,900	3,300	320	390	830	
10-25-95 ⁽³⁾	13,000	4,900	400	580	990	
1-21-97 ⁽³⁾	7,600	2,600	310	330	660	ND<20
11-12-98 ⁽³⁾	31,000	11,000	750	1,500	2,300	ND<900
<u>Monitoring Well MW-3</u>						
1-21-87 ⁽¹⁾	10,287	1,428	3,281	610	2,761	
1-11-89 ⁽¹⁾	5,300	1,800	340	150	160	
7-12-89 ⁽¹⁾	7,800	3,100	900	300	480	
4-09-91 ⁽²⁾	9,400	1,400	730	200	510	
7-14-92 ⁽³⁾	17,000	3,500	390	390	260	
10-7-92 ⁽³⁾	9,200	4,300	470	390	610	
1-11-93 ⁽³⁾	2,000	740	29	58	28	
4-23-93 ⁽³⁾	6,500	2,600	280	260	190	
7-08-93 ⁽³⁾	5,200	2,100	260	250	180	
10-15-93 ⁽³⁾	11,000	3,500	580	430	370	
1-25-94 ⁽³⁾	6,200	2,500	270	160	28	
4-28-94 ⁽³⁾	5,300	1,700	190	210	180	
7-27-94 ⁽³⁾	5,900	2,000	360	260	330	
10-27-94 ⁽³⁾	8,000	2,200	580	260	470	
1-26-95 ⁽³⁾	3,700	1,200	150	150	190	
4-13-95 ⁽³⁾	4,000	1,400	200	180	210	
7-21-95 ⁽³⁾	5,700	2,000	280	270	280	

TABLE 1 (cont'd)

SUMMARY OF GROUND WATER ANALYTICAL TEST DATA

<u>Date Sample</u>	<u>Total Petroleum Hydrocarbons</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl-Benzene</u>	<u>Total Xylenes</u>	<u>MTBE</u>
<u>Monitoring Well MW-3 (cont'd)</u>						
10-25-95 ⁽³⁾	11,000	3,500	1,100	460	680	
1-21-97 ⁽³⁾	2,200	860	63	71	80	ND
11-12-98 ⁽³⁾	180	44	0.51	ND	0.92	ND<20
<u>Monitoring Well MW-4</u>						
4-28-94 ⁽³⁾	190	3.8	2.9	2.1	3.1	
7-27-94 ⁽³⁾	180	15	9.2	7.6	28	
10-27-94 ⁽³⁾	130	8.6	6.6	4.5	17	
1-26-95 ⁽³⁾	110	6.5	1.2	1.8	11	
4-13-95 ⁽³⁾	82	3.9	N.D.	N.D.	2.5	
7-21-95 ⁽³⁾	130	8.8	1.3	4.5	7.6	
10-25-95 ⁽³⁾	95	6.6	1.7	4.3	7.0	
1-21-97 ⁽³⁾	not sampled					
11-12-98 ⁽³⁾	not sampled					
<u>Monitoring Well MW-5</u>						
4-28-94 ⁽³⁾	30,000	4,000	3,000	810	3,500	
7-27-94 ⁽³⁾	9,300	2,000	800	290	940	
10-27-94 ⁽³⁾	15,000	2,700	1,300	420	1,100	
1-26-95 ⁽³⁾	7,900	2,100	680	240	860	
4-13-95 ⁽³⁾	7,900	2,400	580	340	630	
7-21-95 ⁽³⁾	11,000	3,400	760	610	1,200	
10-25-95 ⁽³⁾	13,000	2,900	830	570	1,100	
1-21-97 ⁽³⁾	2,600	750	65	1860	280	ND
11-12-98 ⁽³⁾	ND	2.2	ND	ND	ND	ND

Note: (1) Concentrations reported by Groundwater Technology, Inc.
 (2) Concentrations reported by Environmental Science & Engineering, Inc.
 (3) Samples obtained and reported by Geo Plexus, Inc.

