BLYMYER
ENGINEERS, INC.

April 29, 1994
BEI Job No. 94015

Mr. Sam Kawahara
Kawahara Nursery
16550 Ashland Avenue
San Lorenzo, CA 94508

Subject: Subsurface Investigation Status Report
Kawahara Nursery
16550 Ashland Avenue
San Lorenzo, California

Dear Mr. Kawahara:

Blymyer Engineers, Inc., on behalf of Kawahara Nursery, is pleased to present this letter status report for the subsurface investigation at the above referenced site. The investigation and results summarized in this letter were performed in accordance with Blymyer Engineers' *Subsurface Investigation Letter Revised Workplan*, dated March 10, 1994 (Appendix A). The subsurface investigation is being conducted in phases to determine the source and extent of the petroleum hydrocarbon contamination detected in groundwater samples collected from the site. The phase of the investigation detailed in this status report was conducted to determine the source of the petroleum hydrocarbons and the construction of the deep on-site irrigation well and its influence on the local shallow groundwater.

Background

On December 1, 1992, one steel 5,000-gallon diesel underground storage tank (UST) was removed from the property owned by Kawahara Nursery, located at 16550 Ashland Avenue, San Lorenzo, California (Figure 1), by Tank Protect Engineering of Northern California. Ms. Pamela Evans of the Alameda County Health Care Services Agency (ACHCSA) reported that the UST appeared to be in good condition with no visible evidence of holes at the time of removal. The excavated soil was stockpiled at the site in two distinct piles and a composite soil sample was collected from each pile. Verification soil samples were collected from the southeastern wall, beneath the former UST fill port, and the southwestern wall of the excavation. No water was observed in the excavation during the removal of the UST.

The analytical results of the soil samples collected from the UST excavation indicated detectable concentrations of Total Petroleum Hydrocarbons (TPH) as diesel. The results of the UST closure were described in the *Underground Storage Tank Closure Report*, completed by Tank Protect

(510)521-3773 • 1829 Clement Avenue, Alameda, California 94501-1395 • FAX (510)865-2594

Engineering, dated December 12, 1993.

Following a review of the UST closure assessment results, the ACHCSA, in a letter dated January 27, 1993, requested that a preliminary site assessment be completed to ascertain the extent of soil and groundwater petroleum hydrocarbon contamination at the site.

On June 10, 1993, Blymyer Engineers supervised the installation of three groundwater monitoring wells (MW-1, MW-2, and MW-3) at the site to a depth to 20 feet below grade surface (bgs) (Figure 2). Minor concentrations of petroleum hydrocarbons were detected in the soil samples collected during the installation of monitoring wells MW-2 and MW-3. The groundwater sample collected from monitoring well MW-3, installed in the vicinity of an on-site irrigation well, contained 120,000 micrograms per liter (µg/L) of TPH as gasoline, 170,000 µg/L of TPH as diesel, 4,600 µg/L of benzene, 8,400 µg/L of toluene, 2,100 µg/L of ethylbenzene, and 27,000 µg/L of total xylenes.

Blymyer Engineers also collected four discrete soil samples from the stockpiled soil removed from the southeastern portion of the excavation and composited them into one sample. The results of the analysis of the composite soil sample did not indicate detectable concentrations of TPH as diesel. Following the approval of the ACHCSA the stockpiled soil was place back into the excavation.

The soil removed from the northwestern portion of the excavation is presently stockpiled in a covered shed area at the site.

Scope of Work

In accordance with Blymyer Engineers' *Subsurface Investigation Letter Revised Workplan*, a phased investigation was performed to provide additional groundwater information necessary to reveal potential sources for the petroleum hydrocarbons detected in the groundwater at the site and to design a more detailed subsurface investigation. The scope of work for this phase of the investigation included the following actions:

- Review of available records at the ACHCSA pertaining to the site and surrounding properties to ascertain the presence of USTs and reported petroleum hydrocarbon releases or spills that may have impacted the site

- Review of historical aerial photographs of the site and vicinity to determine former land uses and possible petroleum hydrocarbon sources

- Review of the Water Well Drillers Report for the irrigation well located on the property
- Preparation of a health and safety plan prior to the implementation of investigative activities at the site
- Collection of depth-to-water measurements from the existing monitoring wells before and after disengagement of the irrigation well pump to estimate the radius of influence of the irrigation well pump
- Collection of groundwater samples from the previously installed monitoring wells and irrigation well
- Collection of one discrete soil sample from the stockpiled soil stored in the storage shed at the site
- Preparation of a letter report

Regulatory and Document Review

Records at the ACHCSA and the Regional Water Quality Control Board were reviewed to determine if any toxic chemical or fuel leaks reported within a ¼-mile radius may have impacted the site.

