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.

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SOIL TECH ENGINEERING
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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 work plan to control the dissolved hydrocarbon plume 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 the most cost-effective method to treat the impacted groundwater as requested by the County Environmental Health Department.

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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 with partial landscape irrigation. However, we will pursue for a sanitary sewer district discharge permit. If the sewer district do not allow the discharge of treated groundwater into their system, 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.

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 ivestigate the source. 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 product 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 non-detectable levels.

In September 1990, Kamur Industries, Inc., retained AGS and STE to remove three underground tanks, conduct soil sampling, excavate contaminated soil, 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 northeasterly directions (Fig. 2).

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 north-east (Fig. 2). 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 monitor and sample the wells. In addition, recommended an interim remediation of impacted 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 3 to 5 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 by 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 3 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 on south wall to provide a highly permeable conduit for the removal of all groundwater entering the trench. North wall will be covered by CLAYMAX to control the migration of hydrocarbon contaminations. The drain rock will extend up from the bottom of the trench to 3 feet below grade, the upper portion of the trench will be filled with clean compacted soil. Two submersible centrifugal pumps will be used to continuously remove groundwater from the interceptor trench.

In addition, one submersible pump with associated pipings will also be installed in the existing off-site sump located near storm drain on Adam Street. The intent is to use the Adam Street sump as an additional extraction well, if it is needed to control the plume migration and prevent potential groundwater seepage into the storm drain. The off-site sump will be sampled quarterly as a part of assessing the proposed remediation efficiency and control of plume migration.

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 site.

A plastic membrane 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 soil 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 by two submersible centrifugal pumps. 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: (a) pumping unit with two 4,000 gallon above ground tank containments, (b) two liquid phase activated carbon drums and (c) one 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 4.

INSTALLATION OF OFF-SITE MONITORING WELLS

STE recommends installation of two to three monitoring wells outside the property to assess the control of plume migration. The approximate locations of the off-site wells are shown in Figure 2.

PERMIT REQUIREMENTS:

All necessary permits, 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
- Begin installation of groundwater treatment system -- week 5-8
- Complete site construction -- week 8
- Apply for all required discharge permits (NPDES) -- week 8-10
- Receive NPDES discharge permit -- week 20
- 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.

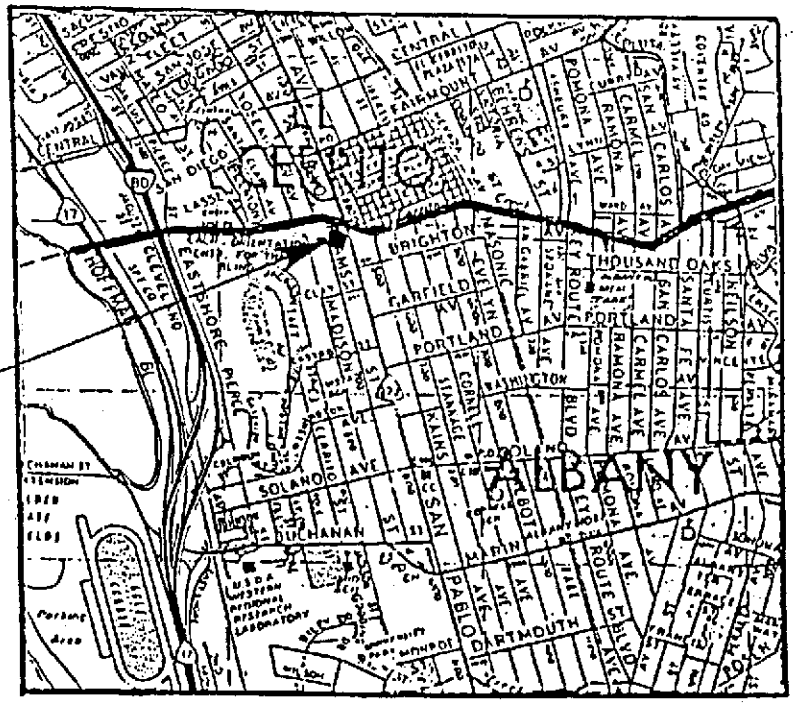
Typical construction tasks will include construction of L-shaped interceptor trench, trenching to accommodate plumbing, air, water and electrical requirements, the installation of treatment components and fencing. All construction will be in accordance with the permit requirements of the building and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

