TIME OIL #176

SOIL VAPOR SURVEY INDICATES CONTAM. IS CONFINED TO UST EXCAVATION AREA.

RECEIVED

MAY 21 1992

DEPT OF ECOLOGY

SEATTLE
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TIME OIL CO

2737 WEST COMMODORE WAY
P.O. BOX 24447

SEATTLE, WA 981
SEATTLE, WA 981

May 1

IN ASSESSING & ONGOING

INTERIM SOIL SR 4/13/92

Mr. John Stormon
State Of Washington Department of Ecology
3190 - 160th Ave. SE
Bellevue, WA 98008-5452

RE: Status Report
24025 - 56th Ave. West, Mountlake Terrace, WA (Property No. 01-176)

Dear Mr. Stormon,

This letter has been prepared to provide you with information regarding the progress of site assessment activities at the above-mentioned property. An outline of Time Oil Co.'s site assessment program and plans for remediation was forwarded to your office on February 21, 1992. A summary of our actions to date follows:

On June 14 and 17, 1991, three gasoline tanks were removed from two excavations at the above-mentioned property. Soil samples collected from the excavations and stockpiled fill sand indicated the presence of gasoline at concentrations ranging from 4 ppm to 2,000 ppm while benzene was indicated at concentrations ranging from "non-detect" to 49 ppm. Sampling locations and analytical results were provided in our "Underground Storage Tank Removal" report forwarded to your office on July 12, 1991.

On March 30, 1992, Environmental Science and Engineering, Inc. and Environmental Control Associates performed a soil vapor survey to assist in defining the vertical and lateral extent of contamination at the subject site. Soil vapor probes were driven with a pneumatic hammer to depths of up to 15 feet in the area of the former tank excavations. After purging the probes, vapor samples were collected with charcoal tubes. The samples were then extracted from the tubes with methanol and injected onto a gas chromatograph.

Results of the soil vapor survey suggest that contamination does not extend beyond the limits of the former excavations. The attached report summarizes the results and methodology of the survey.

During the week of June 1, a mobile drill rig will be utilized to advance borings at the estimated limits of the contamination plume as defined by the soil vapor survey. In the event that contamination extends further than anticipated, additional borings will be placed to define its extent. Several vapor extraction wells will also be placed within the area of the former tank bed for future in-situ remediation by vapor extraction. The wells will be installed to a minimum

depth of 30 feet or to 10 feet below the last observable contamination.

If you have any further questions regarding this matter, please do not hesitate to contact me at 286-4495.

Sincerely,

Anastasia E Duarte

Anastasia E. Duarte
Environmental Toxicologist

aed\may92\1176.lt2

Environmental Science & Engineering, Inc.

DRAFT

April 28, 1992

Ms. Anastasia Duarte
Time Oil Co.
2737 West Commodore Way
Seattle, Washington 98199

RE: Results of a Soil Vapor Survey at Time Oil Facility 01-176 Located at 24205 56th Avenue West, Mountlake Terrace, Washington

Dear Ms. Duarte:

Environmental Science & Engineering, Inc. (ESE) is pleased to submit this letter report documenting activities associated with a soil vapor survey at the subject Time Oil Company (Time Oil) facility. Data collection procedures employed during the field investigation are documented in this report, as are the methods for chemical analyses of soil vapor samples. Conclusions based on the findings of this investigation are also presented. All activities described in this report are in response to authorization from Time Oil in accordance with the contract between ESE and Time Oil.

INTRODUCTION

Objective

The primary objective of the soil vapor survey was to assess the absence or presence of, and relative concentration of, petroleum hydrocarbons in the shallow soil beneath the site. This information will be used to the determine the locations of soil borings and vapor extraction/groundwater monitoring wells during future assessment activities.

Site Description

The subject site is located at 24205 56th Avenue W. in Mountlake Terrace, Washington (Figure 1). The site generally slopes to the south and is bounded on the north by 242nd St. SW, on the west by 56th Avenue W., on the south by a closed pizza restaurant parking lot, and to the east by a single-family residence (Figure 2). The site is partially paved with asphalt. Gravel pads exist over the former location of the gasoline underground storage tanks (USTs) and east of the existing structure. A large portion of the property is landscaped with grass, trees, and shrubs. The site is currently occupied by a single family residence (formerly a live-in retail gasoline station).

