enviros®

April 17, 1995

Mr. Lynn Walker
Shell Oil Company
P.O. Box 4023
Concord, California 94524

RE: **Corrective Action Plan**
Former Shell Service Station
15275 Washington Avenue
San Leandro, California
WIC #204-6852-1108

Dear Mr. Walker:

Enviros, Inc. (Enviros) has prepared this Corrective Action Plan (CAP) to describe a remedial approach for the referenced site (Plates 1 and 2). The approach described in this CAP has been developed to address the Alameda County Health Care Services Agency (ACHCSA) correspondence dated February 16, 1995

1.0 SITE HISTORY

In August 1985, Emcon Associates (Emcon) installed four groundwater monitoring wells (designated S-1 through S-4). Lithology encountered in the borings was primarily clay (CL), with interbedded discreet stringers of sand (SM and SP), and silt (ML). Groundwater was encountered at 6 to 7 feet below grade (fbg). Petroleum hydrocarbons calculated as Gasoline (TPH-G) were identified in soil samples ranging from 3,100 to 3,900 parts per million (ppm). Dissolved TPH-G was detected in groundwater in Wells S-1, S-2, and S-4 ranging from 520 parts per billion (ppb) to 32,000 ppb. Floating product (0.5 ft.) was measured in Well S-3.

In August 1986, Emcon drilled four exploratory soil borings (designated S-A through S-D). This investigation was described in the Emcon report dated September 12, 1986. Boring S-A was drilled adjacent to the waste oil tank. Borings S-B through S-D were drilled adjacent to the fuel underground storage tanks (USTs). Boring S-A soils contained 330 ppm TPH, and no waste oil. Borings S-B and S-C contained TPH concentrations ranging from no detection (ND) to 1,700 ppm. Boring S-D was ND at all sample depths. Boring S-B was completed as a monitoring point by installing 3-inch diameter PVC well casing in the borehole. Floating product was discovered in S-B in August 1986. Product thickness was reported on August 28, 1986 to be 0.40 ft. Subsequently, this well was measured and floating product was bailed on a weekly basis.

In December 1986, Well [redacted] was installed. TPH-G was detected in well S-5 at a concentration of 7,800 ppb. Benzene was detected at a concentration of 380 ppb. This well installation was described in the Emcon report dated January 28, 1987.

Enviros, Inc. 270 Perkins Street P.O. Box 259 Sonoma, California 95476-0259 Tel 707 / 935-4850 Fax 707 / 935-6649

In February 1987, Emcon performed a 1-mile radius water well survey. Based on this survey and calculated groundwater flow direction, southwest-southeast, only three wells were located within a 1/4-mile of the subject property in the downgradient direction. All three wells were former irrigation wells. The closest well was perforated from 100-120 fbg (Well #43). Well #56 was abandoned. Well #41 was drilled to a total depth of 130 feet. No information was available on the perforated zone of this well. Well #41 was located approximately 1/8-mile south of the subject property.

wells reportedly still present during 10/87 trenching activities!

In May 1987, Wells S-B, [redacted] were destroyed during on-site construction activities.

On June 6, 1987, the waste oil tank was replaced with a double-wall tank. This tank removal was documented in the Blaine Tech Services, Inc. (Blaine) report dated June 22, 1987. Soil samples collected beneath the removed tank contained 280 ppm TPH-G and 14 ppm benzene. Analysis for Total Petroleum Hydrocarbons as Diesel (TPH-D) was ND. STLC lead was detected at a concentration of 0.027 mg/L and TTLC lead was detected at a concentration of 22 mg/kg. Organic lead was identified at a concentration of 0.020 mg/kg. Aside from benzene, no VOCs were detected in soil samples from beneath the waste oil tank. As a result, soils were overexcavated to a depth of 13 fbg and approximately 2 to 4 feet beyond the dimensions of the waste oil tank. [redacted]

samples?

On June 9, 1987, four fuel USTs were removed; 2-5,000 gallon tanks, 1-8,000 gallon tank, and 1-7,500 gallon tank. These tank removals are described in the Kaprealian Engineering, Inc. (KEI) report dated June 24, 1987. A total of four soil samples were collected from the tank pit walls (Samples A through D). Groundwater was encountered at 10.5 fbg. Soil sample analyses indicated TPH-G levels of less than 100 ppm in all samples except Sample D (910 ppm). However, due to exposed underground utilities (i.e. sewer line), overexcavation could not be performed. A total of approximately [redacted] n July 1987, KEI sampled the stockpiled soils on site. TPH-G concentrations ranged from 11 to 64 ppm and benzene concentrations ranged from ND to 1.3 ppm. These soils were subsequently transported and disposed of at an appropriate Class III facility.

samples? lacking!

In December 1987, KEI performed a subsurface investigation at the subject property. Three trenches were excavated away from the former tank pit area. The trenches were dug down to a depth of approximately 8.5 fbg. TPH-G was identified in soil at concentrations ranging from 100 to 730 ppm and benzene was identified from at concentrations ranging from 3.9 to 10 ppm. [redacted] On December 22, 1987, the stockpiled soils (approximately [redacted] were sampled. TPH-G was detected in these soils at a concentration of 3.5 ppm. Benzene was ND. [redacted] The results of this investigation are presented in the KEI report dated December 7, 1987.

200 yds³

Quarterly groundwater monitoring of existing wells began in September 1988.

In November 1988, Woodward-Clyde installed monitoring wells S-6 through S-12. Additionally, a soil gas survey was performed. Soil gas from soil samples ranged from 0.63 to 5,800 ppm for TPH-G and 0.070 to 1,000 ppm for benzene. Groundwater samples collected from Wells S-1 through S-12 contained detectable concentrations of

TPH-G ranging from 50 ppb to 70,000 ppb (Well S-3). Benzene was detected at concentrations up to 4,600 ppb (Well S-3). These activities are described in the Woodward-Clyde report dated April 14, 1989.

In April 1989, GeoStrategies, Inc. (GSI) installed Wells S-13 through S-17. Field procedures for these well installations are described in the GSI report dated October 12, 1989. Additionally, the installation of recovery well SR-1 is also described in this GSI report.

In March 1990, GSI performed a variable discharge pump test in Well SR-1, and slug tests in Wells S-1, S-3, S-5, S-7, S-9, S-10, S-13, S-14, and S-16. The variable test lasted 52 minutes at a pumping rate of 2 gallons per minute. The results of these tests indicated that the aquifer beneath the subject property demonstrated very low yield. Transmissivity values ranged from 408 to 11,000 gallons per day per foot. Hydraulic conductivity values ranged from 7.3 to 100 feet per day. These data were derived from the slug tests. Based on actual yield during pumping, these values appear to be inflated and are probably more representative of the surrounding sandpack material than actual formation material. Based on the very low yield of the aquifer and the distribution of petroleum hydrocarbons in the subsurface, GSI recommended that the Benzene Transport Model developed by Shell Oil Company be used to track plume attenuation. Quarterly reporting continued throughout 1990.

In 1991, GSI prepared and submitted four quarterly reports to the appropriate regulatory agencies. Additionally, Well S-18 was installed. This well installation is described in the GSI June 24, 1991 Site Update/Well Installation Report.

In 1993, Wells S-11 through S-15 were paved over by the City of San Leandro. These wells were relocated, vault boxes raised to new grade and elevations were resurveyed.

2.0 SITE CONDITIONS

2.1 Previous Investigations

Previous investigations at the subject property have been performed to delineate the extent of petroleum hydrocarbons in soil and groundwater. Additionally, investigations have been performed to characterize hydraulic properties of the shallow aquifer. These investigations have been presented chronologically in section 1.0 and are described in detail in the following sections of this document.

2.2 Site Geology

A total of nineteen monitoring wells have been installed and four exploratory soil borings have been drilled to characterize subsurface conditions beneath the subject site. Based on data collected from these investigations, the subsurface geology consists primarily of a low permeability clay (CL and CH) with interspersed discreet stringers of sand (SP and SW) and silt (ML). Well SR-1 is the only well that encountered a sandy aquifer (28 to 40.5 fbg). The upper water-bearing zone appears to extend from a depth of approximately 6 feet to 20 fbg. Water in this upper zone is most likely yielded from the discreet sandy interbeds and possibly from silty horizons in the predominantly clay (CL and CH) matrix. A

geologic cross-section prepared by Woodward-Clyde Consultants depicting subsurface lithology is presented in Appendix A. Exploratory boring logs for soil borings and well borings are also presented in Appendix A.

2.3 Site Hydrogeology

First encountered groundwater occurs at depths ranging from approximately 6 to 20 fbg based on review of exploratory boring logs. Stabilized depths to groundwater have ranged from approximately 6 to 9 fbg. Historically, groundwater flow has been predominantly southwest to southeast. Based on a review of historical groundwater elevation data, water level fluctuations appear to be approximately 2 to 4 feet seasonally. Groundwater gradient calculated from the Emcon 4th Quarter 1994 report was 0.004 ft./ft. This gradient is consistent with historical groundwater flow gradient.

The groundwater contour map from the Emcon January 5, 1995 report is included in Appendix B. A summary of Historical Groundwater Elevation Data prepared by Emcon is presented in Table 1.

2.4 Soil Chemistry

Sampling data from the underground storage tank removals indicated the presence of TPH-G and benzene in soils from the pit walls and pit bottoms. As a result, over-excavation was performed, when possible, and stockpiled soils were aerated on site and were then properly disposed. Soil samples from the waste oil tank excavation were also analyzed for TPH-D, volatile organic compounds (VOCs), TTLC and STLC lead. No TPH-D or VOCs (except benzene), were present in the soil. TTLC and STLC lead values were low (refer to section 1.0). Waste oil was not detected in soil samples taken from the boring (S-A) adjacent to the waste oil tank.

no evidence for any source removal other than backfill media

Soil samples taken from UST complex borings (S-B through S-D) and monitoring well borings S-1 through S-18 were analyzed for Total Petroleum Hydrocarbons calculated as gasoline (TPH-G), and benzene, toluene, ethylbenzene, and xylenes (BTEX). Due to shallow groundwater conditions, most of the soil samples analyzed were collected from the capillary fringe or saturated zones and may be representative of groundwater conditions. The distribution of TPH-G and benzene in soils is presented on Plate 3.

No! soil from 4-4.5' depths in borings S-6 thru S-12 do not appear to be representative of GW conditions

2.5 Groundwater Chemistry

Currently, a total of seventeen monitoring wells exist at the subject site. Of these, there are seven on-site wells (S-1, S-3, S-5, S-6, S-7, S-8 and SR-1), and ten off-site wells (S-9 through S-18). The locations of these wells are shown on Plate 2. Quarterly monitoring at the site began in September 1988. Historical Groundwater Analytical Data are presented in Table 2 prepared by Emcon. The most recent TPH-G and BTEX concentration map prepared by Emcon is presented on Plate 4.

Historically, low levels of TPH-G and benzene have been present in Wells S-1, S-6, S-7, S-10, S-11, S-12, S-13, S-15, S-16, S-17 and S-18. Several sampling events indicate levels below method detection limit concentrations in these wells (Table 2). Wells S-1, S-6

2.7 Previous Source Removal and Remediation Activities

In 1987, the underground storage tanks were removed from the site as previously described. During the tank removal, approximately [redacted] of soil were excavated. This soil was aerated prior to disposal offsite.

3.0 GROUNDWATER USE EVALUATION

3.1 Beneficial Uses

The residences and commercial properties in the vicinity of the subject site receive water from the San Leandro and Pardee Reservoirs through the East Bay Municipal Utility District. Drinking water is not supplied from local groundwater. Therefore, groundwater contamination beneath the subject property does not pose a threat to human health since it is not a source of drinking water.

3.2 Well Survey

A well survey was performed by Emcon in 1987 and updated by Enviros in April 1995. The Alameda County Public Works agency was contacted for a list of wells within a 0.5-mile radius of the subject property. The well survey data are presented in Appendix C. Data for downgradient wells identified during this survey are consistent with the 1987 Emcon survey and are presented below.

Dist. from source

Address	Owner	Installation Date	Depth (ft.)	Use	
15325 Washington	Gualco	1920	130	Irrigation	
915 Lewelling	Pianetta	1925	120	Irrigation	0.3 mi / 1584 ft
15547 Sedgeham	Raele	—	—	Abandoned	
983 Lewelling					0.4 mi / 2112 ft

Based on the size of the groundwater plume as it is presently delineated, these wells are at least 1/8-mile from the distal edge of the groundwater plume (i.e. ND perimeter monitoring wells). 660 ft.

3.3 Ecological Considerations

No recreational waterways exist in close proximity to the subject property. San Lorenzo Creek is located approximately 3/16 of a mile due south of the subject property. This surface waterway is not threatened based on current plume delineation.

4.0 REMEDIAL ALTERNATIVES EVALUATION

An evaluation of available remediation alternatives was made based on cost effective capability in protecting groundwater beneficial uses and receptors.

4.1 Soil Remediation Alternatives

Ex-situ alternatives include either excavation and disposal or excavation and treatment. Previous excavation activities removed the majority of contamination in shallow soils.

Remaining contamination is present within capillary fringe and saturated zones. Based on the extent and depth of this soil contamination beneath the subject property, cost of construction activities and disposal of soils to a landfill, and required backfilling activities, this remedial approach is not technically feasible, nor is it cost-effective.

In-situ soil remediation alternatives include soil flushing, solidification/fixation, bioventing, or soil vapor extraction (SVE). Soil flushing is typically used in conjunction with groundwater extraction and requires the injection of a designated "washing" solution which extracts petroleum hydrocarbons from the soil matrix and flushes them down to groundwater for extraction and surface treatment. Soil flushing is technically unfeasible due to low permeability conditions.

Solidification/Fixation involves permanently bonding petroleum hydrocarbons within the soil matrix. Several technologies have been developed for petroleum hydrocarbons such as Portland cement, flyash, and pozzolanic material. However, inherent problems are associated with this technology. The fixing agents must come into intimate contact with the petroleum hydrocarbons to be effective. Since the subsurface lithology is comprised predominantly of clay, this technology is not feasible.

Bioventing is accomplished by supplying oxygen to the soils to enhance and accelerate the natural biodegradation of petroleum hydrocarbons by indigenous microbes. Since the subsurface lithology is comprised of low-permeability clays, this technology is not feasible.

Soil Vapor Extraction (SVE) is a well documented and proven technology to remediate petroleum hydrocarbons in soil and on the groundwater table. A vacuum is applied on extraction wells and the subsequent soil vapors are abated at the ground surface using appropriate abatement equipment. Air flow through the capillary fringe causes volatilization of petroleum hydrocarbons on the groundwater surface. Additionally, as air is pulled through the soil matrix, natural biodegradation is enhanced and accelerated due to the increase in soil oxygen content. Because of the low permeability of subsurface materials and shallow groundwater conditions, SVE is not practical for this site.

Natural Attenuation Modeling and Monitoring involves the implementation of modeling to predict the fate and transport of petroleum hydrocarbons identified in soils, and institutional controls such as groundwater monitoring to demonstrate that the hydrocarbons in soils are not leaching to groundwater in a manner which will impact receptors and beneficial uses of groundwater. The low permeability of subsurface materials (i.e. clays) and aquifer testing indicate that migration of contaminants at this site is very slow. Therefore it is technically feasible that natural attenuation factors will degrade hydrocarbons in the subsurface prior to their migration to potential receptors.

4.2 Groundwater Remediation Alternatives

The ***Ex-situ*** alternative is groundwater extraction and treatment. This alternative includes the installation of extraction wells to capture and transport petroleum hydrocarbons to a surface treatment area. Conventional pump and treat systems have proven to be effective in providing hydrodynamic control to preclude plume migration, however, these types of systems have also been shown to be very costly in operations are not effective in removing

petroleum hydrocarbons from soil surfaces (i.e. residual concentrations are not effectively removed for treatment). Based on aquifer test data for the subject site, pumping of groundwater for remediation purposes will be ineffective. Furthermore, pumping would likely promote migration of contaminants from the adjacent service station site onto the subject site.

In-situ groundwater remedial alternatives include air sparging, groundwater oxygenation and soil vapor extraction (SVE).

Air sparging involves the injection of air under pressure into the groundwater. This alternative combines two specific methods of groundwater remediation. First, air injected into groundwater strips the volatile components of petroleum hydrocarbons from groundwater. Secondly, air sparging increases the oxygen content of groundwater which enhances and accelerates natural biodegradation processes by indigenous microbes. While air sparging can be effective for groundwater remediation within a limited area surrounding an air sparging well, it has not been demonstrated that any significant radius around the well is benefited. Furthermore, the increased pressure zones created within the aquifer by air injection may promote plume migration and no standard method exists for measuring air sparging's areal influence. Additionally, this technology is not feasible due to low permeability conditions beneath the subject site.

Groundwater oxygenation is similar to air sparging. It involves the injection of low flowrates of air into groundwater in order to increase dissolved oxygen concentrations in groundwater and enhance biodegradation rates by the indigenous microbes. While this technology has feasibility to address groundwater, it is probably not feasible at this site due to low permeability conditions in the subsurface. As a result, this technology was not considered as an alternative for this site.

Soil vapor extraction (SVE), as previously mentioned, has been proven to aid in the remediation of groundwater simultaneously with overlying soils and the capillary fringe. Air flow through the capillary zone causes petroleum hydrocarbons to volatilize from this zone and the groundwater surface and migrate into the overlying soils for capture and surface treatment with appropriate equipment. However, because of low permeability conditions in soils and shallow groundwater conditions beneath the subject site, this technology is not feasible.

Natural Attenuation Modeling and Monitoring involves the implementation of modeling to predict the fate and transport of petroleum hydrocarbons identified in groundwater, and institutional controls such as groundwater monitoring to demonstrate that the hydrocarbons are not impacting receptors and beneficial uses of groundwater. The low permeability of subsurface materials (i.e. clays) and aquifer testing indicate that migration of contaminants at this site is very slow. Therefore it is technically feasible that natural attenuation factors will degrade hydrocarbons in the subsurface prior to their migration to potential receptors.

4.3 Evaluation of Remediation Alternatives

Enviros has evaluated the screened remediation technologies. Based on this screening, the technologies have been evaluated for three specific criteria:

- Implementability
- Effectiveness in protecting beneficial uses and groundwater receptors
- Cost

Enviros has prepared a Ranking Matrix which summarizes our evaluations of remedial alternatives:

REMEDIAL ALTERNATIVES
RANKING MATRIX

REMEDIATION ALTERNATIVE	IMPLEMENTABILITY	EFFECTIVENESS IN PROTECTING BENEFICIAL USES	COST
SOIL			
ATTENUATION MONITORING	HIGH	HIGH	LOW
EX-SITU	LOW	HIGH	HIGH
IN-SITU	LOW	HIGH	HIGH
GROUNDWATER			
ATTENUATION MONITORING	HIGH	HIGH	LOW
EX-SITU	LOW	HIGH	HIGH
IN-SITU	LOW	HIGH	HIGH

Due to the limited use of groundwater in the vicinity of the subject site, and the location of potential receptors, any of the alternatives would be effective in protecting groundwater beneficial uses. However, natural attenuation is the most cost-effective alternative. Therefore, natural attenuation modeling and monitoring has been selected to remediate petroleum hydrocarbons present in soil and groundwater.

5.0 NATURAL ATTENUATION MODELING

5.1 Natural Attenuation Process Description

The fate and transport of petroleum hydrocarbons beneath the subject site are determined primarily by physical and chemical processes. The fate of petroleum hydrocarbons in soil and groundwater beneath the subject property are dictated by the processes of adsorption, absorption, advection, dispersion, diffusion, volatilization, bioaccumulation and biodegradation. **For aromatic hydrocarbons, biodegradation is likely to be the most significant natural attenuation factor.**

Petroleum hydrocarbons released from the subject property have migrated down through the unsaturated zone primarily via advection and dispersion processes in the vicinity of the former USTs. Retardation of petroleum hydrocarbons occurs in unsaturated soils through the processes of adsorption, absorption, volatilization, bioaccumulation and biodegradation.

Petroleum hydrocarbons have been released to groundwater from the unsaturated zone. However, because of the very low permeability of the saturated lithology (primarily clays), migration has been slow. As a result, natural attenuation of petroleum hydrocarbons is suspected to have assisted in impeding migration.

A review of historical groundwater data indicate a general stabilization of concentrations in perimeter wells which define the groundwater plume (i.e. S-10, S-11, S-12, S-13, S-15, S-16, S-17 and S-18). These wells have contained at or near ND levels of petroleum hydrocarbons (Table 2).

5.2 Target Receptors

As previously discussed, groundwater is not used as a drinking water source in the vicinity of the subject property. However, the well survey identified three irrigation wells located within a 1/4-mile radius of the subject property in the downgradient direction. These wells are screened in the 100 to 120 fbg range, and are therefore unlikely to be affected by shallow groundwater contamination at the subject site. Furthermore, they are presently located approximately 1/8-mile from the distal edge of the hydrocarbon plume based on monitoring well data. However, they were considered to be receptors in order to maintain a conservative model.

San Leandro Creek was also identified approximately 3/16-mile south of the subject site. This was considered to be an ecological receptor. although it is not threatened based on plume delineation and is located greater than 1/8-mile from the subject site.

5.3 Fate and Transport Modeling

5.3.1 FATE2 Model Description

FATE2 is the fate and transport model chosen to predict the migration of petroleum hydrocarbon contaminants and determine whether migration to target receptors will occur.

FATE2 is a modified version of the three-dimensional analytical transient groundwater contaminant model developed by Domenico (1987). Model assumptions include the following:

- uniform and constant aquifer properties
- one dimensional groundwater flow
- first-order contaminant decay, degradation, or transformation, and
- constant contaminant source of rectangular cross-section in the plane perpendicular to groundwater flow.

This original model was issued as FATE in 1992.

Modifications to Domenico's model have resulted in the implementation of the FATE2 model. These modifications have included:

- automation of model calibration to site specific contaminant plume data
- warning messages which flag input and output parameters which exceed nominal ranges,
- automated calculation of plume attenuation factors, and
- graphical output showing the site specific plume data, receptor location, and the modeled plume attenuation.

Domenico's model is based an equation which calculates the maximum centerline (of plume) concentration (of dissolved contaminant) at steady state. This equation is presented in Appendix D.

5.3.2 FATE2 Model Parameter Inputs and Outputs

Groundwater contamination sources (i.e. USTs and contaminated soil) were removed from the site in 1987. Review of groundwater analytical data from source area wells shows stabilized levels of hydrocarbons. Therefore, application of FATE2 is appropriate for this site.

FATE2 was applied to the subject site by utilizing the following input data in the model:

Soil Porosity, n ($ft.^3/ft.^3$): Porosity is percent void space in the soil. Typical values range from 20% to 50%. **A soil porosity of 35% was used in this model as it is a common clay porosity value.**

Hydraulic Conductivity, K (ft./day): Hydraulic Conductivity is a measure of the capacity of the aquifer to transmit water. Typical values range from 1.00E-04 to 1.00E+02 (ft./day). **Based on site geology and prior aquifer testing, a Hydraulic Conductivity of 3 ft./day was used in this model.**

aquifer tests presented K values of between 7.3 and 100 ft/day

Hydraulic Gradient, i (ft./ft.): Hydraulic Gradient is the change in hydraulic head per unit of horizontal distance measured in the downgradient direction. Typical values range from 0.001 to 0.1 ft./ft. 0.005 ft./ft. was used in this model based upon past quarterly groundwater monitoring data.

Source Concentration, Cs (mg/l): The source concentration is the concentration of the contaminants of concern (in this case benzene and TPH-G) in groundwater at the downgradient edge of the source. For use in this model, it has been estimated by calculating the effective solubility of benzene in groundwater by the following equation:

benzene conc. at 100 ppb as of 4/95

$$Cs = Si * Xi$$

where Si is the solubility limit of the pure compound in water and Xi is the mole fraction of the compound in a hydrocarbon mixture (as it is applied to the groundwater). In this case, Si = 1780 mg/l and Xi = 0.0205. Thus 36.5 mg/l was used in this model as Cs for benzene. It should be noted that this represents a worst case source concentration as Si represents the solubility limit. Furthermore, the highest current benzene concentration in any of the groundwater monitoring wells is 0.467 mg/l, which is 78 times less that the parameter used in the model.

The Cs for TPH-G used in this model was 140 mg/l, which represents the high end of the range of solubility for TPH-G in water and is more than five times greater than any currently measured value.

Source Width, Y (ft.): The source width is the maximum distance in feet perpendicular to the direction of groundwater flow in the saturated zone impacted by the source area. In this case, the width of the former UST area perpendicular the direction of groundwater flow was approximately 40 feet.

Source Thickness, Z (ft.): Source thickness reflects the height of the groundwater column in the source area that contains solubilized petroleum hydrocarbons. Groundwater depths fluctuate from approximately 6 to 9 fbg seasonally. Assuming the total depth of the tank excavation (source area) was 13 fbg, it is estimated that the maximum height of the groundwater column in contact with the former tank excavation is 7 feet, which was thus selected as the source thickness for this model.

Monitoring Point Data: FATE2 is designed for input of data for up to three monitoring point locations. These monitoring points should be located as close to the centerline of the dissolved plume as possible and should span the full length of the dissolved phase plume if possible. The monitoring point data input to FATE2 is the concentration of the contaminants (benzene and TPH-G) and the distance from the source. In this case wells SR-1, S-8, and S-10 were input as monitoring points. Concentrations input into the model are based on worst case conditions, since the highest values which have been detected historically were used for each well. Wells S-12, S-13, and S-14 were not considered as monitoring points as concentration gradients indicate their chemistry may be influenced by the service station located across Lewelling Boulevard to the south of the subject site.

Receptor Distance, R (ft.): The receptor distance is the distance in feet from the downgradient edge of the source to the selected receptor location. As mentioned in the text above, three irrigation wells are listed within a 1/4-mile radius of the subject property in the downgradient direction. Based on the size of the groundwater plume as it is presently delineated, these wells are at least 1/8-mile from the distal edge of the groundwater plume (i.e. ND perimeter monitoring wells). Although the wells are

located an even greater distance from the downgradient edge of the source, the more conservative 1/8 mile (660-feet) distance (the distance from current ND monitoring wells) was used in this model as the receptor distance.

Target Concentration, C^* (mg/l): The target concentration is the selected target exposure point concentration which must be met at the receptor location. In this case the California Department of Health Services Primary MCL of 0.001 mg/l was selected as the target concentration for benzene. No MCL has been established for TPH-G. The analytical method detection limit of 0.050 mg/l was selected as the target concentration for TPH-G.

Attenuation Coefficient, λ (1/day): The attenuation coefficient is a measure of the rate at which a compound is lost from a solute plume due to the combined mechanisms of biodegradation, volatilization, and chemical transformation. For aromatic hydrocarbons, such as benzene, aerobic biodegradation is often the dominant mechanism and attenuation rates of 0.001 to 0.01/day are reported for sites where dissolved oxygen concentrations are sufficient to support aerobic biodegradation. In this case 0.0025/day for benzene and 0.0015/day for TPH-G, near the lower end of the attenuation coefficient range, were selected based on existing monitoring well data

Dispersivity Coefficients, x, y, and z directions (α_x, α_y, α_z): Dispersivity is a measure of the plumes tendency to spread horizontally in the direction of groundwater flow (x direction), horizontally perpendicular to the direction of groundwater flow (y direction), and vertically (z direction). The values used for these input variables (dispersivity multipliers) are those provided by the USEPA Office of Solid Waste *Background Document for the Groundwater Screening Procedure to support 40 CFR Part 268 Land Disposal Restrictions*, 1985. These values are $\alpha_x = 0.1x$ (where x is the downgradient distance from the source), $\alpha_y = \alpha_x/3$, and $\alpha_z = 0.05 * \alpha_x$.

Parameters returned by FATE2 based on input data are as follows:

Attenuation Factor AF: The attenuation factor, AF, is equal the groundwater concentration at a given distance divided by the source concentration and ranges in value from zero to unity. Since the AF varies with distance from the source, the AF output is provided in the form of a plot where AF is plotted versus distance from the source area. This plot also includes the site monitoring input data, receptor distance, and location of plume attenuation length (see below). Therefore, model output can be compared with site monitoring data from selected well points to support model results.

Receptor Attenuation Factor AFr: The receptor attenuation factor, AFr, is equal the groundwater concentration at the receptor distance divided by the source concentration.

Plume Attenuation Length, PAL (ft.): The plume attenuation length or PAL is the distance away from the source in the direction of groundwater flow at which the groundwater concentration equals the target concentration, C^*.

Max Source Concentration, C_S^*: The maximum source concentration that is protective of a receptor is returned based upon the target concentration and the receptor attenuation factor.

5.3.3 FATE2 Model Results

The FATE2 input parameters, output data, and plot are presented in Appendix D. Results of the modeling are as follows:

Plume Attenuation Length: The PAL returned by FATE2 for benzene is 284 feet, and for TPH-G is 289 feet which indicates that at the given source concentrations, the groundwater concentration of benzene will reach the target concentrations for benzene and TPH-G 284 and 289 feet respectively in the downgradient direction. These PAL's represent less than half the distance to the nearest receptor.

Max Source Concentration, C_S^*: The maximum source concentration is returned as >S for both benzene and TPH-G, which indicates that the calculated maximum source concentration exceeds the solubility limit for benzene. This agrees with our input data as we had input the solubility limit as the source concentration.

Receptor Attenuation Factor Afr: Because the calculated maximum source concentration exceeds the solubility limits for benzene and TPH-G, Afr values are extremely low; 3.27E--12 for benzene and 5.8E-11 for TPH-G.

5.3.4 FATE2 Model Results Discussion

In entering FATE2 model input parameters, conservative values were used, including source concentrations which greatly exceed current measured concentrations since the highest historical value was used for each well. Based on these inputs, model results indicate that natural attenuation will degrade hydrocarbons to target levels at distances from the source considerably less than the distance to the nearest receptor (660 feet). The following table summarizes predicted and actual concentrations for TPH-G and benzene for downgradient wells SR-1, S-8, S-9, S-10, S-17, and S-18.

Well ID	Distance from Source (ft.)	Predicted TPH-G (ppm)	Predicted Benzene (ppm)	Actual TPH-G (ppm)	Actual Benzene (ppm)
S-8	90	11.2	0.86	0.733	0.076
S-9	75	12.6	1.80	0.979	0.080
S-10	155	1.4	0.072	<0.050	0.002
S-17	185	0.84	0.027	<0.050	<0.0003
S-18	193	0.73	0.024	<0.050	<0.0003

This table demonstrates that measured concentrations in groundwater are within those values predicted by the model.

6.0 GROUNDWATER MONITORING PROGRAM

A groundwater monitoring program is proposed to evaluate conformance of the site to predicted model values and to ensure that no migration of the plume to potential receptors occurs.

6.1 Proposed Monitoring Program and Rationale

Proposed monitoring frequencies for each well along with rationale for each are listed as follows:

Wells S-1, S-6, S-15

These wells are located upgradient from the former USTs. Wells S-6 and S-15 have been ND for TPH-G and BTEX since their installation, with the exception of isolated anomalous detections. Well S-1 has contained only low-level detections of these compounds. We propose elimination of S-6 and S-15 from the sampling program, and decreasing the sampling frequency of S-1 from quarterly to annual.

Wells S-11 and S-16

Well S-11 has been ND for TPH-G and benzene since its installation. Well S-16 has periodically contained low levels of TPH-G and benzene. We propose elimination of S-11 from the sampling program, and decreasing the sampling frequency of S-16 from quarterly to annual.

Wells SR-1, S-3, S-5, S-7

These wells represent source area wells. S-7 has contained low levels of TPH-G and benzene. Wells SR-1, S-3, and S-5 have contained the highest levels of TPH-G and BTEX, but concentrations in these wells are stable and free product is not present. We propose that these wells be sampled on an annual basis, provided that concentrations in downgradient wells remain within values predicted by the model. These wells will continue to be gauged on a quarterly basis.

Wells S-8 and S-9

These wells are located downgradient of the source area wells. Concentrations in these wells will be used to evaluate the site's conformance with model predictions. These wells will continue to be sampled on a quarterly basis.

Wells S-10, S-17, and S-18

These wells represent a second tier of monitoring downgradient of the source area. Well S-10 has contained low-level concentrations of TPH-G and benzene. Wells S-17 and S-18 have been ND for these compounds since their installation, with the exception of isolated anomalous detections. We propose continued sampling of S-17 on a quarterly basis, in order to provide an immediate downgradient indicator should the site fail to conform to model predictions. Wells S-18 and S-10 are proposed to be sampled on an annual basis.

Wells S-12, S-13, and S-14

These wells are located in a downgradient/crossgradient direction from the subject site. Concentration gradient data suggest that concentrations in these wells are being influenced by the presence of the service station site located across Lewelling Boulevard to the south of the Shell site. **Continued quarterly monitoring of Well S-13 and elimination of Wells S-12 and S-14 from Shell's monitoring program are proposed.**

Summary

A summary of proposed sampling frequencies is as follows:

S-1	Annual (gauge quarterly)
S-3	Annual
S-5	Annual (gauge quarterly)
S-6	Eliminate from program
S-7	Annual
S-8	Quarterly
S-9	Quarterly
S-10	Annual
S-11	Eliminate from program
S-12	Eliminate from program
S-13	Quarterly
S-14	Eliminate from program
S-15	Eliminate from program
S-16	Annual
S-17	Quarterly
S-18	Annual
SR-1	Annual (gauge quarterly)

7.0 SUMMARY

Modeling using the FATE2 modeling program demonstrates that natural attenuation will be effective in remediating petroleum hydrocarbons identified in groundwater prior to their migration to potential receptors.

Data collected during the proposed sampling program will be compared to predicted model values to ensure continued conformance with model output parameters. Any discrepancies will be noted in quarterly monitoring reports, along with explanations and corrective action.

If you have any questions regarding the contents of this document, please call.

Sincerely,

Enviros, Inc.