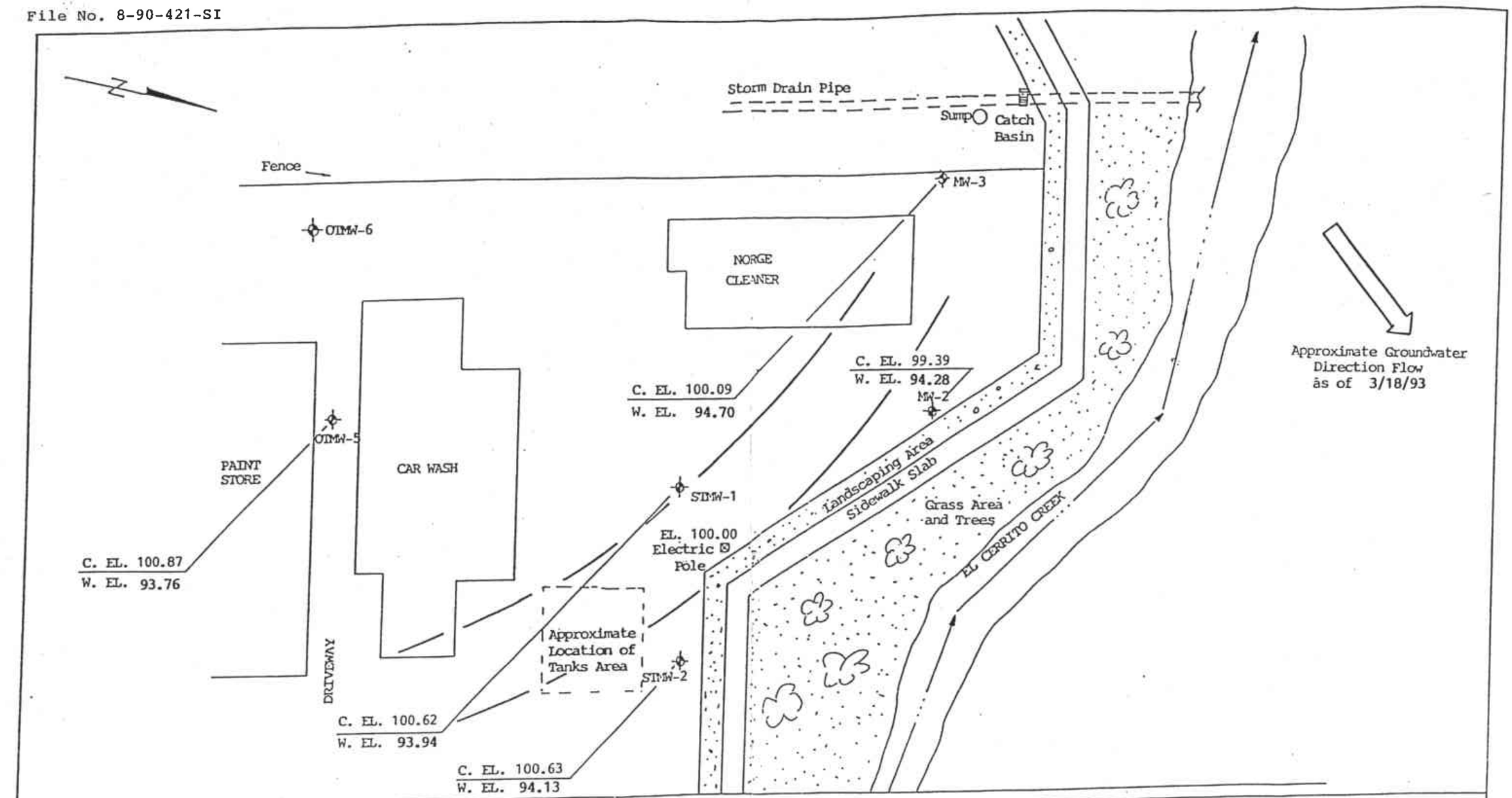
This work plan presents STE's understanding of existing site conditions and approach to conducting work related to the Alameda County Environmental Health Department request to Kamur Industries for a technical report addressing the control of impacted shallow groundwater migration. The information herein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



