File No. 8-90-421-SI

APPLICATION FOR DISCHARGE OF TREATED PETROLEUM HYDROCARBONS AFFECTED GROUNDWATER UNDER GENERAL NPDES PERMIT FOR FUEL LEAK CLEAN UP SITE #CA0029815 LOCATED AT 400 SAN PABLO AVENUE ALBANY, CALIFORNIA AUGUST 9, 1993

PREPARED FOR:

KAMUR INDUSTRIES, INC.

2351 SHORELINE DRIVE

ALAMEDA, CALIFORNIA 94501

BY:

SOIL TECH ENGINEERING, INC.

298 BROKAW ROAD

SANTA CLARA, CALIFORNIA 95050

SOIL TECH ENGINEERING, INC.

File No. 8-90-421-SI

APPLICATION FOR DISCHARGE OF TREATED PETROLEUM HYDROCARBONS AFFECTED GROUNDWATER UNDERGROUND GENERAL NPDES PERMIT NO. CA0029815

FOR

PLAZA CAR WASH
400 SAN PABLO AVENUE
ALBANY, CALIFORNIA

AUGUST 9, 1993

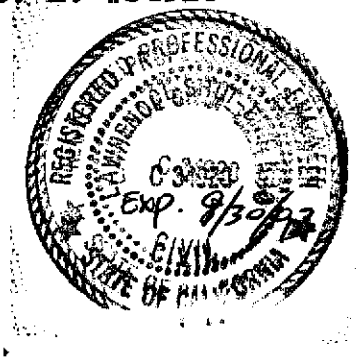
RESPECTFULLY SUBMITTED BY:

SOIL TECH ENGINEERING, INC.

NOORODDIN AMELI
PROJECT ENGINEER

FRANK HAMEDI-FARD
GENERAL MANAGER

LAWRENCE KOO, P.E.
C. E. #34928



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APPLICATION FOR DISCHARGE OF TREATED PETROLEUM HYDROCARBONS AFFECTED GROUNDWATER UNDER GENERAL NPDES PERMIT FOR FUEL LEAK CLEAN UP SITE #CA0029815 AT KAMUR INDUSTRIES PLAZA CAR WASH LOCATED AT 400 SAN PABLO AVENUE ALBANY, CALIFORNIA AUGUST 9, 1993

INTRODUCTION:

This application is submitted to comply with the requirements of the California Regional Water Quality Control Board--San Francisco Bay Region (CRWQCB--SFBR) requesting authorization to discharge treated groundwater under the RWQCB's national Pollutant Discharge Elimination System (NPDES) Permit No. CA0029815 and CRWQCB Order No. 91-056. This permit provides for the issuance of general permits to discharge treated waste water generated by groundwater remediation projects at fuel leaks and other related wastes at service stations and similar sites.

The water being generated is the results of the clean up of groundwater associated with the inadvertent petroleum release of hydrocarbons from the former underground fuel tanks located at the Kamur Industries Plaza Car Wash, located at 400 San Pablo Avenue, in Albany, California (Figure 1). Groundwater will be extracted from a proposed L-shaped groundwater interceptor trench that will be constructed along the easterly and northerly boundary of the

site. The extracted groundwater will be processed through a treatment system consist of two 4,000 gallons above ground tanks, two activated carbon drums, followed by one 1,000 gallons treated groundwater collection tanks to levels below those effluent standards established in the permit referenced above.

SITE DESCRIPTION:

The site is located at 400 San Pablo Avenue, in Albany, California, approximately one mile east of San Francisco Bay (see Figure 1). The site is bordered by El Cerrito Creek to the north, San Pablo Avenue to the east and Adams Street to the west. The surrounding area consists of light commercial and residential sites (Figure 2).

SITE HISTORY:

The site was vacant until the late 1950's when the Plaza Car Wash and the adjacent Norge Dry Cleaner buildings were constructed. The three underground fuel storage tanks were installed on the site in 1970.

The observation of petroleum free-product in the adjacent El Cerrito Creek, on July 3, 1989, prompted the Albany Fire Department to install absorbent materials and a boom as a temporary containment measure. A storm drain, which borders the site on the west, was found to be the source of the petroleum products discharged into the El Cerrito Creek.

The inventory reconciliation records for Plaza Car Wash, reviewed by Kamur Industries in July 1989, showed discrepancies in the unleaded gasoline inventory. A product line test, conducted in mid-July 1989, confirmed a small leak in the unleaded gasoline fuel lines beneath the pump island. The leak was repaired and approximately five to ten cubic yards of gasoline contaminated soil was removed from beneath the line. analytical results of a composite sample of the excavated soil revealed a Total Petroleum Hydrocarbon (TPH) concentrations of 7,500 parts per million (ppm).

SITE INVESTIGATION:

Subsurface Consultants, Inc. (SCI) was retained by Kamur Industries to perform a site assessment. In August 1989, SCI drilled five soil borings and obtained soil samples for laboratory analysis. Four of the soil borings were completed as monitoring wells. Laboratory analysis showed the presence of gasoline contaminants in all soil and groundwater samples.

Per CRWQCB staff request, water samples were also obtained from El Cerrito Creek and the storm drain outlet on August 3, 1989. Laboratory analysis revealed high levels of dissolved hydrocarbons at the storm drain outlet and low levels approximately 20 feet down-stream.

A soil vapor study (SVS), conducted by SCI in the area of the Plaza Car Wash and adjacent properties, revealed the presence of hydrocarbon contamination in the soil.

On September 19, 1989, Pacific Pipeline Survey conducted a video inspection of the Adams Street storm drain. The inspection revealed excess concrete along the pipe bottom, a bend across the pipe section and large cracks in the pipe. The bend area was considered to be the most likely location for petroleum products to enter the storm drain pipe and eventually be discharged into El Cerrito Creek.

On October 10 and 11, 1989, Riedel Environmental Services, Inc. installed a sump on Adams Street adjacent to the damaged section of the storm drain for optimum groundwater level influence.

Storm drain pipe joints exposed during sump installation procedures were sealed with mortar. All excavated soils found to be contaminated (when screened with organic vapor analyzer) were removed and stored on-site pending proper disposal. Stockpiled soils from the product line repair and sump installation areas were treated on-site and transported to the West Contra Costa Sanitary Landfill for disposal.

In December 1989, Kamur Industries retained International Technology Environmental Services (ITES) to conduct the monitoring and sampling of on-site monitoring wells, the Adams Street sump and El Cerrito Creek. The sampling was conducted on a monthly basis from December 1989 through May 1990. All on-site wells showed high levels of dissolved hydrocarbons, and one well showed traces of floating product. The sump also indicated high levels of dissolved

hydrocarbons. The El Cerrito Creek samples, taken after each significant rainstorm, showed non-detectable levels in the up-stream station; the storm drain outlet samples showed moderate levels of dissolved hydrocarbons and the down-stream station showed fairly low to non-detectable levels.

In September 1990, Kamur Industries, Inc., retained AGS and STE to remove three underground tanks, conduct soil sampling and excavate, characterize and dispose of contaminated soil. In addition, STE conducted water sampling of El Cerrito Creek during rainy months per Regional Water Quality Control Board (RWQCB) requirements and installed additional monitoring wells as requested by ACHS-HMP.

The details of tank removal, soil sampling and the excavation of the contaminated soil are described in the AGS and STE reports entitled "Removal of 3 Underground Storage Tanks" dated January 9, 1991 and "Underground Tank Soil Sampling and Excavation Report" dated January 15, 1991. The report on soil treatment and disposal is included in the STE report entitled "Report on Soil Remediation at the Plaza Car Wash" dated May 13, 1991.

In February 1991, STE installed two on-site monitoring wells (STMW-1 and STMW-2). In addition, abandoned the on-site wells MW-1 and MW-4 during soil excavation of the former underground tank area. The investigation revealed no free floating product detected in the wells. Dissolved hydrocarbons were detected in all on-site

and off-site wells. The details of this subsurface investigation is described in the STE's report "Report of Supplemental Subsurface Investigation for Kamur Industries, Inc. at the Plaza Car Wash" dated May 14, 1991.

GROUNDWATER MONITORING AND SAMPLING:

STE is currently conducting a quarterly monitoring and sampling of the on-site and off-site wells, and the results of the groundwater since March 1991 are summarized in Table 1 and 2. The general direction of the shallow groundwater is towards north to northwesterly directions.

SUMMARY OF RESULTS OF PREVIOUS INVESTIGATION:

The soil material beneath the site consists of an irregular layer of clayey silt and sandy clay with some lenses of gravel.

Results of previous subsurface investigations indicated that the shallow groundwater at the site is impacted with the dissolved petroleum hydrocarbons; namely TPHg and BTEX. Dissolved hydrocarbons in groundwater are yet to be delineated off-site to the northeast and west of the site.

Groundwater is encountered at the site at an average depth of 5 to 6.5 feet below grade. The direction of the groundwater flow is towards the north to northwest. The groundwater appears to be

in unconfined condition. The highest concentration of dissolved TPHg was detected in groundwater from the northern and eastern part of the site.

Based on the results of previous investigations, STE recommended no additional delineation of hydrocarbons in the soil, and work proceed to contain and remediate dissolved hydrocarbons in the shallow groundwater.

EVALUATION OF REMEDIAL ALTERNATIVES:

The IRP report evaluated several remediation alternatives for the extraction, treatment and discharge of impacted groundwater. The evaluation of the shallow groundwater is summarized below.

EXTRACTION ALTERNATIVES:

STE has evaluated remedial alternatives for the shallow groundwater. Extraction alternatives considered in the evaluation include (1) extraction wells, (2) an extraction trench, (3) an extraction trench with injection wells to speed up groundwater flow to the trench, and (4) an extraction trench and wells with a slurry wall to dewater the aquifer on-site and soil-vapor extraction. The proposed extraction scenario for the impacted shallow groundwater will include an extraction trench. The expected average flow of groundwater extracted by the trench system is approximately 2 to 3 gallons per minute (gpm). The system may be expanded later to include groundwater extraction wells, if necessary.

TREATMENT ALTERNATIVES:

Three groundwater treatment alternatives were evaluated:

- Granular activated carbon (GAC) adsorption
- Oil/water separator followed by GAC
- UV/oxidation process

The three alternatives were evaluated for their effectiveness, reliability, implementability, regulatory compliance, constructibility, and cost. The evaluation found oil/water separator followed GAC to be the most feasible and cost-effective alternative.

The treatment system will consist of three stages of: (1) pumping unit with two 4,000 gallon above ground Baker tank containments, (2) liquid phase activated carbon and (3) 1,000 gallon treated groundwater collection tank to be used for irrigation and/or discharge into a storm drain (i.e. permitted discharge).

The activated carbon treatment system will be designed with two stages of carbon container in series, each of the two stages will be adequate to treat the entire water stream. An effluent monitoring program will be instituted to assure that the treatment system performs properly, and all water discharged meets the NPDES permit requirements. A process flow chart diagram is shown in Figure 3.

TREATED GROUNDWATER RECLAMATION FEASIBILITY STUDY:

This section presents a summary of the agencies contacted in an attempt to find alternatives for reclaiming or disposing of the treated groundwater.

MUNICIPAL AND DOMESTIC USE:

The City of Albany Department of Public Works and Fire Department were contacted to assess their use of or need for reclaimed groundwater. Their policy is not accept any water regardless of quality or amount, including accepting water for irrigation purposes.

The City of Albany Fire Department was contacted to determine if the treated groundwater could be used in the fire system. Their policy is to not accept any water regardless of quality or amount.