Jeffrey L. Peterson
Hydrogeologist

Diane M. Lundquist, P.E.
Senior Engineer
C46725

Attachments

Table 1: Summary of Historical Groundwater Elevation Data
Table 2: Summary of Historical Groundwater Analytical Data

Plate 1: Vicinity Map
Plate 2: Site Plan
Plate 3: Soil Quality Map
Plate 4: Groundwater Quality Map

Appendix A: Exploratory Boring Logs & Geologic Cross-Section
Appendix B: Fourth Quarter 1994 - Groundwater Contour Map
Appendix C: Well Survey Data
Appendix D: FATE2 Model Parameters

cc: Mr. Scott Seery, Alameda County Health Care Services, Environmental Protection Division
Mr. Rich Hiett, Regional Water Quality Control Board, San Francisco Bay Region
Mr. Mike Bakaldin, San Leandro Fire Department

Table 1
Summary of Historical Groundwater Elevation Data

well	Date	Reference Elevation (ft.-MSL)	Depth to Groudwater (feet)	Depth to Floating Product (feet)	Floating Product Thickness (feet)	Groundwater Elevation (Ft.-MSL)
S-1	11/22/88	21.55	8.01	NA	0.00	13.54
	08/10/89	21.55	7.93	NA	0.00	13.62
	10/10/89	21.55	8.09	NA	0.00	13.46
	01/25/90	21.55	7.73	NA	0.00	13.82
	04/18/90	21.55	7.91	NA	0.00	13.64
	07/23/90	21.55	7.72	NA	0.00	13.83
	10/18/90	21.55	8.55	NA	0.00	13.00
	01/28/91	21.55	8.52	NA	0.00	13.03
	04/25/91	21.55	7.18	NA	0.00	14.37
	07/09/91	21.55	8.22	NA	0.00	13.33
	10/08/91	21.55	8.70	NA	0.00	12.85
	02/05/91	21.55	8.14	NA	0.00	13.41
	04/28/92	21.55	7.52	NA	0.00	14.03
	07/27/92	21.55	8.28	NA	0.00	13.27
	10/26/92	21.55	8.74	NA	0.00	12.81
	01/13/93	21.55	5.91	NA	0.00	15.64
	04/16/93	21.55	6.66	NA	0.00	14.89
	07/23/93	21.55	7.53	NA	0.00	14.02
	10/27/93	21.55	8.20	NA	0.00	13.35
	01/27/94	21.55	7.26	NA	0.00	14.29
	05/05/94	21.27*	7.38	NA	0.00	13.89
	07/26/94	21.27	7.86	NA	0.00	13.41
	10/28/94	21.27	7.86	NA	0.00	13.41
S-3	11/22/88	21.14	7.76	NA	0.00	13.38
	08/10/89	21.14	7.92	NA	0.00	13.22
	10/10/89	21.14	8.00	NA	0.00	13.14
	01/25/90	21.14	7.54	NA	0.00	13.60
	04/18/90	21.14	7.74	NA	0.00	13.40
	07/23/90	21.14	7.55	NA	0.00	13.59
	10/18/90	21.14	8.47	NA	0.00	12.67
	01/28/91	21.14	8.38	NA	0.00	12.76
	04/25/91	21.14	6.91	NA	0.00	14.23
	07/09/91	21.14	8.07	NA	0.00	13.07
	10/08/91	21.14	8.61	NA	0.00	12.53
	02/05/91	21.14	7.80	NA	0.00	13.34
	04/28/92	21.14	7.27	NA	0.00	13.87
	07/27/92	21.14	8.10	NA	0.00	13.04
	10/26/92	21.14	8.62	NA	0.00	12.52
	01/13/93	21.14	5.16	NA	0.00	15.98
	04/16/93	21.14	7.18	NA	0.00	13.96
	07/23/93	21.14	7.34	NA	0.00	13.80
	10/27/93	21.14	8.03	NA	0.00	13.11
	01/27/94	21.14	6.79	NA	0.00	14.35
	05/05/94	20.48*	6.75	NA	0.00	13.73
	07/26/94	20.48	7.30	NA	0.00	13.18
	10/28/94	20.48	8.36	NA	0.00	12.12

Table 1
Summary of Historical Groundwater Elevation Data

well	Date	Reference. Elevation (ft.-MSL)	Depth to Groudwater (feet)	Depth to Floating Product (feet)	Floating Product Thickness (feet)	Groundwater Elevation (Ft.-MSL)
S-5	08/10/89	21.41	8.28	NA	0.00	13.13
	10/10/89	21.41	8.32	NA	0.00	13.09
	01/25/90	21.41	8.20	NA	0.00	13.21
	04/18/90	21.41	8.32	NA	0.00	13.09
	07/23/90	21.41	8.03	NA	0.00	13.38
	10/18/90	21.41	9.03	NA	0.00	12.38
	01/28/91	21.41	8.80	NA	0.00	12.61
	04/25/91	21.41	7.40	NA	0.00	14.01
	07/09/91	21.41	8.52	NA	0.00	12.89
	10/08/91	21.41	9.00	NA	0.00	12.41
	02/05/92	21.41	8.11	NA	0.00	13.30
	04/28/92	21.41	7.70	NA	0.00	13.71
	07/27/92	21.41	8.52	NA	0.00	12.89
	10/26/92	21.41	9.02	NA	0.00	12.39
	01/13/93	21.41	5.22	NA	0.00	16.19
	04/16/93	21.41	7.04	NA	0.00	14.37
	07/23/93	21.41	7.75	NA	0.00	13.66
	10/27/93	21.41	8.49	NA	0.00	12.92
	01/27/94	21.41	7.04	NA	0.00	14.37
	05/05/94	21.03*	7.20	NA	0.00	13.83
	07/27/94	21.03	7.72	NA	0.00	13.31
	10/28/94	21.03	7.82	NA	0.00	13.21
S-6	11/22/88	22.02	8.58	NA	0.00	13.44
	08/10/89	22.02	8.54	NA	0.00	13.48
	10/10/89	22.02	8.58	NA	0.00	13.44
	01/25/90	22.02	8.31	NA	0.00	13.71
	04/18/90	22.02	8.43	NA	0.00	13.59
	07/23/90	22.02	8.24	NA	0.00	13.78
	10/18/90	22.02	9.20	NA	0.00	12.82
	01/28/91	22.02	9.10	NA	0.00	12.92
	04/25/91	22.02	7.74	NA	0.00	14.28
	07/09/91	22.02	8.81	NA	0.00	13.21
	10/08/91	22.02	9.26	NA	0.00	12.76
	02/05/92	22.02	8.47	NA	0.00	13.55
	04/28/92	22.02	7.91	NA	0.00	14.11
	07/27/92	22.02	8.83	NA	0.00	13.19
	10/26/92	22.02	9.29	NA	0.00	12.73
	01/13/93	22.02	9.43	NA	0.00	15.59
	04/16/93	22.02	7.12	NA	0.00	14.90
	07/23/93	22.02	8.14	NA	0.00	13.88
	10/27/93	22.02	8.75	NA	0.00	13.27
	01/27/94	22.02	7.87	NA	0.00	14.15
	05/05/94	21.40*	7.71	NA	0.00	13.69
	07/26/94	21.40	8.10	NA	0.00	13.30
	10/28/94	21.40	8.04	NA	0.00	13.36

Table 1
Summary of Historical Groundwater Elevation Data

well	Date	Reference Elevation (ft.-MSL)	Depth to Groudwater (feet)	Depth to Floating Product (feet)	Floating Product Thickness (feet)	Groundwater Elevation (Ft.-MSL)
S-7	11/22/88	21.47	8.24	NA	0.00	13.23
	08/10/89	21.47	8.18	NA	0.00	13.29
	10/10/89	21.47	8.35	NA	0.00	13.12
	01/25/90	21.47	7.95	NA	0.00	13.52
	04/18/90	21.47	8.06	NA	0.00	13.41
	07/23/90	21.47	7.89	NA	0.00	13.58
	10/18/90	21.47	8.83	NA	0.00	12.64
	01/28/91	21.47	8.77	NA	0.00	12.70
	04/25/91	21.47	7.25	NA	0.00	14.22
	07/09/91	21.47	8.41	NA	0.00	13.06
	10/08/91	21.47	8.95	NA	0.00	12.52
	02/05/92	21.47	8.04	NA	0.00	13.43
	04/28/92	21.47	7.45	NA	0.00	14.02
	07/27/92	21.47	8.48	NA	0.00	12.99
	10/26/92	21.47	9.95	NA	0.00	11.52
	01/13/93	21.47	5.84	NA	0.00	15.63
	04/16/93	21.47	6.38	NA	0.00	15.09
	07/23/93	21.47	7.72	NA	0.00	13.75
	10/27/93	21.47	7.79	NA	0.00	13.68
	01/27/94	21.47	7.85	NA	0.00	13.62
	05/05/94	20.85*	9.45	NA	0.00	11.40
	07/26/94	20.85	7.64	NA	0.00	13.21
	10/28/94	20.85	7.68	NA	0.00	13.17
S-8	11/22/88	20.72	7.76	NA	0.00	12.96
	08/10/89	20.72	7.79	NA	0.00	12.93
	10/10/89	20.72	7.84	NA	0.00	12.88
	01/25/90	20.72	7.47	NA	0.00	13.25
	04/18/90	20.72	7.59	NA	0.00	13.13
	07/23/90	20.72	7.49	NA	0.00	13.23
	10/18/90	20.72	8.44	NA	0.00	12.28
	01/28/91	20.72	8.28	NA	0.00	12.44
	04/25/91	20.72	6.72	NA	0.00	14.00
	07/09/91	20.72	7.98	NA	0.00	12.74
	10/08/91	20.72	8.55	NA	0.00	12.17
	02/05/91	20.72	7.50	NA	0.00	13.22
	04/28/92	20.72	7.14	NA	0.00	13.58
	07/27/92	20.72	8.06	NA	0.00	12.66
	10/26/92	20.72	8.58	NA	0.00	12.14
	01/13/93	20.72	5.32	NA	0.00	15.40
	04/16/93	20.72	5.76	NA	0.00	14.96
	07/23/93	20.72	7.29	NA	0.00	13.43
	10/27/93	20.72	7.93	NA	0.00	12.79
	01/27/94	20.72	6.31	NA	0.00	14.41
	05/05/94	20.32*	6.84	NA	0.00	13.48
	07/26/94	20.32	7.42	NA	0.00	12.90
	10/28/94	20.32	7.56	NA	0.00	12.76

Table 1
Summary of Historical Groundwater Elevation Data

well	Date	Reference Elevation (ft.-MSL)	Depth to Groudwater (feet)	Depth to Floating Product (feet)	Floating Product Thickness (feet)	Groundwater Elevation (Ft.-MSL)
S-9	11/22/88	20.96	7.78	NA	0.00	13.18
	08/10/89	20.96	7.82	NA	0.00	13.14
	10/10/89	20.96	7.87	NA	0.00	13.09
	01/25/90	20.96	7.41	NA	0.00	13.55
	04/18/90	20.96	7.65	NA	0.00	13.31
	07/23/90	20.96	7.58	NA	0.00	13.38
	10/18/90	20.96	8.46	NA	0.00	12.50
	01/28/91	20.96	8.29	NA	0.00	12.67
	04/25/91	20.96	6.09	NA	0.00	14.87
	07/09/91	20.96	7.82	NA	0.00	13.14
	10/08/91	20.96	8.55	NA	0.00	12.41
	02/05/91	20.96	6.96	NA	0.00	14.00
	04/28/92	20.96	6.76	NA	0.00	14.20
	07/27/92	20.96	8.10	NA	0.00	12.86
	10/26/92	20.96	8.53	NA	0.00	12.43
	01/13/93	20.96	6.80	NA	0.00	14.16
	04/16/93	20.96	6.28	NA	0.00	14.68
	07/23/93	20.96	7.26	NA	0.00	13.70
	10/27/93	20.96	8.00	NA	0.00	12.96
	01/27/94	20.96	5.96	NA	0.00	15.00
	05/05/94	20.68*	6.99	NA	0.00	13.69
	07/26/94	20.68	7.56	NA	0.00	13.12
	10/28/94	20.68	7.78	NA	0.00	12.90
S-10	11/22/88	20.69	7.91	NA	0.00	12.78
	08/10/89	20.69	7.94	NA	0.00	12.75
	10/10/89	20.69	7.99	NA	0.00	12.70
	01/25/90	20.69	7.56	NA	0.00	13.13
	04/18/90	20.69	7.71	NA	0.00	12.98
	07/23/90	20.69	7.64	NA	0.00	13.05
	10/18/90	20.69	8.58	NA	0.00	12.11
	01/28/91	20.69	8.35	NA	0.00	12.34
	04/25/91	20.69	6.91	NA	0.00	13.78
	07/09/91	20.69	8.14	NA	0.00	12.55
	10/08/91	20.69	8.70	NA	0.00	11.99
	02/05/91	20.69	7.57	NA	0.00	13.12
	04/28/92	20.69	7.20	NA	0.00	13.49
	07/27/92	20.69	8.17	NA	0.00	12.52
	10/26/92	20.69	8.68	NA	0.00	12.01
	01/13/93	20.69	3.78	NA	0.00	16.91
	04/16/93	20.69	6.46	NA	0.00	14.23
	07/23/93	20.69	7.38	NA	0.00	13.31
	10/27/93	20.69	8.09	NA	0.00	12.60
	01/27/94	20.69	5.81	NA	0.00	14.88
	05/05/94	20.15*	6.82	NA	0.00	13.33
	07/26/94	20.15	7.40	NA	0.00	12.75
	10/28/94	20.15	7.62	NA	0.00	12.53

Table 1
Summary of Historical Groundwater Elevation Data

well	Date	Reference Elevation (ft.-MSL)	Depth to Groudwater (feet)	Depth to Floating Product (feet)	Floating Product Thickness (feet)	Groundwater Elevation (Ft.-MSL)
S-11	11/22/88	21.26	8.62	NA	0.00	12.64
	08/10/89	21.26	8.65	NA	0.00	12.61
	10/10/89	21.26	8.64	NA	0.00	12.62
	01/25/90	21.26	8.43	NA	0.00	12.83
	04/18/90	21.26	8.42	NA	0.00	12.84
	07/23/90	21.26	8.23	NA	0.00	13.03
	10/18/90	21.26	9.20	NA	0.00	12.06
	01/28/91	21.26	9.13	NA	0.00	12.13
	04/25/91	21.26	7.53	NA	0.00	13.73
	07/09/91	21.26	8.85	NA	0.00	12.41
	10/08/91	21.26	9.34	NA	0.00	11.92
	02/05/91	21.26	8.50	NA	0.00	12.76
	04/28/92	21.26	7.80	NA	0.00	13.46
	07/27/92	21.26	8.80	NA	0.00	12.46
	10/26/92	21.26	9.42	NA	0.00	11.84
	01/13/93	21.26	6.52	NA	0.00	14.74
	04/16/93	21.26	6.86	NA	0.00	14.40
	07/23/93	21.26	8.07	NA	0.00	13.19
	10/27/93	21.26	NM	NM	NM	NM
	01/27/94	21.26	NM	NM	NM	NM
	05/05/94	21.24*	7.73	NA	0.00	13.51
	07/26/94	21.24	8.30	NA	0.00	12.94
	10/28/94	21.24	8.30	NA	0.00	12.94
S-12	08/10/89	21.05	8.32	NA	0.00	12.73
	10/10/89	21.05	8.32	NA	0.00	12.73
	01/25/90	21.05	8.18	NA	0.00	12.87
	04/18/90	21.05	8.05	NA	0.00	13.00
	07/23/90	21.05	7.92	NA	0.00	13.13
	10/18/90	21.05	8.90	NA	0.00	12.15
	01/28/91	21.05	8.54	NA	0.00	12.51
	04/25/91	21.05	7.08	NA	0.00	13.97
	07/09/91	21.05	8.42	NA	0.00	12.63
	10/08/91	21.05	8.80	NA	0.00	12.25
	02/05/92	21.05	8.07	NA	0.00	12.98
	04/28/92	21.05	8.33	NA	0.00	12.72
	07/27/92	21.05	8.55	NA	0.00	12.50
	10/26/92	21.05	9.03	NA	0.00	12.02
	01/13/93	21.05	6.38	NA	0.00	14.67
	04/16/93	21.05	6.56	NA	0.00	14.49
	07/23/93	21.05	7.76	NA	0.00	13.29
	10/27/93	21.05	NM	NM	NM	NM
	01/27/94	21.05	NM	NM	NM	NM
	05/05/94	20.71*	7.49	NA	0.00	13.22
	07/26/94	20.71	7.92	NA	0.00	12.79
	10/28/94	20.71	7.78	NA	0.00	12.93

Table 1
Summary of Historical Groundwater Elevation Data

well	Date	Reference Elevation (ft.-MSL)	Depth to Groudwater (feet)	Depth to Floating Product (feet)	Floating Product Thickness (feet)	Groundwater Elevation (Ft.-MSL)
S-13	08/10/89	20.57	8.00	NA	0.00	12.57
	10/10/89	20.57	7.95	NA	0.00	12.62
	01/25/90	20.57	7.79	NA	0.00	12.78
	04/18/90	20.57	7.73	NA	0.00	12.84
	07/23/90	20.57	7.63	NA	0.00	12.94
	10/18/90	20.57	8.58	NA	0.00	11.99
	01/28/91	20.57	8.39	NA	0.00	12.18
	04/25/91	20.57	7.00	NA	0.00	13.57
	07/09/91	20.57	8.12	NA	0.00	12.45
	10/08/91	20.57	8.69	NA	0.00	11.88
	02/05/92	20.57	7.62	NA	0.00	12.95
	04/28/92	20.57	7.15	NA	0.00	13.42
	07/27/92	20.57	8.20	NA	0.00	12.37
	10/26/92	20.57	8.73	NA	0.00	11.84
	01/13/93	20.57	5.06	NA	0.00	15.51
	04/16/93	20.57	6.38	NA	0.00	14.19
	07/23/93	20.57	7.45	NA	0.00	13.12
	10/27/93	20.57	NM	NM	NM	NM
	01/27/94	20.57	NM	NM	NM	NM
	05/05/94	20.16*	6.91	NA	0.00	13.25
	07/26/94	20.16	7.52	NA	0.00	12.64
	10/28/94	20.16	7.68	NA	0.00	12.48
S-14	08/10/89	20.44	7.58	NA	0.00	12.86
	10/10/89	20.44	7.62	NA	0.00	12.82
	01/25/90	20.44	7.82	NA	0.00	12.62
	04/18/90	20.44	7.37	NA	0.00	13.07
	07/23/90	20.44	7.28	NA	0.00	13.16
	10/18/90	20.44	8.10	NA	0.00	12.34
	01/28/91	20.44	8.04	NA	0.00	12.40
	04/25/91	20.44	6.40	NA	0.00	14.04
	07/09/91	20.44	7.69	NA	0.00	12.75
	10/08/91	20.44	8.24	NA	0.00	12.20
	02/05/92	20.44	7.20	NA	0.00	13.24
	04/28/92	20.44	9.75	NA	0.00	10.69
	07/27/92	20.44	7.64	NA	0.00	12.80
	10/26/92	20.44	8.32	NA	0.00	12.12
	01/13/93	20.44	5.07	NA	0.00	15.37
	04/16/93	20.44	5.86	NA	0.00	14.58
	07/23/93	20.44	7.06	NA	0.00	13.38
	10/27/93	20.44	NM	NM	NM	NM
	01/27/94	20.44	NM	NM	NM	NM
	05/05/94	19.99*	6.48	NA	0.00	13.51
	07/26/94	19.99	7.04	NA	0.00	12.95
	10/28/94	19.99	7.07	NA	0.00	12.92

Table 1
Summary of Historical Groundwater Elevation Data

well	Date	Reference Elevation (ft.-MSL)	Depth to Groudwater (feet)	Depth to Floating Product (feet)	Floating Product Thickness (feet)	Groundwater Elevation (Ft.-MSL)
S-15	08/10/89	22.22	8.48	NA	0.00	13.74
	10/10/89	22.22	8.46	NA	0.00	13.76
	01/25/90	22.22	8.34	NA	0.00	13.88
	04/18/90	22.22	8.45	NA	0.00	13.77
	07/23/90	22.22	8.22	NA	0.00	14.00
	10/18/90	22.22	9.11	NA	0.00	13.11
	01/28/91	22.22	9.13	NA	0.00	13.09
	04/25/91	22.22	7.83	NA	0.00	14.39
	07/09/91	22.22	8.93	NA	0.00	13.29
	10/08/91	22.22	9.26	NA	0.00	12.96
	02/05/92	22.22	8.60	NA	0.00	13.62
	04/28/92	22.22	8.09	NA	0.00	14.13
	07/27/92	22.22	8.83	NA	0.00	13.39
	10/26/92	22.22	9.31	NA	0.00	12.91
	01/13/93	22.22	6.64	NA	0.00	15.58
	04/16/93	22.22	7.14	NA	0.00	15.08
	07/23/93	22.22	8.23	NA	0.00	13.99
	10/27/93	22.22	NM	NM	NM	NM
	01/27/94	22.22	NM	NM	NM	NM
	05/05/94	21.42*	7.57	NA	0.00	13.85
	07/26/94	21.42	8.16	NA	0.00	13.26
	10/28/94	21.42	7.87	NA	0.00	13.55
S-16	08/10/89	21.82	8.36	NA	0.00	13.46
	10/10/89	21.82	8.23	NA	0.00	13.59
	01/25/90	21.82	7.88	NA	0.00	13.94
	04/18/90	21.82	8.19	NA	0.00	13.63
	07/23/90	21.82	8.09	NA	0.00	13.73
	10/18/90	21.82	8.90	NA	0.00	12.92
	01/28/91	21.82	8.55	NA	0.00	13.27
	04/25/91	21.82	7.48	NA	0.00	14.34
	07/09/91	21.82	8.48	NA	0.00	13.34
	10/08/91	21.82	8.95	NA	0.00	12.87
	02/05/92	21.82	8.20	NA	0.00	13.62
	04/28/92	21.82	7.80	NA	0.00	14.02
	07/27/92	21.82	8.29	NA	0.00	13.53
	10/26/92	21.82	9.02	NA	0.00	12.80
	01/13/93	21.82	5.78	NA	0.00	16.04
	04/16/93	21.82	6.80	NA	0.00	15.02
	07/23/93	21.82	7.67	NA	0.00	14.15
	10/27/93	21.82	8.52	NM	NM	13.30
	01/27/94	21.82	7.20	NM	NM	14.62
	05/05/94	21.24*	7.76	NA	0.00	13.48
	07/26/94	21.24	7.84	NA	0.00	13.40
	10/28/94	21.24	7.97	NA	0.00	13.27

Table 1
Summary of Historical Groundwater Elevation Data

well	Date	Reference Elevation (ft.-MSL)	Depth to Groudwater (feet)	Depth to Floating Product (feet)	Floating Product Thickness (feet)	Groundwater Elevation (Ft.-MSL)
S-17	08/10/89	20.95	8.13	NA	0.00	12.82
	10/10/89	20.95	8.18	NA	0.00	12.77
	01/25/90	20.95	7.60	NA	0.00	13.35
	04/18/90	20.95	7.95	NA	0.00	13.00
	07/23/90	20.95	7.87	NA	0.00	13.08
	10/18/90	20.95	8.71	NA	0.00	12.24
	01/28/91	20.95	8.54	NA	0.00	12.41
	04/25/91	20.95	7.15	NA	0.00	13.80
	07/09/91	20.95	8.24	NA	0.00	12.71
	10/08/91	20.95	8.86	NA	0.00	12.09
	02/05/92	20.95	7.74	NA	0.00	13.21
	04/28/92	20.95	7.41	NA	0.00	13.54
	07/27/92	20.95	8.34	NA	0.00	12.61
	10/26/92	20.95	8.87	NA	0.00	12.08
	01/13/93	20.95	3.43	NA	0.00	17.52
	04/16/93	20.95	6.70	NA	0.00	14.25
	07/23/93	20.95	7.53	NA	0.00	13.42
	10/27/93	20.95	8.29	NA	0.00	12.66
	01/27/94	20.95	5.78	NA	0.00	15.17
	05/05/94	20.45*	6.99	NA	0.00	13.46
	07/26/94	20.45	7.62	NA	0.00	12.83
	10/28/94	20.45	7.91	NA	0.00	12.54
S-18	04/25/91	21.03	NM	NM	NM	NM
	07/09/91	21.03	8.23	NA	0.00	12.80
	10/08/91	21.03	8.84	NA	0.00	12.19
	02/05/92	21.03	7.67	NA	0.00	13.36
	04/28/92	21.03	7.40	NA	0.00	13.63
	07/27/92	21.03	8.38	NA	0.00	12.69
	10/26/92	21.03	8.83	NA	0.00	12.20
	01/13/93	21.03	5.86	NA	0.00	15.17
	04/16/93	21.03	4.88	NA	0.00	16.15
	07/23/93	21.03	7.56	NA	0.00	13.47
	10/27/93	21.03	8.30	NA	0.00	12.73
	01/27/94	21.03	6.84	NA	0.00	14.19
	05/05/94	20.57*	7.05	NA	0.00	13.52
	07/26/94	20.57	7.62	NA	0.00	12.95
	10/28/94	20.57	8.01	NA	0.00	12.56
SR-1	01/25/90	21.45	7.53	NA	0.00	13.92
	04/18/90	21.45	8.17	NA	0.00	13.28
	07/23/90	21.45	7.58	NA	0.00	13.87
	10/18/90	21.45	8.81	NA	0.00	12.64
	01/28/91	21.45	8.37	NA	0.00	13.08
	04/25/91	21.45	6.91	NA	0.00	14.54
	07/09/91	21.45	8.11	NA	0.00	13.34
	10/08/91	21.45	8.63	NA	0.00	12.82
	02/05/92	21.45	7.68	NA	0.00	13.77
	04/28/92	21.45	7.27	NA	0.00	14.18

Table 1
Summary of Historical Groundwater Elevation Data

well	Date	Reference Elevation (ft.-MSL)	Depth to Groudwater (feet)	Depth to Floating Product (feet)	Floating Product Thickness (feet)	Groundwater Elevation (Ft.-MSL)
SR-1 (cont.)	07/27/92	21.45	8.11	8.10	0.01	13.34
	10/26/92	21.45	8.63	NA	0.00	12.82
	01/13/93	21.45	5.46	NA	0.00	15.99
	04/16/93	21.45	6.28	NA	0.00	15.17
	07/23/93	21.45	7.34	NA	0.00	14.11
	10/27/93	21.45	8.04	NA	0.00	13.41
	01/27/94	21.45	6.68	NA	0.00	14.77
	05/05/94	20.57*	6.81	NA	0.00	13.76
	07/26/94	20.57	7.38	NA	0.00	13.19
	10/28/94	20.57	7.48	NA	0.00	13.09

FT.-MSL = feet above mean sea level
NM = not measured
* Top of casing elevation surveyed by L. Wade Hammond on 5/31/94

Table 2

Summary of Historical Groundwater Analytical Results
(milligrams per liter)

Well Number	Sampling Date	TPHG	Benzene	Toluene	Ethylbenzene	Total Xylenes
S-1	07/08/85	0.52	NA	NA	NA	NA
	09/06/88	<0.050	<0.0005	<.0.001	<.0.001	<0.003
	11/16/88	<0.050	<0.0005	<.0.001	<.0.001	<0.003
	02/27/89	<0.050	0.0005	<.0.001	<.0.001	<0.003
	05/04/89	<0.050	0.001	<.0.001	<.0.001	<0.003
	08/10/89	<0.050	0.0007	<.0.001	<.0.001	<0.003
	10/10/89	<0.050	<0.0005	<.0.001	<.0.001	<0.003
	01/25/90	<0.050	<0.0005	<0.0005	<0.0005	<0.001
	04/18/90	<0.050	<0.0005	<0.0005	<0.0005	<0.001
	07/23/90	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/18/90	0.08	0.005	<0.0005	<0.0005	0.003
	01/28/91	<0.050	0.0045	<0.0005	<0.0005	0.002
	04/25/91	0.080*	0.0037	<0.0005	0.0007	0.002
	07/09/91	0.20	0.016	<0.0005	0.0013	0.0058
	10/08/91	<0.050	0.0023	<0.0005	<0.0005	<0.0005
	02/05/92	0.16	0.0089	<0.0005	0.0021	0.006
	04/28/92	<0.050	0.0024	<0.0005	<0.0005	0.0009
	07/27/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/26/92	0.057	0.003	0.0016	0.0014	0.0017
	01/14/93	0.49	0.053	0.0012	0.020	0.033
	04/16/93	0.24	0.020	<0.0005	0.015	0.24
	07/23/93	<0.050	0.0005	<0.0005	<0.0005	<0.0005
	10/27/93	0.060	0.0059	<0.0005	0.0025	0.0017
	01/27/94	<0.050	0.0021	<0.0005	<0.0005	0.00063
	05/05/94	0.057	0.0039	<0.0005	0.0019	0.0019
	07/26/94	<0.05	0.0022	<0.0003	<0.0003	<0.0006
	10/28/94	<0.05	0.0008	<0.0003	<0.0003	0.0008
S-3	09/06/88	96	3.4 3400	9.5	2.7	17
	11/16/88	70	4.6 4600	8.4	2.5	13
	02/27/89	32	2.4 2400	3.1	1.5	6.4
	05/04/89	47	4.4 4400	0.30	2.4	15
	08/10/89	110	5.7 5700	5.7	3.2	19
	10/10/89	52	4.6 4600	3.3	2.6	15
	01/25/90	420	5.2 5200	4.1	6.7	34
	04/18/90	58	3.8 3800	1.4	2.4	12
	07/23/90	49	3.4 3400	1.8	2.3	12
	10/18/90	44	3.5 3500	0.65	2.4	11
	01/28/91	64	40.9 40,900	0.57	1.94	8.09
	04/25/91	120	3.9 3900	3.6	2.4	8.9
	07/09/91	50	3.6 3600	2.3	1.8	10
	10/08/91	130	3.6 3600	1.0	2.8	8.4
	02/05/92	150	2.5 2500	0.67	2.7	10
	04/28/92	120	2.2 2200	1.2	2	5.8
	07/27/92	190	1.4 1400	<1.25	<1.25	3.4
	10/26/92	950	2.0 2000	8.4	16	36
	01/14/93	41	2.7 2700	2.5	1.8	6.9
	04/16/93	40	0.93 930	2.8	1.9	14
	07/23/93	87	1.6 1600	<0.0050	1.3	4.0

Table 2

Summary of Historical Groundwater Analytical Results
(milligrams per liter)

Well Number	Sampling Date	TPHG	Benzene	Toluene	Ethylbenzene	Total Xylenes
S-3 (cont.)	10/27/93	36	2.2 2200	<0.5	1.5	3.2
	01/27/94	190	3.2 3200	3.1	4.1	15
	05/05/94	36	1.1 1100	0.49	1.6	4.7
	07/26/94	18.0	1.039 1030	0.1705	0.8454	0.9675
	10/28/94	25.869	0.4679 468	0.2940	0.5462	0.3433
S-5	01/08/87	7.8	0.38	0.51	NR	1.0
	09/06/88	7.0	2.6	0.060	0.40	0.7
	11/16/88	3.0	0.66	0.060	0.12	0.22
	02/27/89	5.7	2.0	0.22	0.26	0.32
	05/04/89	9.0	3.0	0.6	0.63	1.7
	08/10/89	5.1	1.1	<0.050	0.27	0.40
	10/10/89	15	3.3	0.16	0.83	2.2
	01/25/90	12	2.4	0.36	0.57	1.4
	04/18/90	5.2	1.1	0.040	0.30	0.46
	07/23/90	5.5	1.3	0.14	0.32	0.73
	10/18/90	12	3.2	0.040	0.72	0.9
	01/28/91	2.55	0.41	0.015	0.11	0.060
	04/25/91	67	5.1	3.1	2.8	11
	07/09/91	4.9	0.48	0.036	0.36	1.0
	10/08/91	6.6	0.37	0.007	0.19	0.38
	02/05/92	44	4.8	0.85	2.7	8.4
	04/28/92	33	1.4	0.32	1.6	5.2
	07/27/92	20	2.4	<0.025	1.8	2.3
	10/26/92	21	1.6	0.14	1.5	2.8
	01/14/93	54	1.9	1.0	2.7	16
	04/16/93	42	2.0	1.3	4.3	18
	07/23/93	46	2.5	2.2	3.4	11
	10/27/93	6.5	0.99	0.031	1.1	1.0
	01/27/94	34	1.8	0.58	2.9	9.7
	05/05/94	24	0.67	0.070	1.4	2.7
	07/27/94	4.7	0.1936	0.0331	0.3323	0.2812
	10/28/94	3.2	0.1673	0.0180	0.2387	0.1045
S-6	11/16/88	0.050	0.0007	<0.001	<0.001	<0.003
	02/27/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	05/04/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	08/10/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	10/10/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	01/25/90	<0.050	<0.0005	<0.0005	<0.0005	<0.001
	04/18/90	<0.050	<0.0005	0.0006	<0.0005	0.001
	07/23/90	<0.050	<0.0005	0.0009	<0.0005	0.0018
	10/18/90	<0.050	<0.0005	0.0007	<0.0005	0.0008
	01/28/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	04/25/91	<0.050	<0.0005	<0.0005	<0.0005	0.0007
	07/09/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/08/91	<0.050	0.0007	<0.0005	<0.0005	<0.0005
	04/28/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/26/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005

Table 2

Summary of Historical Groundwater Analytical Results
(milligrams per liter)

Well Number	Sampling Date	TPHG	Benzene	Toluene	Ethylbenzene	Total Xylenes
S-6 (cont.)	01/13/94	NR	NR	NR	NR	NR
	04/16/93	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/23/93	NR	NR	NR	NR	NR
	10/27/93	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	01/27/94	NR	NR	NR	NR	NR
	05/05/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/26/94	NR	NR	NR	NR	NR
	10/28/94	<0.05	<0.0003	<0.0003	<0.0003	<0.0006
S-7	11/16/88	0.10	0.0051	0.015	0.002	0.013
	02/27/89	0.050	0.0005	0.003	0.001	0.011
	05/04/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	08/10/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	10/10/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	01/25/90	<0.050	<0.0005	<0.0005	<0.0005	<0.001
	04/18/90	<0.050	<0.0005	<0.0005	<0.0005	<0.001
	07/23/90	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/18/90	<0.050	<0.0005	0.0005	0.0005	0.0041
	01/28/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	04/25/91	0.060	<0.0005	<0.0005	<0.0005	<0.0005
	07/09/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	02/05/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/08/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	04/28/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/27/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/26/92	0.57^	<0.0005	<0.0005	<0.0005	<0.0005
	01/14/93	0.056^	<0.0005	<0.0005	<0.0005	<0.0005
	04/16/93	0.11	0.028 28	<0.0005	<0.0005	0.0018
	07/23/93	0.080	0.00048 0.48	<0.0005	<0.0005	0.0008
	10/27/93	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	01/27/94	0.070**	<0.0005	<0.0005	<0.0005	<0.0005
	05/05/94	0.092	0.0021 2.1	<0.0005	<0.0005	<0.0005
	07/26/94	0.088	<0.0003	<0.0003	<0.0003	<0.0006
	10/28/94	0.06	<0.0003	0.0005	<0.0003	<0.0006
S-8	11/16/88	0.21	0.005	<0.001	0.001	0.005
	02/27/89	<0.050	0.0024	<0.001	<0.001	<0.003
	05/04/89	<0.050	0.0075	<0.001	0.002	<0.003
	08/10/89	<0.050	0.0006	<0.001	<0.001	<0.003
	10/10/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	01/25/90	<0.050	<0.0005	<0.0005	<0.0005	<0.001
	04/18/90	<0.050	<0.0005	<0.0005	<0.0005	<0.001
	07/23/90	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/18/90	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	01/28/91	<0.050	0.055 55	0.0005	<0.0005	0.0014
	04/25/91	0.13*	0.019	<0.0005	0.0013	0.0011
	07/09/91	0.20	0.033	<0.0005	0.0018	0.0028
	10/08/91	0.58	0.095 95	0.0022	0.0049	0.0065
	02/05/92	0.090*	0.018	<0.0005	0.0062	0.0018

Table 2

Summary of Historical Groundwater Analytical Results
(milligrams per liter)