17411 N.E. Union Hill Road, Suite 220 Redmond, WA 98052 Phone (206) 869-8220 Fax (206) 867-1366

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Background

The following background information was provided by Time Oil in their request for proposal dated January 8, 1992.

On June 14 and June 17, 1991, three gasoline USTs were removed from the above-referenced site by Lee Morse General Contractors, Inc. as part of a site closure. An 8,000-gallon-capacity UST and a 6,000-gallon-capacity UST were removed from one excavation while another 6,000-gallon-capacity UST was removed from a separate excavation. Although some areas of surface corrosion were present on the tanks, it did not appear that any of the tanks had leaked.

Fill material from around the USTs consisted of fine to medium sand and appeared to contain petroleum hydrocarbons, particularly beneath the tanks. Native soil at the site consists of dense silty sand. Discolored soil was visible on the sidewalls of both excavations, however heavy staining suggested that the majority of the petroleum had migrated downward. No groundwater was encountered to a depth of 15 feet.

Soil samples collected from the sidewalls of the excavations and beneath each end of the former tanks were analyzed for total petroleum hydrocarbons (TPH) as gasoline by EPA Method 8015 and benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8020. TPH concentrations ranging from 230 parts per millions (ppm) to 2,000 ppm and benzene concentrations ranging from 0.72 ppm to 49 ppm were present in samples collected from the bottoms of the excavations. Soil samples collected from the west sidewalls of both excavations were found to contain petroleum hydrocarbons; 130 ppm TPH were found in the sample collected from the large excavation and 1,300 ppm TPH were found in the sample collected from the small excavation. Samples of the fill contained TPH in concentrations ranging from 26 ppm to 550 ppm and benzene at 0.028 ppm to 0.76 ppm.

Due to space limitations, the excavated soil could not be stockpiled on the site and was used to backfill the excavations. Approximately 100 feet of perforated piping was placed into the excavations at a depth of 7 to 8 feet for the purpose of future in-situ remediation by vapor extraction.

SOIL VAPOR SURVEY

Rationale

The soil vapor survey was conducted on March 30, by Environmental Control Associates, of Watsonville, California (ECA). The survey was supervised by an ESE geologist and directed by a representative of Time Oil. Survey points SG-1, SG-2, and SG-2A (Figure 2) were located within the former UST basin to assess the presence or absence of petroleum vapors in the fill, and if possible, within the native soil below the depth of the former UST removal excavation. Survey points SG-3 through SG-8 (Figure 2) were located around the perimeter of the former UST basin to assess the presence or absence of petroleum hydrocarbon vapors in native soil beyond the former UST basin. Survey points SG-6 and SG-7 were located in the parking lane of 56th Avenue West to assess the presence or absence of petroleum hydrocarbon vapors in soil off site to the west.

Methodology

Soil vapor probes consisted of 3/4-inch I.D. galvanized steel pipe fitted with a 1-foot section of perforated pipe and 1/2-inch diameter solid steel insert rods. The probes were pneumatically driven to the desired sampling depth using a 135 cubic feet per minute (cfm) air compressor. Sampling depths were generally 5, 10, and 15 feet bgs, unless the probe met refusal. After reaching sampling depth, the insert rods were removed and the probe pipe opening was connected to a tubing and valve apparatus. Three probe volumes were purged using a hand vacuum pump prior to sampling. After purging, a sealed SKC West charcoal tube was broken open at each end, placed in-line with the tubing and hand pump, and 1 liter of air was drawn through the tube. The ends of the tube were sealed with plastic endcaps and the tube was transported to the on-site mobile laboratory. After sampling, the probe was removed and the probe hole grouted with Portland cement. The probes and insert rods were thoroughly washed between probe locations.

The charcoal tubes were extracted with 500 microliters of methanol to transfer total petroleum hydrocarbons (TPH) compounds into solution. Four microliters of the extract was injected directly on-column in a Hewlett Packard Gas Chromatograph utilizing a flame ionization detector. According to ECA, all analyses were conducted using modified EPA method 8015 and standard SW-846 procedures.