The State of California Department Transportation (Caltrans) was contacted to assess their need for reclaiming groundwater. Caltrans is in the process of expanding the State Highway 880, in the vicinity of the site and can use the water during construction activities; however, Caltrans should not be able to pick up the treated groundwater as daily basis.

Based on the anticipated high costly water transport, only properties and business within the immediate vicinity of the site were assessed as potential reclaimed water users. The site is

bounded to the east by the San Pablo Avenue, to south by small businesses, to the west by a strip of landscape and Adam Street, and to the north by landscape area. Figure 3 shows the location of the proposed trench and groundwater treatment system. The small businesses south of the property will not be able to use the reclaimed water. The use of reclaimed water is also cost prohibitive to be used for car wash due to the plumbing costs and public health exposure.

DISCHARGE TO POTW:

The East Bay Municipal Utility District (EBMUD), which is the local authority governing the publicly owned waste water treatment work (POTW), was contacted to determine if discharge of the treated groundwater would be allowed into the local sanitary sewer system. EBMUD do accept the treated groundwater into their sewer system; however, it is cost prohibitive due to annual sewer charges and monitoring program.

DISCHARGE TO STORM DRAIN AND TO LANDSCAPE AREA:

Because of the limitation use and a high cost factor for POTW discharge, treated groundwater will be used as an irrigation on the northern landscape area, and the excess will be discharged to the near by storm drain vibutary to the El Cerrito Creek. The beneficial habitat and wildlife habitat. The creek is not identified as a municipal, domestic or agricultural water supply.

US ENVIRONMENTAL PROTECTION AGENCY AND STATE APPLICATION FORMS:

Appendix "B" contains U.S. Environmental Protection Agency (USEPA) application Form 1, General Information, and USEPA application Form 2D, New Sources and New Dischargers: Application for Permit to Discharge Process Waste Water.

TREATMENT OF AFFECTED GROUNDWATER:

DEFINITION OF GROUNDWATER CONTAMINATION PLUME:

Based on the most recently available groundwater sampling data collected in July 1993, dissolved petroleum hydrocarbons concentrations detected in the groundwater increased steadily outwards from the site to northwest corner in observation well STMW-7. Highest concentrations of Total Petroleum Hydrocarbons are found in the vicinity of well MW-3, which is situated down-gradient of the former tank locations.

GROUNDWATER EXTRACTION SYSTEM DESIGN:

The goals of the groundwater extraction system are to achieve hydraulic containment of the groundwater affected by petroleum hydrocarbons and to initiate the clean up. STE has proposed, on behalf of Kamur Industries, to use groundwater extraction as an initial phase of remediation in order to deter the further off-site movement of dissolved hydrocarbons. After approximately 3 to 4

months of operation, the groundwater extraction system will be re-evaluated to better assess the radius of influence that can be achieved from existing wells at the site. Based on this evaluation, STE will present appropriate recommendations for enhancing the groundwater extraction system in order to achieve hydraulic control of the groundwater affected by petroleum hydrocarbons.

The objectives of achieving hydraulic containment of the groundwater affected by petroleum hydrocarbons will be achieved by initially installing L-shaped interceptor or trench at the location shown in Figure 3. During operation of the treatment system, monthly depth-to-water measurements will be collected from the existing monitor wells. The data will be used to estimate the radius of influence of the initial extraction well and to provide an indication of the number of additional wells which will be required to achieve hydraulic capture of the groundwater affected by petroleum hydrocarbons.

The detail of the proposed interim remediation is described in STE work plan dated May 4, 1993, which is included in Appendix "C".

PROPOSED MONITORING PROGRAM:

The following influent and effluent monitoring program is proposed:

1. During treatment system start-up, the influent and effluent of the treatment of the sampled on the first and fifth day. On

the first day of start-up, the system will be run until at least three to five extraction sump volumes are removed and until three consecutive readings for pH, conductivity, and temperature are within 5 percent of each other. The influent and effluent will then be sampled and submitted to a state-certified laboratory for priority pollutant metals and cyanide by EPA Methods 6010, 602 and 625. The samples will be analyzed within 48 hours after receipt by the laboratory. The 1,000 gallon treated groundwater storage tank will be used to hold the effluent until the analyses verify the discharge is within the discharge criteria.

After compliance has been verified by the first day's sampling and analyses, the system will be operated continuously for 5 days, with the treated water being discharged to landscape irrigation and to the storm drain, and the influent and effluent sampled and analyzed again within 48 hours. The system will continue to discharge if compliance is verified.

A report will be submitted to the RWQCB presenting the results of the start-up monitoring, including flow rates and analytical results, within 15 days of the end of the start-up phase.

2. After routine discharge is established, the system's influent and effluent will be sampled and analyzed monthly. Monitoring will be consistent with the system's NPDES permit requirements.

OPERATIONS AND MAINTENANCE:

The groundwater treatment system will be operated be inspected and sampled monthly to assure that the system is working properly and in a manner necessary to achieve compliance with the conditions of the NPDES blanket permit.

MAINTENANCE, INSPECTION, AND TESTING SCHEDULE:

To ensure that the groundwater treatment system functions properly, the groundwater treatment system will be fully inspected and tested prior to its being placed on-line. Following installation and testing of the system at the site, the system will be inspected monthly by STE personal who will be trained to.

Records of the inspections will be maintained on-site for review. If inspection reveals that any part of the system is suspect, the treatment unit will immediately be shut down, and will remain shut down until the system is serviced and retested to ensure that all components of the system are functioning properly. An on-site checklist will record data and information associated with the operation and maintenance of the water-treatment unit, including pressure readings, total water-flow readings, electric-meter readings, operational status, path of water flow through the two carbon units, carbon-changeout times, and any other information relevant to any actions or repairs conducted to the on-site water treatment system.

STAFFING AND TRAINING:

The groundwater treatment system will be inspected monthly by STE's personnel properly trained to conduct such work. All work, including testing and maintenance, will be performed under the direction of a registered engineer familiar with the operations and maintenance of the water treatment system. The components of the system will be checked and all pertinent observations will be recorded on a log and inspection form that will remain on-site for review. If the inspection reveals that any component of the system is suspect, the treatment unit will be shut down until it is repaired or serviced. Following repair and servicing, the treatment will be reinspected to assure that all components are in proper working order. Only after all components of the treatment system are determined to be functioning properly will be the system be restarted.

GROUNDWATER DISCHARGE FLOW RATES:

Initially, the estimated average daily flow rate that will be pumped from the groundwater extraction well is estimated to be no more than 3,000 gpd [1 gallon per minute (gpm)]. this rate will be maintained to minimize spiking of maximum and minimum daily flow rates. This flow rate is based on the available data, and may be modified during the operating life of the system to assure maximum capture of hydrocarbons disseminated in the groundwater. The RWQCB will be notified of proposed changes to the flow rate which would exceed 1 gpm.

After approximately 3 to 4 months of operation, the groundwater extraction system will be re-evaluation to better assess the radius of influence that can be achieved for wells at the site. Based on this evaluation, STE will present to Kamur Industries a document outlining appropriate recommendations for enhancing the groundwater extraction system in order to achieve hydraulic control of the groundwater affected by petroleum hydrocarbons.

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TABLE 1
GROUNDWATER MONITORING DATA
(Measured in Feet)

Well No./ Elevation	Date	Depth-to-Water	Groundwater Elevation	FFP Thickness	Odor
STMW-1 (100.62)	3/11/91	5.29	95.33	None	None
	7/03/91	5.83	94.79	None	Mild
	11/04/91	5.83	94.79	None	Mild
	1/20/92	5.79	94.84	Light Sheen	Mild
	5/07/92	5.80	94.82	None	Mild
	8/17/92	5.77	94.85	None	Mild
	12/10/92	6.61	94.01	Light Sheen	Mild
	3/18/93	6.68	93.94	Light Sheen	Mild
	7/13/93	7.13	93.49	Light Rainbown Sheen	Strong Petroleum
STMW-2 (100.63)	3/11/91	5.25	95.38	None	Mild
	7/03/91	4.75	95.88	None	Mild
	11/04/91	5.92	94.71	None	Mild
	1/20/92	5.88	94.75	None	Mild
	5/07/92	5.70	94.92	None	Mild
	8/17/92	5.71	94.92	None	None

TABLE 1 CONT'D
GROUNDWATER MONITORING DATA
(Measured in Feet)

Well No./ Elevation	Date	Depth-to-Water	Groundwater Elevation	FFP Thickness	Petroleum Odor
STMW-2 (100.63)	12/10/92	6.39	94.24	Light Sheen	Mild
	3/18/93	6.50	94.13	Light Sheen	Mild
	7/13/93	6.95	93.68	None	Spetic
MW-2 (99.39)	3/11/91	4.92	95.07	None	Mild
	7/03/91	5.83	93.53	None	Strong
	11/04/91	4.79	94.57	None	Mild
	1/20/92	4.60	94.76	None	Mild
	5/07/92	4.42	94.94	None	Mild
	8/17/92	4.43	94.96	None	Mild
	12/10/92	4.94	94.45	None	Mild
	3/18/93	5.11	94.28	None	Light Sewage
	7/13/93	5.53	93.86	Rainbow Sheen	Light Petroleum

TABLE 1 CONT'D
GROUNDWATER MONITORING DATA
(Measured in Feet)

Well No./ Elevation	Date	Depth-to-Water	Groundwater Elevation	FFP Thickness	Odor
MW-3 (100.09)	3/11/91	4.67	95.42	Trace	Moderate
	7/03/91	5.75	94.55	Light Sheen	Strong
	11/04/91	5.67	94.42	Trace	Strong
	1/20/92	5.54	94.55	Light Sheen	Strong
	5/07/92	5.18	94.91	Rainbow Sheen	Strong
	8/17/92	5.24	94.85	Rainbow Sheen	Mild
	12/10/92	4.42	95.67	Light Sheen	Mild
	3/18/93	5.39	94.70	Thick Sheen	Strong
	7/13/93	6.07	94.02	Light Rainbow Sheen	Strong Petroleum
OTMW-5 (100.87)	3/11/91	5.02	95.85	None	Mild
	7/03/91	5.65	95.12	None	Mild
	11/04/91	5.77	95.10	None	Mild
	1/20/92	5.58	95.29	None	Mild

TABLE 1 CONT'D
GROUNDWATER MONITORING DATA
(Measured in Feet)

Well No./ Elevation	Date	Depth-to-Water	Groundwater Elevation	FFP Thickness	Odor
OTMW-5 (100.87)	5/07/21	5.43	95.44	None	Mild
	8/17/92	5.45	95.42	None	None
	12/10/92	7.30	93.57	None	Mild
	3/18/93	7.11	93.76	None	Light Sewage
	7/13/93	7.45	93.42	None	None
OTMW-6	8/17/92	4.88	NA	None	None

FFP - Free Floating Product
NA - Not Applicable

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TABLE 2
WATER ANALYTICAL RESULTS
IN
MILLIGRAMS PER LITER (mg/L)

Well No.	Date	TPHg	B	T	E	X
STMW-1	3/13/91	0.85	0.1	0.007	ND	0.15
	7/03/91	5.1	1.8	0.5	0.095	0.56
	11/04/91	2.05	0.76	0.054	ND	0.056
	1/20/92	4.6	0.59	0.036	ND	0.19
	5/07/92	4.4	0.066	0.053	0.004	0.16
	8/17/92	2.7	0.031	0.018	0.019	0.067
	12/10/92	35	0.054	0.079	0.083	0.22
	3/18/93	19	0.049	0.052	0.055	0.18
	7/13/93	17	0.034	0.043	0.048	0.17
STMW-2	3/13/91	0.17	0.001	0.0017	ND	0.028
	7/03/91	1.8	0.64	0.048	0.044	0.094
	11/04/91	2.14	1.00	0.057	0.003	0.019
	1/20/92	14	0.12	0.0006	0.0006	0.08
	5/07/92	1.7	0.032	0.017	0.0086	0.048
	8/17/92	16	0.18	0.22	0.21	0.62
	12/10/92	44	0.084	0.096	0.12	0.35