Well Number	Sampling Date	TPHG	Benzene	Toluene	Ethylbenzene	Total Xylenes
S-8 (cont.)	04/28/92	<0.050	0.0059	<0.0005	0.0025	<0.0005
	07/27/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/26/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	01/14/93	0.27	0.074	0.0009	0.025	0.0055
	04/16/93	1.1	0.42 420	<0.0005	0.20	0.020
	07/23/93	0.16	0.023	<0.0005	0.0012	0.0015
	10/27/93	0.42	0.065 ~~0.65~~ 650	0.0007	0.011	0.0017
	01/27/94	0.29	0.065	<0.0010	0.0069	0.0024
	05/05/94	0.12	0.013	<0.0005	<0.0005	<0.0005
	07/26/94	0.115	0.0122	0.0013	<0.0003	0.0027
	10/28/94	0.733	0.0759	0.0032	0.0049	0.0042
S-9	11/16/88	1.4	0.069 69	0.003	0.052	0.18
	02/27/89	1.6	0.24 240	0.004	0.13	0.18
	05/04/89	2.6	0.47 470	0.010	0.24	0.48
	08/10/89	0.52	0.073 73	<0.01	0.040	<0.030
	10/10/89	0.38	0.082 82	<0.001	0.046	0.013
	01/25/90	0.75	0.14 140	0.0012	0.069	0.075
	04/18/90	0.68	0.15 150	0.0017	0.050	0.037
	07/23/90	0.49	0.094 94	0.0012	0.032	0.024
	10/18/90	0.39	0.14 140	0.0007	0.0033	0.024
	01/28/91	1.04	0.45 450	0.0046	0.085	0.097
	04/25/91	5.8	0.88 880	0.009	0.36	0.50
	07/09/91	1.4	0.22 220	0.0028	0.082	0.10
	10/08/91	0.89	0.96 960	<0.0025	0.016	0.029
	02/05/92	0.95	0.24 240	<0.0025	0.028	0.055
	04/28/92	1.4*	0.29 290	0.003	0.10	0.081
	07/27/92	0.89	0.19 190	<0.0025	0.066	0.068
	10/26/92	0.65	0.16 160	<0.0025	0.063	0.089
	01/13/93	19	2.4 2400	0.038	1.7	2.2
	04/16/93	10	1.5 1500	<0.005	1.1	0.99
	07/23/93	1.1	0.40 460	<0.0050	0.26	0.16
	10/27/93	2.5	0.40 400	<0.005	0.19	0.11
	01/27/94	4.8	0.99 990	0.016	0.63	0.49
	05/05/94	3.7	0.48 480	<0.005	0.021	0.12
	07/26/94	1.0	0.1246 124.6	<0.0003	0.0358	0.0286
	10/28/94	0.979	0.0803 80.3	0.0070	0.0217	0.0292
S-10	11/16/88	0.33	0.0005 540 1000 680	<0.001	0.001	0.011
	02/27/89	0.14	<0.0005	<0.003	0.002	0.006
	05/03/89	0.22	<0.0005	0.001	0.002	0.007
	08/10/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	10/09/89	0.17	<0.0005	<0.001	<0.001	<0.003
	01/25/90	<0.050	<0.0005	<0.0005	0.0011	0.004
	04/18/90	<0.050	<0.0005	0.0009	<0.0005	0.002
	07/23/90	0.59	<0.0005	<0.0005	0.0019	0.019
	10/18/90	0.14	<0.0005	0.0007	<0.0005	0.007
	01/28/91	<0.050	<0.0005	<0.0005	<0.0005	0.0005
	04/25/91	<0.050	<0.0005	<0.0005	0.0011	0.0008

Table 2

Summary of Historical Groundwater Analytical Results
(milligrams per liter)

Well Number	Sampling Date	TPHG	Benzene	Toluene	Ethylbenzene	Total Xylenes
S-10 (cont.)	07/09/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/08/91	0.14	<0.0005	<0.0005	<0.0005	<0.0005
	02/05/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	04/28/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/27/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/26/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	01/13/93	0.088	<0.0005	0.0006	0.0006	<0.0005
	04/16/93	0.080	<0.0005	<0.0005	<0.0005	<0.0005
	07/23/93	<0.050	0.0015	<0.0005	0.0007	0.0027
	10/27/93	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	01/27/94	0.27	0.0011	0.0013	0.0020	0.0074
	05/05/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/26/94	<0.05	<0.0003	<0.0003	<0.0003	<0.0006
	10/28/94	<0.05	0.0024	<0.0003	0.0005	0.0008
S-11	11/16/88	<0.050	<0.0005	<0.001	<0.001	<0.003
	02/27/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	05/03/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	08/10/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	10/09/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	01/25/90	<0.050	<0.0005	<0.0005	<0.0005	<0.001
	04/18/90	<0.050	<0.0005	<0.0005	<0.0005	<0.001
	07/23/90	<0.050	<0.0005	0.0006	<0.0005	0.0011
	10/18/90	<0.050	<0.0005	<0.0005	<0.0005	0.0005
	01/28/91	0.063	<0.0005	0.0033	0.0009	0.007
	04/25/91	<0.050	<0.0005	<0.0005	0.0008	<0.0005
	07/09/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/08/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	04/28/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/27/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/26/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	01/13/93	NR	NR	NR	NR	NR
	04/16/93	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/23/93	NR	NR	NR	NR	NR
	10/27/93	NA	NA	NA	NA	NA
	01/27/94	NR	NR	NR	NR	NR
	05/05/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/26/94	NR	NR	NR	NR	NR
	10/28/94	<0.05	<0.0003	<0.0003	<0.0003	<0.0006
S-12	11/16/88	0.050	0.0035	<0.001	<0.001	<0.003
	02/27/89	<0.050	0.0008	<0.001	<0.001	<0.003
	05/03/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	08/10/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	10/09/89	<0.050	<0.0005	<0.001	<0.001	<0.001
	01/25/90	<0.050	<0.0005	<0.0005	<0.0005	<0.001
	04/18/90	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/23/90	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/18/90	<0.050	<0.0005	<0.0005	<0.0005	<0.0005

Table 2

Summary of Historical Groundwater Analytical Results
(milligrams per liter)

Well Number	Sampling Date	TPHG	Benzene	Toluene	Ethylbenzene	Total Xylenes
S-12 (cont.)	01/28/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	04/25/91	0.090	0.0054	<0.0005	0.0011	0.0007
	07/09/91	<0.050	0.0029	<0.0005	<0.0005	<0.0005
	10/08/91	0.050	<0.0005	<0.0005	<0.0005	<0.0005
	02/05/92	0.050*	<0.0005	<0.0005	<0.0005	<0.0005
	04/28/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/27/92	0.094^	<0.0005	<0.0005	<0.0005	<0.0005
	10/26/92	0.086^	<0.0005	<0.0005	<0.0005	<0.0005
	01/14/93	0.12	0.002	<0.0005	<0.0005	<0.0005
	04/16/93	0.060	<0.0005	<0.0005	<0.0005	<0.0005
	07/23/93	0.090	<0.0005	<0.0005	<0.0005	<0.0005
	10/27/93	NA	NA	NA	NA	NA
	01/27/94	NA	NA	NA	NA	NA
	05/05/94	<0.050	0.0020	<0.0005	<0.0005	<0.0005
	07/26/94	0.128	<0.0003	<0.0003	<0.0003	<0.0006
	10/28/94	0.167	<0.0003	<0.0003	<0.0003	<0.0006
S-13	05/03/89	0.15	0.0049	0.004	0.002	0.014
	08/10/89	0.11	0.0029	<0.001	<0.001	<0.003
	10/09/89	0.077	0.0014	<0.001	<0.001	<0.003
	01/25/90	0.051	0.0005	<0.0005	<0.0005	<0.001
	04/18/90	0.085	0.0087	<0.0005	<0.0005	<0.001
	07/23/90	0.080	0.0008	<0.0005	<0.0005	<0.0005
	10/18/90	0.13	<0.0005	<0.0005	<0.0005	<0.005
	01/28/91	<0.050	<0.0005	0.0009	0.0012	0.001
	04/25/91	0.44*	0.0038	<0.0005	<0.0005	0.0006
	07/09/91	0.32*	0.0006	<0.0005	<0.0005	<0.0005
	10/08/91	0.31	<0.0005	<0.0005	<0.0005	<0.0005
	04/28/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/26/92	0.18^	<0.0005	<0.0005	<0.0005	<0.0005
	01/13/93	NR	NR	NR	NR	NR
	04/16/93	0.24	0.0048	<0.0005	0.0013	<0.0005
	07/23/93	NR	NR	NR	NR	NR
	10/27/93	NA	NA	NA	NA	NA
	01/27/94	NR	NR	NR	NR	NR
	05/05/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/26/94	NR	NR	NR	NR	NR
	10/28/94	0.368	<0.0003	<0.0003	<0.0003	<0.0006
S-14	05/03/89	5.3	0.75	0.40	0.2	0.80
	08/10/89	1.8	0.54	0.14	0.042	0.05
	10/09/89	1.0	0.36	0.060	0.02	0.030
	01/25/90	0.64	0.16	0.077	0.017	0.039
	04/18/90	1.2	0.20	0.11	0.03	0.096
	07/23/90	5.0	0.43	0.34	0.14	0.66
	10/18/90	1.8	0.77	0.013	0.017	0.12
	01/28/91	0.72	0.20	0.036	0.021	0.078
	04/25/91	14	0.93	0.43	0.25	0.97
	07/09/91	0.16	0.030	0.0053	0.005	0.016

Table 2

Summary of Historical Groundwater Analytical Results
(milligrams per liter)

Well Number	Sampling Date	TPHG	Benzene	Toluene	Ethylbenzene	Total Xylenes
S-14 (cont.)	10/08/91	5.4	0.081	0.057	0.095	0.38
	04/28/92	2.0	0.27	0.14	0.048	0.17
	10/26/92	0.92	0.033	0.012	0.025	0.088
	01/13/93	NR	NR	NR	NR	NR
	04/16/93	4.5	1.1	0.029	0.091	0.17
	07/23/93	NR	NR	NR	NR	NR
	10/27/93	NA	NA	NA	NA	NA
	01/27/94	NR	NR	NR	NR	NR
	05/05/94	0.81	0.25	<0.0025	0.0094	0.019
	07/26/94	NR	NR	NR	NR	NR
	10/28/94	5.385	0.2906	0.0858	0.0497	0.1862
S-15	05/03/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	08/10/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	10/09/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	01/25/90	<0.050	<0.0005	<0.001	<0.001	<0.001
	04/18/90	<0.050	<0.0005	<0.0005	<0.0005	<0.001
	07/23/90	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/18/90	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	01/28/91	<0.050	<0.0005	0.0006	<0.0005	0.0008
	04/25/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/09/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/08/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	02/05/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	04/28/92	0.050	0.0008	0.0009	<0.0005	0.0014
	07/27/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/26/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	01/14/93	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	04/16/93	<0.050	0.0006	0.001	<0.0005	0.0007
	07/23/93	<0.050	0.0012	<0.0005	<0.0005	0.0016
	10/27/93	NA	NA	NA	NA	NA
	01/27/94	NA	NA	NA	NA	NA
	05/05/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/26/94	<0.05	<0.0003	<0.0003	<0.0003	<0.0006
	10/28/94	<0.05	0.0003	<0.0003	<0.0003	<0.0006
S-16	05/04/94	0.38	0.044	0.003	0.002	<0.003
	08/10/89	<0.050	0.0006	<0.001	<0.001	<0.003
	10/10/89	<0.005	<0.0005	<0.001	<0.001	<0.003
	01/25/90	0.24	0.16	0.0033	0.0008	0.011
	04/18/90	<0.050	0.001	<0.0005	<0.0005	<0.001
	07/23/90	<0.050	0.0011	<0.0005	<0.0005	<0.0005
	10/18/90	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	01/28/91	<0.050	<0.0005	0.0006	<0.0005	0.0009
	04/25/91	0.060^	0.021	0.0005	0.0032	0.0048
	07/09/91	<0.050	0.001	<0.0005	<0.0005	<0.0005
	10/08/91	0.050	0.017	0.0014	0.0012	0.0055
	02/05/92	0.15	0.065	0.0007	<0.0005	0.0084
	04/28/92	<0.050	0.013	<0.0005	<0.0005	<0.0005

Table 2

Summary of Historical Groundwater Analytical Results
(milligrams per liter)

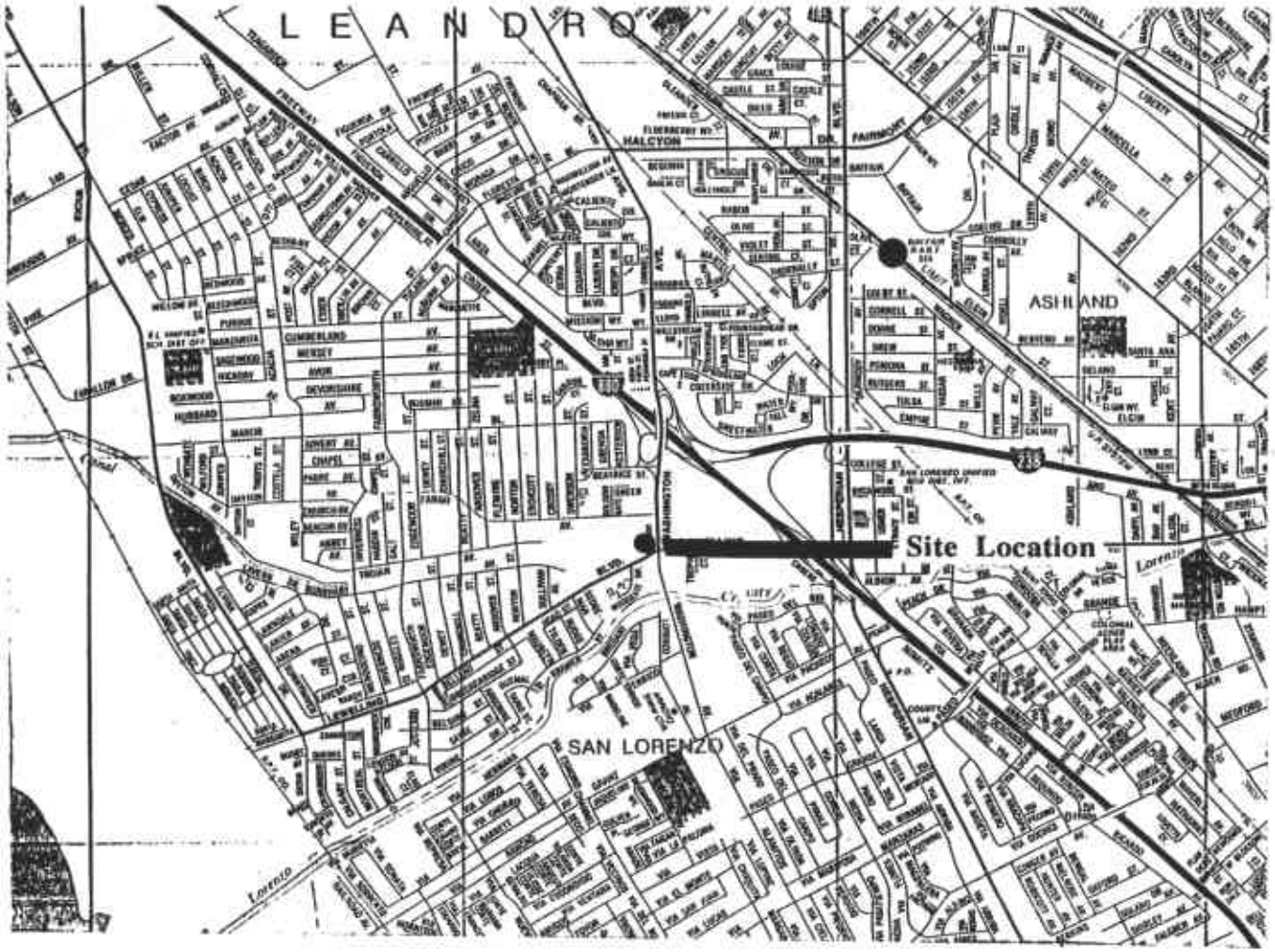
Well Number	Sampling Date	TPHG	Benzene	Toluene	Ethylbenzene	Total Xylenes
S-16 (cont.)	07/27/92	0.51	0.13	<0.0025	<0.0005	0.021
	10/26/92	<0.050	<0.0005	<0.0005	<0.0025	<0.0005
	01/13/93	0.10	0.025	0.0019	<0.0005	0.0084
	04/16/93	0.15	0.056	0.0018	0.0046	0.012
	07/23/93	<0.050	0.0009	<0.0005	<0.0005	<0.0005
	10/27/93	<0.050	0.0015	<0.0005	<0.0005	<0.0005
	01/27/94	0.14	0.085	<0.0010	<0.0010	0.013
	05/05/94	0.071	0.025	<0.0005	<0.0005	0.0042
	07/26/94	<0.05	<0.0003	<0.0003	<0.0003	<0.0006
	10/28/94	<0.05	0.0115	<0.0003	<0.0003	0.0018
S-17	05/03/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	08/10/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	10/09/89	<0.050	<0.0005	<0.001	<0.001	<0.003
	01/25/90	<0.050	<0.0005	<0.0005	<0.0005	<0.001
	04/18/90	<0.050	<0.0005	<0.0005	<0.0005	<0.001
	07/23/90	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/18/90	0.39	0.010	0.062	0.022	0.11
	01/28/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	04/25/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/09/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/08/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	04/28/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/26/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	01/13/93	NR	NR	NR	NR	NR
	04/16/93	0.13	<0.0005	<0.0005	<0.0005	<0.0005
	07/23/93	NR	NR	NR	NR	NR
	10/27/93	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	01/27/94	NR	NR	NR	NR	NR
	05/05/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/26/94	NR	NR	NR	NR	NR
	10/28/94	<0.05	<0.0003	<0.0003	<0.0003	<0.0006
S-18	05/31/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/09/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/08/91	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	02/05/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	04/28/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/27/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/26/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	01/13/93	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	04/16/93	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/23/93	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	10/27/93	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	01/27/94	<0.050	0.0019	<0.0005	<0.0005	<0.0005
	05/05/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	07/26/94	<0.5	<0.003	0.0011	<0.0003	0.0018
	10/28/94	<0.05	<0.0003	<0.0003	<0.0003	<0.0006

Table 2

Summary of Historical Groundwater Analytical Results
(milligrams per liter)

Well Number	Sampling Date	TPHG	Benzene	Toluene	Ethylbenzene	Total Xylenes
SR-1	03/22/89	5.4	1.1 1100	0.23	0.35	1.3
	01/25/90	2.2	0.47 470	0.12	0.11	0.51
	04/18/90	1.0	0.13 130	0.047	0.047	0.22
	07/23/90	3.2	0.47 470	0.32	0.17	0.87
	10/18/90	1.3	0.28 250	0.0066	0.11	0.13
	01/28/91	0.11	0.12 120	0.012	0.051	0.11
	07/09/91	1.4	0.20 200	0.027	0.13	0.34
	10/08/91	0.98	0.079 79	0.0015	0.044	0.052
	02/05/91	3.8	0.58 580	0.036	0.32	0.40
	04/28/92	38	1.8 1800	0.46	1.9	0.75
	07/27/92	FP	FP	FP	FP	FP
	10/26/92	1.8	0.37 370	0.010	0.13	0.13
	1/13/93	47	1.0 1000	1.1	1.7	13
	4/16/93	25	1.7 1700	0.43	2.4	8.3
	7/23/93	33	2.4 2400	2.0	3.8	14
	10/27/93	2.3	0.34 3400	<0.0125	0.27	0.44
	1/27/94	36	2 2000	1.7	3.0	11
	5/5/94	43	1.5 1500	0.13	2.9	12
	7/26/94	13.6	0.6827 682	0.0392	0.9966	2.516
	10/28/94	8.462	0.3015 301	0.0293	0.3847	2.019
			400			
			640			
			760			

TPHG = Total petroleum hydrocarbons as gasoline by EPA Method 8015 (modified).
BTEX = Benzene, toulene, ethylbenzene and total xylenes by EPA Method 8020.
NA = Not analyzed; well inaccessible.
NR = Not required.
* = Compounds detected within the chromatographic range of gasoline but not characteristic of the standard gasoline pattern.
** = The concentration reported as gasoline is primarily due to the presence of a discrete peak not indicative of gasoline.
^ = Compounds detected are volatile aromatics (BTEX) present in sample.



N

0 2200

Scale in Feet

Note: Vicinity Map taken from California State Automobile Association Map.

PLATE

1

SITE VICINITY MAP
Shell Oil Company
15275 Washington Avenue
San Leandro, California

enviros®
95276.01

Drawn By: JLP Date: 3-23-95

Approved By: _____ Date: 4-17-95

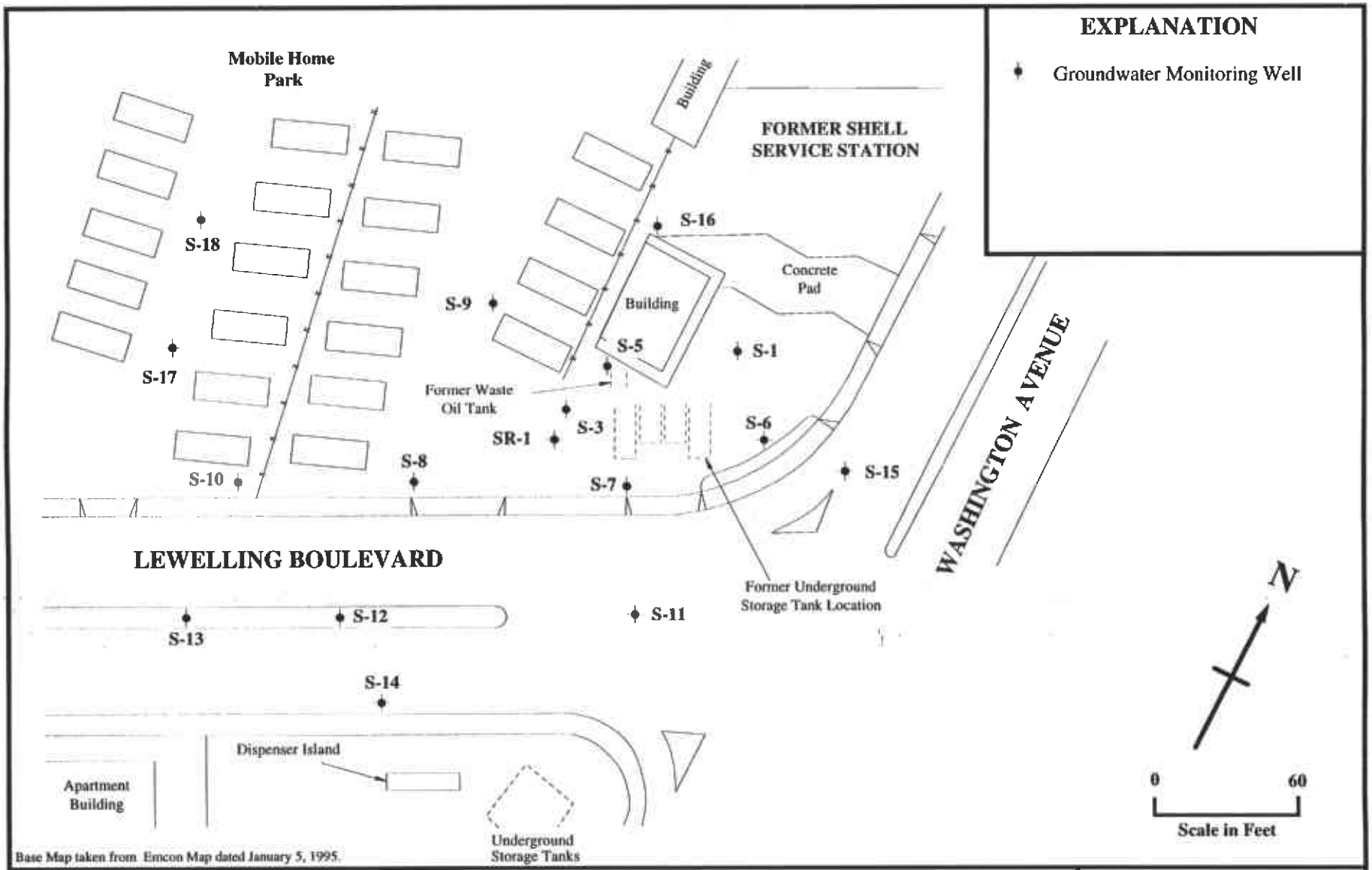
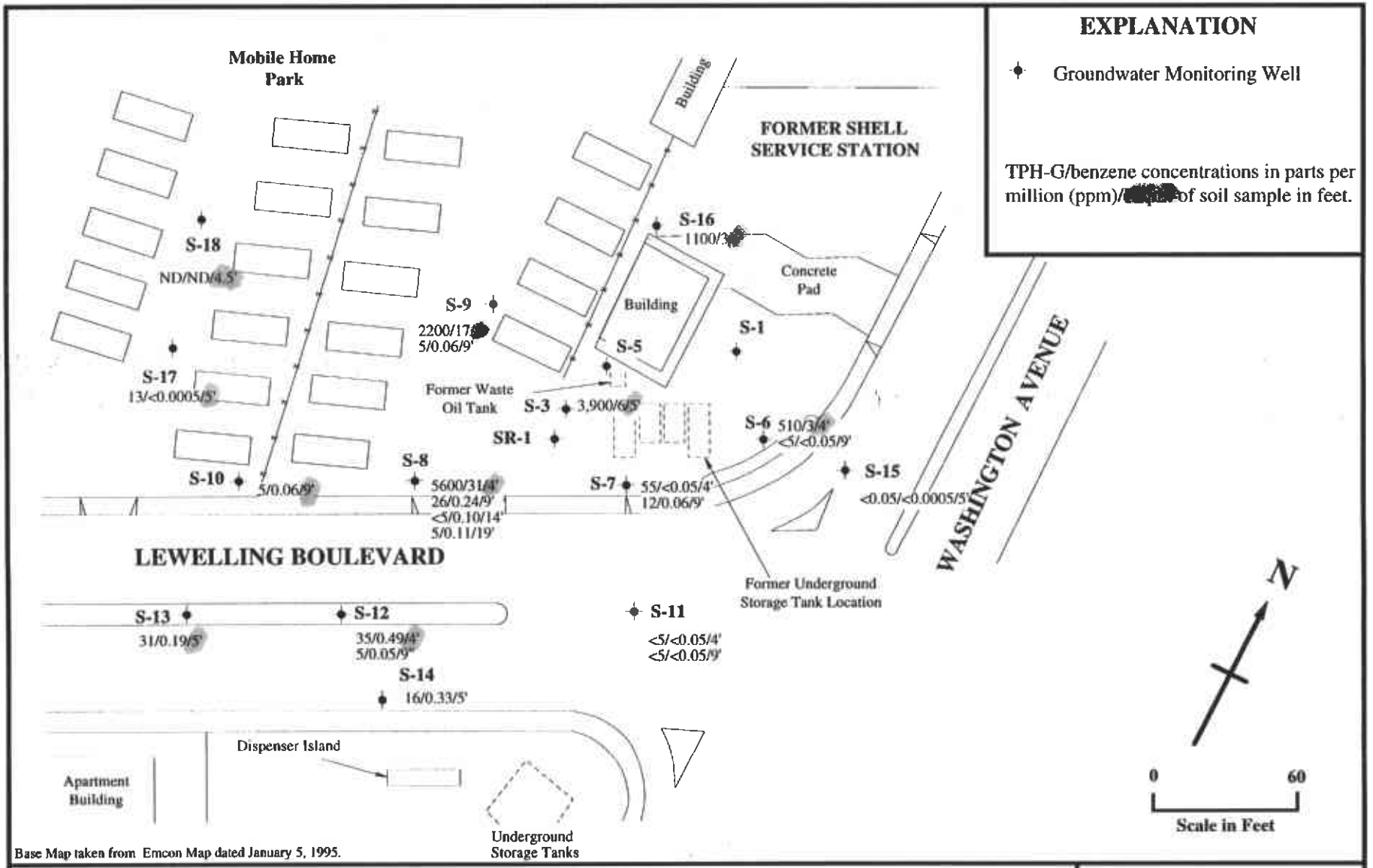


PLATE 2

SITE PLAN
Shell Oil Company
15275 Washington Avenue
San Leandro, California

enviros®
95276.01

Drawn By: JLP | Date: 4-3-95 | Approved By: DR | Date: 4-17-95



EXPLANATION

Groundwater Monitoring Well

TPH-G/benzene concentrations in parts per million (ppm)/[illegible] of soil sample in feet.

Base Map taken from Emcon Map dated January 5, 1995.

PLATE 3

SOIL QUALITY MAP
Shell Oil Company
15275 Washington Avenue
San Leandro, California

enviros®
95276.01

Drawn By: JLP Date: 4-3-95

Approved By: _____ Date: 4-17-95

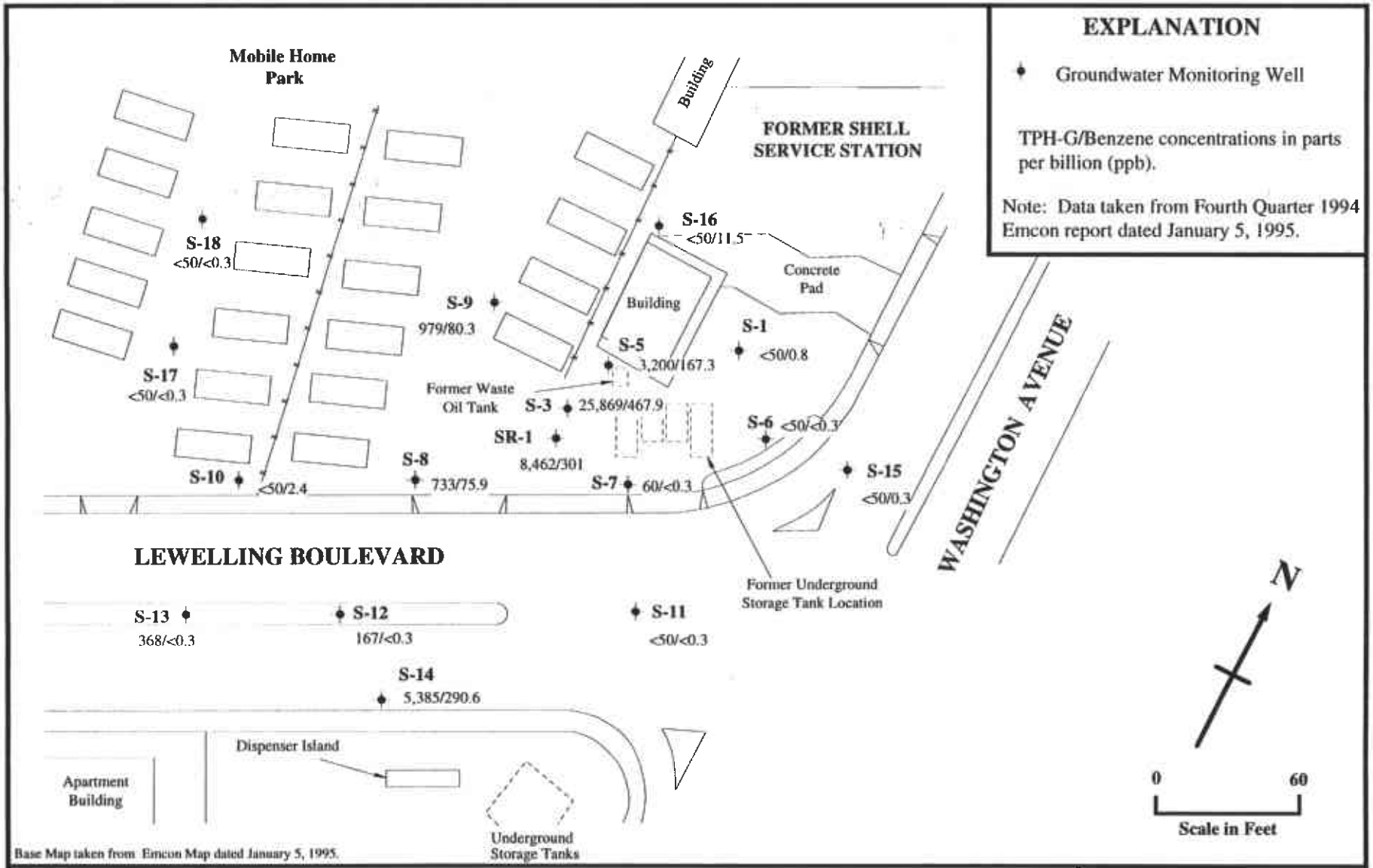


PLATE **4**

GROUNDWATER QUALITY MAP
Shell Oil Company
15275 Washington Avenue
San Leandro, California

enviros ®
95276.01

Drawn By: JLP | Date: 4-4-95 | Approved By: _____ | Date: 4/7-95

APPENDIX A

Exploratory Boring Logs
and
Geologic Cross-Section

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-08.01 BORING NO. S-1

PROJECT NAME Gettler-Ryan, Shell @ Washington & Lewelling, San Leandro PAGE 1 OF 2

BY JB DATE 6/18/85 SURFACE ELEV.

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				0		GC FILL	ASPHALT CLAYEY GRAVEL; Fill; dark olive gray (5Y, 3/2); fine to coarse gravel; 30-35% fines; damp; no product odor.
						CL	CLAY; dark gray (5Y, 4/1); trace fine sand; slightly silty; moist; no product odor.
				5			
			▽				
							@8.5': black (2.5Y, 3/0); no product odor.
	1.25	28		10			@10': grayish brown (2.5Y, 5/2); stiff; wet; slight product odor.
				15			
	3.0	25					
							@20': light olive brown (2.5Y, 5/4); very silty; firm; wet; no product odor.
	1.5	12		20			

REMARKS Drilled using 8-inch continuous flight hollow-stem auger.
Converted to a 3-inch monitoring well, detailed on Plate C.

EMCON ASSOCIATES

PLATE A

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-08.01 BORING NO. S-1

PROJECT NAME Gettler-Ryan, Shell @ Washington & Lewelling, PAGE 2 OF 2

BY JB DATE 6/18/85 San Leandro SURFACE ELEV.

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				20			HOLE TERMINATED AT 21½ FEET.
				25			

REMARKS

EMCON ASSOCIATES

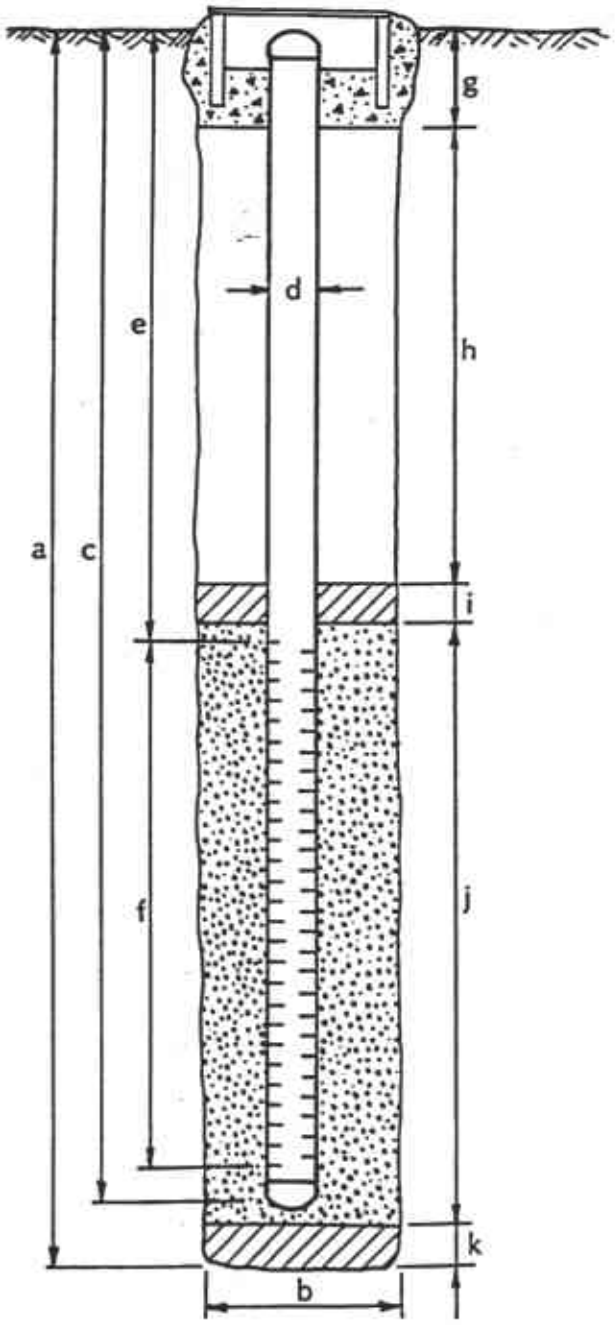
PLATE B

WELL DETAILS

PROJECT NUMBER 738-08.01
PROJECT NAME Gettler-Ryan, Shell @ Washington & Lewelling
COUNTY Alameda
WELL PERMIT NO. _____

BORING / WELL NO. S-1
TOP OF CASING ELEV. _____
GROUND SURFACE ELEV. _____
DATUM _____

G-5 vault box (Std.)