THOMAS BROS. MAP 1982 EDITION
ALAMEDA COUNTY
PAGE 1 D2

Figure 1

File No. 8-90-421-SI



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

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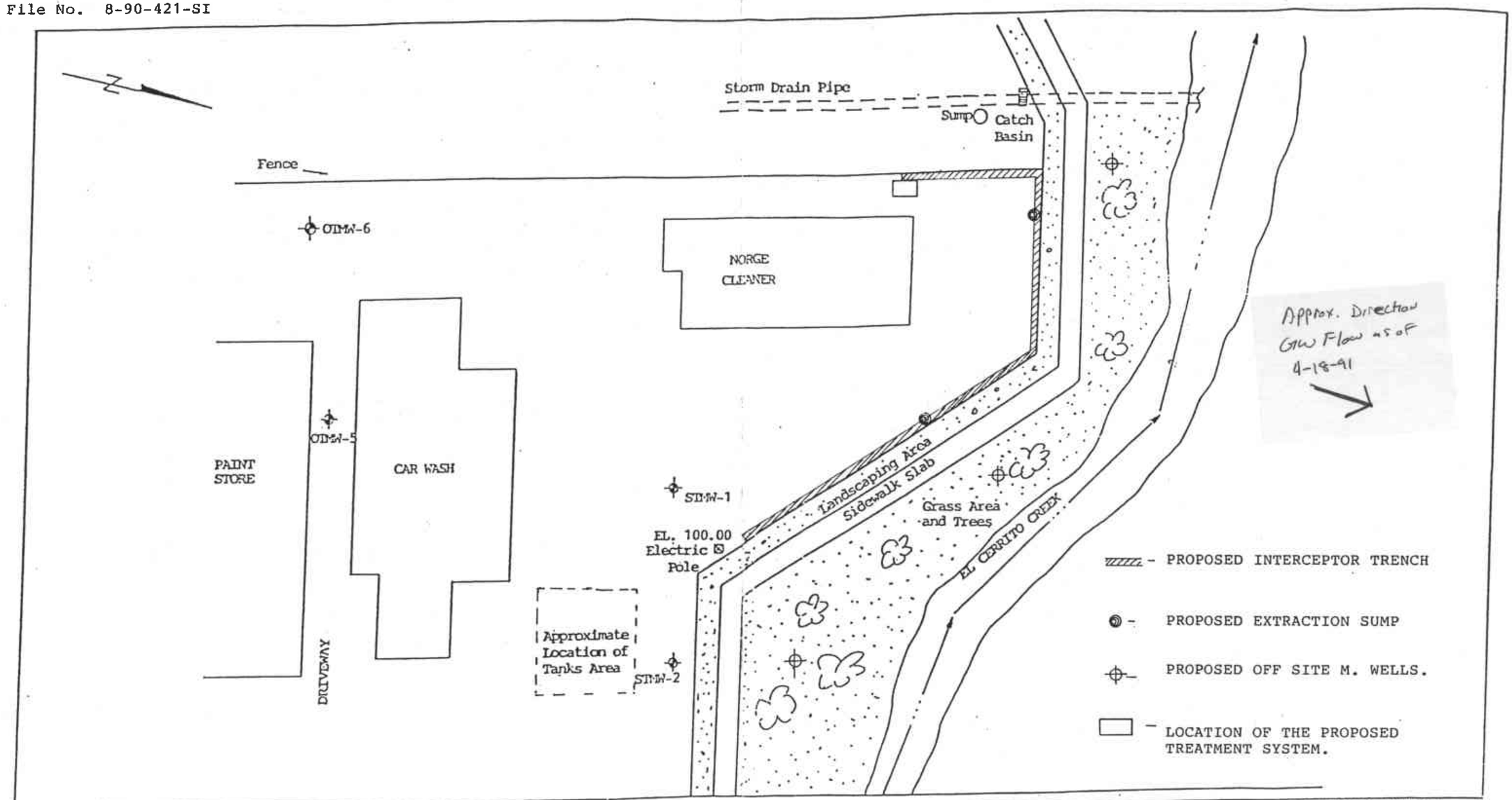

LOCATION OF MONITORING WELLS, INTERCEPTOR TRENCH, AND TREATMENT SYSTEM.