TABLE 2 CONT'D
WATER ANALYTICAL RESULTS
IN
MILLIGRAMS PER LITER (mg/L)

Well No.	Date	TPHg	B	T	E	X
STMW-2	3/18/93	9.2	0.022	0.031	0.04	0.11
	7/13/93	9.3	0.018	0.024	0.026	0.089
MW-2	3/13/91	25	2.6	4.4	ND	5.8
	7/03/91	21	2.8	3.2	ND	4.3
	11/04/91	3.58	1.7	0.119	0.009	0.056
	1/20/92	0.38	0.38	0.0013	ND	0.034
	5/07/92	10	0.062	0.032	0.044	0.16
	8/17/92	6	0.048	0.027	0.065	0.18
	12/10/92	7.2	0.015	0.023	0.032	0.082
	3/18/93	1.4	0.0083	0.011	0.013	0.048
	7/13/93	2.4	0.0047	0.0062	0.0068	0.025
MW-3	3/13/91	47	9.1	9.9	0.27	8.11
	7/03/91	140	12	4.5	1.2	4.0
	11/04/91	102.7	38.87	19.1	3.2	8.3
	1/20/92	510	27	27	5.8	46
	5/07/92	43	0.25	0.23	0.43	1.1

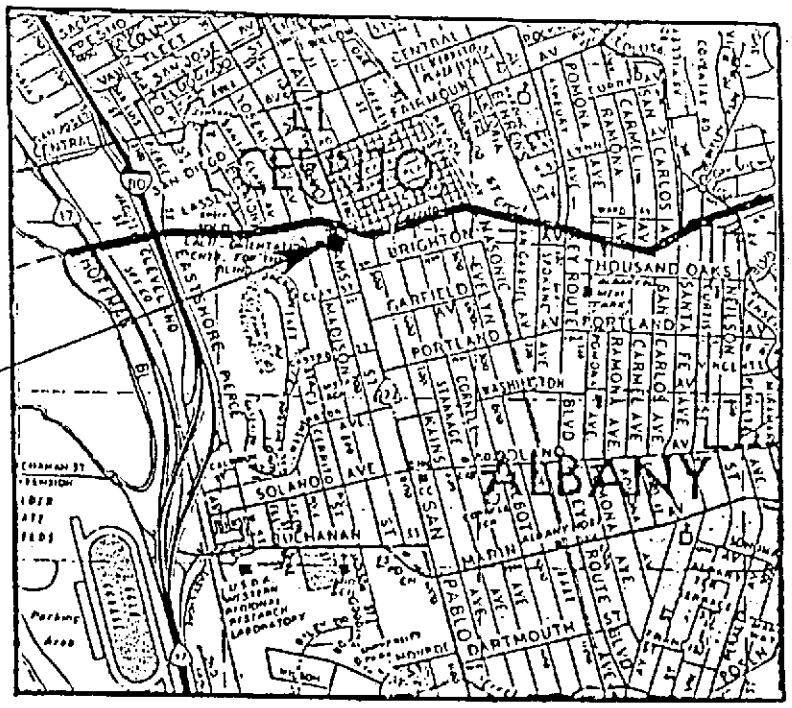
TABLE 2 CONT'D
WATER ANALYTICAL RESULTS
IN
MILLIGRAM PER LITER (mg/L)

Well No.	Date	TPHg	B	T	E	X
MW-3	8/17/92	140	2.5	2.4	1.7	5.5
	12/10/92	94	0.4	0.41	0.43	1.1
	3/18/93	51	0.092	0.13	0.16	0.59
	7/13/93	80	0.16	0.21	0.23	0.82
OTMW-5	3/13/91	0.12	0.046	0.012	0.001	0.004
	7/03/91	0.81	0.32	0.043	0.016	0.043
	11/04/91	0.97	0.1	0.019	0.005	0.013
	1/20/92	0.09	0.0007	0.0007	ND	0.011
	5/07/92	0.18	0.027	0.014	0.0082	0.035
	8/17/92	0.087	0.012	0.0098	0.004	0.042
	12/10/92	0.54	0.0047	0.0045	0.0064	0.019

TABLE 2 CONT'D
WATER ANALYTICAL RESULTS
IN
MILLIGRAM PER LITER (mg/L)

Well No.	Date	TPHg	B	T	E	X
OTMW-5	3/18/93	0.57	0.006	0.0076	0.011	0.029
	7/13/93	3.5	0.0068	0.00086	0.0095	0.036
OTMW-6	8/17/92	ND	ND	ND	ND	ND
SDWS		NL	0.001	0.100*	0.68	1.75

TPHg - Total Petroleum Hydrocarbons as gasoline
BTEX - Benzene, Toluene, Ethylbenzene, Total Xylenes
ND - Not Detected (Below Laboratory Detection Limit)
NL - No MCL Levels
* - Action Level not Enforceable-Health Based Advisory Levels



THOMAS BROS. MAP 1982 EDITION
ALAMEDA COUNTY

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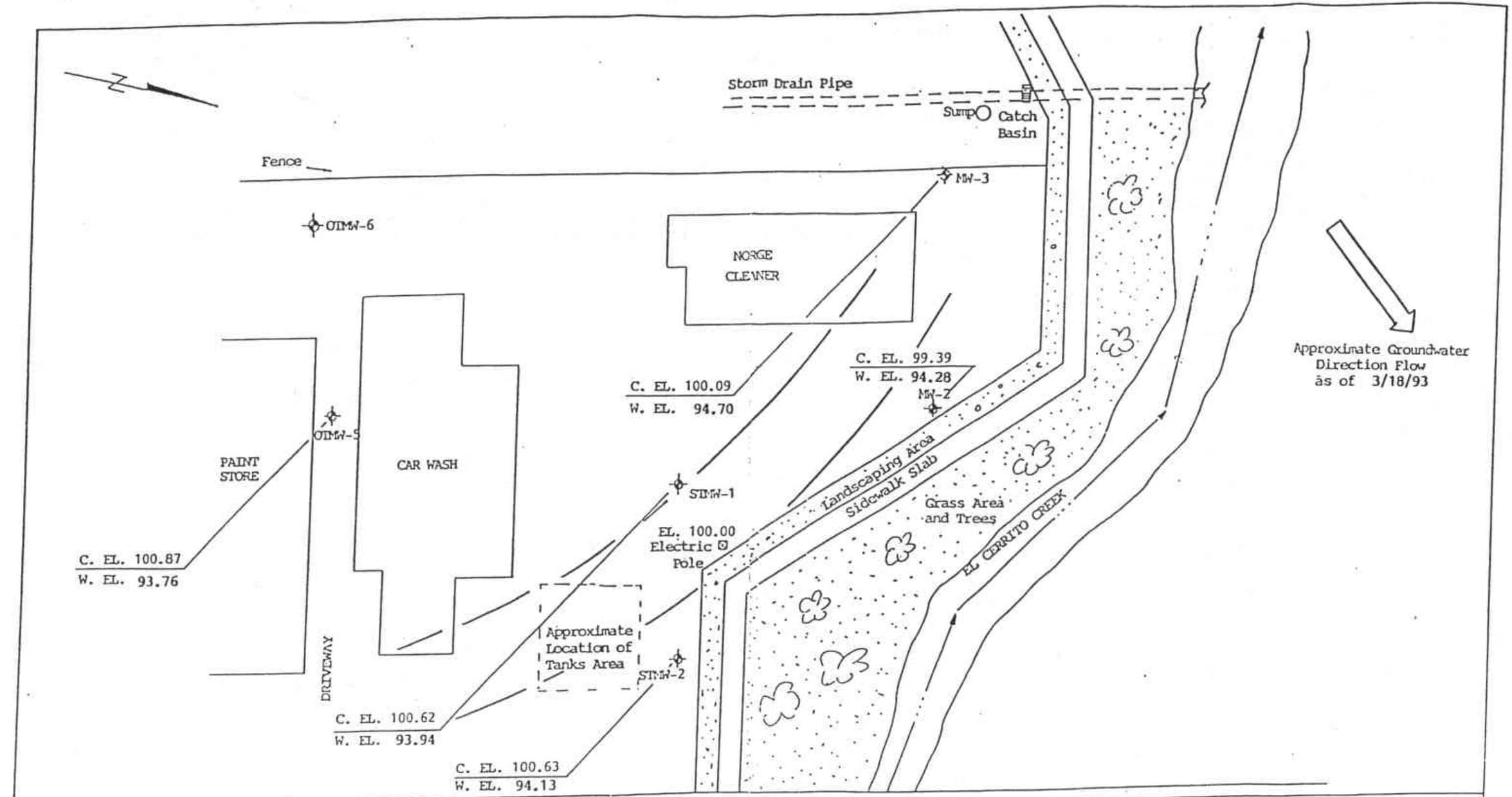
Figure 1

SOIL TECH ENGINEERING, INC.