EXPLORATORY BORING

a. Total depth 21½ ft.
b. Diameter 8 in.
Drilling method Hollow-Stem Auger

WELL CONSTRUCTION

c. Casing length 19 ft.
Material Schedule 40 PVC
d. Diameter 3 in.
e. Depth to top perforations 4 ft.
f. Perforated length 15 ft.
Perforated interval from 4 to 19 ft.
Perforation type Machined Slot
Perforation size 0.020 inch
g. Surface seal 1 ft.
Seal material Cement
h. Backfill 2 ft.
Backfill material Cement
i. Seal ½ ft.
Seal material Bentonite
j. Gravel pack (3½ to 19') 15½ ft.
Pack material 6 x 12 Monterey Sand
k. Bottom seal 2½ ft.
Seal material Bentonite 20-21½
Compacted Clay 19-20

PLATE C

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-08.01 BORING NO. S-2

PROJECT NAME Gettler-Ryan, Shell @ Washington & Lewelling, San Leandro PAGE 1 OF 1

BY JB DATE 6/18/85 SURFACE ELEV.

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				0		GC FILL	ASPHALT GRAVEL; Fill; 30% fines
						CL	CLAY; dark gray (5Y, 3/1); trace fine sand; slightly silty; moist; slight product odor.
				5		SM	SILTY SAND; very dark gray (5Y, 3/1); 50% fine sand; 50% silt; loose; wet; strong product odor.
	2.0	32				CL	CLAY; black (2.5Y, 2/0); slightly silty; very stiff; very moist; slight product odor.
				10			
	3.0	28		15			@13.5': grayish brown (2.5Y, 5/2); stiff; wet; no product odor.
	1.75	15		20			@18.5': light brownish gray (2.5Y, 6/2); 40% silt; trace fine sand; stiff; wet; no product odor. HOLE TERMINATED AT 20 FEET.

REMARKS Drilled using 8-inch continuous flight hollow-stem auger.
Converted to 3-inch monitoring well, detailed on Plate E.

EMCON ASSOCIATES

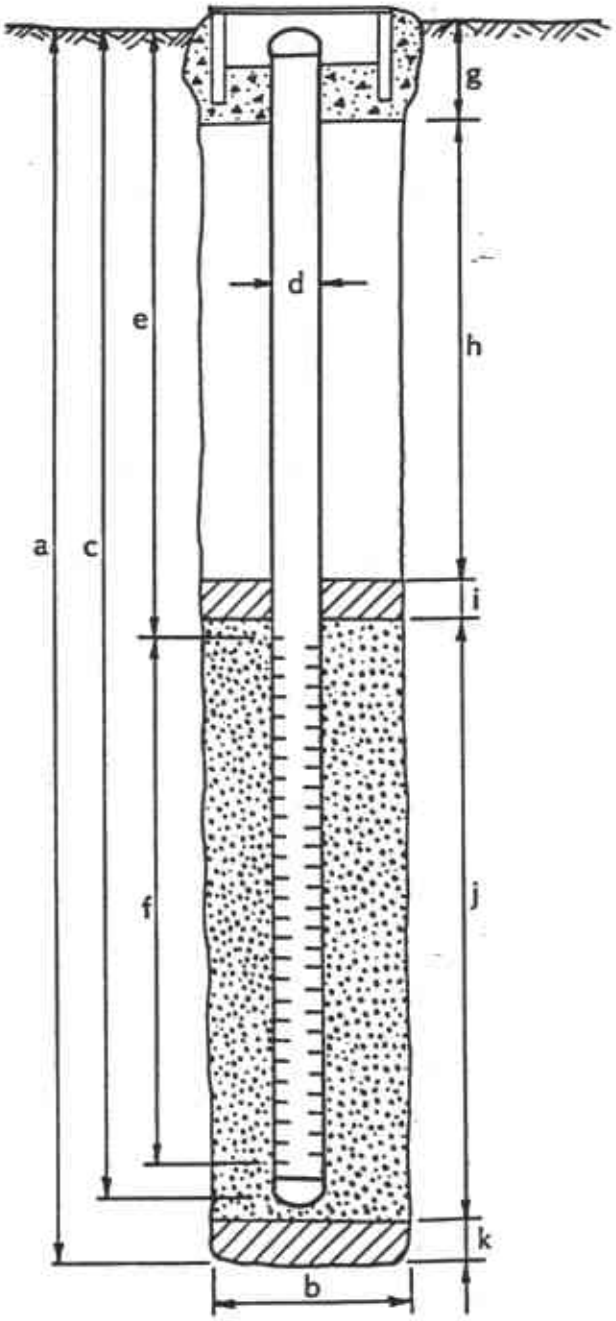
PLATE D

WELL DETAILS

PROJECT NUMBER 738-08.01
PROJECT NAME Gettler-Ryan, Shell @ Washington & Lewelling
COUNTY Alameda
WELL PERMIT NO.

BORING / WELL NO. S-2
TOP OF CASING ELEV.
GROUND SURFACE ELEV.
DATUM

G-5 vault box (Std.)



EXPLORATORY BORING

a. Total depth 20 ft.
b. Diameter 8 in.
Drilling method Hollow-Stem Auger

WELL CONSTRUCTION

c. Casing length 18½ ft.
Material Schedule 40 PVC
d. Diameter 3 in.
e. Depth to top perforations 4 ft.
f. Perforated length 14½ ft.
Perforated interval from 4 to 18½ ft.
Perforation type Machined Slot
Perforation size 0.020 inch
g. Surface seal 1 ft.
Seal material Cement
h. Backfill 2 ft.
Backfill material Cement
i. Seal ½ ft.
Seal material Bentonite
j. Gravel pack (3½ to 18½') 15 ft.
Pack material 6 x 12 Monterey Sand
k. Bottom seal 1½ ft.
Seal material Compacted clay

PLATE E

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-08.01 BORING NO. S-3

PROJECT NAME Gettler-Ryan, Shell @ Washington & Lewelling, San Leandro PAGE 1 OF 1

BY JB DATE 6/18/85 SURFACE ELEV.

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				0			ASPHALT
					GP		GRAVEL; Fill
					CL		CLAY; dark gray (5Y, 3/1); slightly silty; trace fine sand; moist; slight product odor.
				5			
		12	▽		SM-ML		SILTY SAND TO SANDY SILT; very dark gray (5Y, 3/1); 50% fine sand; 50% silt; loose; wet; strong product odor; saturated with product
					CL		CLAY; dark gray (5Y, 4/1); silty; firm; very moist; slight product odor.
				10			@ 10': no product odor.
	1.25	11					
				15			@ 15': stiff; wet; no product odor.
	3.0	24					HOLE TERMINATED AT 16½ FEET.
				20			

REMARKS Drilled using 8-inch continuous flight hollow-stem auger.
Converted to 3-inch monitoring well, detailed on Plate G .

EMCON ASSOCIATES

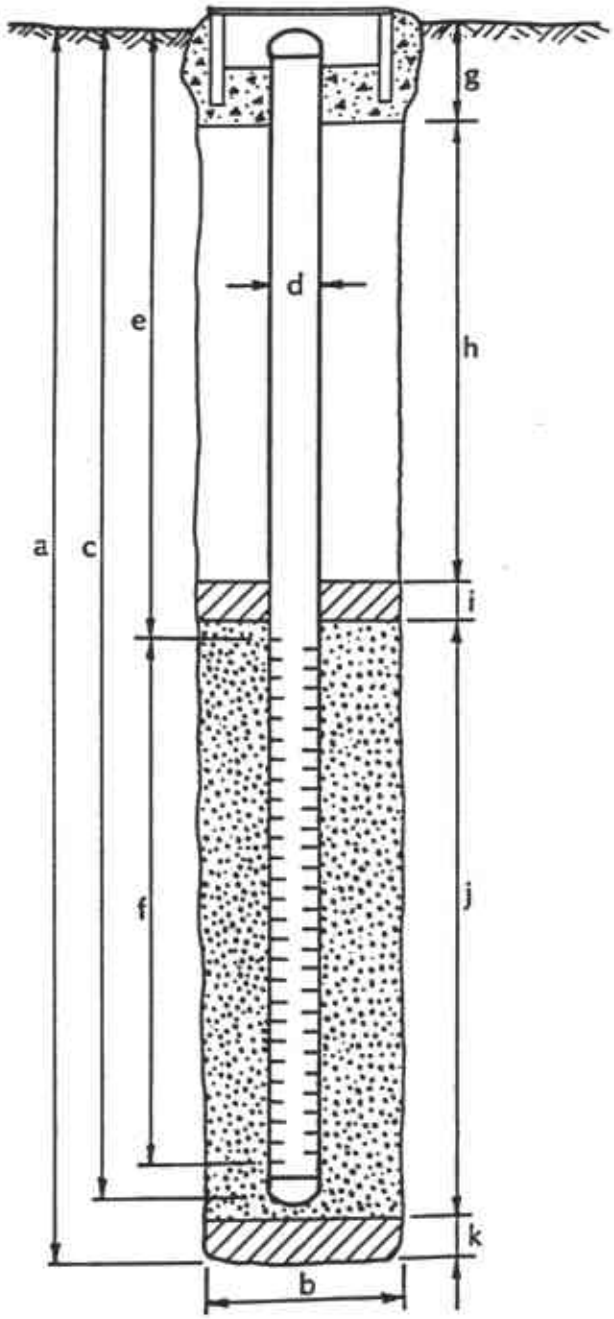
PLATE F

WELL DETAILS

PROJECT NUMBER 738-08.01
PROJECT NAME Gettler-Ryan, Shell @ Washington & Lewelling
COUNTY Alameda
WELL PERMIT NO. _____

BORING / WELL NO. S-3
TOP OF CASING ELEV. _____
GROUND SURFACE ELEV. _____
DATUM _____

G-5 vault box (Std.)



EXPLORATORY BORING

a. Total depth 16½ ft.
b. Diameter 8 in.
Drilling method Hollow-Stem Auger

WELL CONSTRUCTION

c. Casing length 16½ ft.
Material Schedule 40 PVC
d. Diameter 3 in.
e. Depth to top perforations 4 ft.
f. Perforated length 12½ ft.
Perforated interval from 4 to 16½ ft.
Perforation type Machined Slot
Perforation size 0.020 inch
g. Surface seal 1 ft.
Seal material Cement
h. Backfill 1 ft.
Backfill material Cement
i. Seal 1 ft.
Seal material Bentonite
j. Gravel pack (3 to 16½') 13½ ft.
Pack material 6x12 Monterey Sand
k. Bottom seal - ft.
Seal material -

PLATE G

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-08.01 BORING NO. S-4

PROJECT NAME Gettler-Ryan, Shell @ Washington & Lewelling, San Leandro PAGE 1 OF 1

BY JDB DATE 6/18/85 SURFACE ELEV.

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				0			CONCRETE.
						GW	GRAVEL FILL.
						CL	CLAY; dark gray (2.5Y, 3/2); slightly silty; moist; slight product odor.
				5		SP-ML	SILTY SAND to SANDY SILT; very dark gray (5Y, 3/1); loose; wet; strong product odor; saturated with product.
		11	▽				
						CL	CLAY; dark gray (5Y, 4/1); very silty; firm; wet; moderate product odor.
				10			
	2.0	9					
				15			@ 15': less silt; stiff; no product odor.
	2.75	24					
							HOLE TERMINATED AT 18 FEET.
				20			

REMARKS Drilled using 8-inch continuous flight hollow-stem auger. converted to 3-inch monitoring well as detailed on Plate I.

EMCON ASSOCIATES

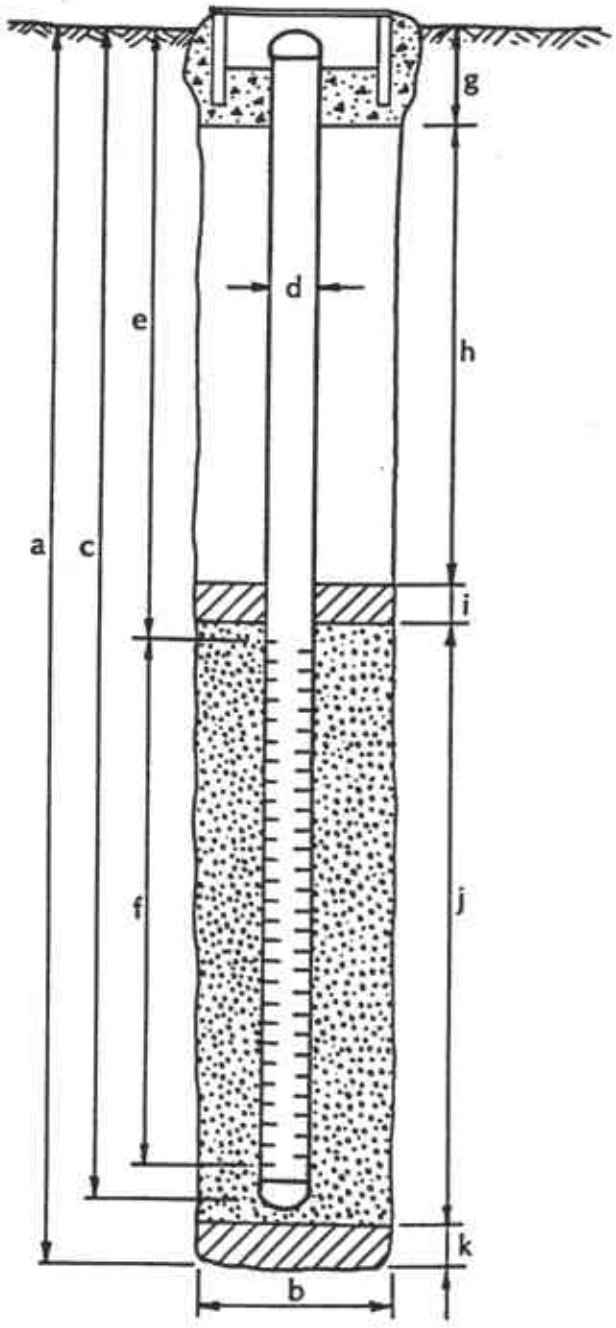
PLATE H

WELL DETAILS

PROJECT NUMBER 738-08.01
PROJECT NAME Gettler-Ryan, Shell @ Washington & Lewelling
COUNTY Alameda
WELL PERMIT NO. _____

BORING / WELL NO. S-4
TOP OF CASING ELEV. _____
GROUND SURFACE ELEV. _____
DATUM _____

G-5 vault box (Std.)



EXPLORATORY BORING

a. Total depth 18 ft.
b. Diameter 8 in.
Drilling method Hollow-Stem Auger

WELL CONSTRUCTION

c. Casing length 18 ft.
Material Schedule 40 PVC
d. Diameter 3 in.
e. Depth to top perforations 4 ft.
f. Perforated length 14 ft.
Perforated interval from 4 to 18 ft.
Perforation type Machined Slot
Perforation size 0.020 inch
g. Surface seal 1 ft.
Seal material Cement
h. Backfill 1 ft.
Backfill material Cement
i. Seal 1 ft.
Seal material Bentonite
j. Gravel pack (3 to 18') 15 ft.
Pack material 6x12 Monterey Sand
k. Bottom seal - ft.
Seal material -

PLATE I

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-08.02 BORING NO. S-A

PROJECT NAME Gettler-Ryan,Shell,Lewelling Bl. & Washington Av. PAGE 1 OF 1

BY EBL DATE 8/15/86 San Leandro SURFACE ELEV. 22'±

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
							ASPHALT, SAND, AND GRAVEL-FILL.
						ML	SANDY SILT; very dark gray (10YR, 3/1); 30-40% fine sand; soft; wet; strong product odor.
	2.0	10	▽	5	1	CH	CLAY; black (10YR,2/1); 10-20% fine sand; stiff; wet; strong product odor.
				10			BOTTOM OF BORING AT 8 FEET.
				15			
				20			
				25			
				30			
				35			
				40			

REMARKS

Drilled by 8-inch continous-flight, hollow-stem auger; samples collected with 2-inch California modified split-spoon sampler. Boring backfilled with cuttings to 1 foot; concrete to surface.

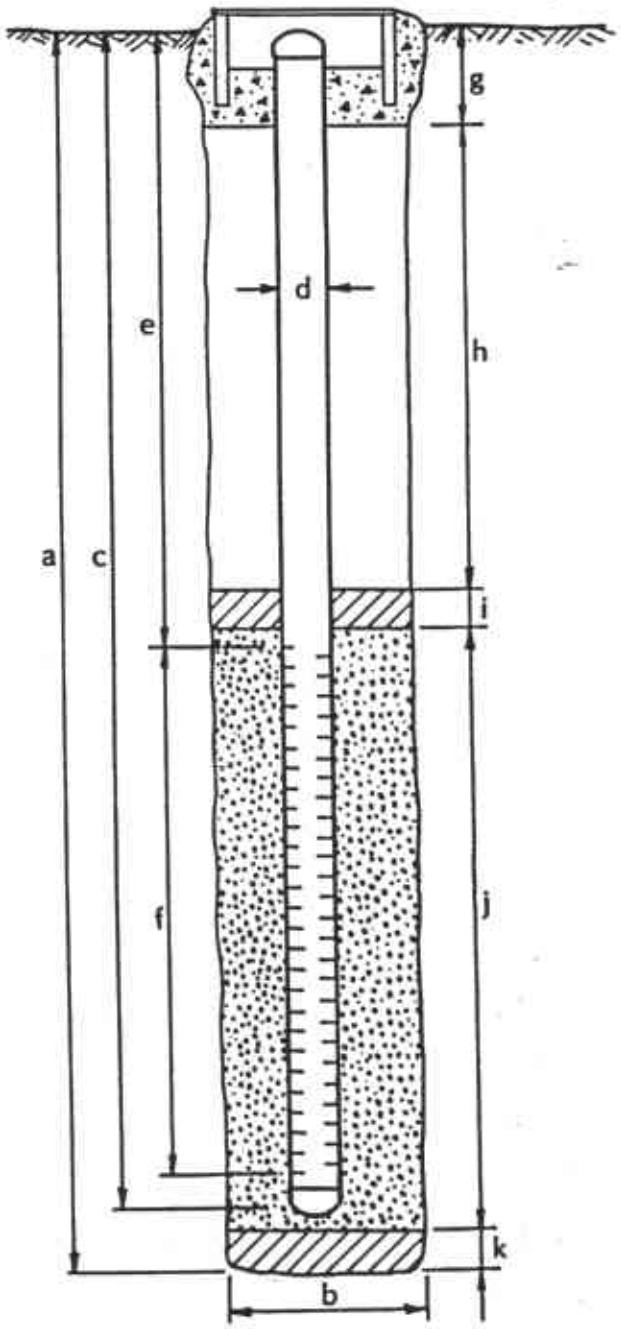
PLATE A

WELL DETAILS

PROJECT NUMBER 738-08.02
PROJECT NAME G-R Shell, San Leandro
COUNTY Alameda
WELL PERMIT NO.

BORING / WELL NO. S-B
TOP OF CASING ELEV.
GROUND SURFACE ELEV. 22' MSL
DATUM USGS

G-5 vault box (Std.)



EXPLORATORY BORING

a. Total depth 15.5 ft.
b. Diameter 8 in.
Drilling method Hollow-Stem Auger

WELL CONSTRUCTION

c. Casing length 15.5 ft.
Material Schedule 40 PVC
d. Diameter 3 in.
e. Depth to top perforations 1 ft.
f. Perforated length 14.5 ft.
Perforated interval from 14.5 to 1 ft.
Perforation type Machined Slot
Perforation size .020 inch
g. Surface seal 0.3 ft.
Seal material Bentonite
h. Backfill 0 ft.
Backfill material
i. Seal 0.7 ft.
Seal material Concrete
j. Gravel pack (13.9 to 1 Ft.) 12.9 ft.
Pack material Coarse Aquarium Sand
k. Bottom seal 0 ft.
Seal material
Note: Borehole caved to 13.9 feet.

PLATE C

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-08.02 BORING NO. S-C

PROJECT NAME Gettler-Ryan,Shell,Lewelling Bl. & Washington Av. PAGE 1 OF 1

BY EBL DATE 8/15/86 San Leandro SURFACE ELEV. 22'± MSL

TORVANE (TSF)	POCKET PENETRO-METER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-GRAPHIC COLUMN	DESCRIPTION
							CONCRETE, SAND, and GRAVEL- FILL.
					1	SW	SAND-FILL; dark gray (10YR, 4/1); < 10% fines; fine to coarse sand; loose; damp; strong product odor.
				5		CL	CLAY-FILL; very dark gray (2.5Y, N3); 10-20% fine sand; soft; moist; strong product odor.
		4	▽		2	SW	SAND-FILL; dark gray (10YR, 4/1); < 10% fines; fine to coarse sand; loose; wet; strong product odor.
				10			
	1.5	13			3	CH	CLAY; very dark grayish brown (2.5Y, 3/2); 15-25% fine sand; stiff; wet; faint product odor.
	3.0	21		15	4		@ 14': very stiff; faint product odor.
	2.5				5		@ 15-1/2': stiff; moist; no product odor.
				20			BOTTOM OF BORING AT 17 FEET.
				25			
				30			
				35			
				40			

REMARKS

Drilled by 8-inch continous-flight, hollow-stem auger; samples collected with 2-inch California modified split-spoon sampler. Boring backfilled with Bentonite to 12 feet, cuttings to 1 foot, and concrete to surface.

PLATE D

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-08.02 BORING NO. S-D

PROJECT NAME Gettler-Ryan,Shell,Lewelling Bl. & Washington Av. PAGE 1 OF 1

BY EBL DATE 8/15/86 San Leandro SURFACE ELEV. 22'± MSL

TORVANE (TSF)	POCKET PENETRO-METER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-GRAPHIC COLUMN	DESCRIPTION
				0			CONCRETE, SAND, and GRAVEL-FILL.
				5	1	SP	SAND; very dark gray (10YR, 3/1); < 10% fines; fine sand; loose; moist; strong product odor.
		2	▽		2		@ 7': moderate product odor.
				10	3		@ 11': wet; strong product odor; product sheen on sampler.
		12				CL	CLAY; very dark grayish brown; (2.5Y, 3/2); 10-20% fine sand; very stiff; moist; no product odor.
	3.0	26		15	4		BOTTOM OF BORING AT 15-1/2 FEET.
				20			
				25			
				30			
				35			
				40			

REMARKS

Drilled by continous-flight, hollow-stem auger; samples collected with 2-inch California modified split-spoon sampler. Boring backfilled with Bentonite to 12 feet, cuttings to 1 foot, and concrete to surface.

PLATE E

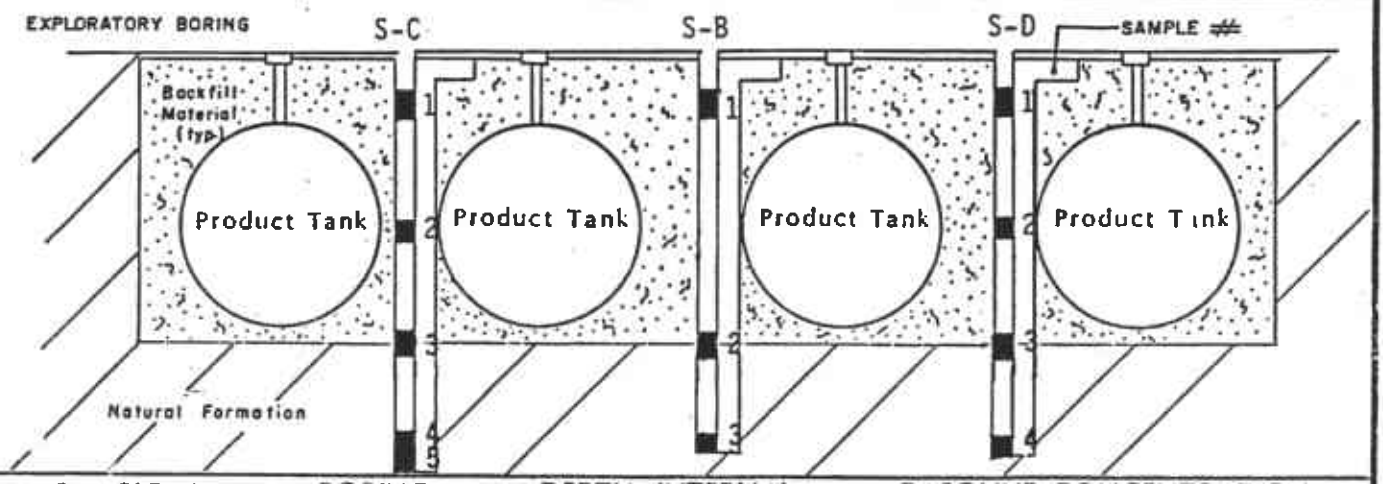
GETTLER-RYAN, INC.

EMCON ASSOCIATES

GENERALIZED PROFILE OF SUBSURFACE TANK COMPLEX AND GASOLINE CONCENTRATIONS WITHIN BACKFILL MATERIAL

PROJECT NUMBER 738-08.02
PROJECT NAME G-R Shell, San Leandro
NUMBER OF TANKS IN COMPLEX 4

MAPVIEW DIMENSIONS 27' x 42'
APPROXIMATE DEPTH 12 feet



SAMPLE #	BORING	DEPTH INTERVAL	GASOLINE CONCENTRATION (parts per million)
1	S-B	3-1/2 to 5	1,700
2	S-B	11 to 12-1/2	1,500
3	S-B	14 to 15-1/2	nd*
1	S-C	3-1/2 to 5	310
2	S-C	7-1/2 to 9	nd[1]
3	S-C	11-1/2 to 13	nd*
4	S-C	14 to 15-1/2	300
5	S-C	15-1/2 to 17	nd*
1	S-D	3-1/2 to 5	nd[2]
2	S-D	7 to 8-1/2	nd*
3	S-D	11 to 12-1/2	nd*
4	S-D	14 to 15-1/2	nd*

nd = no detection.

* Detection limit = 5 parts per million.

1 Detection limit = 200 ppm due to matrix interferences.

2 Detection limit = 100 ppm due to matrix interferences.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-08.03 BORING NO. S-5

PROJECT NAME Gettler-Ryan, Shell, Washington & Lewelling PAGE 1 OF 2

BY JDB DATE 12/24/86 SURFACE ELEV. 21.71'

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
						GP	ASPHALT GRAVEL-FILL; coarse baserock.
						CL	CLAY; dark gray (5Y, 4/1); 98-100% low- to moderate-plasticity fines; <2% fine sand; stiff; damp; no gasoline odor. @4': slight gasoline odor.
	1.25	9		5	1	SC	CLAYEY SAND; dark gray (5Y, 4/1); 20-40% low-plasticity fines; 60-80% fine sand; loose; moist; slight to moderate gasoline odor.
			▽			ML CH-CL	SANDY SILT; dark gray (5Y, 4/1); 70-90% non-plastic fines; 10-30% fine sand; stiff; moderate gasoline odor.
	1.5	17		10	2		CLAY; black (5Y, 2.5/1); 100% moderate- to high-plasticity fines; occasionally calcareous; stiff to very stiff; wet in voids; slight gasoline odor to 10 feet.
						CH	
	2.25	22		15	3		@14': gray (5Y, 5/1); 100% high-plasticity fines; very stiff; very moist; no gasoline odor. @19': abundant caliche disseminated; no gasoline odor.
	2.0	29		20	4		

REMARKS

Drilled with 8- and 12-inch continuous-flight, hollow-stem auger drilling equipment. Converted to a 4-inch monitoring well as detailed on Plate B.

PLATE A

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-08.03 BORING NO. S-5

PROJECT NAME Gettler-Ryan, Shell, Washington & Lewelling PAGE 2 OF 2

BY JDB DATE 12/24/86 SURFACE ELEV. 21.71'

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				20			BOTTOM OF BORING AT 20.5 FEET
				25			
				30			
				35			
				40			

REMARKS

PLATE B

WELL DETAILS

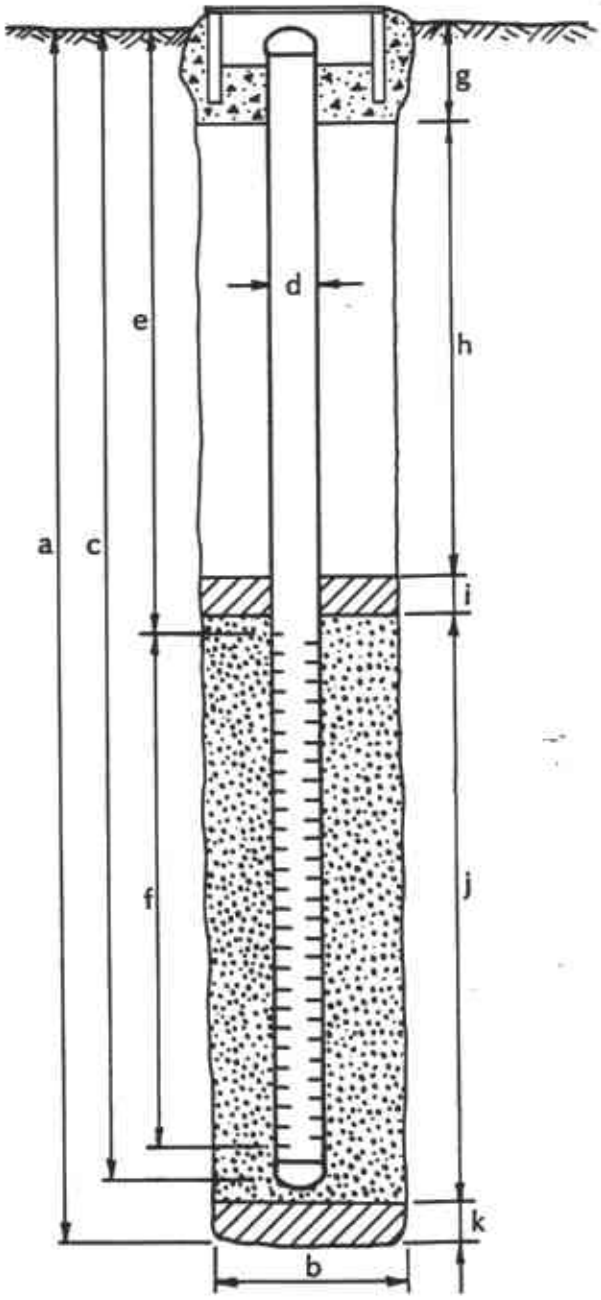
PROJECT NUMBER 738-08.03 BORING / WELL NO. S-5

PROJECT NAME Shell, Washington & Lewelling San Leandro TOP OF CASING ELEV. 21.24'

COUNTY Alameda GROUND SURFACE ELEV. 21.71'

WELL PERMIT NO. DATUM Project

G-5 vault box (Std.)



EXPLORATORY BORING

a. Total depth 20½ ft.

b. Diameter 12 in.

Drilling method Hollow-stem auger

WELL CONSTRUCTION

c. Casing length 18½ ft.

Material schedule 40 PVC

d. Diameter 4 in.

e. Depth to top perforations 3½ ft.

f. Perforated length 15 ft.

Perforated interval from 18½ to 3½ ft.

Perforation type machined slot

Perforation size 0.020 inch

g. Surface seal (1 - 0') 1 ft.

Seal material concrete

h. Backfill (1½ - 1') ½ ft.

Backfill material concrete

i. Seal (2½ - 1½') 1 ft.

Seal material bentonite

j. Gravel pack (18½ - 2½') 16 ft.

Pack material 6x12 Monterey Sand

k. Bottom seal (20½ - 18½') 2 ft.

Seal material compacted clay

PLATE C

Woodward-Clyde Consultants

PROJECT NAME GETTLER-RYAN NO. 8620011A

MONITORING WELL LOCATION	15275 Washington Ave., San Leandro, CA [redacted]	ELEVATION AND DATUM	
DRILLING AGENCY	Bay Land Drilling	DRILLER	Tom/Mack
DATE STARTED / DATE FINISHED	11/4 / 88		
DRILLING EQUIPMENT	CME - 55	COMPLETION DEPTH	24.5'
SAMPLER	Modified California		
DRILLING METHOD	8" Hollow stem auger	NO. OF SAMPLES / DIST.	5
UNDIST.	5		
DRILL BIT	CME Carbide	WATER LEVEL / FIRST	8'
COMPL.	—	24 HRS.	—
SIZE AND TYPE OF CASING	Sch 40 3" PVC — FROM 24.0 TO 0.5 FT.	LOGGED BY:	G. Heyman
CHECKED BY:	M. Bonkowski		
TYPE OF PERFORATION	0.02" — FROM 23.5 TO 3.5 FT.		
SIZE AND TYPE OF PACK	2/12 Monterey Sand — FROM 24.0 TO 3.0 FT.		
TYPE OF SEAL	NO. 1 1/2" Bentonite Pellets — FROM 3 TO 2.5 FT.		
	NO. 2 Cement grout — FROM 2.5 TO surface FT.		

Depth (feet)	Sample	Blows	MATERIAL DESCRIPTION		USCS	Well Construction
			Asphaltic Concrete			
5	1	pushed @ 200 lbs	CLAYEY SAND to SANDY CLAY grading down to SILTY CLAY TO CLAYEY SILT greenish gray at top with gray mottling in middle and bottom of sample, very fine sand, low plasticity, moist, generally homogeneous	OVM jumped to 190 ppm then settled at 120 ppm Weak Hydrocarbon odor	CL	
10	2	4 5 7	SILTY CLAY dark brownish gray, some very fine sand, low plasticity, firm, moist to wet, few beds of clay, sand to 1/4" thick	OVM = 20 ppm Weak Hydrocarbon odor	CL	
15	3	5 8 11	CLAY to SILTY CLAY medium grayish brown, some silt grading to silty clay, medium plasticity, wet homogeneous Driller indiccates drilling through a series of 2 - 4" gravel layers from 16 - 19'	OVM = 0 ppm No Hydrocarbon odor	CL	
20	4	3 4 5	CLAY to SANDY CLAY medium grayish brown, little to some very fine sand occasionally grading to sandy clay, low to medium plasticity, firm, saturated	No Hydrocarbon odor	CL	
			CLAYEY SAND to SANDY CLAY medium yellow brown, very fine sand, saturated	OVM = 1 ppm No Hydrocarbon odor		
	5	4 5 7	SILTY CLAY to CLAYEY SILT medium yellow brown, up to some very fine sand, low to medium plasticity, saturated	OVM = 0 ppm No Hydrocarbon odor	CL	
25			Total Depth = 24.5 feet			
			* = Laboratory Sample			
30						
35						

Woodward-Clyde Consultants PROJECT NAME GETTLER-RYAN NO. 8820011A

MONITORING WELL LOCATION	15275 Washington Ave., San Leandro, CA	ELEVATION AND DATUM	
DRILLING AGENCY	Bay Land Drilling / DRILLER Tom/Mack	DATE STARTED / DATE FINISHED	11/4/88
DRILLING EQUIPMENT	CME - 55	COMPLETION DEPTH 24.5'	SAMPLER Modified California
DRILLING METHOD	8" Hollow stem auger / DRILL BIT CME Carbide	NO. OF SAMPLES DIST. 5	UNDIST. 5
SIZE AND TYPE OF CASING	Sch 40 3" PVC / FROM 24.5 TO 0.5 FT.	WATER LEVEL FIRST 8'	COMPL. 7.8' / 24 HRS. —
TYPE OF PERFORATION	0.02" / FROM 24.0 TO 4.0 FT.	LOGGED BY: G. Heyman	CHECKED BY: M. Bonkowski
SIZE AND TYPE OF PACK	2/12 Monterey Sand / FROM 24.5 TO 3.5 FT.		
TYPE OF SEAL	NO. 1 1/2" Bentonite Pellets / FROM 3.5 TO 3.0 FT.		
	NO. 2 Cement grout / FROM 3.0 TO 0.5 FT.		