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FINDINGS

Laboratory results of the soil vapor analyses are summarized in Table 1. Laboratory reports and chain-of-custody documents are included in Attachment A.

Petroleum hydrocarbon concentrations were detected in soil vapor samples collected from survey points SG-1, SG-2 and SG-2A, located within the former UST basin. Petroleum hydrocarbons were not detected in soil vapor samples collected from survey points SG-3 through SG-8, located around the perimeter of the former UST basin (Figure 2).

The laboratory data were used to prepare a TPH concentration contour map at 5 feet bgs (Figure 3). Below 5 feet bgs, only sample SG-2 at 12' contained detectable concentrations of petroleum hydrocarbons. For this reason, only the data from 5 feet bgs was presented and contoured on a figure (Figure 3). Because of the nature of the data generated through soil vapor survey techniques, TPH concentration contour maps should be evaluated in a qualitative manner. The maps are intended to provide a general indication of the lateral extent of soil vapor containing petroleum hydrocarbons at the various sample depths, while highlighting areas of apparent highest concentrations of petroleum hydrocarbons.

Water was found at 10 feet below ground surface (bgs) within the soil vapor probes located within the former UST basin. Groundwater was not encountered within 10 feet bgs at any of the probe locations outside the perimeter of the former UST basin.

TABLE 1
Time Oil Company
24205 56th Avenue West
Mountlake Terrace, Washington
Soil Vapor Survey Analytical Results

Survey Point	Sample Depth	TPH (ng/ml)	Survey Point	Sample Depth	TPH (ng/ml)
SG-1	5	550	SG-4	5	ND
	10	ND		9	ND
	12	ND	SG-5	5	ND
SG-2A	5	490	SG-6	5	ND
SG-2	10	ND		10	ND
	12	340	SG-7	5	ND
SG-3	5	ND		10	ND
	9	ND	SG-8	5	ND
				8	ND

NOTES:
ND: TPH not detected above 250 ng/ml (nanograms per milliliter or parts per billion - ppb)
TPH: Total petroleum hydrocarbons

CONCLUSIONS

Based on the findings presented above, ESE concludes the following:

- Petroleum hydrocarbons were detected in soil vapor samples collected from within the former UST basin to 12 feet bgs.
- Petroleum hydrocarbons were not detected in soil vapor samples collected from the perimeter of the former UST basin, including locations off site to the west.
- Some subsurface water appears to have accumulated in the backfill of the former UST excavation.

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It has been ESE's pleasure to assist you in this project. If you have any questions, please do not hesitate to contact the undersigned at (206) 869-8220.

Sincerely,
ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

Michael Meyer
Senior Staff Geologist

Chris L. Generous
Senior Engineer
Geosciences Department Manager

Attachments

J:\PROJECTS\92-7167\SOIL.VAP.RPT

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ATTACHMENT A
LABORATORY RESULTS AND CHAIN-OF-CUSTODY DOCUMENTS

DRAFT

Attention: Mr. Michael Myer
Environmental Science
and Engineering Inc.
17411 N.E. Union Hill Road, Suite 220
Redmond, Washington, 98052

Date Sampled: 03-30-92
Date Analyzed: 03-30-92
Matrix: Air

Project: Time Oil/Mountlake Terrace
24205 Fiftysixth Avenue West
Mountlake Terrace, Washington
6-92-7167 (01-176)

	TPHg ng/ml
Reporting Limit:	250
SAMPLE	
SG1@10	ND
SG2@10	ND
SG3@5	ND
SG4@5	ND
SG5@5	*ND
SG2A@5	490
SG1@12	ND
SG2@12	340
SG3@9	ND
SG1@5	550
SG6@10	ND
SG6@5	ND
SG7@5	ND
SG7@10	ND
SG8@5	ND
SG4@9	ND
SG8@8	ND

ND = Not Detected at Reporting Limit
* Unidentified peak not recognized as TPHg

Laboratory Representative

4-17-92
Date

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Quality Assurance, Quality Control

Three point curves were generated at each site with correlation coefficient values of between 0.998 and 1.000. Sample blanks were injected daily and quantitated below the reporting limit. Calibration standards were regularly injected and relative standard deviations were less than 20%. Spikes and duplicates were injected daily and had less than 15 % relative percent difference.