M1

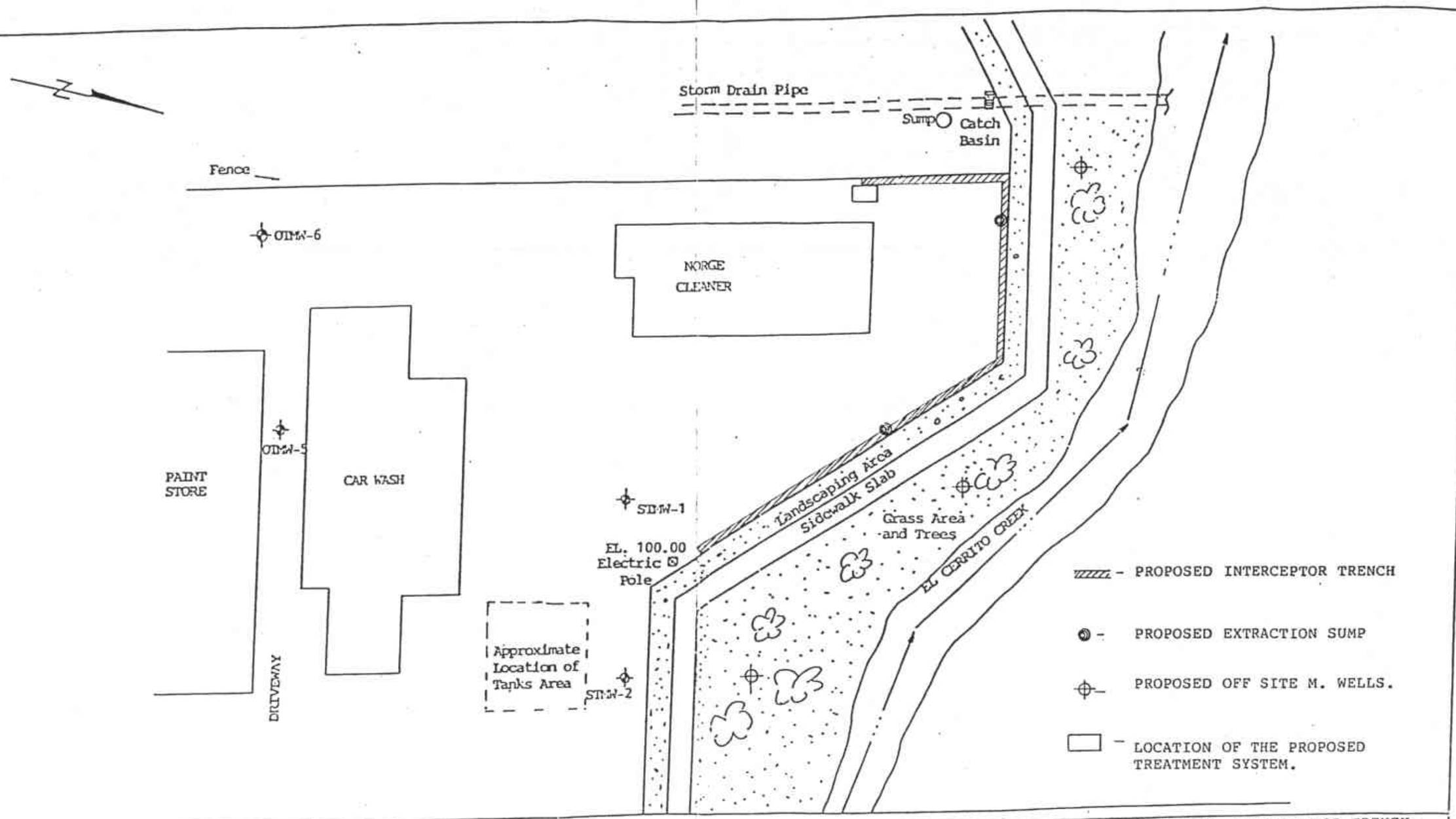


DIRECTION OF GROUNDWATER FLOW

400 SAN PABLO AVENUE, ALBANY, CALIFONRIA

1" = 30'	PROJECT NO. 8-90-421-SI	FIGURE - 2
DRAWN BY N.A.		3/18/93

SOIL TECH ENGINEERING, INC.
298 BROKAW ROAD, SANTA CLARA, CA 95050



LOCATION OF MONITORING WELLS, INTERCEPTOR TRENCH, AND TREATMENT SYSTEM.

400 SAN PABLO AVENUE, ALBANY, CALIFONRIA

1" = 30'	PROJECT NO. 8-90-421-SI	FIGURE - 3
DRAWN BY N.A.		May 4, 1993

SOIL TECH ENGINEERING, INC.
298 BROKAW ROAD, SANTA CLARA, CA 95050

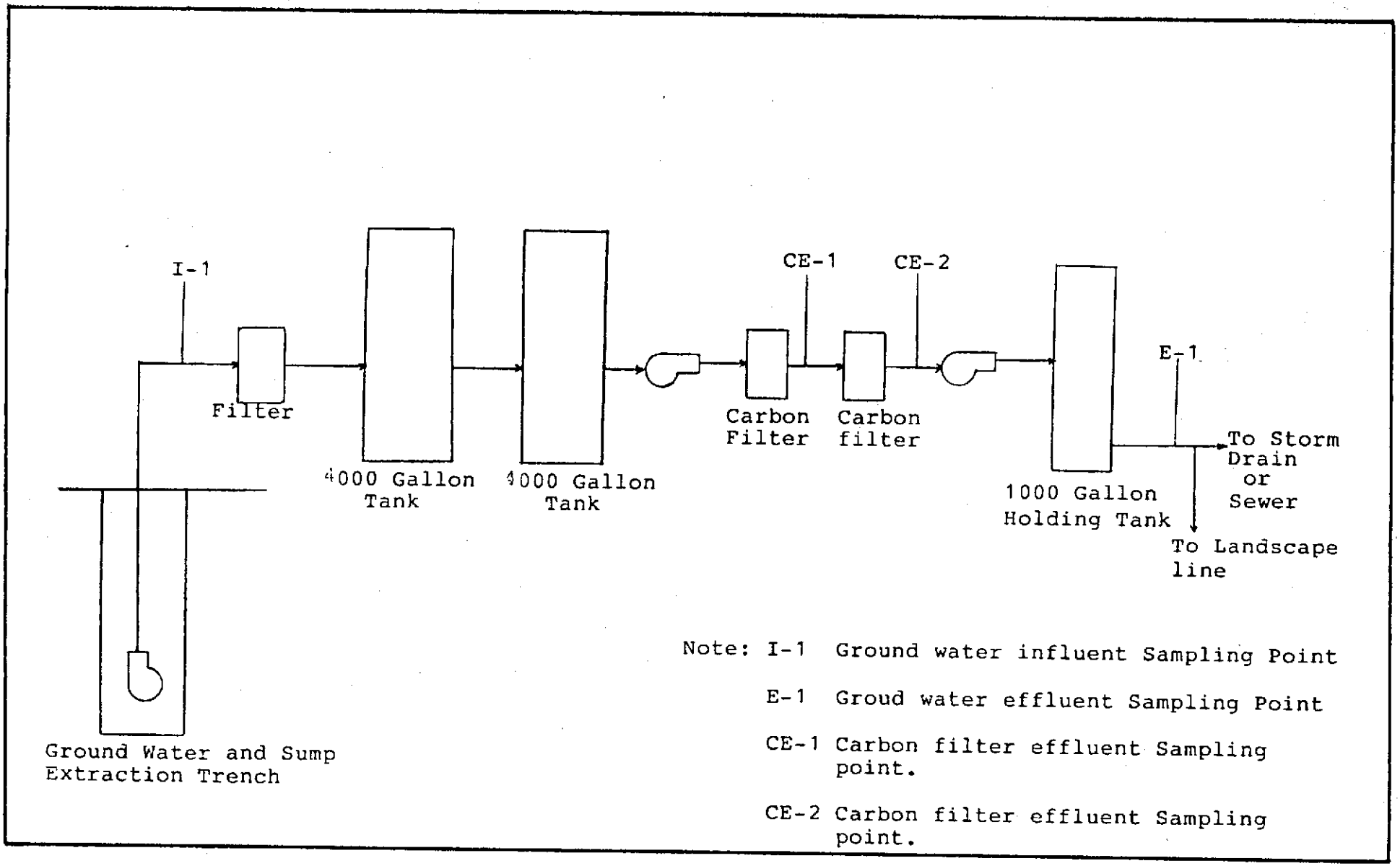


Figure 4. Proposed IRP Treatment System Diagram.

Fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved. OMB No. 2040-0086. Approval expires 7-31-85

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F

D

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X		D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)	X		X
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)		X		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP: PLAZA CAR WASH

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 STEVENS MURRAY OWNER	510 523 7866

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX			
3 2351 SHORELINE DRIVE			
B. CITY OR TOWN	**C. STATE**	**D. ZIP CODE**	
4 ALAMEDA	CA	94501	

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER			
5 400 SAN PABLO AVENUE			
B. COUNTY NAME			
ALAMEDA			
C. CITY OR TOWN	**D. STATE**	**E. ZIP CODE**	**F. COUNTY CODE (if known)**
6 ALAMEDA	CA	94706	001

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST	B. SECOND
(specify) N/A No Manufacturing	(specify) N/A
C. THIRD	**D. FOURTH**
(specify) N/A	(specify)

VIII. OPERATOR INFORMATION

A. NAME

PLAZA CAR WASH

B. Is the name listed in Item VIII-A also the owner? ☐ YES ☐ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)

F = FEDERAL; S = STATE; P = PRIVATE; M = PUBLIC (other than federal or state); O = OTHER (specify)

P (specify)

D. PHONE (area code & no.) A

E. STREET OR P.O. BOX

400 SAN PABLO AVENUE

F. CITY OR TOWN

ALBANY

G. STATE CA

H. ZIP CODE 94706

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☐ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water) N	**D. PSD** (Air Emissions from Proposed Sources) P	
B. UIC (Underground Injection of Fluids) U	**E. OTHER** (specify) 9	(specify)
C. RCRA (Hazardous Wastes) R	**E. OTHER** (specify) 9	(specify)

N/A

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

Former gasoline service station. Currently it is used as a car wash facility.

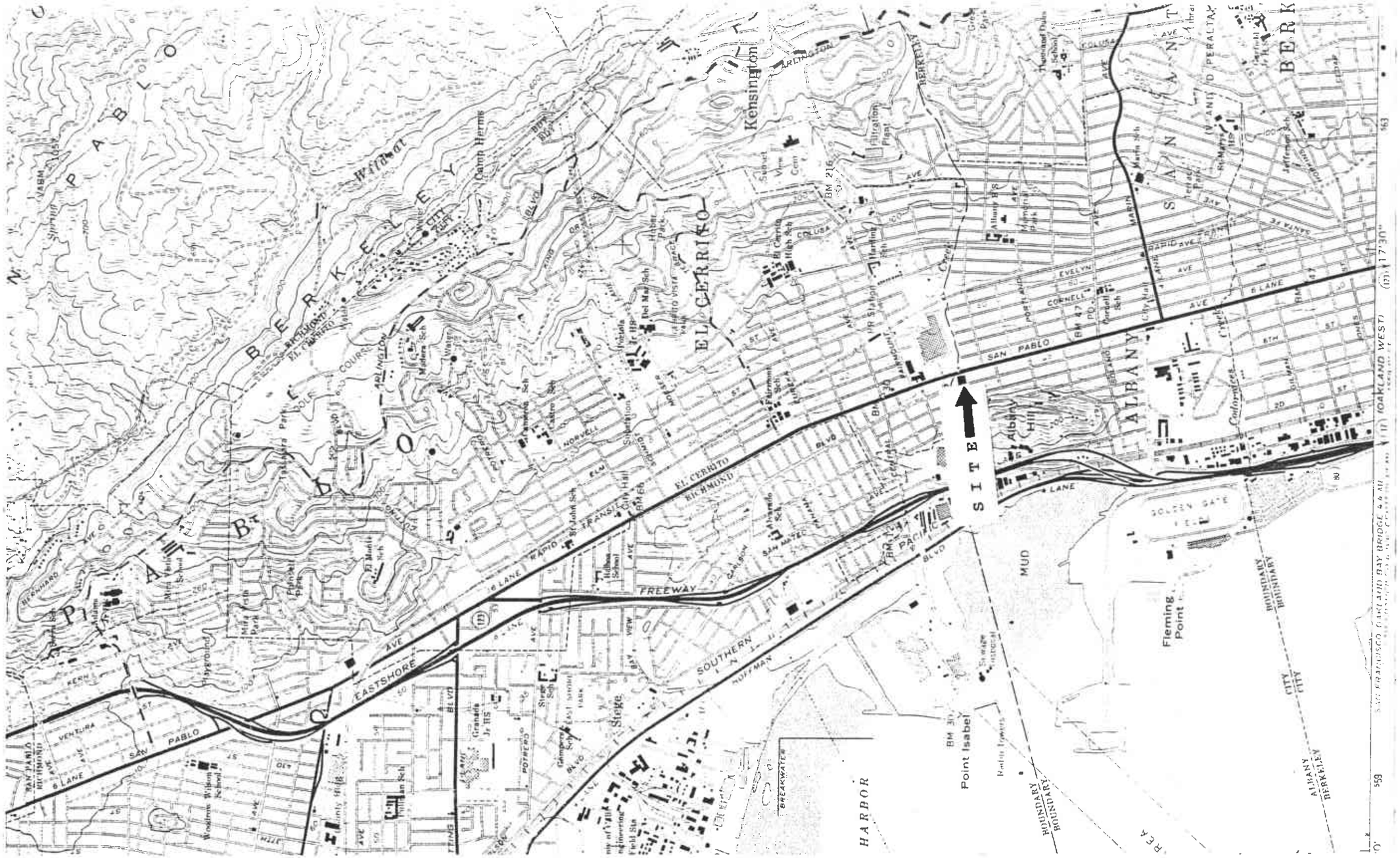
XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
[illegible] President	[signature]	8/11/93

COMMENTS FOR OFFICIAL USE ONLY

C



SCALE 1:24000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 5 FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

PLAZA CAR WASH
400 SAN PABLO AVENUE
ALBANY, CALIFORNIA

SOIL TECH ENGINEERING, INC.
298 BROKAW ROAD
SANTA CLARA, CALIFORNIA 95050

Please type or print in the unshaded areas only

EPA ID Number *(copy from Item 1 of Form 1)*

Form Approved
OMB No. 2040-0086
Approval expires 7-31-88

Form 2D NPDES

EPA New Sources and New Dischargers Application for Permit to Discharge Process Wastewater

I. Outfall Location

For each outfall, list the latitude and longitude, and the name of the receiving water.