400 SAN PABLO AVENUE, ALBANY, CALIFONRIA

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

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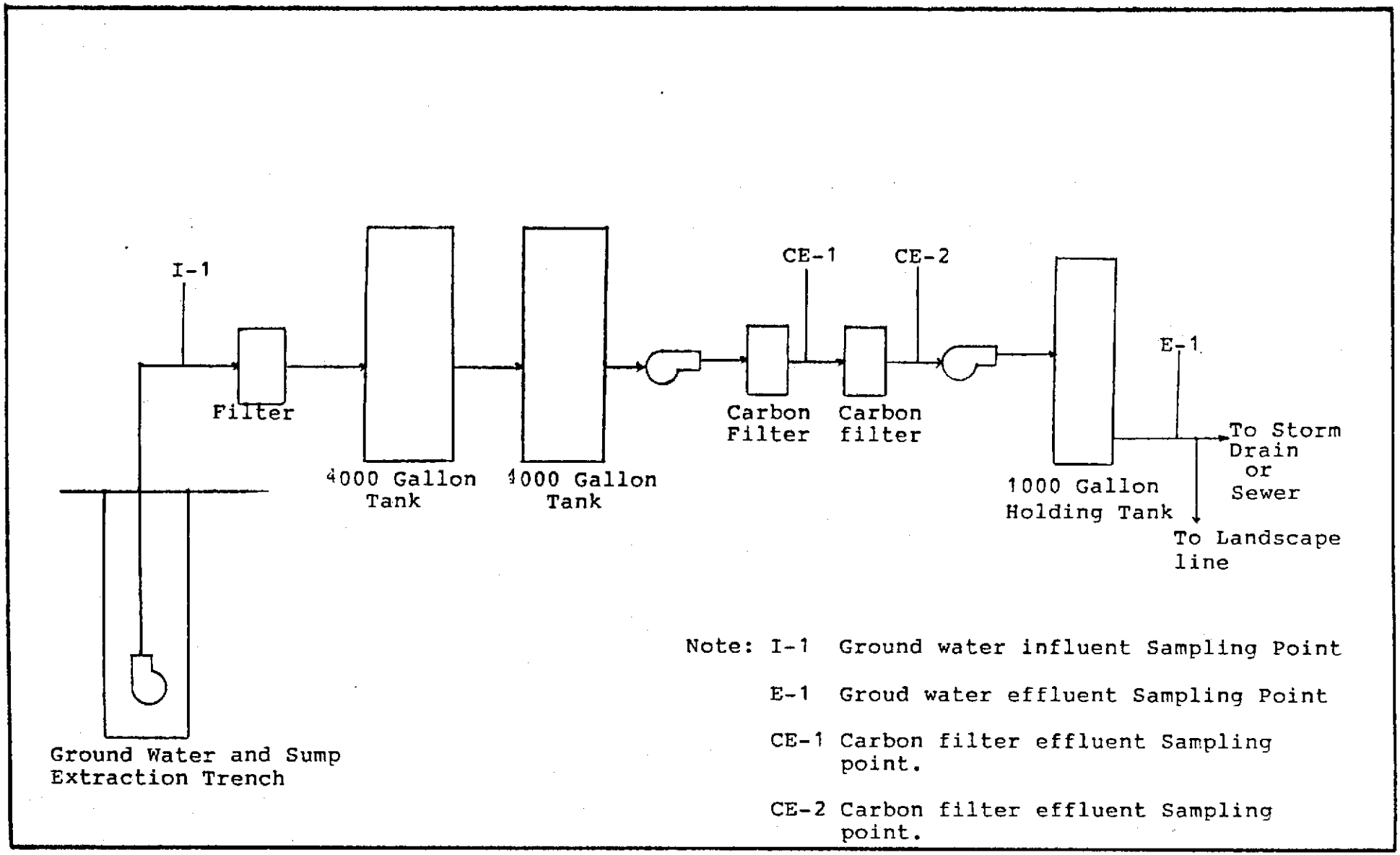

Figure 4. Proposed IRP Treatment System Diagram.