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ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
17411 N.E. Union Hill Road, Suite 220
Redmond, Washington 98052
Phone (206)869-8220 Fax (206)867-1366

Chain of Custody Record

REPORT TO BE SENT TO: Michael Meyer

SAMPLED BY: Michael Meyer / Environmental Control Associates DATE: 3/30/92

PROJECT NAME: Time Oil / Mountlake Terrace

PROJECT LOCATION: 24205 56th Ave W.

SITE NUMBER: 6-92-7167 (01-176)

Sample Number	Date/Time Sampled	Type of Samples	# of Containers	Analyses Required	Comments
SG-1 e 5'	3/30/92 1310	Air	1	TPH-Gasoline	
SG-1 e 10'	1005		1		
SG-1 e 12'	1200		1		
SG-2A e 5'	1400		1		
SG-2 e 10'	1015		1		
SG-2 e 12'	1215		1		
SG-3 e 5'	1025		1		
SG 3 e 9'	1245		1		
SG-4 e 5'	1035		1		
SG-4 e 8'	1755		1		
SG-5 e 5'	1045		1		
SG-6 e 5'	1520		1		
SG-6 e 10'	1630		1		

Relinquished by: (Signature)
NAME: Michael J. Meyer
FIRM: ESE

Date: 3/30/92
Time: 1900

Received by: (Signature)
NAME:
FIRM:

Date: 3/30/92
Time: 19:05

DRAFT

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
17411 N.E. Union Hill Road, Suite 220
Redmond, Washington 98052
Phone (206)869-8220 Fax (206)867-1366

Chain of Custody Record

REPORT TO BE SENT TO: Michael Meyer

SAMPLED BY: Michael Meyer/Environmental control services DATE: 3/30/92

PROJECT NAME: Tine Oil / Mountlake Terrace

PROJECT LOCATION: 24205 56th Ave. W.

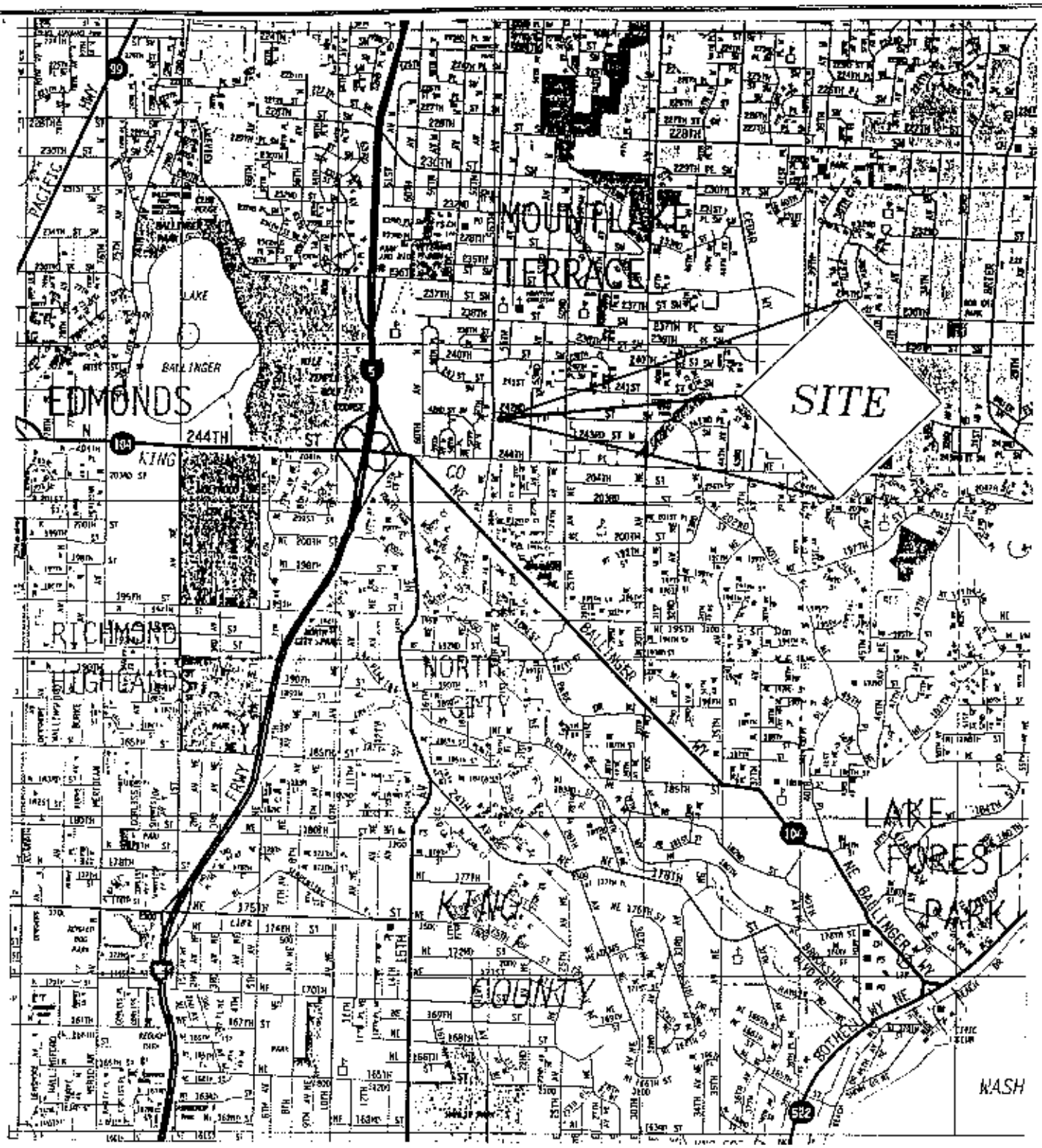
SITE NUMBER: 6-92-7167 (01-176)