Outfall Number *(list)*	Latitude			Longitude			Receiving Water *(name)*
	Deg	Min	Sec	Deg	Min	Sec	
E-1	37	53	53	122	18	2	U.S.G.S. Map

II. Discharge Date *(When do you expect to begin discharging?)*

III. Flows, Sources of Pollution, and Treatment Technologies

A. For each outfall, provide a description of (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and stormwater runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

Outfall Number	1. Operations Contributing Flow *(list)*	2. Average Flow *(include units)*	3. Treatment *(Description or List Codes from Table 2D-1)*
E-1	Groundwater Treatment System	<1gpm	Carbon Absorption

B. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item III-A. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

C. Except for storm runoff, leaks, or spills, will any of the discharges described in item III-A be intermittent or seasonal?

☐ Yes *(complete the following table)* ☒ No *(go to item IV)*

Outfall Number	1. Frequency		2. Flow		
	a. Days Per Week *(specify average)*	b. Months Per Year *(specify average)*	a. Maximum Daily Flow Rate *(in mgd)*	b. Maximum Total Volume *(specify with units)*	c. Duration *(in days)*

IV. Production

If there is an applicable production-based effluent guideline or NSPS, for each outfall list the estimated level of production (projection of actual production level, not design), expressed in the terms and units used in the applicable effluent guideline or NSPS, for each of the first 3 years of operation. If production is likely to vary, you may also submit alternative estimates (attach a separate sheet).

Year	a. Quantity Per Day	b. Units of Measure	c. Operation, Product, Material, etc *(specify)*
			No

CONTINUE ON NEXT PAGE

CONTINUED FROM THE FRONT	EPA ID Number *(copy from Item 1 of Form 1)*	Outfall Number

V. Effluent Characteristics

A, and B. These items require you to report estimated amounts *(both concentration and mass)* of the pollutants to be discharged from each of your outfalls. Each part of this item addresses a different set of pollutants and should be completed in accordance with the specific instructions for that part. Data for each outfall should be on a separate page. Attach additional sheets of paper if necessary.

General Instructions *(See table 2D-2 for Pollutants)*

Each part of this item requests you to provide an estimated daily maximum and average for certain pollutants and the source of information. Data for all pollutants in Group A, for all outfalls, must be submitted unless waived by the permitting authority. For all outfalls, data for pollutants in Group B should be reported only for pollutants which you believe will be present or are limited directly by an effluent limitations guideline or NSPS or indirectly through limitations on an indicator pollutant.

1. Pollutant	2. Maximum Daily Value *(include units)*	3. Average Daily Value *(include units)*	4. Source *(see instructions)*
None			

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT	EPA ID Number *(copy from Item 1 of Form 1)*	

C. Use the space below to list any of the pollutants listed in Table 2D-3 of the instructions which you know or have reason to believe will be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it will be present.

1. Pollutant	2. Reason for Discharge
None	

VI. Engineering Report on Wastewater Treatment

A If there is any technical evaluation concerning your wastewater treatment, including engineering reports or pilot plant studies, check the appropriate box below.

☐ Report Available ☒ No Report

B Provide the name and location of any existing plant(s) which, to the best of your knowledge, resembles this production facility with respect to production processes, wastewater constituents, or wastewater treatments.

Name	Location
None	

EPA ID Number (copy from item one of Form 1)

VII. Other Information (Optional)

Use the space below to expand upon any of the above questions or to bring to the attention of the reviewer any other information you feel should be considered in establishing permit limitations for the proposed facility. Attach additional sheets if necessary.

The estimated daily volume of treated groundwater is 3,880 gallons per day based on approximately 2 gallons per minute. The extracted groundwater will be treated using a oil/water seperator, followed by a granular activated carbon vends, and affluent holding to levels below those prescribed by the NPDES permit and Order No. 91-056. The treated effluent will be used for irrigation area and excess will be dishcarged into a storm drain, a tributary to El Cerrito Creek and ultimately to San Francisco Bay.

VIII. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. Name and Official Title (type or print)

MURRAY T. STEVENS

B. Phone No.

(510) 523-7866

C. Signature

D. Date Signed

8/11/93

EPA Form 3510-2D (9-86)

SOIL TECH ENGINEERING

Soil, Foundation and Geological Engineers

298 BROKAW ROAD, SANTA CLARA, CA 95050 ■ (408) 496-0265 OR (408) 496-0266

May 28, 1993

File No. 8-90-421-SI

Ms. Juliet Shin
Alameda County
Health Care Services Agency
80 Swan Way, Room 200
Oakland, California 94621

Regarding: Kamur Industries Plaza Car Wash
Located at 400 San Pablo Avenue, in
Albany, California

Dear Ms. Shin:

This letter is to confirm our telephone conversation on May 27, 1993, regarding the proposed remediation plan for the above reference site. As discussed, the recommended changes have been incorporated into the Revised Interim Remedial Plan dated May 4, 1993 (attached). The amendments to the work plan are on page 10, second paragraph; page 12 under "Installation Off-Site Monitoring Well" and "Schedule". Figure 3 shows the location of the proposed off-site monitoring wells.

We appreciate your cooperation, and your prompt response to the proposed remedial work plan will be greatly appreciated.

File No. 8-90-421-SI

If you have any questions or require additional information, please feel free to contact our office at your convenience.

Sincerely,

SOIL TECH ENGINEERING, INC.

FRANK HAMEDI-FARD
GENERAL MANAGER

Attachment: Revised Interim Remediation Work Plan

cc: Mr. Murray Stevens, Kamur Industries, Inc.

File No. 8-90-421-SI

PROPOSED REVISED INTERIM GROUNDWATER REMEDIATION WORK PLAN FOR KAMUR INDUSTRIES PLAZA CAR WASH LOCATED AT 400 SAN PABLO AVENUE ALBANY, CALIFORNIA

MAY 4, 1993

PREPARED FOR:

KAMUR INDUSTRIES

2351 SHORELINE DRIVE

ALAMEDA, CALIFORNIA 94501

BY:

SOIL TECH ENGINEERING, INC.

298 BROKAW ROAD

SANTA CLARA, CALIFORNIA 95050

SOIL TECH ENGINEERING, INC.

SOIL TECH ENGINEERING
Soil, Foundation and Geological Engineers
298 BROKAW ROAD, SANTA CLARA, CA 95050 ■ (408) 496-0265 OR (408) 496-0266

May 4, 1993

File No. 8-90-421-SI

Kamur Industries, Inc.
2351 Shoreline Drive
Alameda, California 94501

ATTENTION: MR. MURRAY STEVENS

SUBJECT: PLAZA CAR WASH
Located at 400 San Pablo Avenue, in
Albany, California

Dear Mr. Stevens:

The attached work plan describes the proposed Interim Remedial Plan (IRP) for treating the impacted groundwater at the subject site. The proposed IRP is written in response to Alameda County Environmental Health Department (ACEHD) letter dated January 22, 1993, requesting a description of how we plan to control the dissolved hydrocarbon plum migration. The IRP briefly describes the previous investigation and the planned interim groundwater treatment system.

Based on the best available technology used in this environmental field, we believe the proposed IRP will provide cost-effective method to treat the impacted groundwater as requested by the County Environmental Health Department.

File No. 8-90-421-SI

For your information, it appears that the local sewer district may not accept the treated groundwater; therefore, a state permit will be required in order to discharge the effluent either into storm drain or partial landscape irrigation. However, we will apply for sewer district discharge, which may be more cost-effective than the state permit. If the sewer discharge is denied, then an application will be made for a state permit.

California Regional Water Quality Control Board--San Francisco Bay (CRWQCB--SFB) has jurisdiction on issuing a permit (NPDES permit) for discharge of treated groundwater. Normally it takes 3 to 4 months to obtain a discharge permit once the completed application is accepted by the Water Board.

Please submit the proper IRP to the Local County Health Department.

If you have any questions or require additional information, please feel free to contact our office at your convenience.

Sincerely,

SOIL TECH ENGINEERING, INC.

NOORODDIN AMELI
PROJECT ENGINEER

LAWRENCE KOO, P. E.
C. E. #34928

FRANK HAMEDI-FARD
GENERAL MANAGER

File No. 8-90-421-SI

INTERIM GROUNDWATER REMEDIATION
WORK PLAN FOR
KAMUR INDUSTRIES PLAZA CAR WASH
LOCATED AT 400 SAN PABLO AVENUE
ALBANY, CALIFORNIA
MAY 4, 1993

INTRODUCTION:

Soil Tech engineering, Inc. (STE), is pleased to submit this interim remediation plan (IRP) to describe a proposed groundwater remediation measure for Kamur Industries Plaza Car Wash located at 400 San Pablo Avenue, in Albany, California. The main objective of this IRP action is to remediate the petroleum hydrocarbon contamination in the shallow groundwater and control further migration.

This proposed IRP describes the site, briefly summarizes the previous investigation conducted at the site, describes the proposed IRP and the proposed schedule of this work.

BACKGROUND:

SITE DESCRIPTION:

The site is located at 400 San Pablo Avenue, in Albany, California, approximately one mile east of San Francisco Bay (see Figure 1). The site is bordered by El Cerrito Creek to the north, San Pablo Avenue to the east and Adams Street to the west. The surrounding area consists of light commercial and residential sites (Figure 2).

The site was vacant until the late 1950's when the Plaza Car Wash and the adjacent Norge Dry Cleaner buildings were constructed. The three underground fuel storage tanks were installed on the site in 1970.

The observation of petroleum free-product in the adjacent El Cerrito Creek, on July 3, 1989, prompted the Albany Fire Department to install absorbent materials and a boom as a temporary containment measure. A storm drain, which borders the site on the west, was found to be the source of the petroleum products discharged into the El Cerrito Creek.

The inventory reconciliation records for Plaza Car Wash, reviewed by Kamur Industries in July 1989, showed discrepancies in the unleaded gasoline inventory. A product line test, conducted in mid-July 1989, confirmed a small leak in the unleaded gasoline fuel lines beneath the pump island. The leak was repaired and approximately five to ten cubic yards of gasoline contaminated soil was removed from beneath the line. analytical results of a composite sample of the excavated soil revealed a Total Petroleum Hydrocarbon (TPH) concentration of 7,500 parts per million (ppm).

PREVIOUS INVESTIGATION:

Subsurface Consultants, Inc. (SCI) was retained by Kamur Industries to perform a site assessment. In August 1989, SCI drilled five soil borings and obtained soil samples for laboratory analysis. Four of the soil borings were completed as monitoring

wells. Laboratory analysis showed the presence of gasoline contaminants in all soil and groundwater samples.

Per CRWQCB staff request, water samples were also obtained from El Cerrito Creek and the storm drain outlet on August 3, 1989. Laboratory analysis revealed high levels of dissolved hydrocarbons at the storm drain outlet and low levels approximately 20 feet down-stream.