RISK ASSESSMENT INVESTIGATION

A Remedial Risk Assessment was subsequently performed which included advancing three (3) gas collection probes at the site to obtain soil gas measurements within and exterior to the existing building and performing a Tier-II ASTM Risk-Based Corrective Action (RBCA) assessment for the project site.

Soil gas samples were obtained at depths of 3-feet below the ground surface through the use of summa canisters. The analytical testing of the soil gas probe samples did not indicate the presence of significant volatile organic vapors within the upper 3-feet of soil at the "source area". This confirmed that, although there is some soil and ground water contaminants remaining, the extent of off-gassing through the upper soils is very low.

REMEDIAL ACTION THRESHOLD CRITERIA

Various agencies have published criteria and guidelines related to investigation and remediation of soil and ground water contaminated with petroleum compounds. This section addresses the documents and guidelines which were considered applicable to the project site and addresses the technical approach used to develop evaluation criteria for the project site.

The principal guidance document applicable to estimating the human health and environmental risk of site contaminants is the ASTM Risk-Based Corrective Action (RBCA) document. The ASTM-RBCA document outlines general assessment criteria based on the risk of exposure to the contaminated soil (by off-gassing and/or direct contact), by the potential for contaminants to leach to the ground water, by off-gassing from ground water, and from ground water ingestion.

Although the Tri-Regional Guidelines and State of California Drinking Water Standards have been used a standard for petroleum hydrocarbon clean-up activities throughout the San Francisco Bay Area, the ASTM-RBCA criteria provide a conservative level of assurance that potential risks have been mitigated. Using the ASTM-RBCA approach, the following site conditions and assumptions were used to assess the project site:

- (1) the project site is a commercial/industrial land use site and is surrounded by commercial and industrial properties;
- (2) the site is planned for continued commercial/industrial use and is not anticipated to be developed in the future for residential use;
- (3) ground water is at a depth of 8- to 13-feet below the ground surface;
- (4) the existing soil contamination does not extend beneath the existing building;
- (5) the ground water contaminant plume is located beneath paved open space areas and does not extend beneath the existing building; and
- (6) domestic ground water wells do not exist within 500-feet from the property.

Based on the above factors, use of a commercial cancer risk of 1×10^{-4} as outlined in the ASTM-RBCA document was considered to be conservative and applicable for the development of petroleum related evaluation levels for the project site. The risk-based analysis required establishing Tier-II Evaluation Risk-Based Site Specific Threshold Levels (SSTL's) for the contaminants of concern.

To assess the potential health risk of the project site, a Tier II Risk Based Corrective Action analysis was performed in accordance with the procedures presented in ASTM E 1739-95 using a commercially available, automated process known as "Tier 2 RBCA Tool Kit" published by Groundwater Services, Inc. using a "commercial" health risk of 1×10^{-4} as established and included the petroleum constituents known to be present.

The soil contaminant data set was derived from the previous soil borings/geoprobes EB-8, EB-9, EB-10, EB-11, and EB-12 to represent the "source area" at a depth of 8.5- to 12.5-feet. The contaminant concentrations were averaged from each sample for each individual constituent. Similarly, the ground water contaminant data set was derived from averaging the last five (5) sample events for Monitoring Well MW-2 (also to represent the "source area").

The analysis did not identify the shallow soils (less than 3-feet) to be a source of contaminant risk for: (1) soil contaminant leaching to the underlying ground water resources; or (2) for dermal contact or ingestion with the soil.

The analysis indicated that the concentrations of Benzene and MTBE in the subsurface soils (below 3-feet) represented a risk for impacting the underlying ground water and that the concentrations of Benzene and Ethylbenzene in the subsurface soils represented a risk for generation of gas to indoor air.

The analysis further indicated that the concentrations of Benzene present in the ground water exceed the SSTL's for drinking water and for generation of gas to indoor air.