Depth (feet)	Samples	Blows	MATERIAL DESCRIPTION		USCS	Well Construction
			Asphaltic Concrete and base rock			
5	1	pushed @ 175 lbs	SILTY to SANDY CLAY greenish gray, silt and very fine grained sand, content varies vertically, low plasticity, firm, moist, numerous vesicles less than 1 mm diameter	OVM = 110 ppm Moderate Hydrocarbon odor	CL	
				Strong Hydrocarbon odor in cuttings at 8'		
10	2	4 7 9	SILTY CLAY to CLAYEY SILT dark brown, little to some very fine sand, low plasticity, moist to wet, few vesicles	OVM = 0 ppm No Hydrocarbon odor	CL-ML	
15	3	5 9 11	SILTY CLAY greenish brown, little to some very fine sand, medium plasticity, wet with saturated areas, gravel layers 1 - 2" thick from 16 - 18' (driller)	OVM = 0 ppm No Hydrocarbon odor	CL	
20	4*	3 4 4	SILTY CLAY with Interbedded CLAYEY SAND to SANDY CLAY Clay is grayish brown, medium plasticity, wet with saturated areas, sand is light yellow brown, very fine grained, loose, wet to saturated, up to 3" thick	OVM = 0.5 ppm No Hydrocarbon odor	CL-SC	
	5	4 7 8	SANDY CLAY to CLAYEY SAND layers are up to 5" thick, as above	No Hydrocarbon odor	CL	
25			Total Depth = 24.5 feet * = Laboratory Sample			
30						
35						

Woodward-Clyde Consultants

PROJECT NAME GETTLER-RYAN NO. 8820011A

MONITORING WELL LOCATION 15275 Washington Ave., San Leandro, CA		ELEVATION AND DATUM	
DRILLING AGENCY Bay Land Drilling	DRILLER Tom/Mack	DATE STARTED 11/4/88 DATE FINISHED	
DRILLING EQUIPMENT CME - 55		COMPLETION DEPTH 18'	SAMPLER Modified California
DRILLING METHOD 8" Hollow stem auger	DRILL BIT CME Carbide	NO. OF SAMPLES DIST. 4	UNDIST. —
SIZE AND TYPE OF CASING Sch 40 3" PVC	FROM 18.0 TO 0.5 FT.	WATER LEVEL FIRST 5' +/-	COMPL. 7.1' 24 HRS. —
TYPE OF PERFORATION 0.02"	FROM 17.5 TO 4.0 FT.	LOGGED BY: G. Heyman	CHECKED BY: M. Bonkowski
SIZE AND TYPE OF PACK 2/12 Monterey Sand	FROM 18 TO 3.0 FT.		
TYPE OF SEAL NO. 1 1/2" Bentonite Pellets	FROM 3 TO 2.5 FT.		
NO. 2 Cement grout	FROM 2.5 TO surface FT.		

Depth (feet)	Samples	Blows	MATERIAL DESCRIPTION		USCS	Well Construction
			Asphaltic Concrete			
5	1*	pushed @ 100 lbs	SILTY to SANDY SILT dark gray, very fine sand, low plasticity, soft, moist, homogeneous	OVM = 0 ppm No Hydrocarbon odor	CL	
10	2*	3 4 7	Interlayered SILTY CLAY and CLAYEY SAND dark greenish gray, little very fine sand in clay, low plasticity, moist, wet with few saturated areas	OVM = 3.7 ppm No Hydrocarbon odor Weak Hydrocarbon odor in 20 minutes	CL-SC	
15	3	5 8 9	CLAY to SILTY CLAY light to medium brown, low to medium plasticity, moist, few off-white brittle veinlets 2 - 3 mm thick	OVM = 0 ppm No Hydrocarbon odor	CL-CH	
20	4	4 5 7	SILTY CLAY medium gray brown, some very fine sand, trace fine gravel, medium plasticity, wet to occasionally saturated	No Hydrocarbon odor	CL-CH	
25			Total Depth = feet * = Laboratory Sample			
30						
35						

LOG OF MONITORING WELL NO. S-10 SHEET 1 OF 1

Woodward-Clyde Consultants

PROJECT NAME GETTLER-RYAN NO. 8820011A

MONITORING WELL LOCATION 15275 Washington Ave., San Leandro, CA		ELEVATION AND DATUM	
DRILLING AGENCY Bay Land Drilling	DRILLER Tom/Mack	DATE STARTED / DATE FINISHED 11/4/88	
DRILLING EQUIPMENT CME - 55		COMPLETION DEPTH 18'	SAMPLER Modified California
DRILLING METHOD 8" Hollow stem auger	DRILL BIT CME Carbide	NO. OF SAMPLES DIST. 4	UNDIST. —
SIZE AND TYPE OF CASING Sch 40 3" PVC	FROM 18.0 TO 0.5 FT.	WATER LEVEL FIRST 8' +/-	COMPL. 6.2' / 24 HRS. —
TYPE OF PERFORATION 0.02"	FROM 17.5 TO 4.0 FT.	LOGGED BY: G. Heyman	CHECKED BY: M. Bonkowski
SIZE AND TYPE OF PACK 2/12 Monterey Sand	FROM 18 TO 3.0 FT.		
TYPE OF SEAL NO. 1 1/2" Bentonite Pellets	FROM 3 TO 2.5 FT.		
NO. 2 Cement grout	FROM 2.5 TO surface FT.		

Depth (feet)	Samples	Blows	MATERIAL DESCRIPTION		USCS	Well Construction
			Asphaltic Concrete			
			FILL - SAND and GRAVEL			
			SILTY CLAY to CLAYEY SILT (cuttings) dark gray, little to some very fine sand, low to medium plasticity, moist to wet	Moderate Hydrocarbon odor		
5	1*	pushed @ 150 lbs	SILTY CLAY to CLAYEY SILT dark gray, some very fine sand, low plasticity, soft, moist, homogeneous	OVM = 540 ppm Strong Hydrocarbon odor	CL	
10	2*	3 4 5	SANDY SILT to SANDY CLAY medium gray grading down to medium brown, very fine sand, low plasticity, wet, few vesicles less than 1 mm diameter, few root traces	OVM = 27 ppm Weak Hydrocarbon odor	CL	
15	3	6 8 12	CLAY to SILTY CLAY medium gray brown to green brown, occasionally little very fine sand, little to some silt, medium plasticity, moist with wet to saturated areas adjacent to vesicles, few root fragments, few vesicles	OVM = 8 ppm No Hydrocarbon odor	CL-CH	
20	4		CLAYEY SILT to SILTY CLAY medium gray brown, medium plasticity, firm, wet	OVM = 5 ppm No Hydrocarbon odor	CL-ML-SM	
			SANDY SILT to SILTY SAND light yellow brown, very fine sand, little to some clay, wet to saturated			
			Total Depth = 20.5 feet			
			* = Laboratory Sample			
25						
30						
35						

LOG OF MONITORING WELL NO. S-9 SHEET 1 OF 1

Woodward-Clyde Consultants PROJECT NAME GETTLER-RYAN NO. 8820011A

MONITORING WELL LOCATION 15275 Washington Ave., San Leandro, CA (S-8)		ELEVATION AND DATUM	
DRILLING AGENCY Bay Land Drilling	DRILLER Tom/Mack	DATE STARTED / DATE FINISHED	11/3/88
DRILLING EQUIPMENT CME - 55		COMPLETION DEPTH 24.5'	SAMPLER Modified California
DRILLING METHOD 8" Hollow stem auger	DRILL BIT CME Carbide	NO. OF SAMPLES	DIST. 5 / UNDIST. 5
SIZE AND TYPE OF CASING Sch 40 3" PVC	FROM 24.0 TO 0.5 FT.	WATER LEVEL	FIRST -8' / COMPL. — / 24 HRS. —
TYPE OF PERFORATION 0.02"	FROM 24.0 TO 4.0 FT.	LOGGED BY: R. Siegel	CHECKED BY: M. Bonkowski
SIZE AND TYPE OF PACK 2/12 Monterey Sand	FROM 24.5 TO 3.0 FT.		
TYPE OF SEAL NO. 1 1/2" Bentonite Pellets	FROM 3 TO 2.5 FT.		
NO. 2 Cement grout	FROM 2.5 TO 0.5 FT.		

Depth (feet)	Samples	Blows	MATERIAL DESCRIPTION		USCS	Well Construction
			Asphaltic Concrete			
5	1*	5 7 9	FILL - SILTY CLAY some pebbles to 1", low plasticity, moist, low cohesion	OVM = 43 ppm Very strong Hydrocarbon odor	CL	
10	2*	5 7 14	SILTY to SANDY CLAY mottled black and brown, fine to medium sand, a few pebbles to 1/4" diameter, poorly sorted, dry to moist	OVM = 1.4 ppm	CL	
15	3*	5 9 14	as above, poor recovery, resampled from same depth gravels and pebbles present in clay, pebbles to 1/8", increased moisture, decreased cohesion	OVM = 453 ppm	CL	
20	4*	3 5 5 7	as above then goes to (A tube), Silty to Sandy Clay, light brown, fine sand, moist to dry, moderate cohesion	OVM = 4.8 ppm	CL	
	5*	5 6 10	No recovery after 2 attempts			
25			Total Depth = 24.5 feet * = Laboratory Sample			
30						
35						

Woodward-Clyde Consultants

PROJECT NAME GETTLER-RYAN NO. 8820011A

MONITORING WELL LOCATION 15275 Washington Ave., San Leandro, CA (S-7)		ELEVATION AND DATUM	
DRILLING AGENCY Bay Land Drilling	DRILLER Tom/Mack	DATE STARTED / DATE FINISHED 11/3/88	
DRILLING EQUIPMENT CME - 55		COMPLETION DEPTH 24.5'	SAMPLER Modified California
DRILLING METHOD 8" Hollow stem auger	DRILL BIT CME Carbide	NO. OF SAMPLES DIST. 5	UNDIST. 5
SIZE AND TYPE OF CASING Sch 40 3" PVC	FROM 24.0 TO 0.5 FT.	WATER LEVEL FIRST ~8'	COMPL. — 24 HRS. —
TYPE OF PERFORATION 0.02"	FROM 24.0 TO 4.0 FT.	LOGGED BY: R. Siegel	CHECKED BY: M. Bonkowski
SIZE AND TYPE OF PACK 2/12 Monterey Sand	FROM 24.5 TO 3.0 FT.		
TYPE OF SEAL NO. 1 Bentonite	FROM 3 TO 2.5 FT.		
NO. 2 Cement grout	FROM 2.5 TO 0.5 FT.		

Depth (feet)	Samples	Blows	MATERIAL DESCRIPTION		USCS	Well Construction
			Asphaltic Concrete			
5	1*	pushed @ 200 lbs	FILL - CLAY silty sandy clay with large pebbles to 2" diameter, plastic, moist to wet, cohesive, Note: pipe encountered at ~5', moved auger over slightly	OVM = 9.0 ppm	CL	
10	2*	5 8 10	CLAY black mottled with green, low plastiviey, stiff, dry, moderate cohesion	OVM = 32 ppm	CL	
15	3	6 9 12	SILTY CLAY mottled black and brown, gravelly clay present in top, stiff, dry, moderate cohesion	OVM = 2.2 ppm	CL	
20	4	7 7 9	same as Silty Clay above	OVM = 1.8 ppm	CL	
	5	5 5 4	same as Silty Clay above but some fine sands present	OVM = 0.6 ppm		
25			Total Depth = 24.5 feet * = Laboratory Sample			
30						
35						

Woodward-Clyde Consultants

PROJECT NAME GETTLER-RYAN NO. 8820011A

MONITORING WELL LOCATION	15275 Washington Ave., San Leandro, CA (S-6)	ELEVATION AND DATUM	
DRILLING AGENCY	Bay Land Drilling	DRILLER Tom/Mack	DATE STARTED 11/3/88 DATE FINISHED
DRILLING EQUIPMENT	CME - 55	COMPLETION DEPTH 24.5'	SAMPLER Modified California
DRILLING METHOD	6" Hollow stem auger	DRILL BIT CME Carbide	NO. OF SAMPLES DIST. 5 UNDIST. 5
SIZE AND TYPE OF CASING	Sch 40 3" PVC	FROM 24.0 TO 0.5 FT.	WATER LEVEL FIRST 8' COMPL. — 24 HRS. —
TYPE OF PERFORATION	0.02"	FROM 24.0 TO 4.0 FT.	LOGGED BY: R. Siegel
SIZE AND TYPE OF PACK	2/12 Monterey Sand	FROM 24.5 TO 3.0 FT.	CHECKED BY: M. Bonkowski
TYPE OF SEAL NO. 1	1/2" Bentonite Pellets	FROM 3 TO 2.5 FT.	
NO. 2	Cement grout	FROM 2.5 TO 0.5 FT.	

Depth (feet)	Samples	Blows	MATERIAL DESCRIPTION		USCS	Well Construction
			Asphaltic Concrete			
			FILL black, pebbly clay, moist			
5	1*	pushed @ 150 lbs	SILTY CLAY gray black, low plasticity, moist to dry, moderately cohesive, some vegetative debris with iron - oxide staining	OVM = 482 ppm Hydrocarbon odor	CL	
10	2*	5 7 9	SANDY to SILTY CLAY mottled brown and black, fine to medium sand with 5% pebbles up to 1/4", moist to dry, low cohesiveness - grades in B and A sample tubes to clay, black, dry, very dense and cohesive, 5% silt	OVM = 1.3 ppm	CL	
15	3	5 9 14	CLAY mottled black and brown, very stiff, dry, cohesive	OVM = 26.5 ppm	CL	
			B and C tubes - same as sample 3			
20	4	5 11 15	SANDY to SILTY CLAY light brown with some black mottling, moderate cohesion, some vegetative debris with iron oxide staining	OVM = 0.8 ppm	CL	
	5	5 7 8	CLAY black to mottled brown and black, minor silt (<5%), very stiff, dry, cohesive	OVM = 2.6 ppm	CL	
25			SILTY to SANDY CLAY light brown, fine sand, moist to dry, moderate cohesion, based on drilling resistance, probably a number of alternating clay and sandy clay layers from 15' to bottom of hole			
			Total Depth = 24.5 feet			
30			* = Laboratory Sample			
35						

LOG OF MONITORING WELL NO. S-6 SHEET 1 OF 1

Field location of boring:

Project No.: 7615	Date: 4/26/89	Boring No: S-13	
Client: Shell			
Location: 15275 Washington Ave/Lewelling			
City: San Leandro		Sheet 1 of 2	
Logged by: DAF	Driller: Bayland		

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 8 inch

Top of Box Elevation: Datum:

Water Level	8.4'	7.3'			
Time	11:50am				
Date	4/26	5/10			

PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				PAVEMENT SECTION - 2 feet.
				2				CLAY (CL)- dark gray (10YR 4/1); soft; damp; low plasticity; trace gravel; no chemical odor.
				3				
				4				
350	150	S&H	S-13-5'	5				color change to dark olive gray (5Y 3/2); no chemical odor.
		push						
				6				
				7				
				8				
				9				
50	2	S&H	S-13-	10				SILTY SAND (SM)- light olive brown (2.5Y 5/4); loose; damp; 20-30% silt; mottled brown; no chemical odor.
	3		10'					
	6							
				11				
				12				CLAY (CL)- dark olive gray (5Y 3/2), medium stiff; damp; low plasticity; trace gravel; rootholes; no chemical odor.
				13				
				14				
40	3	S&H	S-13-	15				color change to very dark gray (5Y 3/1) mottled; organics present; no chemical odor.
	5		15'					
	7							
				16				
				17				becoming saturated at 17.5 feet.
				18				
				19				
0	2	S&H	S-13-	20				SANDY SILT (ML)- light yellowish brown (2.5Y 6/4); medium stiff; saturated;
	3		20'					

Remarks:

GeoStrategies Inc.

BORING NO. S-13

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615	CEG 1262	5/89		

Field location of boring:

Project No.: 7615 | Date: 4/26/89 | Boring No.: S-13
Client: Shell
Location: 15275 Washington Ave/Lewelling
City: San Leandro | Sheet 2 of 2
Logged by: DAF | Driller: Bayland
Casing installation data:

Drilling method: Hollow Stem Auger
Hole diameter: 8 inch
Top of Box Elevation: | Datum:

Water Level			
Time			
Date			

PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
	4							15% very fine to fine sand; 10% clay;
				21				trace organics; rootholes; mottled
								brown & black; no chemical odor.
				22				
				23				
				24				
25	2	S&H	S-13-					SILTY CLAY (CL-ML)- light olive brown
	3		25'	25				(2.5Y 5/4); medium stiff; moist; trace
	4							organics; mottled brown & black;
								no chemical odor.
								Bottom of boring 24.0 feet,
								Sampled to 25.5 feet
								4/26/89

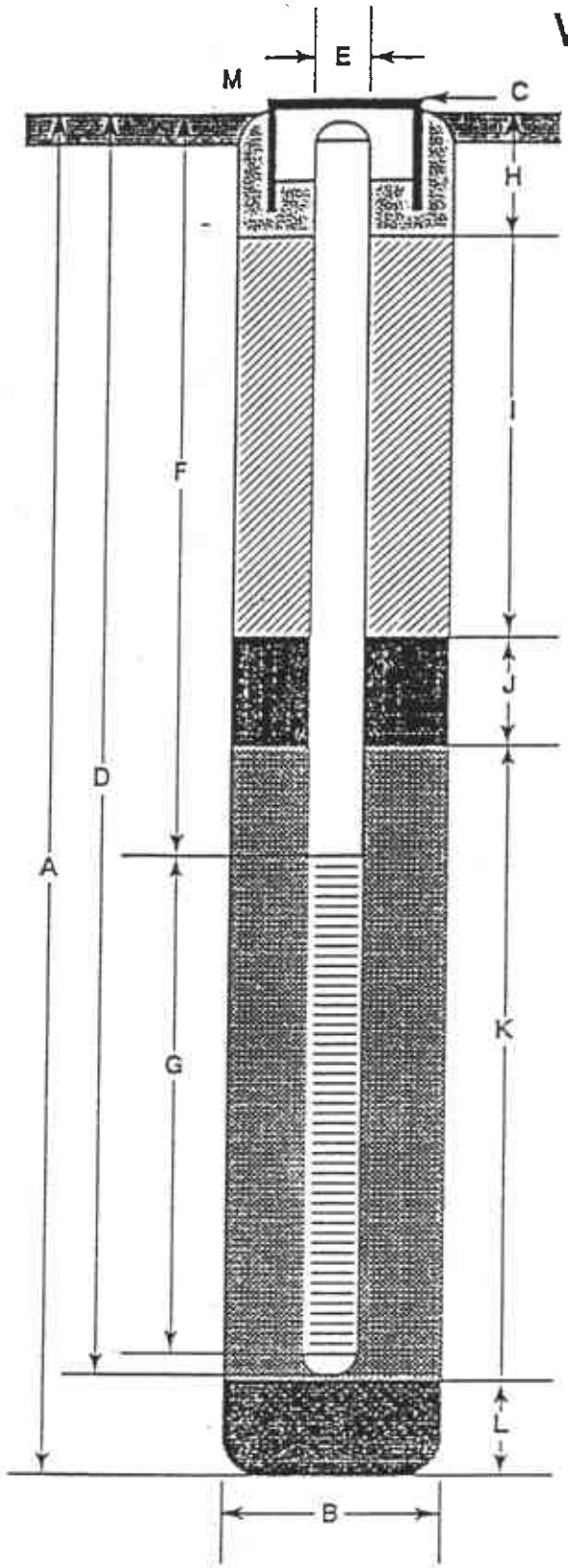
Remarks:

GSI GeoStrategies Inc.

BORING NO. S-13

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615		5/89		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 24 ft.

B Diameter of Boring 8 in.
Drilling Method HOLLOW STEM AUGER

C Top of Box Elevation 20.57 ft.
☐ Referenced to Mean Sea Level
☒ Referenced to Project Datum

D Casing Length 23.5 ft.
Material SCH 40 PVC

E Casing Diameter 3 in.

F Depth to Top Perforations 4 ft.

G Perforated Length 20 ft.
Perforated Interval from 4 to 24 ft.
Perforation Type FACTORY SLOTTED
Perforation Size 0.020

H Surface Seal 2.5 ft.
Seal Material CONCRETE

I Backfill ft.
Backfill Material

J Seal 0.5 ft.
Seal Material BENTONITE

K Gravel Pack 21 ft.
Pack Material LONESTAR 2/12 & #3

L Bottom Seal ft.
Seal Material

M CHRISTY BOX

GeoStrategies Inc.

Well Construction Detail
Former Shell Service Station
15275 Washington Ave.
San Leandro

WELL NO
S-13

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615	CMP CEG 1262	5/89		

Field location of boring:

Project No.: 7615	Date: 4/26/89	Boring No: S-14	
Client: Shell			
Location: 15275 Washington Ave/Lewelling			
City: San Leandro		Sheet 1 of 2	
Logged by: DAF	Driller: Bayland		
Casing installation data:			
Drilling method: Hollow Stem Auger			
Hole diameter: 8 inch	Top of Box Elevation:	Datum:	
Water Level: 9'			
Time: 10:00am			
Date: 4/26/89			

PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				PAVEMENT SECTION - 2 feet.
				2				
				3				SILTY CLAY (CL-ML)- dark gray (2.5Y N4); soft; damp.
				4				becoming firm at 5 feet; with slight odor.
500	150	S&H	S-14-5'	5				
		push						
				6				
				7				SILTY SAND (SM)- olive (5Y 4/3); loose; damp; 30% medium sand; 20% very fine to fine sand; trace clay; no chemical odor, comment: drill cuttings.
				8				
				9				▼ CLAY (CL)- dark gray (2.5Y N4); stiff; damp; low plasticity; no chemical odor.
50	2	S&H	S-14-	10				
	3		10'					CLAY WITH SAND (CL)- light yellowish brown (2.5Y 6/4); medium stiff; damp; 10% very fine to fine sand; 5-10% silt; trace caliche nodules; mottled; no chemical odor.
	4			11				
				12				
				13				
				14				CLAY (CL)- dark gray (2.5Y N4); stiff; damp; low plasticity; pockets of silt; trace black & brown organics; no chemical odor.
0	2	S&H	S-14-	15				
	6		15'					
	7			16				color change to grayish brown (2.5Y 5/2) at 15 feet.
				17				
				18				
				19				▽ becoming saturated at 19 feet.
50	2	S&H	S-14-	20				
	6		20'					

Remarks:

GeoStrategies Inc.

BORING NO. S-14

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615	CEG 1262	5/89		

Field location of boring:

Project No.: 7615 | Date: 4/26/89 | Boring No.: S-14

Client: Shell

Location: 15275 Washington Ave/Lewelling

City: San Leandro | Sheet 2 of 2

Logged by: DAF | Driller: Bayland

Drilling method: Hollow Stem Auger

Casing installation data:

Hole diameter: 8 inch

Top of Box Elevation: | Datum:

Water Level				
Time				
Date				

PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
	7							
				21				SANDY SILT (ML)- light yellowish brown (2.5Y 6/4); medium stiff; saturated; 30% very fine to fine sand; 5-10% clay; trace caliche nodules; mottled brown & black; no chemical odor.
				22				
				23				
				24				
	2	SPT						
	2			25				CLAY (CL)- grayish brown (2.5Y 5/2); medium stiff; damp; low plasticity; trace caliche nodules; no chemical odor
	4							
								Bottom of boring 24.0 feet, sampled to 25.5 feet 4/26/89

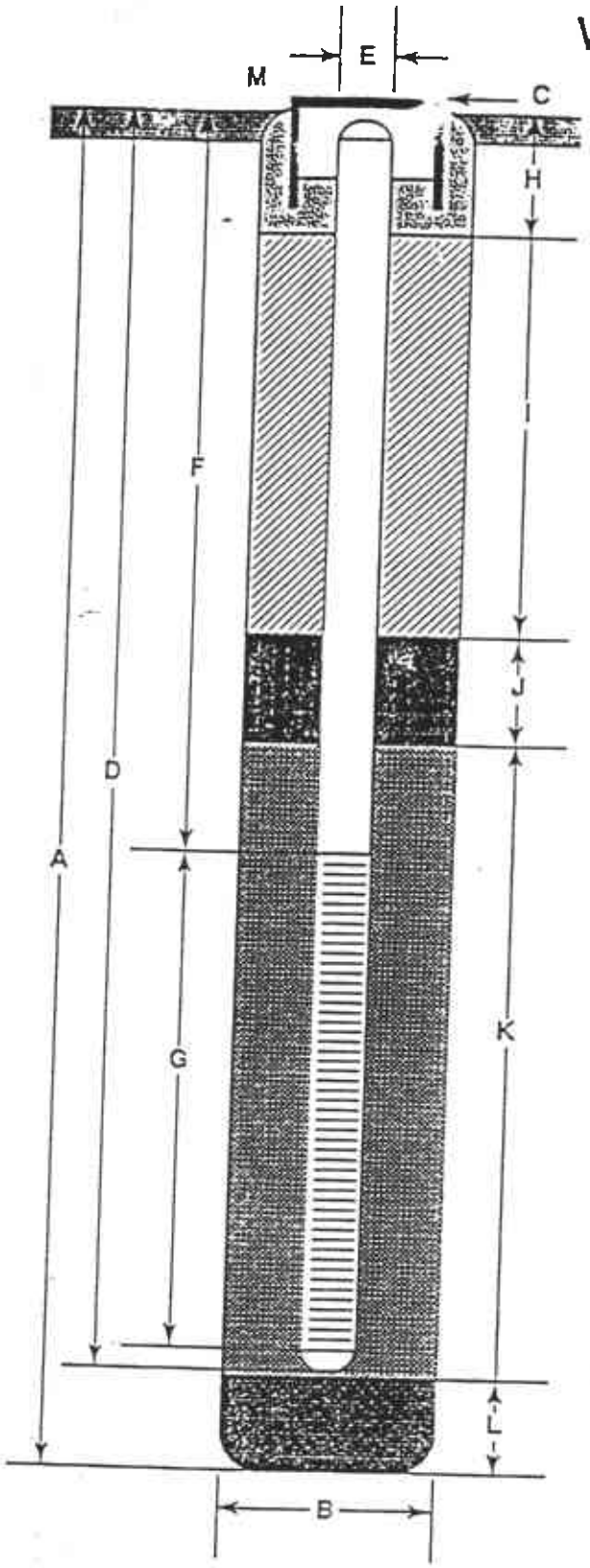
Remarks:

GeoStrategies Inc.

BORING NO. S-14

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615		5/89		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 24 ft.

B Diameter of Boring 8 in.
Drilling Method HOLLOW STEM AUGER

C Top of Box Elevation 20.44 ft.
☐ Referenced to Mean Sea Level
☒ Referenced to Project Datum

D Casing Length 23.5 ft.
Material SCH 40 PVC

E Casing Diameter 3 in.

F Depth to Top Perforations 4 ft.

G Perforated Length 20 ft.
Perforated Interval from 4 to 24 ft.
Perforation Type FACTORY SLOTTED
Perforation Size 0.020

H Surface Seal 2.5 ft.
Seal Material CONCRETE

I Backfill ft.
Backfill Material

J Seal 0.5 ft.
Seal Material BENTONITE

K Gravel Pack 21 ft.
Pack Material LONESTAR 2/12 & #3

L Bottom Seal ft.
Seal Material

M CHRISTY BOX

GeoStrategies Inc.

Well Construction Detail
Former Shell Service Station
15275 Washington Ave.
San Leandro

WELL NO. S-14

JOB NUMBER 7615

REVIEWED BY RG/CEG CWP CE41262

DATE 5/89

REVISED DATE

REVISED DATE

Field location of boring:

Project No.: 7615	Date: 4/26/89	Boring No: S-15
Client: Shell		
Location: 15275 Washington Ave/Lewelling		
City: San Leandro		Sheet: 1 of 2
Logged by: DAF	Driller: Bayland	
Casing installation data:		
Drilling method: Hollow Stem Auger		
Hole diameter: 8 inch	Top of Box Elevation:	Datum:
	Water Level: 8.3'	
	Time: 2:25pm	
	Date: 4/26/89	

PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				PAVEMENT SECTION - 2.5 feet.
				2				
				3				CLAY (CL)- very dark grayish brown (2.5Y 3/2); medium stiff; damp; low plasticity; trace gravel.
				4				
55	150	S&H	S-15-5'	5				SILTY CLAY (CL-ML) -olive (5Y 4/3); soft; damp; low plasticity; mottled brown.
		push		6				
Driller notes change @ 7'				7				SILTY SAND (SM) -olive brown (2.5Y 4/4); loose; moist; poorly graded; trace clay.
				8				
				9				
35	2	S&H	S-15-	10				CLAY (CL) -very dark gray (5Y 3/1); stiff; damp; low plasticity; trace gravel; mottled brown; rootholes.
	2		10'					
	4			11				
				12				
				13				
				14				becoming soft; 5% silt; trace caliche nodules at 14 feet.
55	1	S&H	S-15-	15				
	4		15'					CLAY (CL) -olive gray (5Y 4/2); stiff; damp; low plasticity; mottled; trace caliche nodules.
	8			16				
				17				
				18				becoming saturated at 18.5 feet.
				19				SILTY CLAY (CL-ML) -light olive brown (2.5Y 5/4); medium stiff; saturated; trace organics; trace caliche nodules.
NM	3	SPT		20				
	2							

Remarks:

GeoStrategies Inc.

BORING NO. S-15

JOB NUMBER	REVIEWED BY HG/CEG	DATE	REVISED DATE	REVISED DATE
7615	CEG 1262	5/89		

Field location of boring:

Project No.: 7615 | Date: 4/26/89 | Boring No.: S-15

Client: Shell

Location: 15275 Washington Ave/Lewelling

City: San Leandro | Sheet 2 of 2

Logged by: DAF | Driller: Bayland

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 8 inch

Top of Box Elevation: | Datum:

Water Level | Time | Date

PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
	4							
				21				
				22				
				23				CLAY (CL) -very dark gray (5Y 3/1); medium stiff; damp; low plasticity.
				24				
NM	1	SPT						SILTY CLAY (CL-ML) - light olive brown
	3			25				(2.5Y 5/4); medium stiff; damp; some
	5							sandy lenses.
								Bottom of boring 24.0 feet,
								Sampled to 25.5 feet
								4/26/89

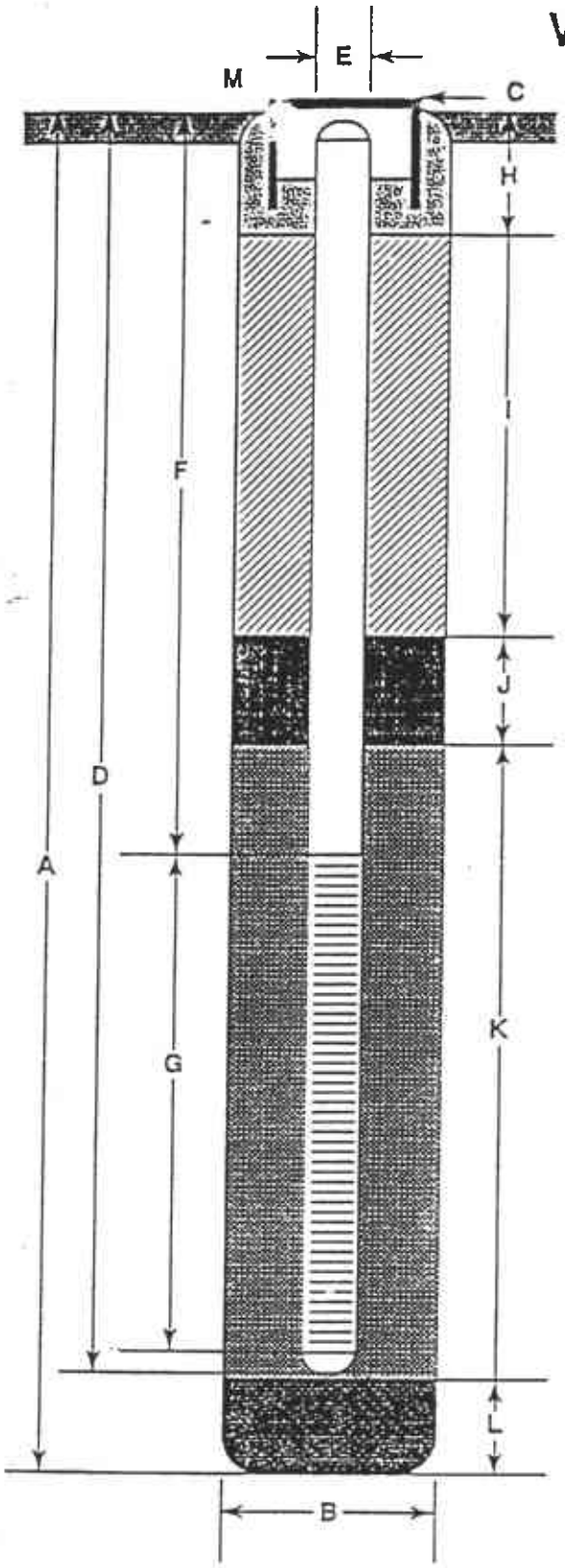
Remarks:

GeoStrategies Inc.

BORING NO. S-15

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615		5/89		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 24 ft.

B Diameter of Boring 8 in.
Drilling Method HOLLOW STEM AUGER

C Top of Box Elevation 22.22 ft.
☐ Referenced to Mean Sea Level
☒ Referenced to Project Datum

D Casing Length 23.5 ft.
Material SCH 40 PVC

E Casing Diameter 3 in.

F Depth to Top Perforations 4 ft.

G Perforated Length 20 ft.
Perforated Interval from 4 to 24 ft.
Perforation Type FACTORY SLOTTED
Perforation Size 0.020

H Surface Seal 2.5 ft.
Seal Material CONCRETE

I Backfill ft.
Backfill Material

J Seal 0.5 ft.
Seal Material BENTONITE

K Gravel Pack 21 ft.
Pack Material LONESTAR 2/12 & #3

L Bottom Seal ft.
Seal Material

M CHRISTY BOX

GeoStrategies Inc.

Well Construction Detail
Former Shell Service Station
15275 Washington Ave.
San Leandro

WELL NO. S-15

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615	CEG 1262	5/89		

Field location of boring:

Project No.: 7615 | Date: 4/25/89 | Boring No: S-16

Client: Shell

Location: 15275 Washington Ave/Lewelling

City: San Leandro | Sheet 2 of 2

Logged by: DAF | Driller: Bayland

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 8 inch

Top of Box Elevation: | Datum:

Water Level				
Time				
Date				

PID (ppm)	Blowsft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
	5							▽
				21				CLAYEY SAND (SC) -pale brown (10 YR 6/3); loose; saturated.
				22				
				23				
				24				
0	1	S&H	S-16-					SILTY CLAY (CL-ML) -brown (10YR 5/3);
	1		25'	25				soft; damp; 10% silt; <10% fine sand;
	1							trace organics; mottled gray & orange.
								Bottom of boring 24.0 feet,
								sampled to 25.5 feet.
								4/25/89

Remarks:

GSI GeoStrategies Inc.