A soil vapor study (SVS), conducted by SCI in the area of the Plaza Car Wash and adjacent properties, revealed the presence of hydrocarbon contamination in the soil.

On September 19, 1989, Pacific Pipeline Survey conducted a video inspection of the Adams Street storm drain. The inspection revealed excess concrete along the pipe bottom, a bend across the pipe section and large cracks in the pipe. The bend area was considered to be the most likely location for petroleum products to enter the storm drain pipe and eventually be discharged into El Cerrito Creek.

On October 10 and 11, 1989, Riedel Environmental Services, Inc. installed a sump on Adams Street adjacent to the damaged section of the storm drain for optimum groundwater level influence.

Storm drain pipe joints exposed during sump installation procedures were sealed with mortar. All excavated soils found to be contaminated (when screened with organic vapor analyzer) were

removed and stored on-site pending proper disposal. Stockpiled soils from the product line repair and sump installation areas were treated on-site and transported to the West Contra Costa Sanitary Landfill for disposal.

In December 1989, Kamur Industries retained International Technology Environmental Services (ITES) to conduct the monitoring and sampling of on-site monitoring wells, the Adams Street sump and El Cerrito Creek. The sampling was conducted on a monthly basis from December 1989 through May 1990. All on-site wells showed high levels of dissolved hydrocarbons, and one well showed traces of floating product. The sump also indicated high levels of dissolved hydrocarbons. The El Cerrito Creek samples, taken after each significant rainstorm, showed non-detectable levels in the up-stream station; the storm drain outlet samples showed moderate levels of dissolved hydrocarbons and the down-stream station showed fairly low to mon-detectable levels.

In September 1990, Kamur Industries, Inc., retained AGS and STE to remove three underground tanks, conduct soil sampling and excavate, characterize and dispose of contaminated soil. In addition, STE conducted water sampling of El Cerrito Creek during rainy months per Regional Water Quality Control Board (RWQCB) requirements and installed additional monitoring wells as requested by ACHS-HMP.

The details of tank removal, soil sampling and the excavation of the contaminated soil are described in the AGS and STE reports entitled "Removal of 3 Underground Storage Tanks" dated January 9, 1991 and "Underground Tank Soil Sampling and Excavation Report" dated January 15, 1991. The report on soil treatment and disposal is included in the STE report entitled "Report on Soil Remediation at the Plaza Car Wash" dated May 13, 1991.

In February 1991, STE installed two on-site monitoring wells (STMW-1 and STMW-2). In addition, abandoned the on-site wells MW-1 and MW-4 during soil excavation of the former underground tank area. The investigation revealed no free floating product detected in the wells. Dissolved hydrocarbons were detected in all on-site and off-site wells. The details of this subsurface investigation is described in the STE's report "Report of Supplemental Subsurface Investigation for Kamur Industries, Inc. at the Plaza Car Wash" dated May 14, 1991.

GROUNDWATER MONITORING AND SAMPLING:

STE is currently conducting a quarterly monitoring and sampling of the on-site and off-site wells, and the results of the groundwater since March 1991 are summarized in Table 1 and 2. The general direction of the shallow groundwater is towards north to northwesterly directions.

SUMMARY OF RESULTS OF PREVIOUS INVESTIGATION:

The soil material beneath the site consists of an irregular layer of clayey silt and sandy clay with some lenses of gravel.

Results of previous subsurface investigations indicated that the shallow groundwater at the site is impacted with the dissolved petroleum hydrocarbons; namely TPHg and BTEX. Dissolved hydrocarbons in groundwater are yet to be delineated off-site to the northeast and west of the site.

Groundwater is encountered at the site at an average depth of 5 to 6.5 feet below grade. The direction of the groundwater flow is towards the north to northwest. The groundwater appears to be in unconfined condition. The highest concentration of dissolved TPHg was detected in groundwater from the northern and eastern part of the site.

Based on the results of previous investigations, STE recommended no additional delineation of hydrocarbons in the soil, and work proceed to contain and remediate dissolved hydrocarbons in the shallow groundwater.

EVALUATION OF REMEDIAL ALTERNATIVES:

The IRP report evaluated several remediation alternatives for the extraction, treatment and discharge of impacted groundwater. The evaluation of the shallow groundwater is summarized below.

EXTRACTION ALTERNATIVES:

STE has evaluated remedial alternatives for the shallow groundwater. Extraction alternatives considered in the evaluation include (1) extraction wells, (2) an extraction trench, (3) an extraction trench with injection wells to speed up groundwater flow to the trench, and (4) an extraction trench and wells with a slurry wall to dewater the aquifer on-site and soil-vapor extraction. The proposed extraction scenario for the impacted shallow groundwater will include an extraction trench. The expected average flow of groundwater extracted by the trench system is approximately 2 to 3 gallons per minute (gpm). The system may be expanded later to include groundwater extraction wells, if necessary.

TREATMENT ALTERNATIVES:

Three groundwater treatment alternatives were evaluated:

- Granular activated carbon (GAC) adsorption
- Oil/water separator followed by GAC
- UV/oxidation process

The three alternatives were evaluated for their effectiveness, reliability, implementability, regulatory compliance, constructibility, and cost. The evaluation found oil/water separator followed GAC to be the most feasible and cost-effective alternative.

INTERIM REMEDIAL PLAN:

Based on the information obtained from the previous subsurface characterization of the site by STE and other consultant, STE recommends a groundwater interceptor trench along the easterly and northerly boundary of the site. The L-shaped interceptor trench shown on Figure 2 will be approximately 100 feet in length and extend approximately 10 to 12 feet below grade. The trench will be filled with drain rock surrounded by geotextile fabric to provide a highly permeable conduit for the removal of all groundwater entering the trench. The drain rock will extend up from the bottom of the trench to 12 feet below grade, the upper portion of the trench will be filled with clean compacted soil. A submersible centrifugal pump will be used to continuously remove groundwater from the interceptor trench.

Soil removed from the trench excavation will be classified according to hydrocarbon concentration with a portable, photo-ionization-type organic compound detector and stockpiled on the grounds of the terminal. A plastic membranae will be placed under the stockpiles to insure that uncontaminated soil in the stockpiled area is not contaminated by the stockpiled soil. Composite samples of soil from the stockpiles will be submitted to an analytical laboratory to determine the hydrocarbon concentration for proper disposal. The sol samples will be analyzed for Total Petroleum Hydrocarbons as gasoline (TPHg). In addition, a few sidewall samples of the trench will also be taken to assess presence of any dissolved petroleum hydrocarbons in the soil.

GROUNDWATER TREATMENT SYSTEM:

Groundwater will be continuously removed from the interceptor trench to a submersible centrifugal pump. The extracted water will be pumped to a treatment system designed to reduce the hydrocarbon concentration to a level acceptable for discharge. The treated water will either be used as a landscape irrigation or discharged either to the local sanitary sewer system or a storm drain. A totalizing flowmeter will be installed on the treatment system effluent to record the total quantity of water treated and discharge.

The extracted groundwater removed from the proposed L-shaped interceptor trench will be pumped to a treatment system designed to reduce the hydrocarbons levels acceptable for landscape irrigation, sewer and/or discharge to the storm drain.

The treatment system will consist of three stages of: (1) pumping unit with two 2,000 gallon above ground Baker tank containments, (2) liquid phase activated carbon and (3) 1,000 gallon treated groundwater collection tank to be used for irrigation and/or discharge into a storm drain (i.e. permitted discharge).

The activated carbon treatment system will be designed with two stages of carbon container in series, each of the two stages will be adequate to treat the entire water stream. An effluent monitoring program will be instituted to assure that the treatment system performs properly, and all water discharged meets the NPDES permit requirements. A process flow chart diagram is shown in Figure 3.

PERMIT REQUIREMENTS:

All necessary permit, required to install and operate the proposed IRP treatment system will be obtained such as City permit, Sewer District, or an NPDES discharge permit from the Regional Water Quality Control Board (RWQCB) and Bay Area Air Quality Management District.

SCHEDULE:

The duration of the project is estimated as follows:

- Submittal of IRP plan to regulatory agencies -- week 0
- Acceptance of IRP treatment system by Alameda County Health Department and RWQCB -- week 2 to 4
- Apply for all required discharge permit (NPDES) -- week 4-6
- Begin installation of groundwater treatment system -- week 6-8
- Complete site construction -- week 8
- Receive NPDES discharge permit -- week 32
- Begin system operation -- week 34

The estimated above schedule assumes that all necessary permits can be obtained in a timely manner. Any delays imposed by the various regulatory agencies will affect the start-up date.

The work plan, design of treatment unit and permit application process will be initiated promptly upon acceptance of the proposed recommendation by you, State and Local regulatory agencies.

CONSTRUCTION:

Construction of the proposed IRP system will be performed by STE under the direction of our licensed contractor. The services of licensed electrical and plumbing contractors will be employed to complete these respective portions of the project.

Typical construction tasks will include construction of L-shaped interceptor trench, trenching to accommodate plumbing, air, water and electrical requirements, the installation of treatment components and fencing. All construction will be in accordance with the permit requirements of the building and fire departments.

OPERATION AND MAINTENANCE:

The treatment system will be operated by STE within the permit guidelines specified by the governing regulatory agencies. Weekly maintenance and monitoring of system parameters will be performed to provide efficient system operation. System parameters will be logged and a copy of these records will be kept at the site at all times.

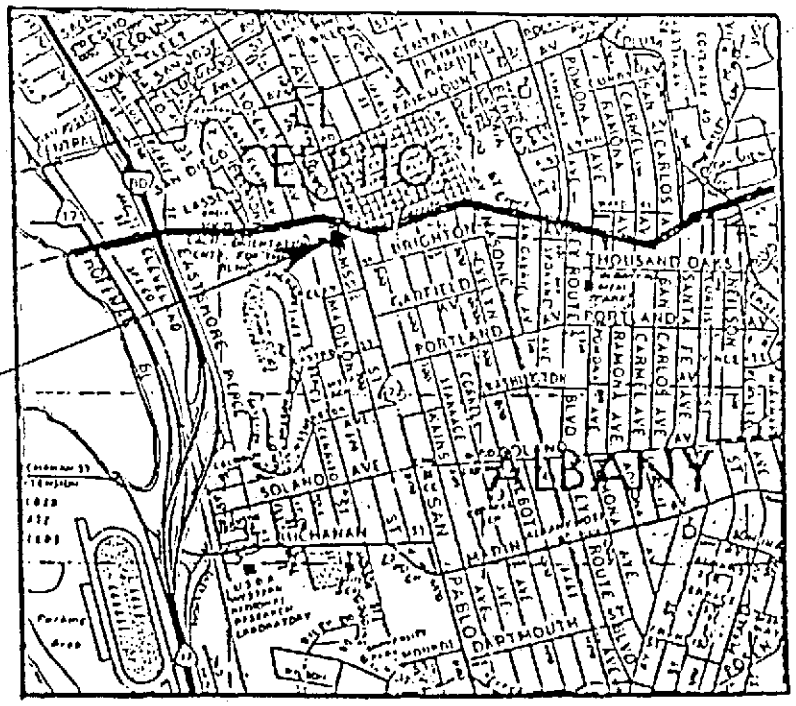
LIMITATIONS:

This work plan presents STE's understanding of existing site conditions and approach to conducting work related to the Alameda County Environmental Health Department request to Kamur Industries for a technical report addressing the control of impacted shallow groundwater migration. The information herein is based on the analytical results obtained form the preliminary site assessment.