The records search indicated that the Organizational Maintenance Shop No. 35 (National Guard), located at 16501 Ashland Avenue, approximately 300 feet northwest of the Kawahara Nursery property, has reported an unauthorized petroleum hydrocarbon release to the ACHCSA. The National Guard reported petroleum hydrocarbon contamination in the soil and groundwater at the site following the removal of two 2,000-gallon gasoline USTs in April 1993. The Subsurface Investigation report, completed by Tetra Tech, Inc. and dated August 1993, documented that free phase petroleum hydrocarbons were observed in a monitoring well installed downgradient of the UST excavation. According to Tetra Tech's report, the extent of the petroleum hydrocarbon contamination in the soil and groundwater at the site has not yet been defined in both the upgradient and downgradient direction of the former USTs. Groundwater was reported to flow to the north at an average gradient of .004 feet/foot. The petroleum hydrocarbon release at this site is not expected to impact the subject property.

Historical aerial photographs were reviewed at Pacific Aerial Survey to determine past uses of the site and vicinity and possible petroleum hydrocarbon sources. Aerial photographs from 1947 to the present, at approximately 5-year intervals, were reviewed. The National Guard, located

at 16501 Ashland Avenue, and what appeared to be a nursery on the subject property were first apparent on the 1953 aerial. No other potential petroleum hydrocarbon sources were apparent in the vicinity of the site in the aerial photographs.

Irrigation Well Information and Depth to Groundwater Measurements

A copy of the Water Well Drillers Report for the existing irrigation well was obtained from the California Department of Water Resources (Appendix B). The irrigation well was installed in June 1988 to a total depth of 65 feet bgs. The well was constructed of 8-inch-diameter PVC with .032-inch factory screened PVC from 45 to 65 feet bgs.

On March 24, 1994, the depth to groundwater was measured in each of the previously installed monitoring wells. The irrigation well pump was disengaged on March 26, 1994. Depth to groundwater measured in each of the monitoring wells was measured again on March 28, 1994, approximately 48 hours after the disengagement of the irrigation well pump. Following the disengagement of the irrigation well pump, the groundwater elevation decreased less than 0.2 inch in each of the monitoring wells. The groundwater elevation measurements are presented in Table I. The direction of groundwater flow was to the northwest during both measuring events (Figures 3 and 4).

Collection and Analysis of Groundwater Samples

On March 28, 1994, the depth to groundwater was measured in each of the wells. Each well was then purged of approximately three well volumes of water, and the temperature, conductivity, and pH of the water were monitored to insure that these parameters were each within 15 percent of the previous measurement prior to sampling. A groundwater sample was then collected from each monitoring well using a clean Teflon® bailer. The Well Purging and Sampling Data Sheets are presented as Appendix C. All purge water was stored on site in Department of Transportation-approved, 55-gallon drums for disposal by the owner.

The irrigation well pump was reactivated and allowed to operate for approximately one hour. A water sample was then collected from the outlet line connected to the bottom of the irrigation well.

In accordance with the *Subsurface Investigation Letter Revised Workplan*, the groundwater samples were analyzed for TPH as diesel and TPH as gasoline by modified EPA Method 8015, and benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8020 by Sequoia Analytical Laboratory, a California-certified laboratory.

The analytical results of the groundwater samples collected from monitoring wells MW-1 and MW-2 did not indicate concentrations of TPH as diesel, TPH as gasoline, or BTEX above the analytical method reporting limits. The analytical results of the groundwater sample collected from monitoring well MW-3 indicated 23,000 µg/L of TPH as diesel, 94,000 µg/L of TPH as gasoline, 4,800 µg/L of benzene, 6,500 µg/L of toluene, 3,000 µg/L of ethylbenzene, and 15,000 µg/L of total xylenes. According to the laboratory report, the TPH as diesel detected in the groundwater sample collected from well MW-3 displayed a chromatograph pattern consisting of shorter chain hydrocarbons, which is more indicative of gasoline. The chromatograph patterns for TPH as gasoline and TPH as diesel slightly overlap and if these parameters are present in a weathered or otherwise altered state they can often mask each other.

The analytical results of the water sample collected from the irrigation well (WW-1) did not indicate concentrations of TPH as diesel, TPH as gasoline, or BTEX above the analytical method reporting limits. The groundwater analytical results are summarized in Table II. The laboratory analytical report is presented as Appendix D.

Collection and Analysis of Soil Sample

On March 28, 1994, one discrete soil sample (SP-1) was collected from the soil stockpile located in the storage shed at the site. The soil sample was collected by driving a 6-inch-long brass sampling sleeve into the approximate center of the soil pile. The soil sample was prepared for shipment by placing a Teflon® film over each end of the brass sleeve and sealing the ends with plastic end caps and silicone adhesiveless tape.

In accordance with the *Subsurface Investigation Letter Revised Workplan* submitted by Blymyer Engineers, the soil sample was analyzed for TPH as diesel and TPH as gasoline by modified EPA Method 8015 and BTEX by EPA Method 8020 by Sequoia Analytical Laboratory, a California-certified laboratory.

The analytical results of the collected soil sample indicated 51 milligram per kilogram (mg/kg) of TPH as diesel. However, the reported chromatograph pattern for the sample indicated a non-diesel range hydrocarbon chain. The soil sample did not contain concentrations of TPH as gasoline or BTEX above the respective method detection limits. The soil sample analytical results are presented in Table III. The laboratory results are presented as Appendix E.