Sample Number	Date/Time Sampled	Type of Samples	# of Containers	Analyses Required	Comments
SG-7@5'	3-30-92 1535	Air	1	TPH Gasoline	
SG-7@10'	1635		1		
SG-8@5'	1645		1		
SG-8@8'	1730		1		

Relinquished by: (Signature)
NAME: Michael T Meyer
FIRM: ESE
Date: 3/30/92
Time: 1900

Received by: (Signature)
NAME:
FIRM:
Date: 3/30/92
Time: 19:05

FIGURES



FROM: THOMAS BROS. MAPS, 1992
STATE: WASHINGTON
COUNTY: SNOHOMISH
PAGE: 475
SECTION: D-3

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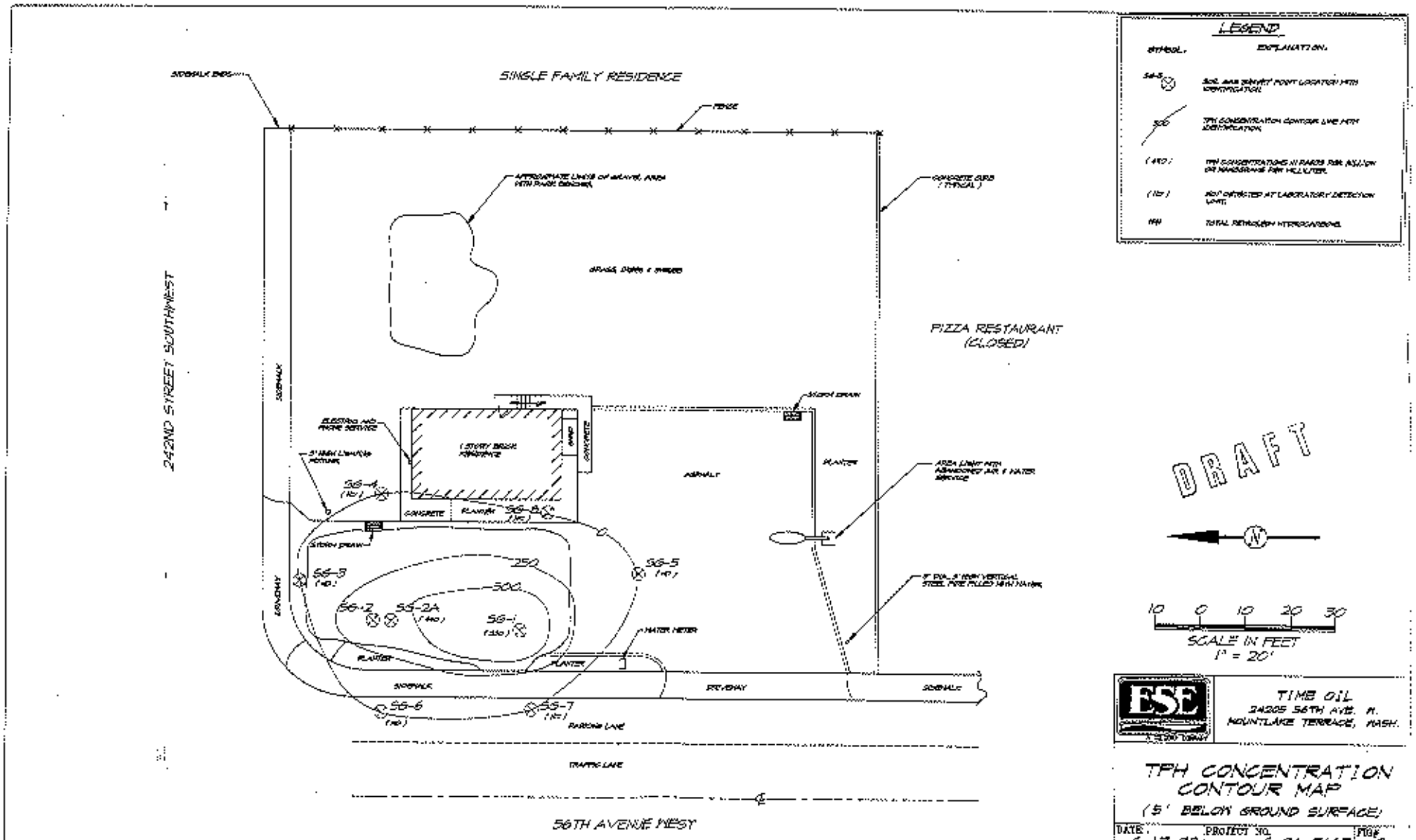
0 2400 Feet

ESE
A GILCORP COMPANY

TIME OIL COMPANY
24205 56TH AVE N.
MOUNTLAKE TERRACE, WASH.

LOCATION MAP

DATE:	PROJECT NO.	FIG#
4-13-92	6-92-7167	1
SCALE:	DWG NO.:	SIZE:
1"=2400'	TOCO9A--	A
DRAWN BY:	APPROVED BY:	REV:
M. ARMSTRONG	M. MEYER	-



LEGEND

SYMBOL	EXPLANATION
SS-5 ⊗	SOIL BORING (GRAB) POINT LOCATION WITH IDENTIFICATION
500	TPH CONCENTRATION CONTOUR LINE WITH IDENTIFICATION
(440)	TPH CONCENTRATIONS IN PARTS PER MILLION OR MILLIGRAMS PER KILOGRAM
(ND)	NOT DETECTED AT LABORATORY DETECTION LIMIT
TPH	TOTAL PETROLEUM HYDROCARBONS