SUMMARY OF PREVIOUS FINDINGS

The analytical test data from previous investigation activities indicated that low to moderate concentrations of Total Petroleum Hydrocarbons as gasoline and Volatile Aromatic Compounds (BTEX) remain in the soil in the immediate vicinity of the former tanks; however, the extent of soil contamination is limited. There is no significant presence of MTBE in the soil. The highest concentrations of gasoline were detected in Borings EB-9, 10, and 11 which are located down-gradient of the former tanks and dispenser pump. The remaining samples indicated that the soil contamination extends in a radial pattern (cross- and down-gradient) from the former tank area.

The monitoring wells continued to exhibit low to moderate concentrations of Total Petroleum Hydrocarbons as gasoline and Volatile Aromatic Compounds (Benzene, Toluene, Ethyl Benzene, and Xylene) suggesting that the source of these compounds is the former underground storage tanks. However, the concentrations reduce significantly with distance from the source area and there is no detectable presence of MTBE in the ground water.

The concentrations of Benzene in the soil exceed the Tier-II SSTL's for contaminant leaching to ground water and gas migration to indoor air; however, the concentrations are not significantly elevated from the SSTL's (less than one order of magnitude difference). Furthermore, the contaminant area is located beneath paved parking areas and not located beneath structures.

The concentrations of Benzene in the ground water exceed the Tier-II SSTL's for ground water ingestion and gas migration to indoor air; however, the shallow ground water is not used for human consumption and that there are no buildings existing or planned within the boundaries of the plume. Noting that the concentrations of Benzene are below the Tier-II SSTL's for gas migration to outdoor air, the two previous exposure pathways are of limited concern for the site conditions.

RECOMMENDATIONS FOR REMEDIAL ACTION

It remains our recommendation (as presented in April, 1997) that limited site remediation be accomplished using oxygen releasing compounds (ORC manufactured by Regenisis) placed directly into the soil (boring backfill material) throughout the source area to promote oxygenation of the "shallow" soil and ground water and resulting in the associated biostimulation/bioremediation of the existing petroleum compounds. Dissolved oxygen content, concentrations of contaminant gas constituents, and carbon dioxide levels should be monitored at the existing wells to evaluate the remedial progress and to support site closure.

PROPOSED REMEDIAL ACTION PLAN

The objective of the proposed remedial action is to achieve sustained concentrations of Benzene and MTBE (and associated petroleum related contaminants) in the ground water below the RBCA Tier-II Threshold Levels for a commercial cancer risk of 1×10^{-4} . It is fully anticipated that residual concentrations of heavier hydrocarbon compounds (referred to as Total Petroleum Hydrocarbons) will persist in the soil and ground water following completion of the treatment period. However, it is noted that current State of California guidelines do not include these heavier petroleum compounds in the remedial criteria. 10⁻⁵

To accomplish this objective, it is proposed to inject Oxygen Releasing Compounds (ORC's), manufactured and distributed by Regenisis Bioremediation Products and composed of magnesium peroxide directly into the soil throughout the "source area" as indicated on Figure 5.

The principal benefits of this product are the oxygen release to the ground water to provide positive barrier for potential migration of these contaminants and further promote the bacterial degradation of the contaminants in the ground water.

It is anticipated that approximately 25-30 injection locations (advanced on 5-foot grid centers) with injection from 4-feet to 15-feet below the ground surface would be required to accomplish the remedial strategy.

The effectiveness of the remedial program would be monitored using existing ground water monitoring wells and would not result in additional wells at the site. To monitor the oxygenation and remediation process, soil gas parameters including: lower explosive limit (LEL), total volatile hydrocarbons (TVH), percent oxygen (O₂), and carbon dioxide (CO₂) content will measured along with the dissolved oxygen (DO) content of the ground water in the monitoring wells.

It is anticipated that the passive remedial action would take approximately 18-30 months to accomplish the objective with one additional re-injection episode (after 1-year) to re-stimulate recalcitrant sections of the contaminant plume.

Quarterly ground water monitoring reports will be prepared to continue to document the ground water conditions and to present the results of the analytical testing.