File No. 8-90-421-SI

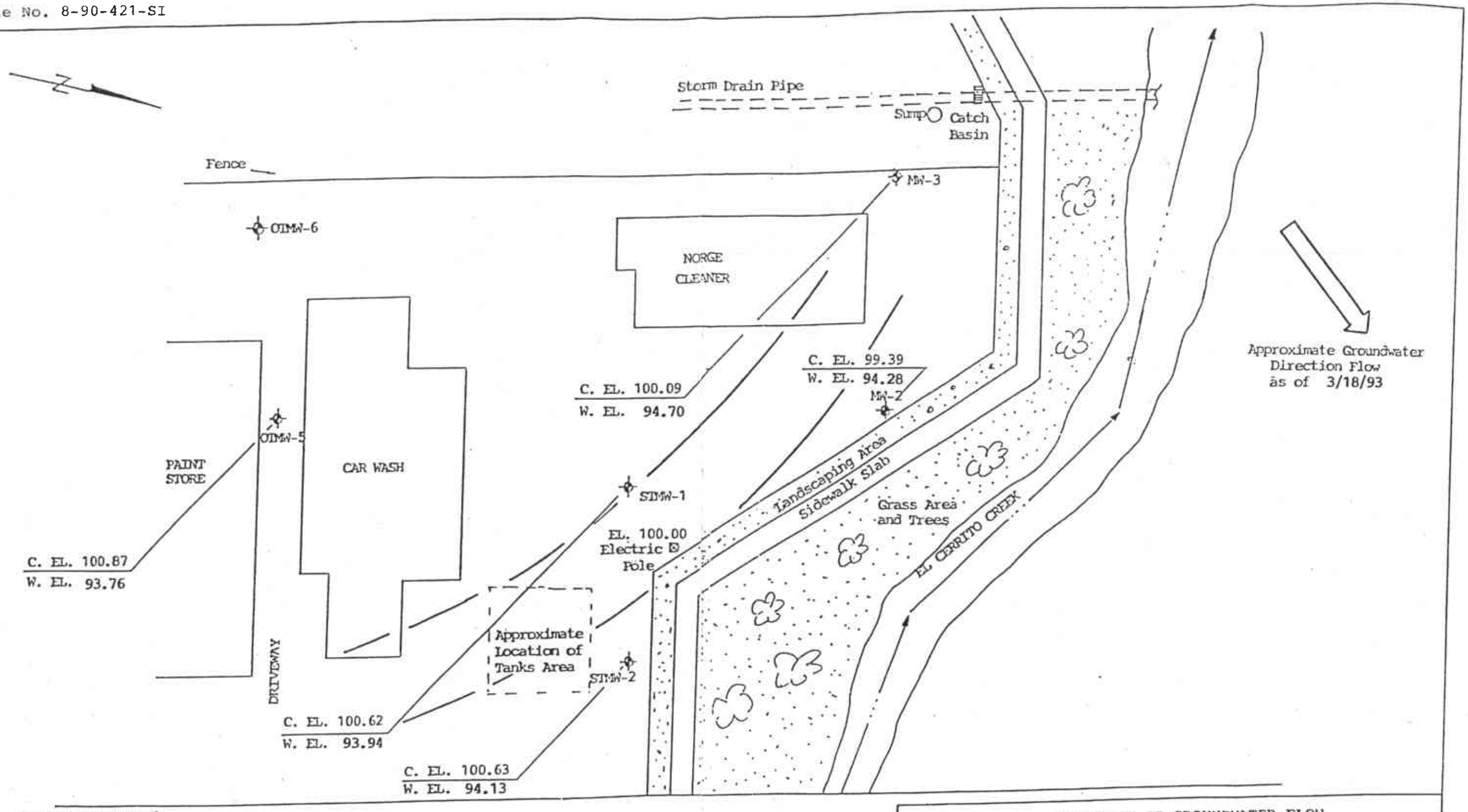
A P P E N D I X "A"

SOIL TECH ENGINEERING, INC.



THOMAS BROS. MAP 1982 EDITION
ALAMEDA COUNTY
PAGE 1 D2

Figure 1

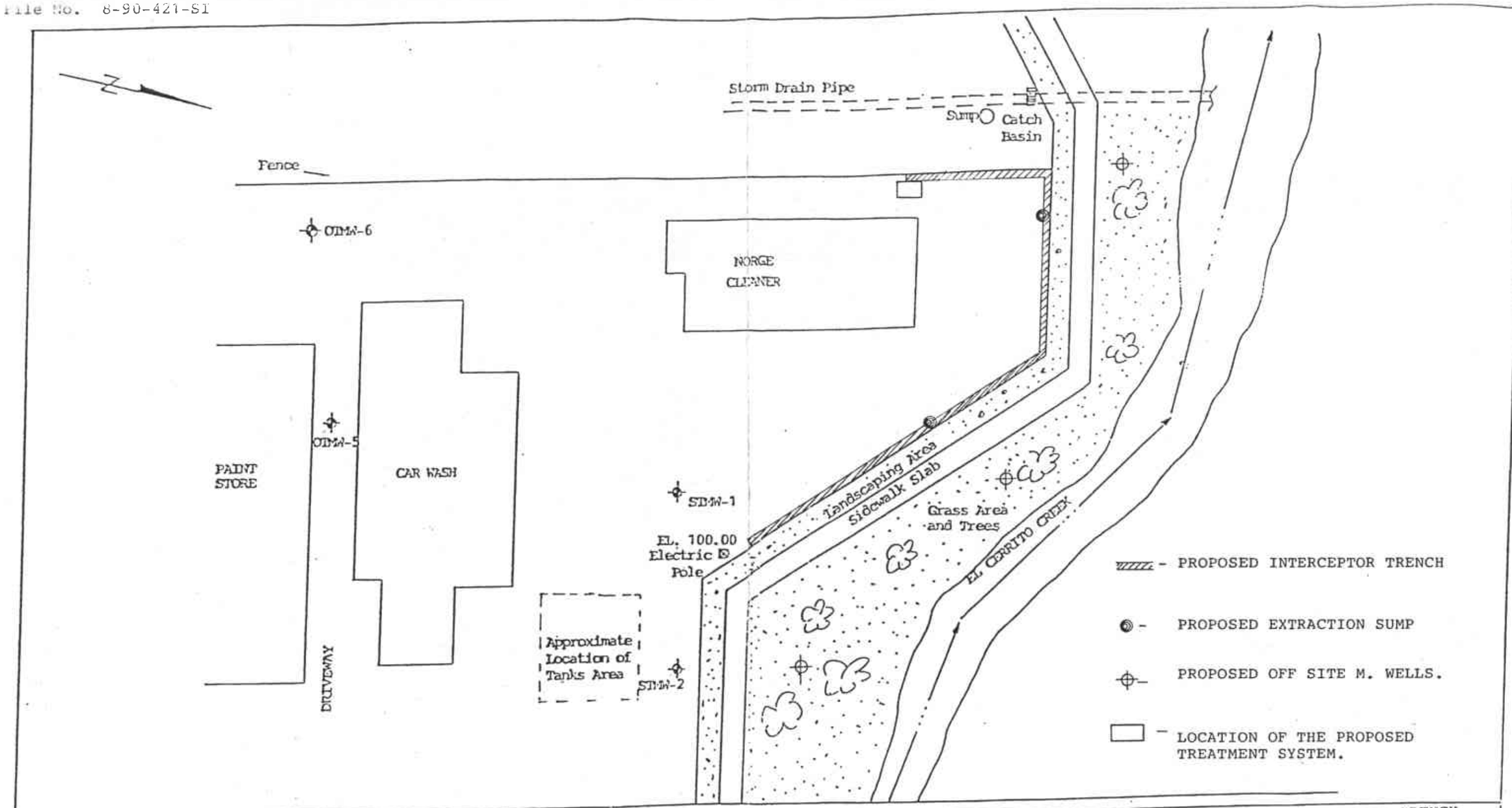


DIRECTION OF GROUNDWATER FLOW

400 SAN PABLO AVENUE, ALBANY, CALIFONRIA

1" = 30'	PROJECT NO. 8-90-421-SI	FIGURE - 2
DRAWN BY N.A.		3/18/93

SOIL TECH ENGINEERING, INC.
298 BROKAW ROAD, SANTA CLARA, CA 95050



LOCATION OF MONITORING WELLS, INTERCEPTOR TRENCH, AND TREATMENT SYSTEM.

400 SAN PABLO AVENUE, ALBANY, CALIFONRIA

1" = 30'	PROJECT NO. 8-90-421-SI	FIGURE - 3
DRAWN BY N.A.		May 4, 1993

SOIL TECH ENGINEERING, INC.
298 BROKAW ROAD, SANTA CLARA, CA 95050

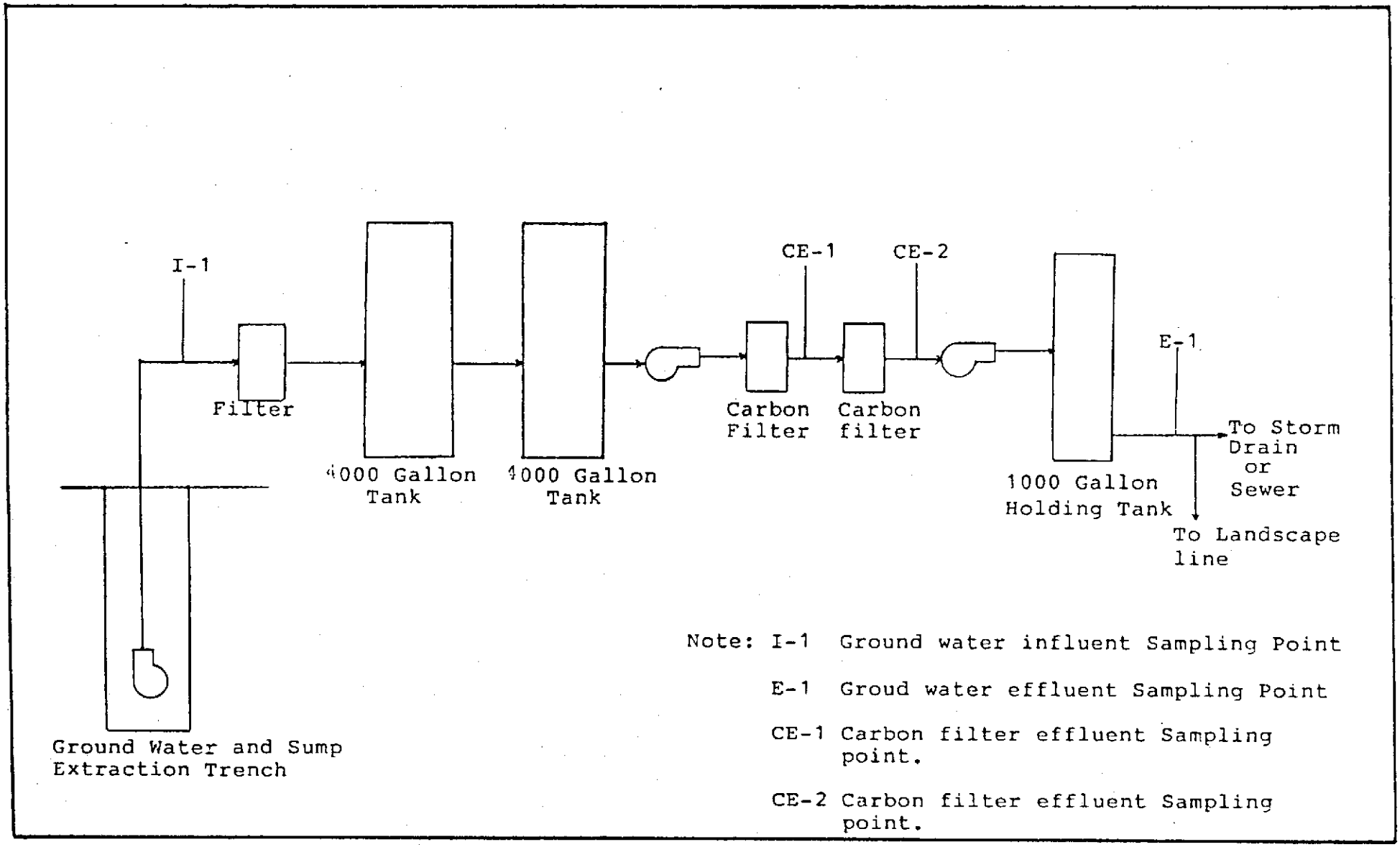


Figure 4. Proposed IRP Treatment System Diagram.