BORING NO.

S-16

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615		5/89		

Field location of boring:

Project No.: 7615 Date: 4/25/89

Client: Shell

Location: 15275 Washington Ave/Lewelling

City: San Leandro

Logged by: DAF Driller: Bayland

Boring No: S-16

Sheet 2 of 2

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 8 inch

Top of Box Elevation: Datum:

	Water Level			
	Time			
	Date			

PID (ppm)	Blowsft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
	5							
				21				CLAYEY SAND (SC) -pale brown (10 YR 6/3); loose; saturated.
				22				
				23				
				24				
0	1	S&H	S-16-					SILTY CLAY (CL-ML) -brown (10YR 5/3); soft; damp; 10% silt; <10% fine sand; trace organics; mottled gray & orange.
	1		25'	25				
	1							
								Bottom of boring 24.0 feet, sampled to 25.5 feet. 4/25/89

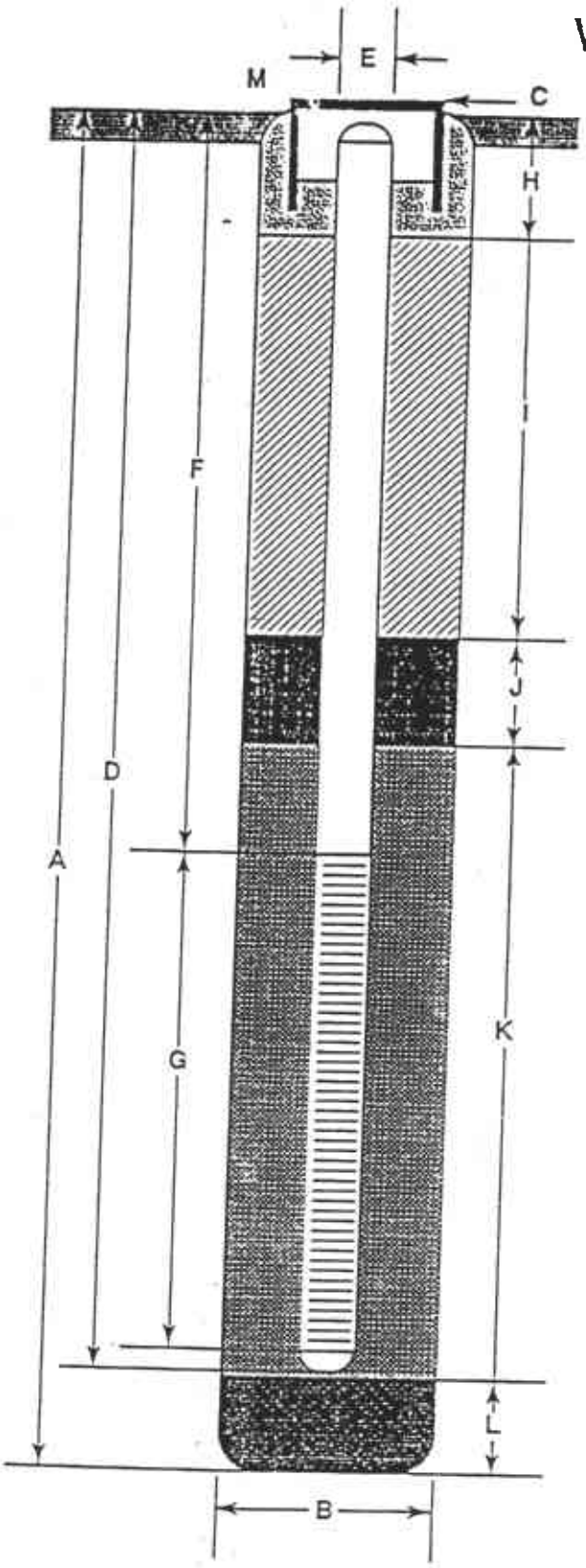
Remarks:

GeoStrategies Inc.

BORING NO. S-16

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615		5/89		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 24 ft.

B Diameter of Boring 8 in.
Drilling Method HOLLOW STEM AUGER

C Top of Box Elevation 21.82 ft.
☐ Referenced to Mean Sea Level
☒ Referenced to Project Datum

D Casing Length 23.5 ft.
Material SCH 40 PVC

E Casing Diameter 3 in.

F Depth to Top Perforations 4 ft.

G Perforated Length 20 ft.
Perforated Interval from 4 to 24 ft.
Perforation Type FACTORY SLOTTED
Perforation Size 0.020

H Surface Seal 2.5 ft.
Seal Material CONCRETE

I Backfill ft.
Backfill Material

J Seal 0.5 ft.
Seal Material BENTONITE

K Gravel Pack 21 ft.
Pack Material LONESTAR 2/12 & #3

L Bottom Seal ft.
Seal Material

M CHRISTY BOX

GeoStrategies Inc.

Well Construction Detail

Former Shell Service Station
15275 Washington Ave.
San Leandro

WELL NO.
S-16

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615	CEG 1262	5/89		

Field location of boring:

Project No.: 7615 | Date: 4/25/89 | Boring No: S-17

Client: Shell

Location: 15275 Washington Ave/Lewelling

City: San Leandro | Sheet 1 of 2

Logged by: DAF | Driller: Bayland

Drilling method: Hollow Stemm Auger

Casing installation data:

Hole diameter: 8 inch

Top of Box Elevation: | Datum:

Water Level: 7.5'

Time: 12.50 pm

Date: 4/25/89

PID (ppm)	Blowcts. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				PAVEMENT SECTION - 2 feet.
				2				
				3				SILTY SAND (SM) -very dark gray (5Y 3/1); loose; dry; >50% very fine to fine sand; trace clay.
				4				
12.5	150	S&H	S-17-5'	5				SILTY CLAY (CL-ML) -dark greenish gray (5GY 4/1); medium stiff; damp; 5% very fine to fine sand; slight mottling - olive green & gray; moderate chemical odor.
		push		6				
				7				
				8				SANDY SILT (ML) -dark greenish gray (5GY 4/1); loose; saturated; 40% fine to very fine sand; 10% clay; weak chemical odor.
				9				
0	3	S&H	S-17-	10				
	4		10'					
	7							SILTY CLAY WITH SAND (CL-ML) -dark gray (5Y 4/1), stiff; damp; 15-20% very fine to fine sand; trace caliche nodules; trace organics; mottled; rootholes.
				11				
				12				
				13				
				14				gravels up to 1 cm at 14 feet.
NM	2	SPT		15				CLAY (CL) -grayish brown (5Y 5/2); stiff; damp; trace caliche nodules up to 1 cm; mottled; occasional sand lens.
	4							
	7							
				16				
				17				
				18				SANDY SILT (ML) -light yellowish brown (10 YR 6/4); loose; saturated; 30% very fine to fine sand; trace clay; trace caliche nodules; trace medium grain sized sand.
				19				
NM	2	SPT		20				
	2							

Remarks:

GeoStrategies Inc.

BORING NO. S-17

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615	CEG 1262	5/89		

Field location of boring:

Project No.: 7615 | Date: 4/25/89 | Boring No: S-17

Client: Shell

Location: 15275 Washington Ave/Lewelling

City: San Leandro | Sheet 2 of 2

Logged by: DAF | Driller: Bayland

Drilling method: Hollow Stemm Auger

Casing installation data:

Hole diameter: 8 inch

Top of Box Elevation: | Datum:

Water Level			
Time			
Date			

PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
	4							increasing clay at 20.5 feet.
				21				
				22				
				23				
				24				SILTY CLAY (CL-ML) -olive (5Y 5/3); firm; damp; 10% very fine to fine sand; trace caliche nodules; trace medium to coarse grain sized sand; trace organics; trace saturated silt pockets.
NM	NM	SPT		25				
								Bottom of boring 24.0 feet.
								Sampled to 25.5 feet.
								4/25/89

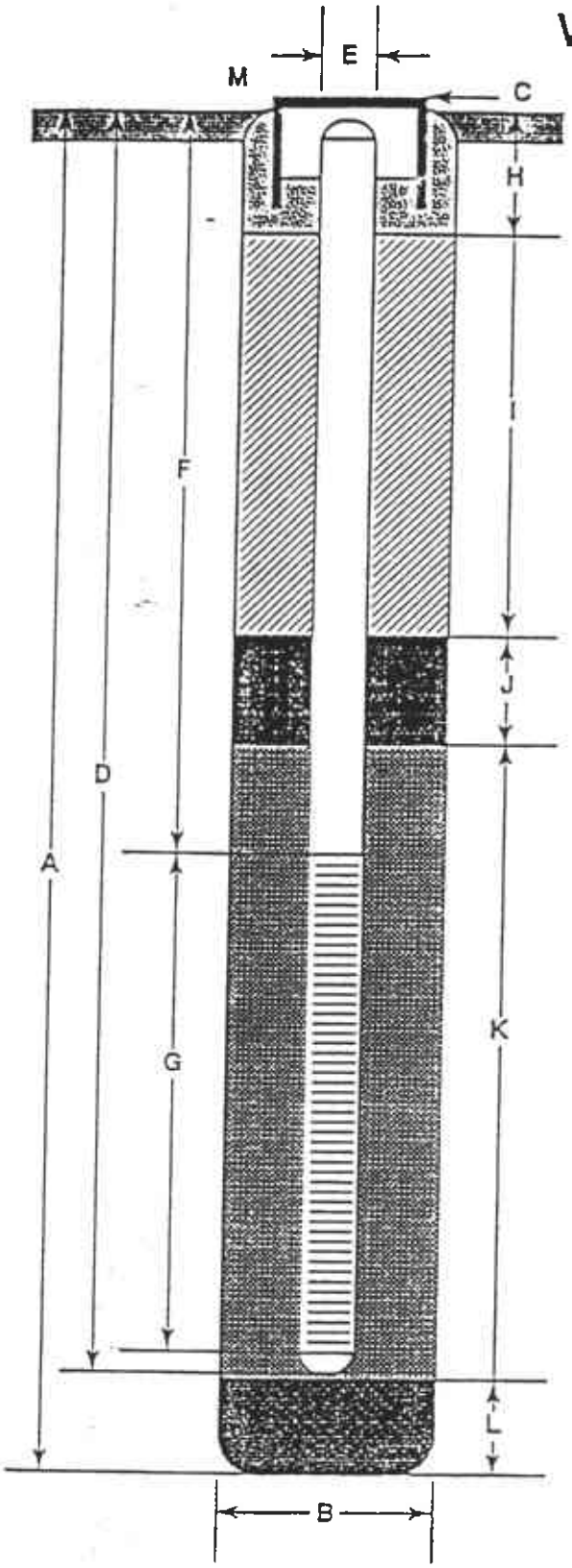
Remarks:

GeoStrategies Inc.

BORING NO. S-17

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615		5/89		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 24 ft.

B Diameter of Boring 8 in.
Drilling Method HOLLOW STEM AUGER

C Top of Box Elevation 20.95 ft.
☐ Referenced to Mean Sea Level
☒ Referenced to Project Datum

D Casing Length 23.5 ft.
Material SCH 40 PVC

E Casing Diameter 3 in.

F Depth to Top Perforations 4 ft.

G Perforated Length 20 ft.
Perforated Interval from 4 to 24 ft.
Perforation Type FACTORY SLOTTED
Perforation Size 0.020

H Surface Seal 2.5 ft.
Seal Material CONCRETE

I Backfill ft.
Backfill Material

J Seal 0.5 ft.
Seal Material BENTONITE

K Gravel Pack 21 ft.
Pack Material LONESTAR 2/12 & #3

L Bottom Seal ft.
Seal Material

M CHRISTY BOX

GeoStrategies Inc.

Well Construction Detail
Former Shell Service Station
15275 Washington Ave.
San Leandro

WELL NO.
S-17

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615	CWP 06/13/62	5/89		

Field location of boring: (See Plate 2)

Project No.: 7615	Date: 10/27/89	Boring No: SR-1	
Client: Shell Oil Company			
Location: 15275 Washington Avenue			
City: San Leandro, California		Sheet 1 of 3	
Logged by: M.J.J.	Driller: Bayland		

Casing installation data: Pilot Boring

Drilling method: Hollow-Stem Auger

Hole diameter: 8-inches

Top of Box Elevation: Datum:

Water Level	12.5	10.9		
Time				
Date	10/27/89	10/27/89		

PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
								PAVEMENT SECTION - 4 inches
				1				
								FILL - Gravel (GW) - dark brown (10YR 3/3), damp, very loose.
				2				FILL - Clay with Silt (CL) - black (5Y 2.5/1), damp, soft, high plasticity; ≤ 5% coarse sand; strong chemical odor.
				3				
				4				
231	2							
	3	S&H	SR1-5	5				
	4							CLAY (CL) - black (2.5Y N3/2), damp, soft, medium plasticity; interbeds of clayey sand (SP-SC); sand is very fine to fine; interbeds occur as discrete units 3 to 5 inches thick; contain 10-20% fines; strong chemical odor.
	3			6				
243	4	S&H	SR1-6.5					
	5			7				
	1							
296	2	S&H	SR1-8	8				
	3							
	2			9				
	4							moderate chemical odor.
373	6	S&H	SR1-10	10				
	2							COLOR CHANGE to black (10YR 3.3) at 10.5 feet.
108	4	S&H		11		▼		SILTY SAND (SM) - moist, loose, interbedded with
	6		SR1-					clayey silt (ML-CL), medium plasticity; no chemical odor.
			11.5	12				
				13				CLAY (CL) - very dark grayish brown (10YR 3/2), damp, stiff, high plasticity; fractured texture; no chemical odor.
				14				
	2							
4.3	4	S&H	SR1-15	15				
	8							first encountered water at 16.0 feet. Increasing sand at
				16		▽		16 feet. Interbedded clay with sand and clayey sand
								(observed during drilling with bucket auger, 11/16/89)
				17				
				18				
				19				

Remarks:

GSI GeoStrategies Inc.

Log of Boring

BORING NO. SR-1

JOB NUMBER	REVIEWED BY PG/CEG	DATE	REVISED DATE	REVISED DATE
7615	CEG 1262	11/89		

Field location of boring: (See Plate 2)

Project No.:	7615	Date: 10/27/89	Boring No.: SR-1
Client:	Shell Oil Company		
Location:	15275 Washington Avenue		
City:	San Leandro, California		Sheet 2 of 3
Logged by:	M.J.J.	Driller: Bayland	

Drilling method: Hollow-Stem Auger

Hole diameter: 8-inches

Casing installation data: Pilot Boring

Top of Box Elevation: Datum:

Water Level				
Time				
Date				

PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
	2							
80	4	S&H	SR1-20	20				
	6							
				21				CLAYEY SILT (ML-CL) - light olive brown (2.5Y 5/4), saturated, medium plasticity; 30% clay; 5% fine to medium sand; no chemical odor.
				22				
				23				CLAY with SAND (CL) - olive gray (5Y 4/2), saturated, stiff; high plasticity; 20% very fine to fine sand; no chemical odor.
				24				
	3							
66	3	S&H	SR1-30	25				
	6							
				26				SILT with SAND (ML) - light olive brown (2.5Y 5/4), saturated, stiff; 15% fine to medium sand; 20-30% clay; no chemical odor.
				27				
				28				
				29				SAND with SILT (SP-SM) - light olive brown (5Y 4/2), fine sand, saturated, medium dense; well sorted; 10% silt; trace clay; laminae of silt 0.25 inches thick in shoe; iron oxide staining; no chemical odor.
	3							
10	8	S&H	SR1-30	30				
	10							
				31				
				32				
				33				
				34				SILTY SAND (SM) - light olive brown (5Y 4/2), saturated, dense; very fine to medium sand; 15% silt; trace clay; no chemical odor.
	5							
34	7	S&H	SR1-35	35				
	18							
				36				
				37				
				38				SAND (SP) - dark grayish brown (2.5Y 3/2), saturated, dense, very fine to medium sand; interbeds of fine
				39				

Remarks:

Log of Boring

BORING NO. SR-1

GeoStrategies Inc.

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615	CWP CEG 1262	11/89		

Field location of boring: (See Plate 2)	Project No.: 7615	Date: 10/27/89	Boring No.: SR-1
	Client: Shell Oil Company		
	Location: 15275 Washington Avenue		
	City: San Leandro, California		Sheet 3 of 3
	Logged by: M.J.J.	Drill. : Bayland	
Drilling method: Hollow-Stem Auger	Casing installation data: Pilot Boring		
Hole diameter: 8-inches	Top of Box Elevation:	Datum:	

PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Water Level / Time / Date	Description
	9								silty sand 0.5 to 3.0 inches thick; no chemical odor.
8.2	13	S&H	SR1-40	40					
	17								Bottom of boring at 40.5 feet.
				41					Bottom of sample at 40.5 feet.
									10/27/89
				42					
				43					
				44					
				45					
				46					
				47					
				48					
				49					
				50					
				51					
				52					
				53					
				54					
				55					
				56					
				57					
				58					
				59					

Remarks: Boring caved to 30 feet, Bentonite from 19 to 30 feet.

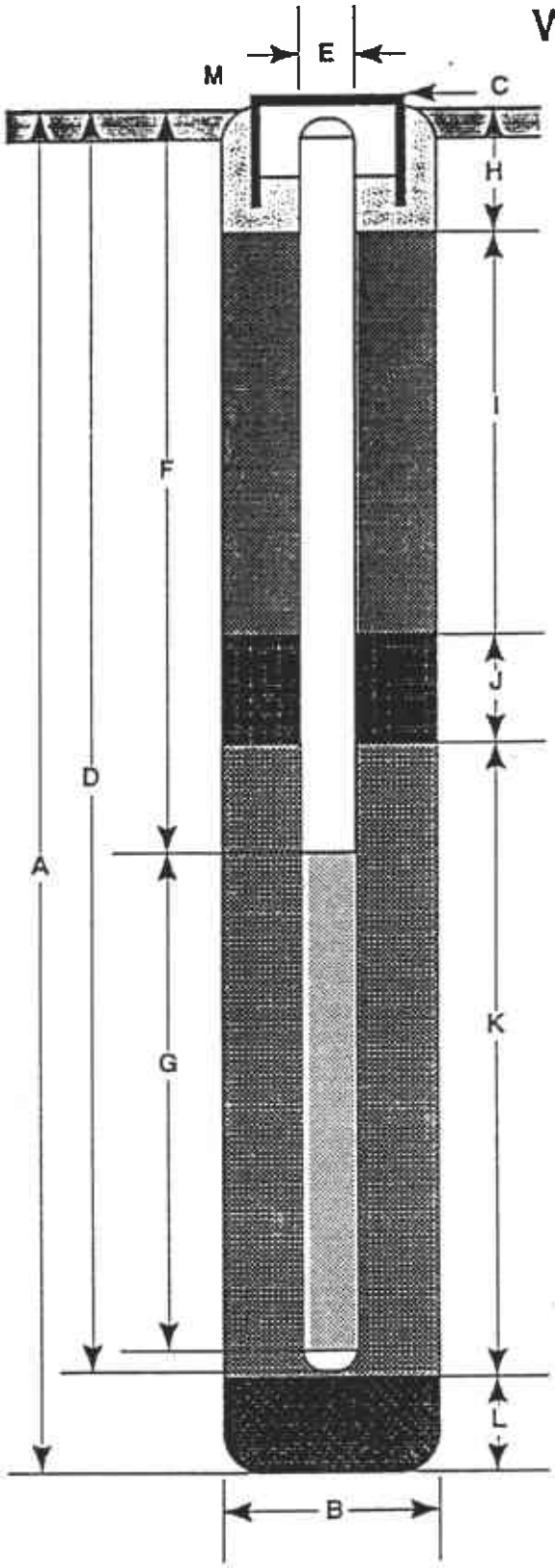
GeoStrategies Inc.

Log of Boring

BORING NO. SR-1

JOB NUMBER	REVIEWED BY PG/CEG	DATE	REVISED DATE	REVISED DATE
7615	CWP CEG 1762	11/89		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 40.5 ft.

B Diameter of Boring 20 in.
Drilling Method Bucket Auger

C Top of Box Elevation _____ ft.
☐ Referenced to Mean Sea Level
☐ Referenced to Project Datum

D Casing Length 21 ft.
Material Schedule 40 PVC

E Casing Diameter 6 in.

F Depth to Top Perforations 6.5 ft.

G Perforated Length 15 ft.
Perforated Interval from 6.5 to 21.5 ft.
Perforation Type Machine Slot
Perforation Size 0.020 in.

H Surface Seal from 0.5 to 1.0 ft.
Seal Material concrete

I Backfill from 1.0 to 4.5 ft.
Backfill Material cement

J Seal from 4.5 to 5.5 ft.
Seal Material Bentonite

K Gravel Pack from 5.5 to 21.5 ft.
Pack Material 2/12 Lonestar sand

L Bottom Seal 21.5-30 ft.
Seal Material Bentonite

M Christy Box

Note: 30 to 40.5 Native Material (slough)

GeoStrategies Inc.

Well Construction Detail

WELL NO. SR-1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615	CEG 1262	10/89		

Field location of boring:

(See Plate 2)

Project No.:	761502	Date:	05/16/91
Client:	Shell Oil Company		
Location:	15275 Washington		
City:	San Leandro, California		
Logged by:	E.C.F.	Driller:	Bayland

Boring No: S-18

Sheet 1 of 2

Casing installation data: (See Well Construction Detail)

Drilling method: Hollow Stem Auger

Hole diameter: 8-inches

Top of Box Elevation: Datum:

Water Level	7.5'	7.6'
Time	10:00	12:03
Date	05/16/91	05/16/91

PID (ppm)	Blowsft. * or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				0				PAVEMENT SECTION - 0.33 feet
				1				SAND (SP) - yellowish brown (10YR 5/4), medium dense, damp; 80% coarse to medium sand; 15% gravel; 5% fines (FILL).
				2				
				3				
				4				
	450	S&H		5				
0	450		S18-4.5					
	450			6				
				7				
		S&H						SILT with SAND (ML) - very dark gray (7.5YR N3/), stiff, damp; 80% silt; 20% very fine sand (ALLUVIUM).
0	4		S18-8	8				Soft drilling at 7.0 feet.
				9				SILTY SAND (SM) - dark grayish brown (10YR 4/2), loose, saturated; 70% sand; 30% silt.
		S&H						
0	6		S18-10	10				Increasing moisture and silt content with depth.
				11				
				12				
				13				
				14				
		S&H						CLAY (CL) - gray brown (2.5Y 5/2), stiff, moist; trace fine sand with rootholes and vertical dark stains.
0	16		S18-15	15				
				16				
				17				
				18				
				19				

Remarks:

* Converted to equivalent Standard Penetration blows/ft.

Log of Boring

BORING NO. S-18

GSI GeoStrategies Inc.

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
761502	DHP	05/91		

Field location of boring:

(See Plate 2)

Project No.:	761502	Date: 05/16/91	Boring No: S-18
Client:	Shell Oil Company		
Location:	15275 Washington		Sheet 2 of 2
City:	San Leandro, California		
Logged by:	E.C.F.	Driller: Bayland	

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 8-Inches

Top of Box Elevation: Datum:

Water Level				
Time				
Date				

PID (ppm)	Blows/ft. * or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
		S&H		20				
	12							COLOR CHANGE to light yellow brown (2.5YR 6/4), stiff, damp; 80% clay; 20% coarse sand.
			S18-20.5	21				
				22				Bottom of boring at 19.0 feet.
				23				Bottom of sample at 20.5 feet.
				24				
				25				
				26				
				27				
				28				
				29				
				30				
				31				
				32				
				33				
				34				
				35				
				36				
				37				
				38				
				39				

Remarks:

Log of Boring

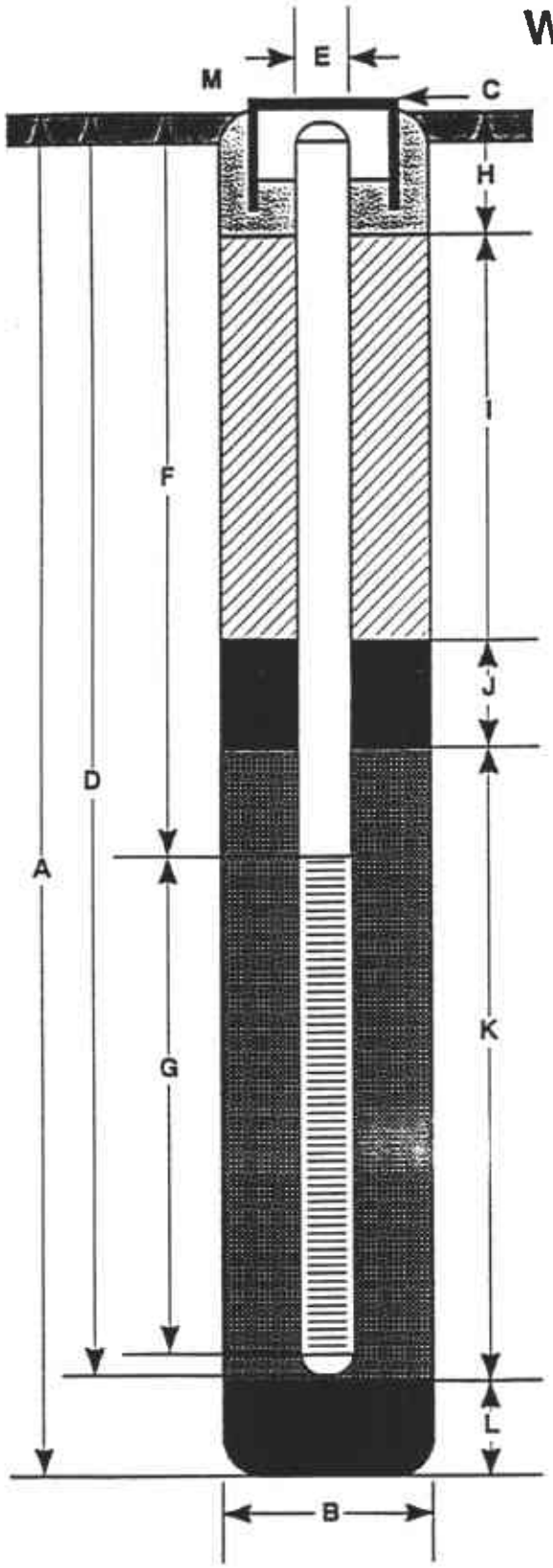
BORING NO.

S-18

GeoStrategies Inc.

JOB NUMBER	REVIEWED BY PG/CEG	DATE	REVISED DATE	REVISED DATE
761502	DHP	05/91		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 19.0 ft.

B Diameter of Boring 8 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation _____ ft.
☐ Referenced to Mean Sea Level
☐ Referenced to Project Datum

D Casing Length 18.0 ft.
Material Schedule 40 PVC

E Casing Diameter 3 in.

F Depth to Top Perforations 4 ft.

G Perforated Length 12 ft.
Perforated Interval from 4 to 18 ft.
Perforation Type Machine Slotted
Perforation Size 0.02 in.

H Surface Seal from 0 to 1.5 ft.
Seal Material Concrete

I Backfill from 1.5 to 2 ft.
Backfill Material Concrete

J Seal from 2 to 3 ft.
Seal Material Bentonite

K Gravel Pack from 3 to 18 ft.
Pack Material 2/12 Lonestar Sand

L Bottom Seal 1 ft.
Seal Material Bentonite

M Underground vault with cover, cap and lock.

Note: Depths measured from initial ground surface.

GSI GeoStrategies Inc.

Well Construction Detail

WELL NO. S-18

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
761502	DMP	5/91		

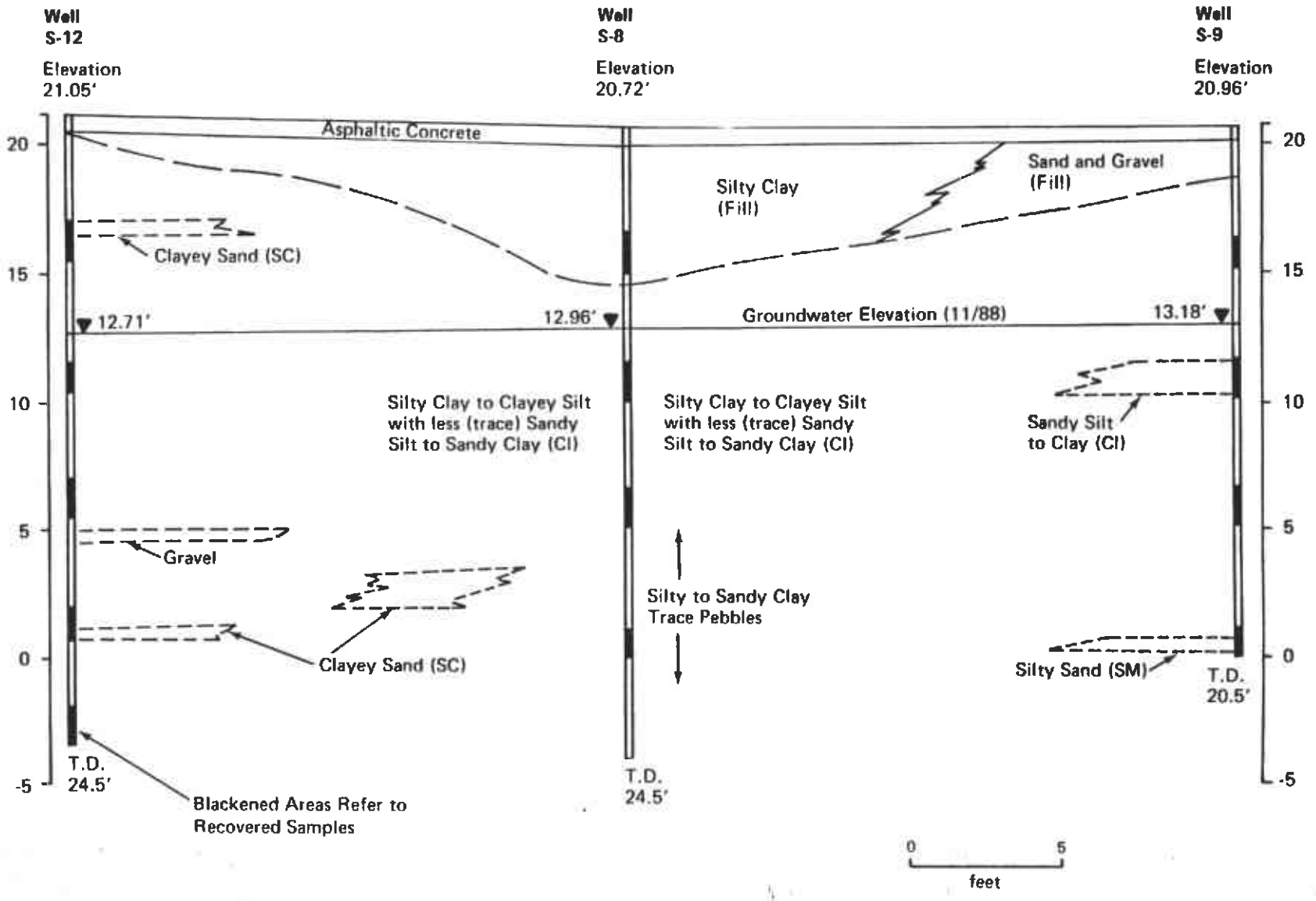
Project No. 8820011A

Gettler Ryan

Woodward-Clyde Consultants

CROSS SECTION
SHELL SERVICE STATION
LEWELLING BLVD. AND WASHINGTON AVE.
SAN LEANDRO, CALIFORNIA

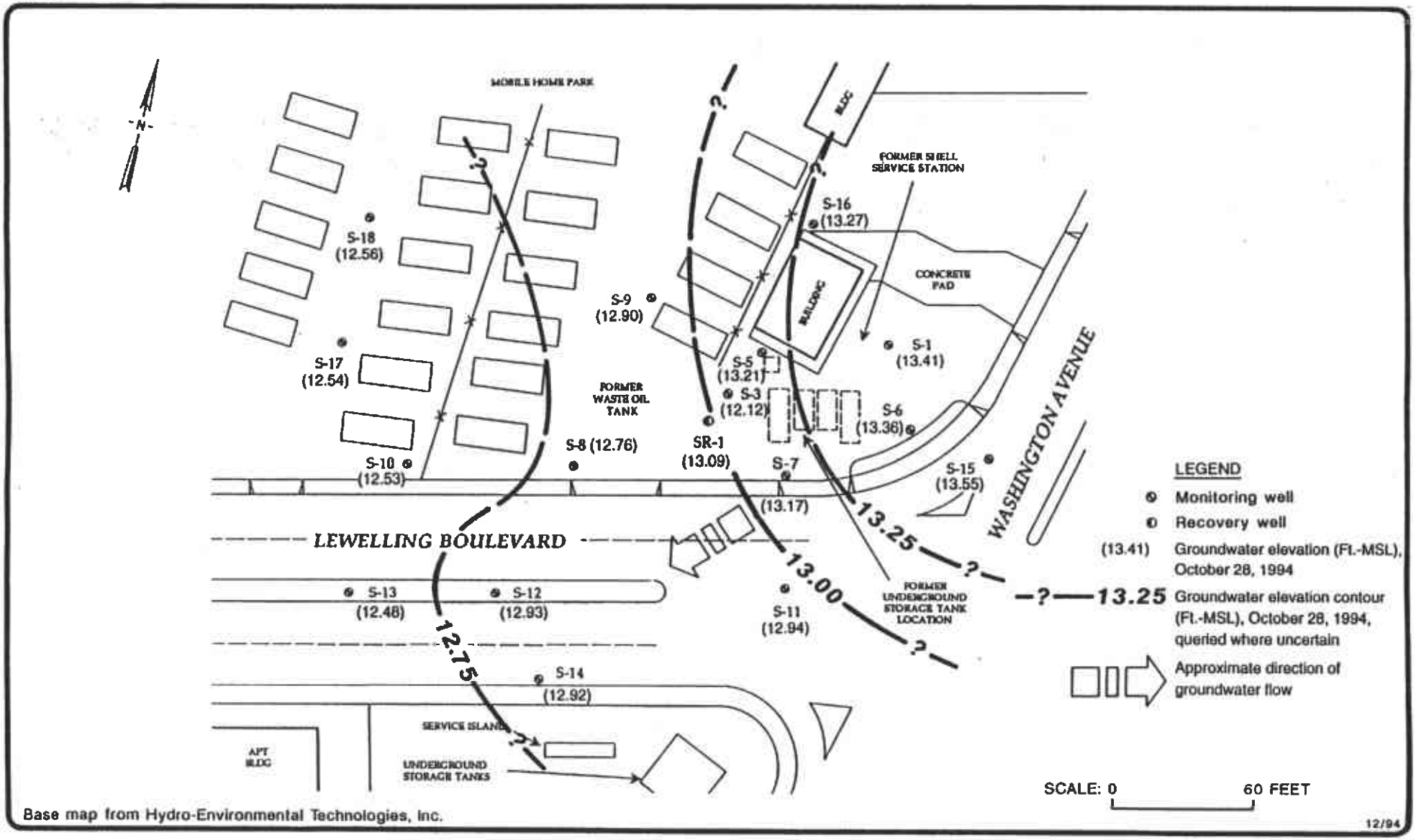
Figure 6



APPENDIX B

Fourth Quarter 1994
Groundwater Contour Map

149984



Base map from Hydro-Environmental Technologies, Inc.