It is further recommended that a formal bid proposal be prepared and issued to a minimum of three (3) technical consultants/contractors to accomplish the proposed work in accordance with the State of California Underground Storage Tank Fund requirements.

One copy of this Work Plan should be forwarded to:

Ms. Eva Chu
Alameda County Health Care Services
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

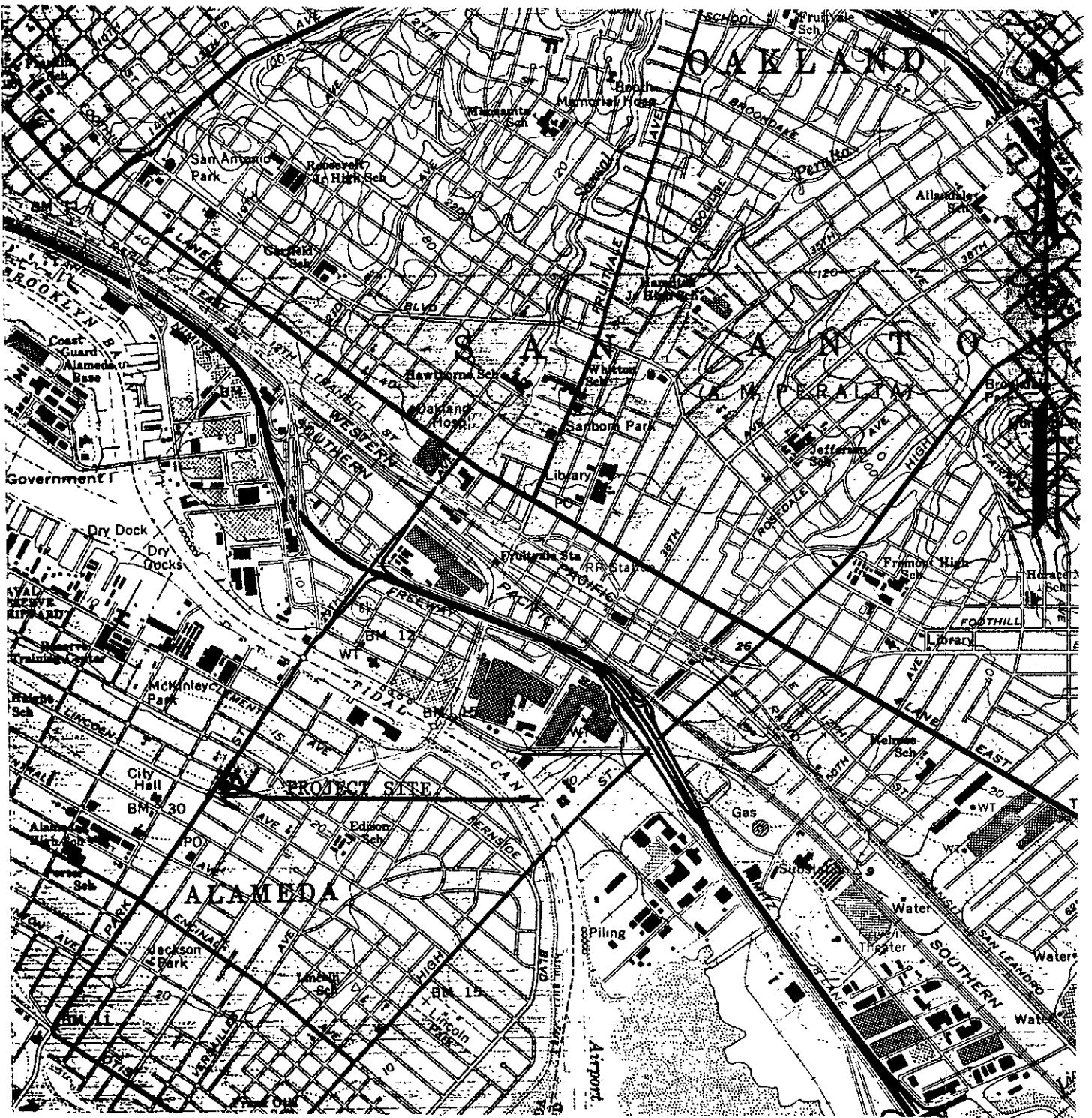
It has been a pleasure to be of service to you on this project. Questions or comments regarding the attached Report should be addressed to the undersigned.