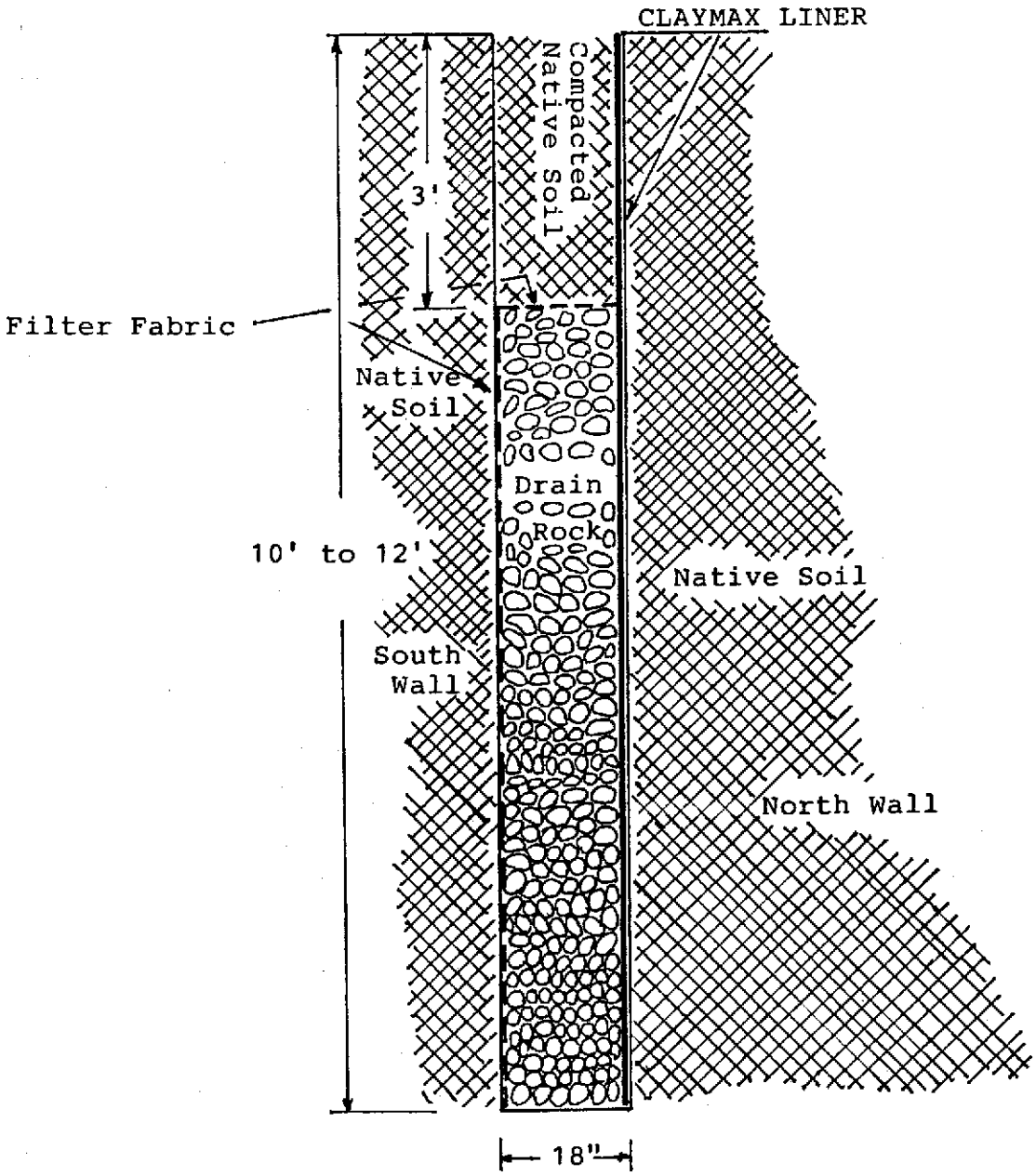

Figure 5. PROPOSED PROFILE OF INTERCEPTOR TRENCH.

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)