12/94

EMCON Associates
Sacramento, California

SHELL OIL COMPANY
FORMER SHELL SERVICE STATION
15275 WASHINGTON AVENUE
SAN LEANDRO, CALIFORNIA

GROUNDWATER CONTOUR MAP, OCTOBER 28, 1994

FIGURE 2

PROJECT NO. 0117-115.01

APPENDIX C

Well Survey Data

COUNTY OF ALAMEDA
PUBLIC WORKS AGENCY
399 Elmhurst Street • Hayward, CA 94544-1395
(510) 670-5480
FAX (510) 670-5262

FAX TRANSMITTAL FAX TRANSMITTAL FAX TRANSMITTAL FAX TRANSMITTAL

DATE: 3-30-95

TO: ENVIROS
BOX 259
SONOMA, CA 95476 (707) 939-2131
(707) 935-6649

FROM: CRAIG JOHNSON
(510) 670-5248

ATTN: GREG VAUGHN

OF PAGES (INCLUDING COVER SHEET) 9

COMMENTS:
WELL SURVEY .5 MILE RADIUS FROM LEWELLING & WASHINGTON, SAN LEANDRO.
COVER SHEET, 1 MAP, 3 DATA, 4 EXPLANATION SHEETS.

If you do not receive the entire transmittal, or if it is illegible, please call _____ at (510) 670-5543

WELL INVENTORY FILE

Definitions and abbreviations for items listed in the well inventory file are as follows:

[WELLNO] Well number - Wells are numbered according to their location in the rectangular system of the Public Land Survey. The part of the number preceding the slash indicates the township; the part following the slash indicates the range and section number; the letter following the section number indicates the 40-acre subdivision; and the final digit is a serial number for wells in each 40-acre subdivision.

[DAT] Date - The month and year when drilling or boring was completed.

[ELEV] Surface elevation - The surface elevation of the well, if known, in feet above mean sea level. A zero designates an unknown elevation.

[TD] Total depth - The depth of the well. This usually designates the completed well depth. If the well has a well log available on file, then the total drilled depth of the well is given. The inventory does not show total depth data for geotechnical borings. This is because only one state well number is assigned to one boring at a site, and there are usually several borings of different depth.

[DTW] Depth to water - This category usually indicates the standing groundwater level in the well on the date of completion. The "depth to first water encountered" is recorded in the inventory when it is the only water level data reported on the well driller's report.

[USE] Use - The well use (or in the case of cathodic protection wells and geotechnical borings, the reason for the excavation) as indicated in the well driller's report or data sheets. A plus sign (+) after the well use indicates a well in the current ACFC & WCD monitoring network.

[ABN] Abandoned well - A well whose use has been permanently discontinued or which is in such a state of disrepair that no water can be produced. In the inventory, this may include wells which are covered or capped but not properly destroyed.

[DES] Destroyed well - A well that has been properly filled so that it cannot produce water nor act as a vertical conduit for the movement of groundwater.

[DOM] Domestic well - A water well which is used to supply water for the domestic needs of an individual residence or systems of four or less service connections or "hookups".

[INA] Inactive well - A well not routinely operating but capable of being made operable with a minimum of effort. Also called a "standby well".

[IND] Industrial well - A water well used to supply industry on an individual basis.

[IRR] Irrigation well - A water well used to supply water only for irrigation or other agricultural purposes. In the inventory, this category includes large capacity wells as well as small capacity wells for lawn irrigation.

[MON] Monitoring or observation well - Wells constructed for the purpose of observing or monitoring groundwater conditions. (see piezometer).

[MUN] Municipal well - A water well used to supply water for domestic purposes in systems subject to Chapter 7, Part 1,
Division 5 of the California Health and Safety Code. Included are wells supplying public water systems classified by the Department of Health Services. (Also referred to as community water supply wells).

[PIE] Piezometer - A piezometer is a well specifically designated to measure the hydraulic head within a zone small enough to be considered a point as contrasted with a well that reflects the average head of the aquifer for the screened interval.

[STO] Stock - A water well used primarily for livestock.

[TES] Test well and test hole - A test well is constructed for the purpose of obtaining the information needed to design a well prior to its construction. Such wells are not to be confused with "test holes" which are temporary in nature (i.e., uncased excavations whose purpose is the immediate determination of existing geologic and hydrologic conditions). Test wells are cased and can be converted to observation or monitoring wells, and under certain circumstances, to production wells. In the inventory, "TES" includes both test wells and test holes.

[?] Unidentified use - This indicates water wells whose use could not be ascertained from the available well data.

[CAT] Cathodic protection well - Any artificial excavation constructed by any method for the purpose of installing equipment or facilities for the protection from

corrosion by electrochemical methods of metallic equipment (usually piping) in contact with the ground; commonly referred to as cathodic protection.

[GEO] Geotechnical boring - A temporary boring made to determine certain engineering properties of soils. An asterisk (*) indicates that the state well number assigned to the boring represents more than one boring at a particular site.

[LOG] Log - This category indicates whether a geologic record, or log, for the well or boring is available in the Agency's files. Abbreviations are as follows:

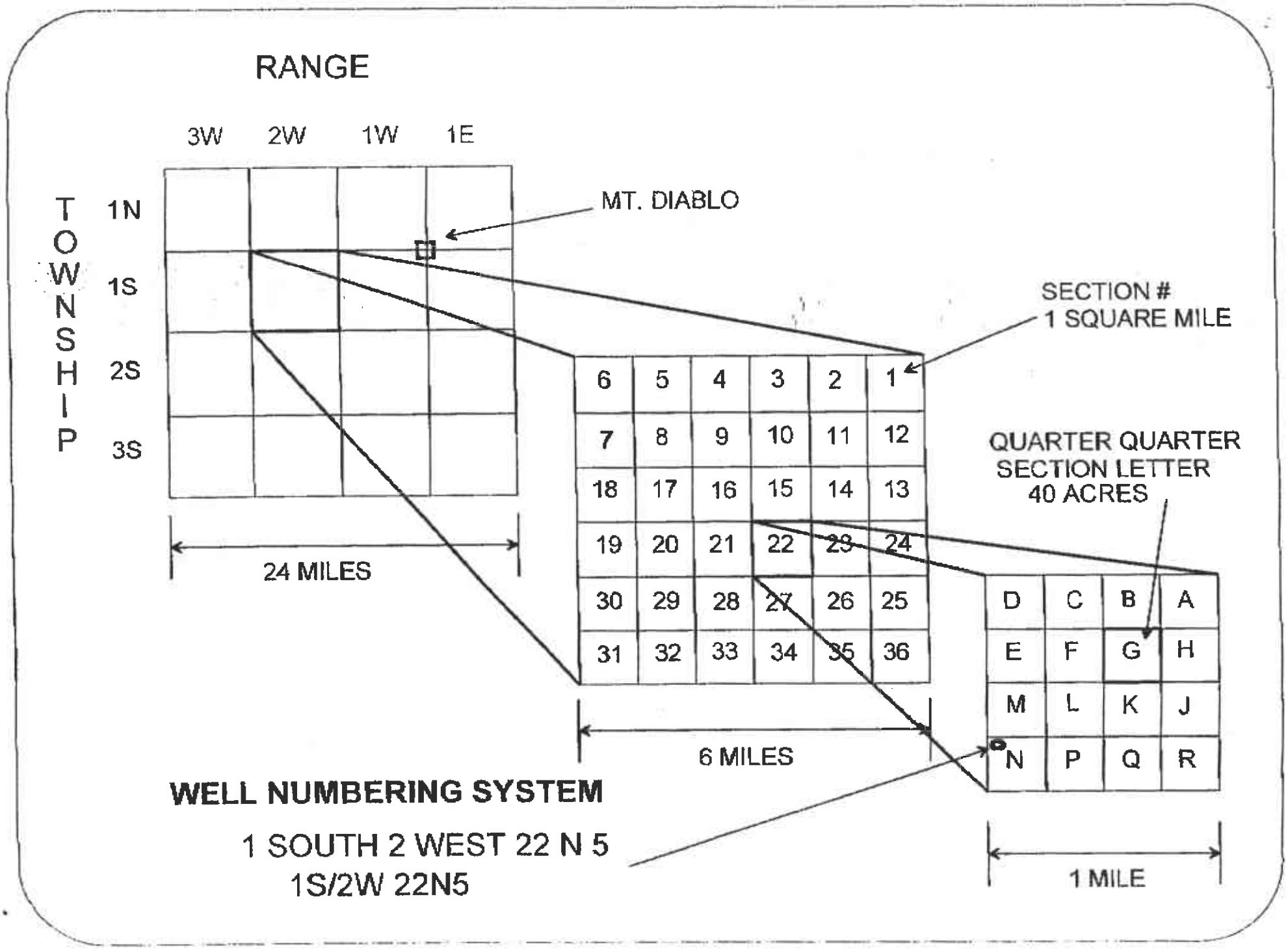
D - well driller's log
G - geotechnical boring log
E - electric (resistivity) log or other subsurface geophysical logs.

[WQ] Water quality data available - This category indicates which wells have water quality data available in ACFC & WCD files. The numbers 1 through 9 signify the number of sets of water quality measurements available for that well. A plus sign (+) indicates that 10 or more sets of data are available. A "0" indicates that no data is available.

[WL] Water level data available - This category indicates which wells have water level data other than the data reported on the well driller's logs. The numbers 1 through 9 signify the number of water level measurements available. A plus sign (+) indicates that 10 or more measurements are available for that well.
A "0" indicates that no data is available.

[YLD] Yield - The maximum pumping rate in gallons per minute that can be supplied by a well without lowering the water level in the well below the pump intake. This data is taken from pump test data recorded in the driller's records. Some of the yield data reflects current production rates and does not reflect maximum yield values determined in a capacity test.

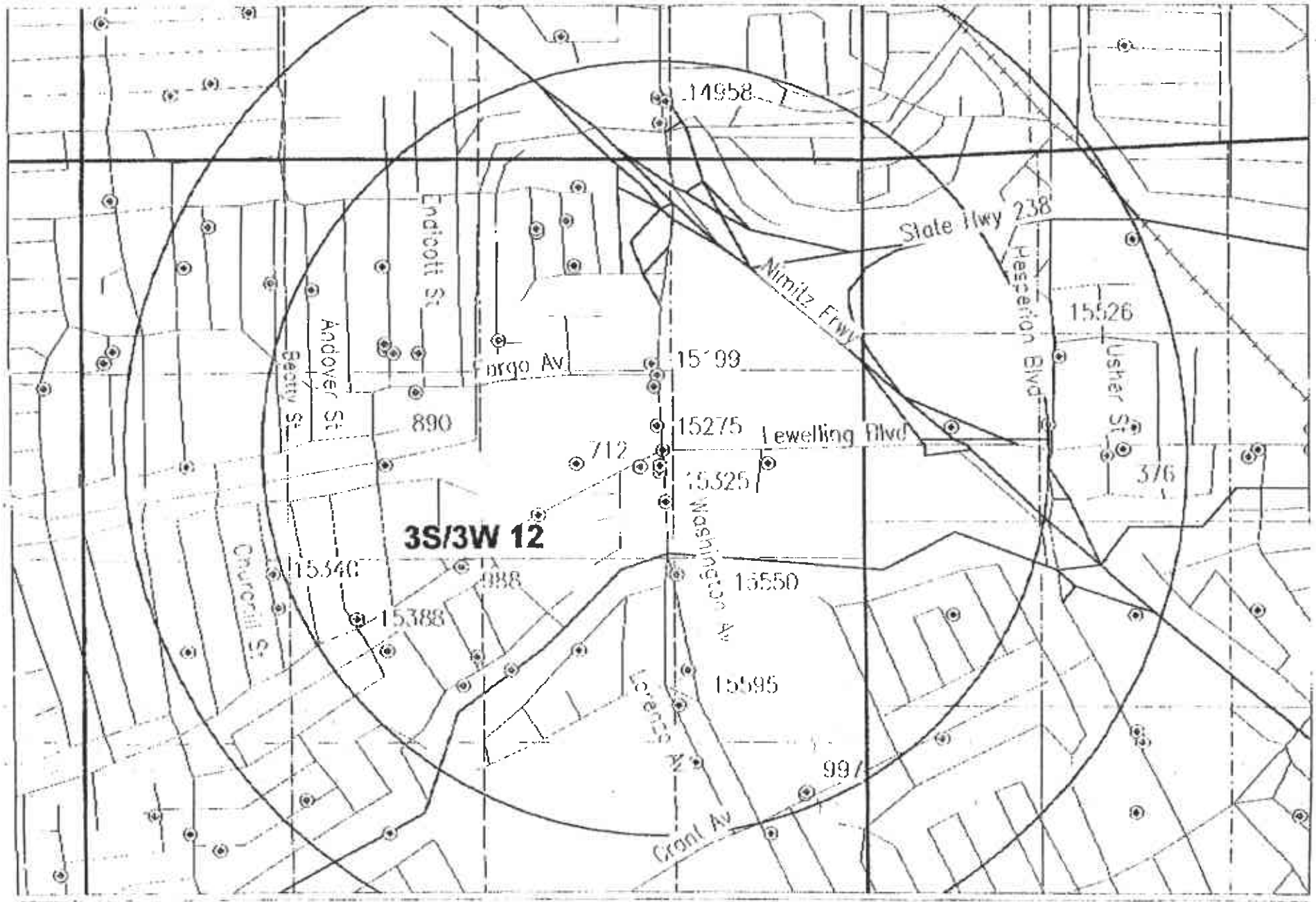
[DIA] Diameter - The diameter in inches of the main casing in a well. May also indicate the diameter of a hand-dug well. Diameter data is not recorded for geotechnical borings.


RANGE
3W
2W
1W
1E
TOWNSHIP
1N
1S
2S
3S
MT. DIABLO
SECTION #
1 SQUARE MILE
6 5 4 3 2 1
7 8 9 10 11 12
18 17 16 15 14 13
19 20 21 22 23 24
30 29 28 27 26 25
31 32 33 34 35 36
24 MILES
6 MILES
QUARTER QUARTER
SECTION LETTER
40 ACRES
D C B A
E F G H
M L K J
N P Q R
1 MILE
WELL NUMBERING SYSTEM
1 SOUTH 2 WEST 22 N 5
1S/2W 22N5

WELL #	CITY	ADDRESS	OWNER		PHONE	USE	DR.DATE	DIAM	TOT.DEPTH	DTW	ST.ELEV	WA.ELEV	YIELD	LOG	BQ	WL	DATRORGN	MARGIN
2S/3W 18M 4	SLE	15275 WASHINGTON AVE	SHELL OIL CO.		0	MON	04/89	3	26	8	0	0	0	D	0	0	L	
2S/3W 18M 5	SLE	15275 WASHINGTON AVE	SHELL OIL CO.		0	MON	04/89	3	26	9	0	0	0	D	0	0	L	
2S/3W 18M 6	SLE	15275 WASHINGTON AVE	SHELL OIL CO.		0	MON	04/89	3	26	9	0	0	0	D	0	0	L	
2S/3W 18M 7	SLE	15275 WASHINGTON AVE	SHELL OIL CO.		0	MON	04/89	3	26	8	0	0	0	D	0	0	L	
3S/2W 7C 1	SLZ	SYCAMORE	STENZEL		0	IRR	/35	10	270	0	37	0	0	?	0	0	L	Yes
3S/2W 7E 2	SLE	15599 Hesperian Blvd	Unocal Corporation		0	MON	4/91	2	20	12	37	25	0	D	2	2	D	
3S/2W 7E 3	SLE	15599 Hesperian Blvd	Unocal Corporation		0	MON	4/91	2	23	11	36	25	0	D	1	1	D	
3S/2W 7E 4	SLE	15599 Hesperian Blvd	Unocal Corporation		0	MON	4/91	2	25	16	37	21	0	G	1	1	D	
3S/2W 7E 5	SLE	1599 Hesperian Blvd	Unocal Corporation		0	DES	2/91	10	40	0	0	0	0	?	0	0	D	
3S/2W 7E 5	SLE	15599 Hesperian Blvd	Unocal Corp	MW4	0	MON	7/91	2	26	18	0	0	0	G	1	1	D	
3S/2W 7E 6	SLE	15599 Hesperian Blvd	Unocal Corp	MW5	0	MON	7/91	2	25	18	0	0	0	G	1	1	D	
3S/2W 7E 7	SLE	15599 Hesperian Blvd	Unocal Corp	MW6	0	MON	7/91	2	26	21	0	0	0	G	1	1	D	
3S/2W 7E 8	SLE	15599 Hesperian Blvd	Unocal Corp	RW-1	0	REC	4/92	6	30	17	0	0	0	G	1	1	D	
3S/2W 7F 1	SLZ	15559 OSHER	CHARLES GONSALVES		0	IRR	?	0	25	0	38	0	0	?	0	0	L	Yes
3S/2W 7F 2	SLE	15594 SHARON ST	FRANK RACIEL		0	IRR	/55	4	27	0	44	0	0	?	0	0	L	Yes
3S/2W 7F 3	SLZ	376 LEWELLING BLVD	UNOCAL STATION		0	MON	02/88	3	30	18	0	0	0	G	0	0	L	Yes
3S/2W 7G 3	SLZ	SAN LORENZO H.S.	HAY UNION H.S. DISTRICT		0	IRR	9/51	14	616	20	42	22	250	D	1	0	L	
3S/2W 7L 6	HAY	15900 Hesperian	Chevron USA		0	MON	11/89	2	25	0	0	0	0	D	0	0	D	Yes
3S/2W 7L 7	HAY	15900 Hesperian	Chevron USA		0	MON	11/89	2	25	0	0	0	0	D	0	0	D	Yes
3S/2W 7L 8	HAY	15900 Hesperian	Chevron USA		0	MON	11/89	2	26	0	0	0	0	D	0	0	D	Yes
3S/2W 7M 1	SLZ	646 VIA DELRIO	LEVY		0	IRR	?	4	22	0	28	0	0	?	0	0	L	
3S/2W 7N 2	SLE	LEWELLING	KING NURSERY		0	IRR	/20	12	150	0	30	0	0	?	0	0	L	
3S/2W 8E 2	SLE	LEWELLING	S. BOTTINCOURT		0	IRR	?	12	108	0	54	0	0	?	0	0	L	
3S/2W 8L 3	SLE	988 LEWELLING BLVD	KNAPP'S NURSERY		0	IRR+	/42	10	211	0	57	0	200	?	0	+	L	
3S/3W 1Q 5	SLE	15558 WASHINGTON AVE	MODERN VEGETABLE PRO.		0	IRR	9/64	12	460	0	0	0	750	D	0	0	L	
3S/3W 1Q 6	SLE	14985 WASHINGTON AVE	ROTO ROOTER		0	TES	4/86	2	29	9	0	0	0	D	0	0	L	
3S/3W 1Q 7	SLE	14985 WASHINGTON AVE	ROTO ROOTER		0	TES	4/86	2	20	7	0	0	0	D	0	0	L	
3S/3W 1Q 8	SLE	14985 Washington Ave.	Roto-Rooter		0	MON	2/91	4	21	10	0	0	0	D	0	0	D	
3S/3W 1Q 9	SLE	14985 Washington Ave	Roto-Rooter		0	MON	3/91	2	15	7	0	0	0	D	0	0	D	
3S/3W 1Q10	SLE	14985 Washington Ave.	Roto-Rooter		0	DOM	3/91	5	200	30	0	0	25	D	0	0	D	
3S/3W 11Q 1	SLE	LEWELLING BLVD	TROJAN BOMBER CO.		0	ABN	?	12	535	0	0	0	0	D	5	0	L	
3S/3W 11Q 2	SLE	LEWELLING BLVD	EBNUD		0	CAT	1/76	0	65	0	0	0	0	D	0	0	L	
3S/3W 11R 1	SLE	LEWELLING & WASHINGTON	?		0	IRR	?	8	500	0	13	0	0	?	0	+	L	
3S/3W 11R 2	SLE	LEWELLING BLVD & SPRR	?		0	IRR	?	0	0	0	9	0	0	?	0	0	L	
3S/3W 12A 1	SLE	14953 WASHINGTON	D. MARENGO		0	?	/20	8	60	0	22	0	0	?	0	0	L	
3S/3W 12A 2	SLE	14958 WASHINGTON	TWIN NURSERY CORP		0	IRR	/36	12	335	0	0	0	0	?	0	0	L	
3S/3W 12A 3	SLE	14958 WASHINGTON AV	TWIN NURSERY CORP.		0	DES	11/61	12	603	0	0	0	0	D	0	0	L	
3S/3W 12B 1	SLZ	391 W. 150 AV	FAKA BROTHERS		0	DOM	/30	10	120	0	20	0	0	?	0	0	L	
3S/3W 12B 2	SLZ	150 & WASHINGTON	H. GANSBERGER		0	IRR	9/34	12	545	0	35	0	0	D	0	0	L	
3S/3W 12B 3	SLZ	14960 CROSBY ST	L. RAMIREZ		0	IRR	/49	4	32	0	0	0	0	?	0	0	L	
3S/3W 12B 4	SLE	15038 ALEXANDRIA ST	J. BOSTICK		0	IRR	7/77	4	29	8	0	0	0	D	0	0	L	
3S/3W 12B 5	SLE	15034 ALEXANDRIA ST	ROY SWATHAM		0	IRR	8/77	4	28	7	0	0	15	D	0	0	L	
3S/3W 12B 6	SLE	15020 GRENADA ST	LYLE BATES		0	IRR	5/77	4	28	8	0	0	0	D	0	0	L	
3S/3W 12B 7	SLE	GREENHOUSE MARKET PLAZA	GREENHOUSE MARKET PLAZA		0	MON	6/85	0	22	13	0	0	0	G	0	0	L	
3S/3W 12B 8	SLE	GREENHOUSE MARKET PLAZA	GREENHOUSE MARKET PLAZA		0	MON	6/85	0	27	7	0	0	0	G	0	0	L	
3S/3W 12B 9	SLE	GREENHOUSE MARKET PLAZA	GREENHOUSE MARKET PLAZA		0	MON	6/85	0	22	14	0	0	0	G	0	0	L	
3S/3W 12B10	SLE	519 MANOR BLVD	SARIA BROTHERS HARDWARE		0	MON	08/86	2	23	11	0	0	0	G	0	0	L	
3S/3W 12B11	SLE	Swenson St & Swenson Ct	PG&E		0	OTH	12/91	0	122	0	0	0	0	D	0	0	D	
3S/3W 12B12	SLE	15199 Washington Ave.	BP Oil Co. MW-2		0	MON	10/92	2	13	8	22	14	0	G	0	0	D	
3S/3W 12B13	SLE	15199 Washington Ave.	BP Oil Co. MW-3		0	MON	10/92	2	15	6	22	16	0	G	0	0	D	
3S/3W 12B14	SLE	15199 Washington Ave.	BP Oil Co. MW-4		0	MON	10/92	2	15	6	22	16	0	G	0	0	D	
3S/3W 12C 1	SLZ	ZELMA & MERSHY	CITY OF SAN LORENZO		0	IRR	?	10	106	0	0	0	0	?	0	0	L	
3S/3W 12C 2	SLZ	W. 150 AV & ZELMA	KNAPP		0	IRR	/47	6	75	0	0	0	0	?	0	0	L	
3S/3W 12C 3	SLE	15088 ANDOVER ST	ORLINO ANDRADA		0	IRR	7/77	4	34	8	0	0	0	D	0	0	L	
3S/3W 12D 1	SLZ	1146 BODMIN AV	O. OWLSON		0	IRR	?	6	38	0	0	0	0	?	0	0	L	Yes
3S/3W 12E 1	SLE	15099 EDGEMOOR	JOE ALAMEDA		0	IRR	?	4	32	0	10	0	0	?	0	0	L	Yes
3S/3W 12E 2	SLZ	15118 INVERNESS ST			0	?	?	0	0	0	0	0	0	?	0	0	L	Yes
3S/3W 12F 1	SLZ	15211 NORTON ST	KRAIEMIN		0	IRR	/52	6	16	0	0	0	0	?	0	0	L	
3S/3W 12F 2	SLZ	15049 FLEMING ST	L. BOTHELL		0	IRR	/58	6	28	0	0	0	0	?	0	0	L	
3S/3W 12F 3	SLE	15185 NORTON ST	HERMAN ALBRIGHT		0	IRR	4/77	5	46	38	0	0	0	D	0	0	L	
3S/3W 12F 4	SLE	15177 NORTON ST	RICHARD ARMSTRONG		0	IRR	8/77	4	40	31	0	0	0	D	0	0	L	
3S/3W 12F 5	SLE	15193 ENDICOTT ST	JAN TISEY		0	IRR	6/77	4	28	11	0	0	0	D	0	0	L	

WELL #	CITY	ADDRESS	OWNER		PHONE	USE	DR.DATE	DIAM	TOT.DEPTH	DTW	ST.ELEV	WA.ELEV	YIELD	LOG	WQ	WL	DATAGROM	MARGIN
3S/3W 12F 7	SLE	890 FARGO AV	CHRIST PRESBYTERIAN		0	IRR	7/77	4	28	0	0	0	0	D	0	0	L	
3S/3W 12P 8	SLE	15190 NORTON ST	SAL. CAMPILENGO		0	IRR	5/77	6	35	8	0	8	0	D	0	0	L	
3S/3W 12G 1	SLZ	685 FARGO AV			0	DOM	?	0	42	0	0	0	0	?	0	0	L	
3S/3W 12G 2	SLE	WASHINGTON & FARGO AVE	MOBIL OIL CORP		0	MON	03/86	2	20	10	0	0	0	G	0	0	L	
3S/3W 12G 3	SLE	15275 WASHINGTON AVE	SHELL OIL		0	MON	12/86	4	20	7	22	0	0	G			L	
3S/3W 12G 4	SLE	15275 WASH. AVE.	SHELL OIL		0	MON	11/88	3	24	8	0	0	0	G	0	0	L	
3S/3W 12G 5	SLE	15275 WASHINGTON AVE	SHELL OIL		0	MON	11/88	3	24	8	0	0	0	G	0	0	L	
3S/3W 12G 6	SLE	15275 WASH. AVE.	SHELL		0	MON	11/88	3	24	8	0	0	0	G	0	0	L	
3S/3W 12G 7	SLE	15275 WASH. AVE.	SHELL OIL		0	MON	11/88	3	20	8	0	0	0	G	0	0	L	
3S/3W 12G 8	SLE	15275 WASH. AVE.	SHELL OIL		0	MON	11/88	3	20	8	0	0	0	G	0	0	L	
3S/3W 12G 9	SLE	15275 WASH. AVE.	SHELL OIL		0	MON	11/88	3	25	8	0	0	0	G	0	0	L	
3S/3W 12G10	SLE	15275 WASH. AVE.	SHELL OIL		0	MON	11/88	3	24	8	0	0	0	G	0	0	L	
3S/3W 12G11	SLE	15275 WASHINGTON AVE	SHELL OIL		0	MON	04/89	3	24	9	0	0	0	G	0	0	L	
3S/3W 12G12	SLE	15275 WASHINGTON AVE	SHELL OIL		0	MON	05/89	3	24	9	0	0	0	G	0	0	L	
3S/3W 12G13	SLE	15275 WASHINGTON AVE	SHELL OIL		0	MON	05/89	3	24	9	0	0	0	G	0	0	L	
3S/3W 12G14	SLE	15275 WASHINGTON AVE	SHELL OIL		0	MON	05/89	3	24	9	0	0	0	G	0	0	L	
3S/3W 12G15	SLE	15275 WASHINGTON AVE	SHELL OIL		0	MON	05/89	3	24	8	0	0	0	G	0	0	L	
3S/3W 12G16	SLE	15201 WASH. AVE.	DESERT PETROLEUM		0	MON	09/88	2	28	80	0	0	0	D	Y	0	L	
3S/3W 12G17	SLE	15201 WASH. AVE.	DESERT PETROLEUM		0	MON	09/88	2	28	8	0	0	0	D	Y	0	L	
3S/3W 12G18	SLE	15201 WASH. AVE.	DESERT PETROLEUM		0	MON	09/88	2	29	9	0	0	0	D	Y	0	L	
3S/3W 12G19	SLE	15275 East Washington St.	Shell Oil Company		0	TES	10/89	6	22	11	0	0	0	D	0	0	D	
3S/3W 12G20	SLE	713 Lewelling Blvd.	ARCO		0	MON	8/90	2	41	6	10	4	0	G	0	0	D	
3S/3W 12G21	SLE	713 Lewelling Blvd.	ARCO		0	MON	6/90	2	12	9	0	0	0	G	0	0	D	
3S/3W 12G22	SLE	713 Lewelling Blvd.	ARCO		0	MON	6/90	2	12	11	0	0	0	G	0	0	D	
3S/3W 12G23	SLE	713 Lewelling Blvd	ARCO Prod. Co.	MW-4	0	MON	5/91	4	18	8	0	0	0	D	0	0	D	
3S/3W 12G24	SLE	713 Lewelling Blvd	ARCO Prod. Co.	MW-5	0	MON	5/91	4	20	8	0	0	0	D	0	0	D	
3S/3W 12G25	SLE	713 Lewelling Blvd	ARCO Prod. Co.	MW-6	0	MON	5/91	4	16	0	0	0	0	D	0	0	D	
3S/3W 12G26	SLE	713 Lewelling Blvd	ARCO Prod. Co.	MW-7	0	MON	5/91	4	16	9	0	0	0	D	0	0	D	
3S/3W 12G27	SLE	713 Lewelling Blvd	ARCO Prod Co.	MW-8	0	MON	5/91	4	16	9	0	0	0	D	0	0	D	
3S/3W 12G28	SLE	15275 Washington Ave	Shell Oil Co	SLE	0	TEST	5/91	3	19	8	0	0	0	D	0	0	D	
3S/3W 12G29	SLE	15301 Washington Ave.	Arco Products Co.	MW-14	0	MON	8/92	2	13	12	0	0	0	D	0	0	D	
3S/3W 12G30	SLE	713 Lewelling Blvd.	ARCO MW-15		0	MON	3/93	2	11	6	0	0	0	D	0	0	D	
3S/3W 12G31	SLE	713 Lewelling Blvd.	ARCO MW-13		0	MON	11/92	2	14	12	0	0	0	G	0	0	D	
3S/3W 12G32	SLE	713 Lewelling Blvd.	ARCO #601 MW-11		0	MON	10/92	4	12	9	0	0	0	G	0	0	D	
3S/3W 12G33	SLE	713 Lewelling Blvd.	ARCO #601 MW-12		0	MON	10/92	4	13	8	0	0	0	G	0	0	D	
3S/3W 12H 1	SLZ	15100 WASHINGTON AV	SAN LORENZO NURSERY		0	IRR	6/57	12	525	32	23	-9	0	D	0	0	L	
3S/3W 12H 2	SLZ	15100 WASHINGTON AV	SAN LORENZO NURSERY		0	ABN	10/47	12	720	0	23	0	4	D	0	0	L	
3S/3W 12J 2	SLE	15550 WASHINGTON	MODERN VEGETABLE NURSERY		0	IRR	/32	12	360	0	24	0	0	?	0	0	L	
3S/3W 12J 3	SLE	15325 WASHINGTON	E. MANUEL CHALCO		0	IRR	/20	10	130	0	0	0	0	?	0	0	L	
3S/3W 12J 4	SLE	15600 LORENZO AVE	FRANK PERRY		0	IRR	8/78	6	80	9	0	0	20	D	0	0	L	
3S/3W 12J 5	SLE	15595 WASHINGTON AVE	TEXACO		0	MON	08/86	2	15	11	0	0	0	G	0	0	L	
3S/3W 12J 6	SLE	15595 WASHINGTON AVE	TEXACO		0	MON	08/86	2	15	9	0	0	0	G	0	0	L	
3S/3W 12J 7	SLE	15595 WASHINGTON AVE	TEXACO		0	MON	08/86	2	16	12	0	0	0	G	0	0	L	
3S/3W 12K 1	SLZ	915 LEWELLING ST	E. PIANETTA		0	IRR	/25	12	130	0	17	0	0	?	0	0	L	
3S/3W 12K 2	SLZ	963 LEWELLING BLVD	W. JONES		0	IRR	?	6	42	0	17	0	0	?	0	0	L	
3S/3W 12K 4	SLZ	15547 SHERMAN ST	EAGLE		0	IRR	/77	6	30	13	0	0	0	D	0	0	L	
3S/3W 12L 1	SLE	15388 ANDOVER ST	E. PIANETTA		0	IRR	/57	6	22	0	0	0	0	?	0	0	L	
3S/3W 12L 2	SLZ	15367 NORTON ST	BURKE		0	IRR	/53	6	30	0	0	0	0	?	0	0	L	
3S/3W 12L 3	SLE	15596 TILDEN ST	ROBERT PERINO		0	IRR	3/77	4	30	12	0	0	0	D	0	+	L	
3S/3W 12L 4	SLE	1018 KRAMER ST	AUBREY ELLIOTT		0	IRR	4/77	6	30	14	0	0	0	D	0	+	L	
3S/3W 12M 1	SLZ	15311 FARNSWORTH ST	STRATMAN		0	IRR	/56	6	36	0	0	0	0	?	0	0	L	Yes
3S/3W 12M 2	SLZ	15301 FARNSWORTH ST	E. ROSENQUIST		0	IRR	?	6	30	0	0	0	0	?	0	0	L	Yes
3S/3W 12M 4	SLZ	15307 FARNSWORTH ST	HERMAN HOWELL		0	IRR	5/77	6	24	7	0	0	0	D	0	0	L	Yes
3S/3W 12P 1	SLE	TWIN PALMS	MASSOLA		0	IRR	?	8	0	0	17	0	0	?	0	0	L	Yes
3S/3W 12Q 1	SLZ	15701 Lorenzo Ave.	Arroyo H.S. (Blanco USD)		0	PIE	1/91	2	20	8	0	0	0	D	0	0	D	
3S/3W 12Q 2	SLZ	15701 Lorenzo Ave.	Arroyo H.S. (Blanco USD)		0	MON	1/91	2	25	11	0	0	0	G	0	0	D	
3S/3W 12Q 3	SLZ	15701 Lorenzo Ave.	Arroyo H.S. (Blanco USD)		0	MON	1/91	2	25	11	0	0	0	G	0	0	D	
3S/3W 12R 2	SLE	15651 WASHINGTON	CORSO		0			0	0	0	0	0	0				A	Yes
3S/3W 12R 4	HAY	GRANT & WASHINGTON	TOM CLEMENTS		0	IRR	12/89	8	38	0	0	0	0	?	0	0	L	Yes
3S/3W 12R 5	SLZ	997 Grant Ave	Chevron USA		0	MON	9/90	4	35	10	0	0	0	D	0	0	D	
3S/3W 12R 6	SLZ	997 Grant Ave	Chevron USA		0	MON	11/90	2	28	13	0	0	0	D	0	0	D	
3S/3W 12R 7	SLZ	997 Grant Ave	Chevron USA		0	MON	11/90	2	28	11	0	0	0	D	0	0	D	