Respectfully submitted,

Geo Plexus, Incorporated

Cathrene Diane Glick, CEG 1338, HG 32
Director, Geologic and Environmental Services





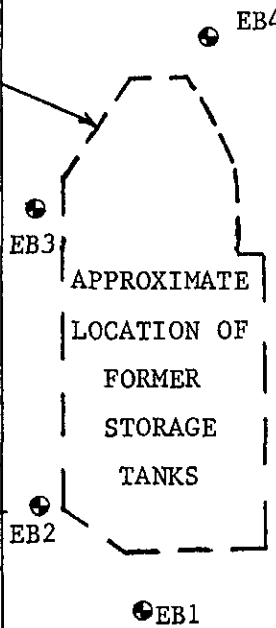
GOOD CHEVROLET		
DATE	SCALE	DRAWN BY
10-9-92	1"=2000'	dgc
LOCATION MAP		
		Figure 1

GeoPlexus, Inc.

SIDEWALK

GOOD CHEVROLET
SHOW ROOM

APPROXIMATE
LIMITS OF
PREVIOUS
EXCAVATION



SERVICE CENTER

PROPERTY FENCE LINE

GOOD CHEVROLET		
DATE 10/25/93	SCALE 1"=10'	DRAWN BY dgc
SITE PLAN		
		Figure 2

ARROW INDICATES DIRECTION OF TRAFFIC FLOW

CENTER LINE

PARKING LANE

SIDEWALK

SIDEWALK

GOOD CHEVROLET SHOWROOM

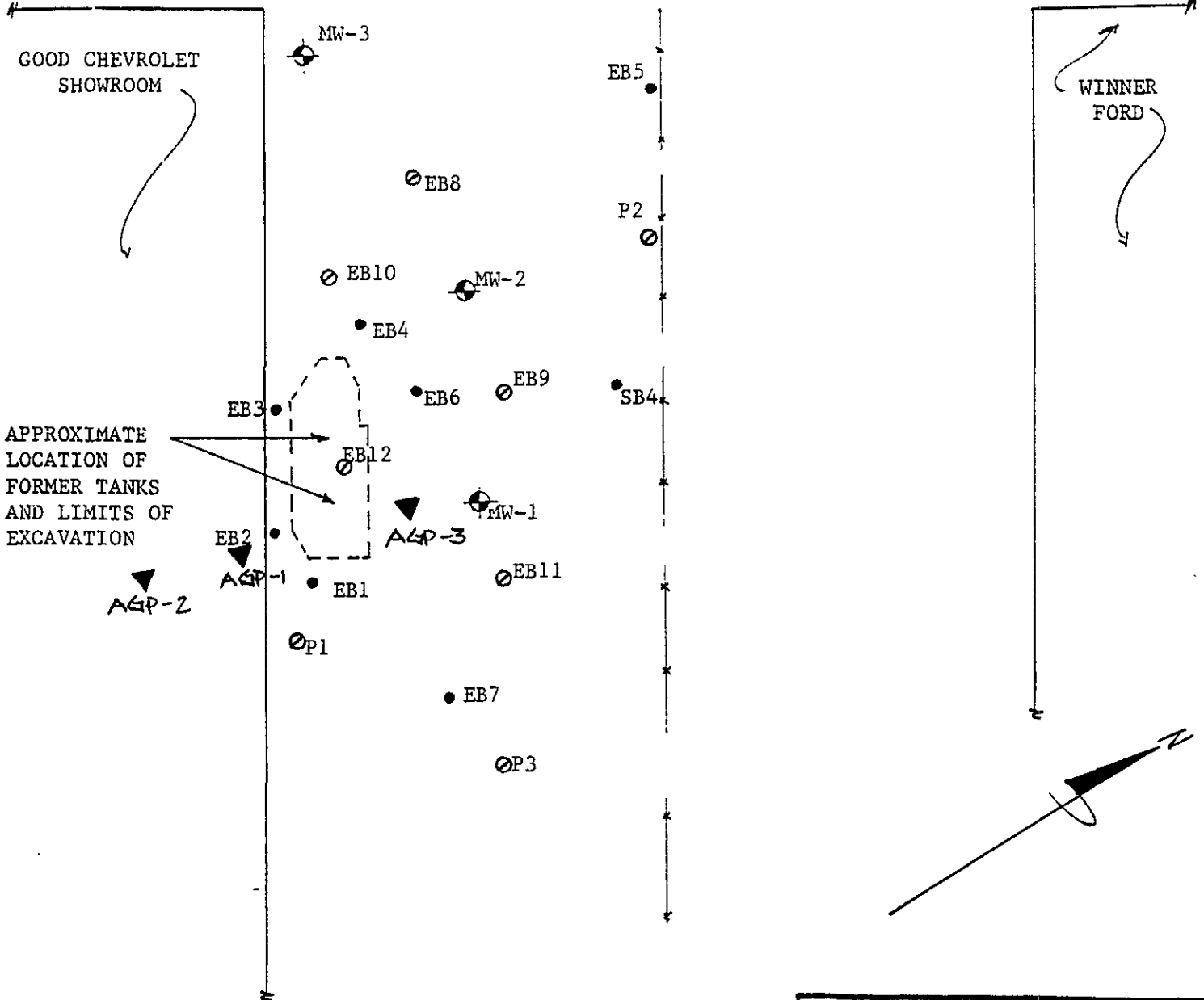
WINNER FORD