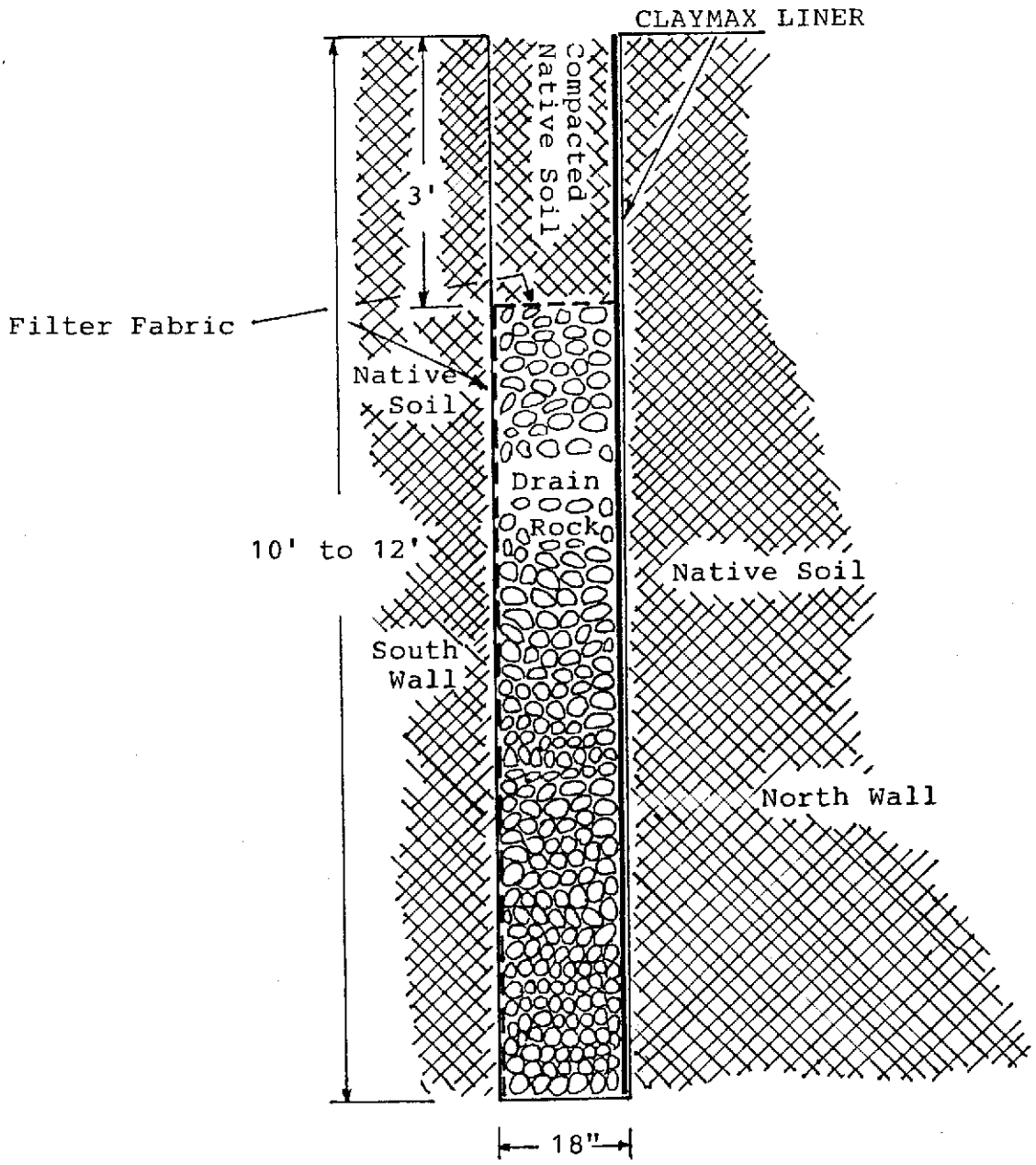


Figure 5. PROPOSED PROFILE OF INTERCEPTOR TRENCH.

File No. 8-90-421-SI

A P P E N D I X "B"

SOIL TECH ENGINEERING, INC.

TABLE 1
GROUNDWATER MONITORING DATA
(Measured in Feet)

Well No./ Elevation	Date	Depth-to-Water	Groundwater Elevation	FFP Thickness	Petroleum Odor
STMW-1 (100.62)	3/11/91	5.29	95.33	None	None
	7/03/91	5.83	94.79	None	Mild
	11/04/91	5.83	94.79	None	Mild
	1/20/92	5.79	94.84	Light Sheen	Mild
	5/07/92	5.80	94.82	None	Mild
	8/17/92	5.77	94.85	None	Mild
	12/10/92	6.61	94.01	Light Sheen	Mild
	3/18/93	6.68	93.94	Light Sheen	Mild
STMW-2 (100.63)	3/11/91	5.25	95.38	None	Mild
	7/03/91	4.75	95.88	None	Mild
	11/04/91	5.92	94.71	None	Mild
	1/20/92	5.88	94.75	None	Mild
	5/07/92	5.70	94.92	None	Mild
	8/17/92	5.71	94.92	None	None
	12/10/92	6.39	94.24	Light Sheen	Mild
	3/18/93	6.50	94.13	Light Sheen	Mild

TABLE 1 CONT'D
GROUNDWATER MONITORING DATA
(Measured in Feet)

Well No./ Elevation	Date	Depth-to-Water	Groundwater Elevation	FFP Thickness	Petroleum Odor
MW-2 (99.39)	3/11/91	4.29	95.07	None	Mild
	7/03/91	5.83	93.53	None	Strong
	11/04/91	4.79	94.57	None	Mild
	1/20/92	4.60	94.76	None	Mild
	5/07/92	4.42	94.94	None	Mild
	8/17/92	4.43	94.96	None	Mild
	12/10/92	4.94	94.45	None	Mild
	3/18/93	5.11	94.28	None	Light Sewage
MW-3 (100.09)	3/11/91	4.67	95.42	Trace	Moderate
	7/03/91	5.75	94.55	Light Sheen	Strong
	11/04/92	5.67	94.42	Trace	Strong
	1/20/92	5.54	94.55	Light Sheen	Strong
	5/07/92	5.18	94.91	Rainbow Sheen	Strong
	8/17/92	5.24	94.85	Rainbow Sheen	Mild
	12/10/92	4.42	95.67	Light Sheen	Mild
	3/18/93	5.39	94.70	Thick Sheen	Strong

TABLE 1 CONT'D
GROUNDWATER MONITORING DATA
(Measured in Feet)

Well No./ Elevation	Date	Depth-to-Water	Groundwater Elevation	FFP Thickness	Petroleum Odor
OTMW-5 (100.87)	3/11/91	5.02	95.85	None	Mild
	7/03/91	5.75	95.12	None	Mild
	11/04/91	5.77	95.10	None	Mild
	1/20/92	5.58	95.29	None	Mild
	5/07/92	5.43	95.44	None	Mild
	8/17/92	5.45	95.42	None	None
	12/10/92	7.30	93.57	None	Mild
	3/18/93	7.11	93.76	None	Light Sewage
OTMW-6	8/17/92	4.88	NA	None	None

FFP - Free Floating Product
NA - Not Applicable

TABLE 2
WATER ANALYTICAL RESULTS
IN
MILLIGRAMS PER LITER (mg/L)

Well No.	Date	TPHg	B	T	E	X
STMW-1	3/13/91	0.85	0.1	0.007	ND	0.15
	7/03/91	5.1	1.8	0.5	0.095	0.56
	11/04/91	2.05	0.76	0.054	ND	0.056
	1/20/92	4.6	0.59	0.036	ND	0.19
	5/07/92	4.4	0.066	0.053	0.004	0.16
	8/17/92	2.7	0.031	0.018	0.019	0.067
	12/10/92	35	0.054	0.079	0.083	0.22
	3/18/93	19	0.049	0.052	0.055	0.18
STMW-2	3/13/91	0.17	0.001	0.0017	ND	0.028
	7/03/91	1.8	0.64	0.048	0.044	0.094
	11/04/91	2.14	1.00	0.057	0.003	0.019
	1/20/92	14	0.12	0.0006	0.0006	0.08
	5/07/92	1.7	0.032	0.017	0.0086	0.048
	8/17/92	16	0.18	0.22	0.21	0.62
	12/10/92	44	0.084	0.096	0.12	0.35
	3/18/93	9.2	0.022	0.031	0.04	0.11

TABLE 2 CONT'D
WATER ANALYTICAL RESULTS
IN
MILLIGRAMS PER LITER (mg/L)

Well No.	Date	TPHg	B	T	E	X
MW-2	3/13/91	25	2.6	4.4	ND	5.8
	7/03/91	21	2.8	3.2	ND	4.3
	11/04/91	3.58	1.7	0.119	0.009	0.056
	1/20/92	0.38	0.38	0.0013	ND	0.034
	5/07/92	10	0.062	0.032	0.044	0.16
	8/17/92	6	0.048	0.027	0.065	0.18
	12/10/92	7.2	0.015	0.023	0.032	0.082
	3/18/93	1.4	0.0083	0.011	0.013	0.048
MW-3	3/13/91	47	9.1	9.9	0.27	8.11
	7/03/91	40	12	4.5	1.2	4.0
	11/04/91	102.7	38.87	19.1	3.2	8.3
	1/20/92	510	27	27	5.8	46
	5/07/92	43	0.25	0.23	0.12	0.47
	8/17/92	140	2.5	2.4	1.7	5.5
	12/10/92	94	0.4	0.41	0.43	1.1
	3/18/93	51	0.092	0.13	0.16	0.59

TABLE 2 CONT'D
WATER ANALYTICAL RESULTS
IN
MILLIGRAM PER LITER (mg/L)

Well No.	Date	TPHg	B	T	E	X
OTMW-5	3/13/91	0.12	0.046	0.012	0.001	0.004
	7/03/91	0.81	0.32	0.043	0.016	0.043
	11/04/91	0.97	0.1	0.019	0.005	0.013
	1/20/92	0.09	0.0007	0.0007	ND	0.011
	5/07/92	0.18	0.027	0.014	0.0082	0.035
	8/17/92	0.087	0.012	0.0098	0.004	0.042
	12/10/92	0.54	0.0047	0.0045	0.0064	0.019
	3/18/93	0.57	0.006	0.0076	0.011	0.029
OTMW-6	8/17/92	ND	ND	ND	ND	ND

TPHg - Total Petroleum Hydrocarbons as gasoline
BTEX - Benzene, Toluene, Ethylbenzene, Total Xylenes
ND - Not Detected (Below Laboratory Detection Limit)