WELL #	CITY	ADDRESS	OWNER	PHONE	USE	DR.DATE	DIAM	TOT.DEPTH	DTW	ST.ELEV	WA.ELEV	YIELD	LOG	WQ	WL	DATAORGN	MARGIN
3S/3W 12R 8	SLZ	937 Grant Ave	Chevron USA	0	MON	11/90	2	27	12	0	0	0	D	0	0		D
3S/3W 12R 8	SLZ	957 Grant Ave	Chevron USA	0	MON	2/91	2	14	4	100	96	0	G				D
3S/3W 12R 9	SLZ	15703 Lorenzo Ave.	SLZ Unified School Distri	0	MON	8/92	2	24	20	0	0	0	D	0	0		D
3S/3W 12R10	SLZ	15121 Wicks Blvd.	SLZ Unified School Dist.	0	MON	8/92	2	25	10	0	0	0	D	0	0		D
3S/3W 12R11	SLZ	15223 Wicks Blvd.	SLZ Unified School Dist.	0	MON	8/92	2	20	11	0	0	0	D	0	0		D
3S/3W 12R12	SLZ	15221 Wicks Blvd.	SLZ Unified School Dist.	0	MON	8/92	2	20	5	0	0	0	D	0	0		D
3S/3W 12R13	SLZ	937 Grant Ave	Chevron USA C-5	0	MON	2/93	2	21	15	0	0	0	G	0	0		D
3S/3W 13B 1	SLZ	15550 WASHINGTON AV	NORBRN VEGETABLE NURSERY	0	IRR	6/48	12	550	0	0	0	0	D	0	0		E
3S/3W 14A 2	SLZ	SAN LORENZO WELL FIELD	EBMUD	0	MUN	10/15	10	834	0	7	0	0	D	0	0		E
3S/3W 14B 1	SLZ	LEWELLING	TROJAN POWDER CO.	0	ABN	?	12	533	0	6	0	0	D	0	0		E
3S/3W 14C 4	SLZ	LEWELLING BLVD	LIVERMORE-AMADOR VALLEY	0	CAT	5/79	0	140	0	0	0	0	D	0	0		E
3S/3W 14F 1	SLZ	LEWELLING BLVD	TROJAN POWDER CO	0	ABN	10/15	12	769	0	0	0	0	D	0	0		E
3S/3W 14G 1	SLZ	LEWELLING	TROJAN POWDER CO.	0	ABN	8/15	12	600	0	0	0	0	D	0	0		E
3S/3W 14G 2	SLZ	LEWELLING BLVD	TROJAN POWDER CO.	0	ABN	9/19	12	785	0	5	0	0	D	0	0		E
3S/3W 14H 3	SLZ	LEWELLING BLVD	TROJAN POWDER CO.	0	ABN	?	10	0	0	0	0	0	?	0	0		E



.5 mile radius from Lewelling & Washington Ave.
03/30/1995

EMCON ASSOCIATES | WATER WELL SURVEY FORM 738-08.03 | SHEET 1 OF 16. | DMD: 2/5/87

EMCON WELL NUMBER	DATE DRILLED, DRILLER	WELL OWNER LISTED	STATUS IF KNOWN	WELL CONSTRUCTION DETAILS									EDITED DRILLER REPORTS
				TOT. DPTH (FT.)	COMP. DPTH (FT.)	PERF. INTER. (FT.)	SEAL DPTH (FT.)	CASE DIA. (IN.)	CASE MAT.	WAT. LEV. (FT.)	EST. Q (GPM)	SURF. ELEV. (FT.)	
1	1900	Heide	Domestic	?	36			6					
	Owner	90 Grant											
		San Lorenzo											
2	1935	Gianelli	Irrig.	?	113	48-113		10-8					
	Owner	143 Grant											
		San Lorenzo											
3	6/12/48	Modern Veg.	Irrig.	?	?								
	?	Nursery											
		15550 Washington Ave.			550			12					
		San Lorenzo											
4	?	Gianelli	Irrig.	?	113	48-113							
	?	15841 Nielson Ave.											
		San Lorenzo											
5	Owner	Bratton	Irrig.	?	21								
	?	15868 Corte											
		Ulisse, San Lorenzo											
6	Owner	Moyers	Irrig.	?	30								
	?	1508 Via											
		Hermana											
		San Lorenzo											
7	?	Norris	Irrig.	?	20								
	?	16030 Via											
		Nueva											
		San Lorenzo											
8	8/5/56	Lichty	Irrig.	?	30	15-30		6					
	Domestic	16148 Channel											
	Water Well	St. San Lorenzo											
	Company												

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				TOT. DPTH (FT.)	COMP. DPTH (FT.)	PERF. INTER. (FT.)	SEAL DPTH (FT.)	CASE DIA. (IN.)	CASE MAT.	WAT. LEV. (FT.)	EST. Q (GPM)	SURF. ELEV. (FT.)	
9	1920	Marengo		?	60			8					
	?	14953 Washington											
		San Lorenzo											
10	1936	Twn. Nursery [illegible]		?	335			14				23	
	White	Corp. 14958											
		Washington											
		San Lorenzo											
11	1936	Twn. Nursery Irrig.		?	325			14				23	
	White	Corp. 14958											
		Washington											
		San Lorenzo											
12	5/26/78	McCarthy		?	?								
	AR-GO	2770 Scott Blvd.											
	Pump Co.	Santa Clara											
13	1930	Fara Bros.	Domestic	?	120	99-110		10				20	
	?	391 W. 150th											
		San Lorenzo											
14	1949	Ramirez	Irrig.	?	32	22-32		4					
	Owner	14960 Crosby											
		San Lorenzo											
						453-469							
15	9/28/34	Gansberger		?	545	487-492		12				35	
	G.P. Nelson					518-520							
						521-528							
						530-540							

EMCON ASSOCIATES | WATER WELL SURVEY FORM | SHEET 4 OF 16. | D:O:2/5/87

EMCON WELL NUMBER	DATE DRILLED, DRILLER	WELL OWNER LISTED	STATUS IF KNOWN	WELL CONSTRUCTION DETAILS									EDITED DRILLER REPORTS
				TOT. DPTH (FT.)	COMP. DPTH (FT.)	PERF. INTER. (FT.)	SEAL DPTH (FT.)	CASE DIA. (IN.)	CASE MAT.	WAT. LEV. (FT.)	EST. Q (GPM)	SURF. ELEV. (FT.)	
24	?												
	owner	Alameda	Irrig.	?	32			4				10	
		15099 Edgemoore											
		San Lorenzo											
25	?	?	Irrig.	?	?								
	?	15118 Inverness											
		San Lorenzo											
26	1977	Vandenberg	Irrig.	?	40								
		15202 Galt											
		San Leandro											
27	1977	Fassler	Irrig.	30	30								
	?	15205 Galt											
		San Leandro											
28	1952	Reairwin	Irrig.	?	18			6					
	Owner	15211 Norton											
		San Leandro											
29	1958	Bothell	Irrig.	?	28			6					
	Owner	15049 Fleming											
		San Leandro											
30	?	Albright	Irrig.	46	20								
	Owner	15185 Norton											
		San Leandro											
31	?	Armstrong	Irrig.	?	?								
	Owner	15177 Norton											
		San Leandro											
32	1977	Tisby	Irrig.	20	20								
	?	15193 Endicott											
		San Leandro											

EMCON WELL NUMBER	DATE DRILLED, DRILLER	WELL OWNER LISTED	STATUS IF KNOWN	WELL CONSTRUCTION DETAILS									EDITED DRILLER REPORTS
				TOT. DPTH (FT.)	COMP. DPTH (FT.)	PERF. INTER. (FT.)	SEAL DPTH (FT.)	CASE DIA. (IN.)	CASE MAT.	WAT. LEV. (FT.)	EST. Q (GPM)	SURF. ELEV. (FT.)	
33	1977	Lapin	Irrig.	38	38								
	?	15105 Beatty											
		San Leandro											
34	?	Christ	Irrig.	?	?								
	?	Prebyterian											
		Church											
		840 Fargo											
		San Leandro											
35	1976	Campilengo	Irrig.	35	35								
	?	15190 Norton St.											
		San Leandro											
36	?	?	Domestic ?		42								
	?	658 Fargo											
		San Leandro											
37	1957	San Leandro Aband.	?		525	341-354		16					
	Bassett	Nursery	1985			490-511							
		15100 Washington											
		San Lorenzo											
38	1947	"	Inactive ?		720	660-720		12				23	
	Fuentes	"											
		"											
		"											
39	1938	Christensen	Irrig.		370			12				26.5	
	Silva Bros.												

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				TOT. DPTH (FT.)	COMP. DPTH (FT.)	PERF. INTER. (FT.)	SEAL DPTH (FT.)	CASE DIA. (IN.)	CASE MAT.	WAT. LEV. (FT.)	EST. Q (GPM)	SURF. ELEV. (FT.)	
		Modern											
40	1932	Vegetable	Irrig.	?	350	340-350		12				24	
	Western	Nursery											
	Well	15550 Washington											
		San Leandro											
41	1920	Gualco	Irrig.	?	130			10				24	
	Swan	15325 Washington											
		San Leandro											
42	1978	Perry	Irrig.	?	?								
	Wood Co.	15600 Lorenzo											
		San Lorenzo											
43	1925	Pianetta	Irrig.	?	120	100-120		12				17	
	Nunes	915 Lewelling											
		San Lorenzo											
44		Jones	Irrig.	?	42	30-42		6				17	
	Owner	983 Lewelling											
		San Lorenzo											
45		Raele	Irrig.	?	?								
		15547											
		Sedgeham											
		San Leandro											
46	1957	Pianetta	Irrig.	?	22			6				21	
	Owner	15388 Andover											
		San Leandro											

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				TOT. DPTH (FT.)	COMP. DPTH (FT.)	PERF. INTER. (FT.)	SEAL DPTH (FT.)	CASE DIA. (IN.)	CASE MAT.	WAT. LEV. (FT.)	EST. Q (GPM)	SURF. ELEV. (FT.)	
47	1953	Burke											
	Owner	15367 Norton Irig		?	30			6					
		San Lorenzo											
48	1956	Stratman	Irrig.	?	36			6					
	Owner	15311 Farnsworth											
		San Lorenzo											
49	?	Rosenquist	Irrig	?	30			6					
	Owner	15301 Farnsworth											
		San Lorenzo											
50	1977	Perino	Irrig.	30	30								
	?	15596 Tilden											
		San Leandro											
51	1977	Elliott	Irrig.	30	30								
		1018 Kramer											
		San Leandro											
52	?	Wollery	Irrig.	?	23								
	?	15340 Churchill											
		San Leandro											
53	?	Howell	Irrig	24	25								
		15302 Farnsworth											
		San Leandro											
54	1977	Stanley		30	30								
	?	15368 Churchill											
		San Leandro											

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		Parodi											
55	?	1508	Domestic	?	?								
	?	Lewelling											
		San Lorenzo											
56		Beuit Enterprises		?	?								
	?	2020 Davis	Abandoned										
		San Leandro											
57	1977	McTigue	Irrig.	21	20								
	?	1500 Sayre											
		San Leandro											
58	?	Bolla	Irrig.	?	?								
	?	1335 Sayre											
		San Leandro											
59	?	Brown	Irrig.	31	31								
		15591 Jutland											
		San Leandro											
60	?	Perry	Irrig	?	60			12	12				
	?	15500 Lorenzo											
		San Lorenzo											
61	1957	Arroyo High	Irrig	?	600							19	
	?	School											
		Grant St.											
		San Lorenzo											
62	?	Corso	?	?	?								
	?	15651 Washington											
		San Lorenzo											

EMCON ASSOCIATES — WATER WELL SURVEY FORM — SHEET ___ OF ___ — D.W.R. 2/3/87

EMCON WELL NUMBER	DATE DRILLED, DRILLER	WELL OWNER LISTED	STATUS IF KNOWN	WELL CONSTRUCTION DETAILS									EDITED DRILLER REPORTS
				TOT. DPTH (FT.)	COMP. DPTH (FT.)	PERF. INTER. (FT.)	SEAL DPTH (FT.)	CASE DIA. (IN.)	CASE MAT.	WAT. LEV. (FT.)	EST. Q (GPM)	SURF. ELEV. (FT.)	
		Richols											
63	1946	3000	Domestic ?		197			10					
	Basset	Halcolm											
		San Leandro											
64	1937	Moore	Irrg.	?	50	30-47		6				26	
	Jet	15241 Upton											
		San Leandro											
6_	1952	Crane	Irrig	?	20			4				29	
	Owner	487 Lloyd											
		San Leandro											
66	1953	Wilson	Irrig.	?	25			8				27	
	Owner	15360 Dermody											
		San Leandro											
67	1958	Cuimente	Irrig	?	20			6				28	
	Owner	15508 Werner											
		San Leandro											
68	1935	Stewzel	Irrig	?	270			10				38	
	Silva	Sycamore											
		San Leandro											
69	?	Twin	Irrig	?	?							31	
	?	Nursery											
		Washington Street											
		San Leandro											
70	?	Twin	Abandoned		?			8				30	
	?	Nursery											
		Washington St.											
		San Leandro											

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	?	Gonzales											
71	?	15559 Usher Irrg		?	25							38	
		San Leandro											
72	1955	Maciel	Irrig.	?	27			4				44	
	Owner	15594 Sharon											
		San Lorenzo											
73	1951	Hayward	Domestic	?	616			30/14				42	
	Western	Union High	Irrig.										
	Well	School Dist.											
		San Lorenzo											
74	1937	Teel	Domestic	?	75			8					
	Swanson	624 Lewelling											
		San Lorenzo											
75	1949	Ratti	Domestic	?	410								
	Anderson	Lewelling?	Irrig.										
		Hesperian											
		San Lorenzo											
76	?	Levy	Irrig.	?	22			4				28	
	?	646 Via Del Oro											
		San Lorenzo											
77	1920	Kino Nurs-	Irrig	?	150			12				33	
	?	ery											
		880 Lewelling											
		San Lorenzo											

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		P. Duncan	Irrig.	?	?								
78	?	16089 Via Alamitos											
	?	San Lorenzo											
		Avansino											
79	1951	1441	Irrig.	?	701			12				36	
	Bassett	Washington											
		San Leandro											
80	1951	Abansino	Irrig.	?	701							35	
	?	Mortenson Nursery Co.											
		14441 Washington											
		San Leandro											
81	1952	Abansino	Irrig.	?	701							32	
	?	Mortenson Nursery Co.											
		14441 Washington											
		San Leandro											
82	1937	Abansino	Irrig.	?	288			10				35	
	?	Mortenson Nursery Co.											
		14441 Washington											
		San Leandro											
83	?	Abansino	Irrig.	?	135			8/10				38	
	?	Mortenson Nursery Co.											
		14441 Washington											
		San Leandro											
84	1931	Abansino	Irrig.	?	235			12				34	
	?	Mortenson Nursery Co.											
		14441 Washington											
		San Leandro											

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85	?	Abansino	Irrig.	?	254			12					
	?	Mortenson Nursery Co.											
		14441 Washington											
		San Leandro											
86	1931	Avansino	Irrig.	?	235			12				34	
	?	Mortenson Nursery Co.											
		14441 Washington											
		San Leandro											
87	?	Avansino	Irrig.	?	135			12					
	?	Mortenson											
		14441 Washington											
		San Leandro											
88	1956	Clark	Irrig.	?	30			6					
	Domestic	417 Bradrick											
	Well	San Leandro											
89	1930	Cardoza	Domestic	?	150			10					
	?	14700 Washington	Irrig.										
		San Leandro											
90	?	Olsen	Irrig.	62	60								
	AAA Drilling	14737 Harold San Leandro											
91	1951	K-Mart	Irrig.	?	701			12				35	
	Bassett	14441 Washington San Leandro											

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92	1957	Graves	Irrig.	?	23			4					
	Owner	3894 Carmel											
		San Leandro											
93	1958	Kirkland	Irrig.	?	19			4					
	Owner	883 Halycon											
		San Leandro											
	1956	Grego	Irrig.	?	125			5				30	
	Murphy	3701 Monterey											
		San Leandro											
95	?	Hastie											
	?	3712 Awrawy	Irrig	?	?								
		San Leandro											
96	1955	Thomas	Irrig.	?	29			4					
	Owner	3689 Figueroa											
		San Leandro											
97	?	Bolesworth	Irrig.	?	?								
	?	1044 Marquette											
		San Leandro											
98	1977	Spitznagle	Irrig.	?	38								
	?	1075 Tulane											
		San Leandro											
99	1956	Smith	Irrig.	?	16			5					
	Owner	1227 Purdue											
		San Leandro											

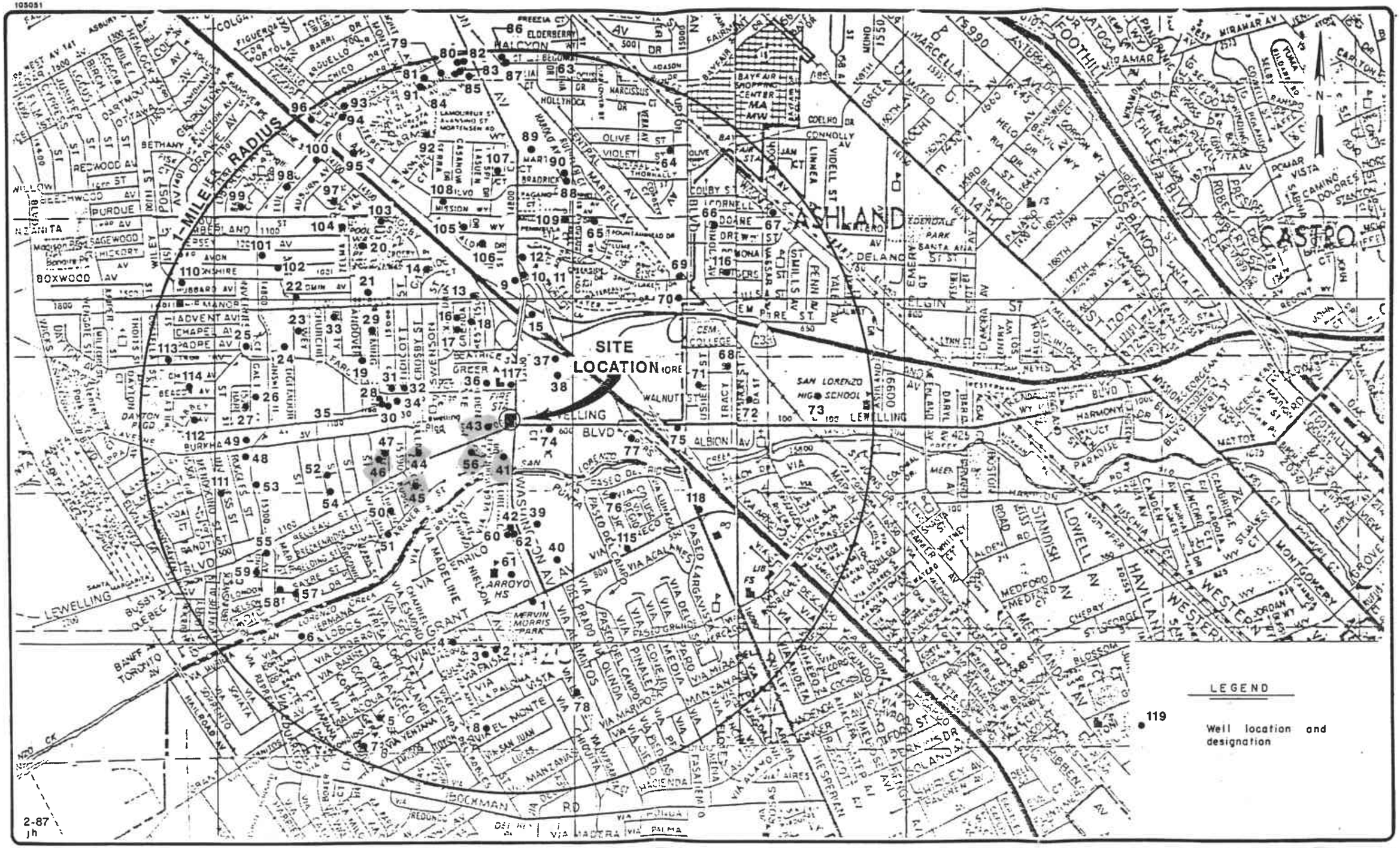
EMCON WELL NUMBER	DATE DRILLED, DRILLER	WELL OWNER LISTED	STATUS IF KNOWN	WELL CONSTRUCTION DETAILS									EDITED DRILLER REPORTS
				TOT. DPTH (FT.)	COMP. DPTH (FT.)	PERF. INTER. (FT.)	SEAL DPTH (FT.)	CASE DIA. (IN.)	CASE MAT.	WAT. LEV. (FT.)	EST. Q (GPM)	SURF. ELEV. (FT.)	
100	1957	Hawks	Irrig.	?	60			4				27	
	Owner	1051 Tulane											
		San Leandro											
101	?	Tavis	Irrig.	?	?								
	?	1144 Avon											
		San Leandro											
102	1977	Brannon	Irrig.	?	36								
	?	1075 Avon											
		San Leandro											
103	1957	Heisler	Irrig.	?	37			6					
	Leite	14861 Crosby											
		San Leandro											
104	1952	Souza	Irrig.	?	27			6					
	Owner	1009 Cumberland											
		San Leandro											
	1977	Friesen	Domestic	?	84								
	?	324 Anza											
		San Leandro											
106	?	Chuck	Irrig.	?	30			4					
	Owner	335 Aloha											
		San Lorenzo											
107	1958	Calvao	Irrig.	?	23	15-23		5					
	Owner	830 Crespi											
		San Leandro											

EMCON WELL NUMBER	DATE DRILLED, DRILLER	WELL OWNER LISTED	STATUS IF KNOWN	WELL CONSTRUCTION DETAILS									EDITED DRILLER REPORTS
				TOT. DPTH (FT.)	COMP. DPTH (FT.)	PERF. INTER. (FT.)	SEAL DPTH (FT.)	CASE DIA. (IN.)	CASE MAT.	WAT. LEV. (FT.)	EST. Q (GPM)	SURF. ELEV. (FT.)	
108	1957	Payne	Irrig.	?	14								
	Owner	916 Sierra											
		San Leandro											
109	1955	Davies	Irrig.	?	28								
	Owner	418 Lloyd											
		San Leandro											
.0	1977	Brooks	Irrig.	?	?								
	?	1341 Devonshire											
		San Leandro											
111	1977	Henwood	Irrig.	18	18								
	?	15700 Inverness											
		San Leandro											
112	1977	Knupler	Irrig.	25	25								
	?	1439 Abbey											
		San Leandro											
)	1977	Tatman	Irrig.	27	27								
	?	15149 Wiley											
		San Leandro											
114	1977	Gietzen	Irrig.	28	27								
	?	1435 Church											
		San Leandro											
115	1977	Frink	Irrig.	?	?								
	?	754 Grant											
		San Lorenzo											

EMCON ASSOCIATES | WATER WELL SURVEY FORM | SHEET 16 OF 16. | D:O:2/5/87

EMCON WELL NUMBER	DATE DRILLED, DRILLER	WELL OWNER LISTED	STATUS IF KNOWN	WELL CONSTRUCTION DETAILS									EDITED DRILLER REPORTS
				TOT. DPTH (FT.)	COMP. DPTH (FT.)	PERF. INTER. (FT.)	SEAL DPTH (FT.)	CASE DIA. (IN.)	CASE MAT.	WAT. LEV. (FT.)	EST. Q (GPM)	SURF. ELEV. (FT.)	
116	1977	Maxwell	Irrig.	?	?								
	?	538 Rutgers											
		San Leandro											
117	1986	Mobil Oil	Mon.	?	?								
	?	Washington & Fargo											
		San Leandro											
118	1986	Mobil Oil	4 Mon	?	?								
	?	15884 Hesparian											
		San Lorenzo											

105051



EMCON Associates

SCALE 0 1/2 1.0 MILES

GETTLER-RYAN INC.
SUBSURFACE HYDROGEOLOGIC INVESTIGATION
SHELL SERVICE STATION, 15275 WASHINGTON AVE.
SAN LORENZO, CALIFORNIA

WELL SURVEY MAP

FIGURE 1

PROJECT NO. 738-08.03

APPENDIX D

FATE2 Model Parameters

Domenico's Model...

Assumes: uniform and constant aquifer properties, one dimensional groundwater flow, first-order contaminant decay, degradation, or transformation, constant contaminant source of rectangular cross-section in the plane perpendicular to groundwater flow.

Maximum Centerline Concentration at Steady-State:

$$\frac{C(x,y=0,z=0)}{C_{source}} = \exp\left\{\frac{x}{2\alpha_x}\left[1-\left(1+4\lambda\frac{\alpha_x}{q}\right)^{1/2}\right]\right\}\left(erf\left[\frac{Y}{4\sqrt{\alpha_y x}}\right]\right)\left(erf\left[\frac{Z}{4\sqrt{\alpha_z x}}\right]\right)$$

C(x,y,z)	= solute concentration at location (x,y,z) [mg/l]
C_{source}	= solute concentration at (x=0,y=0,z=0) [mg/l]
x	= distance downgradient of source [ft]
α_x	= 0.1x = longitudinal (x) dispersivity [ft]
α_y	= α_x/3 = transverse (y) dispersivity [ft]
α_z	= 0.05 α_x = vertical (z) dispersivity [ft]
q	= groundwater velocity (or specific discharge) [ft/d]
l	= attenuation (degradation) coefficient [d-1]
Y	= source width (perpendicular to groundwater flow in the horizontal plane) [ft]
Z	= source depth (perpendicular to groundwater flow in the vertical plane) [ft]
erf(h)	= Error Function evaluated for value (h)

Plume Attenuation Model: FATE2

MODEL PARAMETER INPUT

1) Input Flow Model Parameters:	**Input**		**Min**	**Max**
n - Porosity [ft^3/ft^3]	**0.35**		0.25	0.6
K - Hydraulic Conductivity [ft/day]	**3**		0.0001	100
i - Groundwater Gradient [ft/ft]	**0.005**		0.001	0.01
lamda - attenuation rate [1/day]	**0.0025**		0.001	0.01
Mx - multiplier for longitudinal dispersivity [alpha-x = Mx*x]	**0.1**		0.05	0.2
My - multiplier for transverse dispersivity [alpha-y = My*alpha-x]	**0.033**	**Min**	0.1	0.3333
Mz - multiplier for vertical dispersivity [alpha-z = Mz*alpha-x]	**0.005**	**Min**	0.0125	0.1

2) Input Source Data:	
Cs - Source Concentration [mg/l]	**36**
Y - source width perpendicular to groundwater flow [ft]	**40**
Z - source depth below water table [ft]	**7**
L - farthest distance to be evaluated from source [ft]	**660**

3) Input Monitoring Point Data:			
Monitoring Point	**1**	**2**	**3**
Cm - concentration at monitoring locations [mg/l]	**36**	**0.65**	**0.0024**
M - Distance to Monitoring Locations [ft]	**25**	**90**	**155**

4) Input Receptor Data:	
R - Distance to Nearest Receptor Location [ft]	**660**
Cgw* - Target Concentration [mg/l]	**0.001**

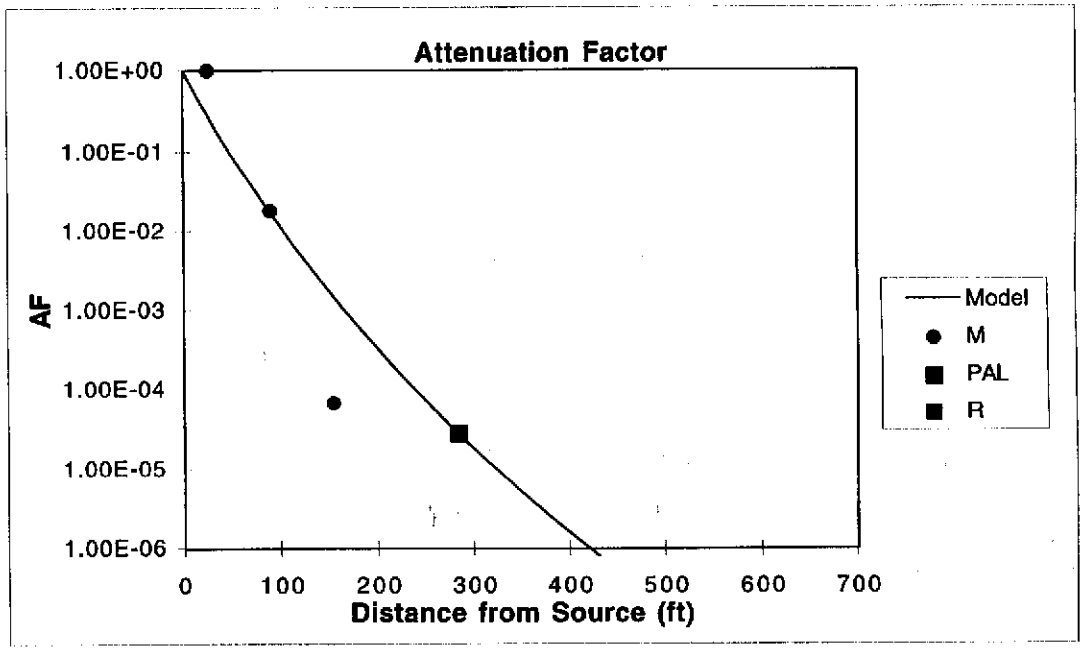
Plume Attenuation Model: FATE2

MODEL CALIBRATION

5) Run Calibration Macros

lamda - attenuation rate [1/day] (.001 - .01)	0.0025	(from cell B8)
Mx - multiplier for longitudinal dispersivity [alpha-x = Mx*x] (0.1)	0.1000	(from cell B9)

AFm - attenuation factor at location m	1.00E+00	1.81E-02	6.67E-05
AFm* - modeled attenuation factor at location m	2.75E-01	1.73E-02	1.49E-03
(1-AFm*/AFm)^2	5.26E-01	1.71E-03	4.58E+02
Sum of Squares (1-AFm*/AFm)^2	4.58E+02		



Plume Attenuation Model: FATE2

MODEL OUTPUT

6) Run Plume Attenuation Length Macro "PAL"

Cgw*/Cs - attenuation factor at target concentration	2.78E-05
(Cgw*/Cs - AFpal)/(Cgw*/Cs)	-9.78E-04

PAL - Plume Attenuation Length [ft]	284
PAL/L - Scaled Plume Attenuation Length	0.43
R - Distance to Nearest Receptor Location [ft]	660

7) Receptor Attenuation

AFr - Attenuation Factor at Receptor	9.24E-09
Cr - Concentration at Receptor [mg/l]	3.33E-07
Cgw* - Target Concentration [mg/l]	0.001

8) Input Contaminant Data

S - Solubility Limit of Contaminant (mg/l)	**36.48** Benzene in Gasoline

9) Target Source Concetration

Cs* - Maximum Source Concentration [mg/l]	>S
Cs - Source Concentration [mg/l]	36

Plume Attenuation Model: FATE2

MODEL PARAMETER INPUT

1) Input Flow Model Parameters:	Input		Min	Max
n - Porosity [ft^3/ft^3]	**0.35**		0.25	0.6
K - Hydraulic Conductivity [ft/day]	**3**		0.0001	100
i - Groundwater Gradient [ft/ft]	**0.005**		0.001	0.01
lamda - attenuation rate [1/day]	**0.0015**		0.001	0.01
Mx - multiplier for longitudinal dispersivity [alpha-x = Mx*x]	**0.1**		0.05	0.2
My - multiplier for transverse dispersivity [alpha-y = My*alpha-x]	**0.033**	**Min**	0.1	0.3333
Mz - multiplier for vertical dispersivity [alpha-z = Mz*alpha-x]	**0.005**	**Min**	0.0125	0.1

2) Input Source Data:		
Cs - Source Concentration [mg/l]	**140**	
Y - source width perpendicular to groundwater flow [ft]	**40**	
Z - source depth below water table [ft]	**7**	
L - farthest distance to be evaluated from source [ft]	**660**	

3) Input Monitoring Point Data:			
Monitoring Point	**1**	**2**	**3**
Cm - concentration at monitoring locations [mg/l]	**140**	**1.1**	**0.59**
M - Distance to Monitoring Locations [ft]	**25**	**90**	**155**

4) Input Receptor Data:	
R - Distance to Nearest Receptor Location [ft]	**660**
Cgw* - Target Concentration [mg/l]	**0.05**

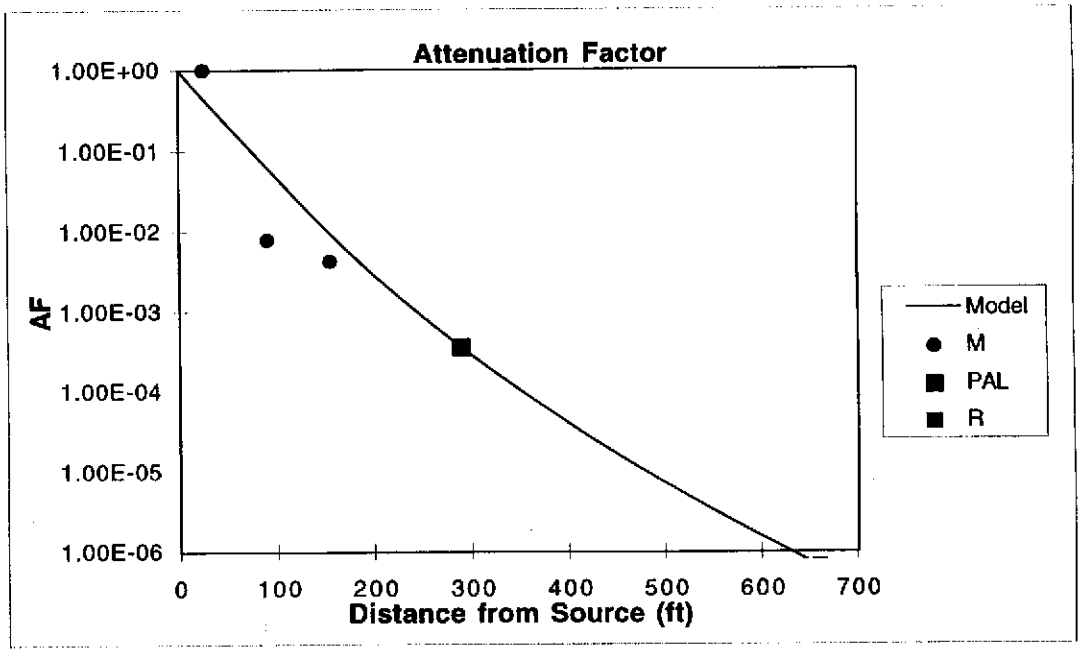
Plume Attenuation Model: FATE2

MODEL CALIBRATION

5) Run Calibration Macros

lamda - attenuation rate [1/day] (.001 - .01)	0.0015	(from cell B8)
Mx - multiplier for longitudinal dispersivity [alpha-x = Mx*x] (0.1)	0.1000	(from cell B9)

AFm - attenuation factor at location m	1.00E+00	7.86E-03	4.21E-03
AFm* - modeled attenuation factor at location m	4.45E-01	6.27E-02	9.41E-03
(1-AFm*/AFm)^2	3.08E-01	4.87E+01	1.52E+00
Sum of Squares (1-AFm*/AFm)^2	5.05E+01		



Plume Attenuation Model: FATE2

Cgw*/Cs - attenuation factor at target concentration	3.57E-04
(Cgw*/Cs - AFpal)/(Cgw*/Cs)	2.32E-04

PAL - Plume Attenuation Length [ft]	217
PAL/L - Scaled Plume Attenuation Length	0.33
R - Distance to Nearest Receptor Location [ft]	660

7) Receptor Attenuation

AFr - Attenuation Factor at Receptor	2.12E-07
Cr - Concentration at Receptor [mg/l]	2.97E-05
Cgw* - Target Concentration [mg/l]	0.05

8) Input Contaminant Data

S - Solubility Limit of Contaminant (mg/l)	**140.5** Gasoline

9) Target Source Concetration

Cs* - Maximum Source Concentration [mg/l]	>S
Cs - Source Concentration [mg/l]	140