APPROXIMATE LOCATION OF FORMER TANKS AND LIMITS OF EXCAVATION

- ⊕ Monitoring Wells
- Borings Previous Studies
- ⊙ Borings Previous Study 1/97

GeoPlexus, Inc.

GOOD CHEVROLET		
DATE 12/5/98	SCALE 1"=20'	DRAWN BY dgc
SOIL GAS PROBE LOCATION PLAN		
		Figure 3



ARROW INDICATES DIRECTION OF TRAFFIC FLOW

CENTER LINE

PARKING LANE

SIDEWALK

SIDEWALK

GOOD CHEVROLET SHOWROOM

WINNER FORD

APPROXIMATE LOCATION OF FORMER TANKS AND LIMITS OF EXCAVATION

97.50

MW-3

MW-4

MW-5

EB8

EB5

EB10

MW-2

EB4

P2

EB3

EB6

EB9

SB4

EB12

MW-1

EB2

EB11

OP1

EB7

OP3

- ⊕ Monitoring Wells
- Borings Previous Studies
- ⊙ Borings Previous Study 1/97

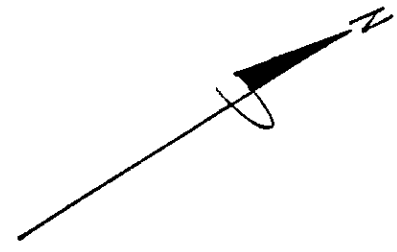
GeoPlexus, Inc.