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N

10 0 10 20 30

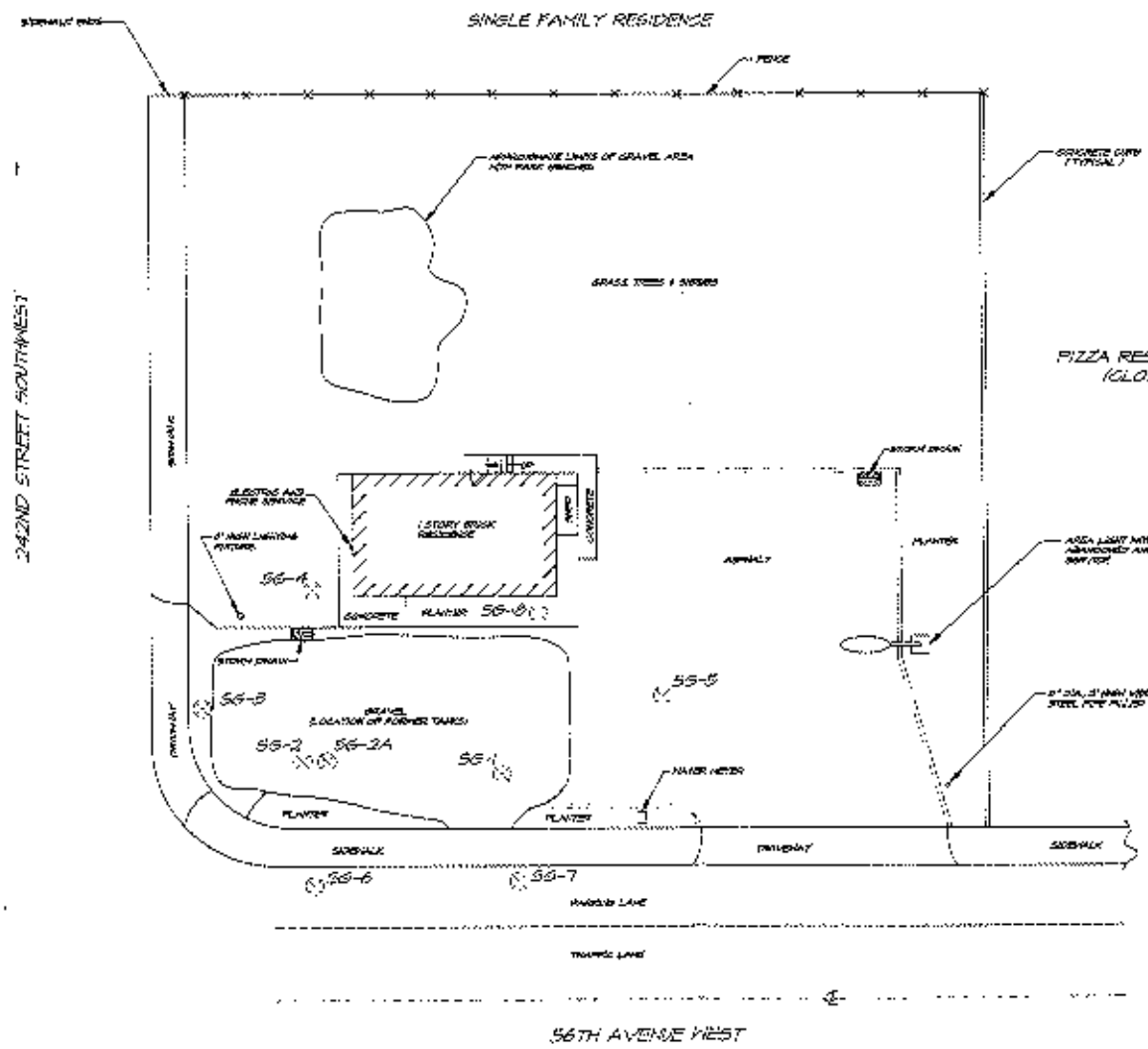
SCALE IN FEET
1" = 20'

ESE

TIME OIL
24205 56TH AVE. N.
MOUNTLAKE TERRACE, WASH.

TPH CONCENTRATION CONTOUR MAP
(5' BELOW GROUND SURFACE)

DATE: 6-17-92	PROJECT NO. 6-91-767	FIG. 3
SCALE: 1"=20'	DWG NO.: TOCONTPH	SIZE: B
DRAWN BY: M. ARMSTRONG	APPROVED BY: M. MEYER	REV.



LEGEND

SYMBOL	EXPLANATION
SS-1	SOIL AND GROUND POINT LOCATION AND DESIGNATION

DRAFT

N

10 0 10 20 30

SCALE IN FEET
1" = 20'

ESE

TIME OIL
20808 56TH AVE. W.
MOUNTLAKE TERRACE, WASH.

SITE MAP

DATE 2-17-92	PROJECT NO. 6-91-7167	FIG. 2
SCALE 1"=20'	DWG NO. 7167SM	SIZE B
DRAWN BY M. ARMSTRONG	APPROVED BY M. MEYER	REV