GOOD CHEVROLET		
DATE 12-5-98	SCALE 1"=20'	DRAWN BY dgc
GROUNDWATER GRADIENT PLAN		
		Figure 4

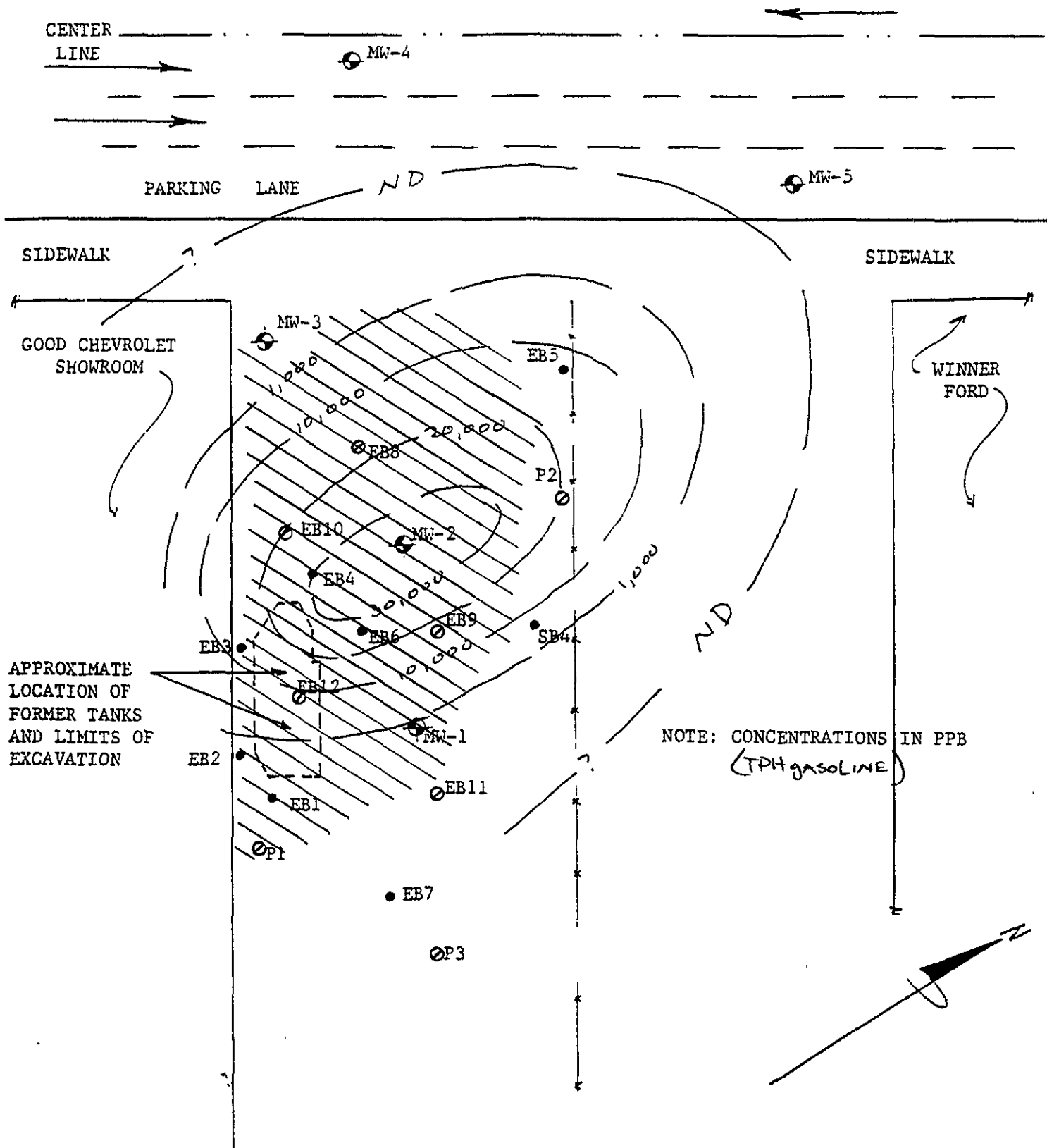
0.0013 S.F. DIRECTION OF FLOW

0.576

0.016



ARROW INDICATES DIRECTION OF TRAFFIC FLOW



APPROXIMATE LOCATION OF FORMER TANKS AND LIMITS OF EXCAVATION

NOTE: CONCENTRATIONS IN PPB (TPH GASOLINE)

- ⊕ Monitoring Wells
- Borings Previous Studies
- ⊙ Borings Previous Study 1/97

GeoPlexus, Inc.

GOOD CHEVROLET		
DATE 12-5-98	SCALE 1"=20'	DRAWN BY dcg
PROPOSED INJECTION AREA		
Figure 5		