? Non-diesel range $C_{16}-C_{22}$

Conclusions

The following conclusions were reached from the information obtained during this phase of the site investigation:

- The pump in the on-site irrigation well does not influence the shallow groundwater at the site.
- The shallow groundwater in the vicinity of the irrigation well is impacted by petroleum hydrocarbons.
- The National Guard facility located approximately 300 feet downgradient of the site has reported an unauthorized release of gasoline into the groundwater.
- Concentrations of petroleum hydrocarbons are present in the soil presently stockpiled at the site.

Recommended Additional Scope of Work

Based on the aforementioned investigative conclusions, Blymyer Engineers proposes the following scope of work to determine the source and extent of the petroleum hydrocarbon contamination at the site:

- Perform a soil gas survey at the site with sampling points positioned in the locations indicated on Figure 5 in an attempt to assess the source of the petroleum hydrocarbon contamination and determine the location of future monitoring wells.
- Install up to three on- and off-site groundwater monitoring wells to define the upgradient and downgradient extent of the petroleum hydrocarbon contamination.

Limitations

Services performed by Blymyer Engineers, Inc. have been provided in accordance with generally accepted professional practices for the nature and conditions of similar work completed in the same or similar localities prescribed by the client. The scope of work for the project was conducted within the limitations prescribed by the client. This report is not meant to represent a legal opinion. No other warranty, expressed or implied, is made. This report was prepared for the sole use of Kawahara Nursery.

Should you have any questions or desire further information, please do not hesitate to contact Laurie Buckman at Blymyer Engineers.

Very truly yours,

Blymyer Engineers, Inc.

By: _____
Laurie Buckman
Project Geologist

And: _____
John Morrison; RG 5773
Director, Earth Sciences

Attachments:

Attachment A:	Subsurface Investigation Letter Workplan, March 10, 1994, Blymyer Engineers, Inc.
Attachment B:	California Department of Water Resources Water Well Drillers Report, No. 271572,
Attachment C:	Well Purging and Sampling Data sheets, March 28, 1994
Attachment D:	Sequoia Analytical laboratory analytical results, dated April 13, 1993

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Table I, Groundwater Elevation Measurements BEI Job No. 94015, Kawahara Nursery, Inc. 16550 Ashland Avenue, San Lorenzo, CA				
Sample ID	Date	TOC Elevation (feet)	Depth to Water (feet)	Water Surface Elevation (feet)
MW-1	6/16/93	100	10.7	89.30
	3/24/94	100	11.11	88.89
	3/28/94	100	11.26	88.74
MW-2	6/16/93	99.27	10.24	89.03
	3/24/94	99.27	10.65	88.62
	3/28/94	99.27	10.79	88.48
MW-3	6/16/93	99.52	10.46	89.06
	3/24/94	99.52	10.81	88.71
	3/28/94	99.52	10.96	88.56

Notes:

TOC = Top of casing

Table II, Groundwater Sample Analytical Results
BEI Job No. 94015, Kawahara Nursery
16550 Ashland Avenue, San Lorenzo, California

Sample ID	TPH as diesel Modified EPA Method 8015 (µg/L)	TPH as gasoline Modified EPA Method 8015 (µg/L)	EPA Method 8020 (µg/L)			
			Benzene	Toluene	Ethyl-benzene	Total Xylenes
MW-1	<50	<50	<0.50	<0.50	<0.50	<0.50
MW-2	<50	<50	<0.50	<0.50	<0.50	<0.50
MW-3	**23,000 ***	**94,000**	**4,800**	**6,500**	**3,000**	**15,000**
SW-1	<50	<50	<0.50	<0.50	<0.50	<0.50

Notes:

<x	=	less than the analytical reporting limit (x)
TPH	=	Total Petroleum Hydrocarbons
EPA	=	Environmental Protection Agency
µg/L	=	micrograms per Liter
*	=	laboratory results indicated a non-diesel mix <C16

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Table III, Stockpile Soil Sample Analytical Results
BEI Job No. 94015, Kawahara Nursery
16550 Ashland Avenue, San Lorenzo, California

Sample ID	TPH as diesel Modified EPA Method 8015 (mg/kg)	TPH as gasoline Modified EPA Method 8015 (mg/kg)	EPA Method 8020 (mg/kg)			
			Benzene	Toluene	Ethyl-benzene	Total Xylenes
SP-1	**51***	<1.0	<0.0050	<0.0050	<0.0050	<0.0050

Notes:

<x	=	less than the analytical reporting limit (x)
TPH	=	Total Petroleum Hydrocarbons
EPA	=	Environmental Protection Agency
mg/kg	=	milligrams per kilogram
*	=	laboratory results indicated non-diesel mix C16-C20

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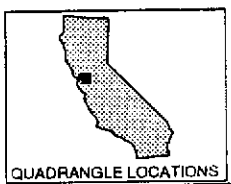
SOURCE: UNITED STATES GEOGRAPHICAL SURVEY 7.5' QUAD. 'SAN LEANDRO, CA ' AND 'HAYWARD, CA' BOTH PHOTOREVISED 1980.



BLYMYER ENGINEERS, INC.

BEI JOB NO. 93071

DATE 4/93

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SCALE IN FEET

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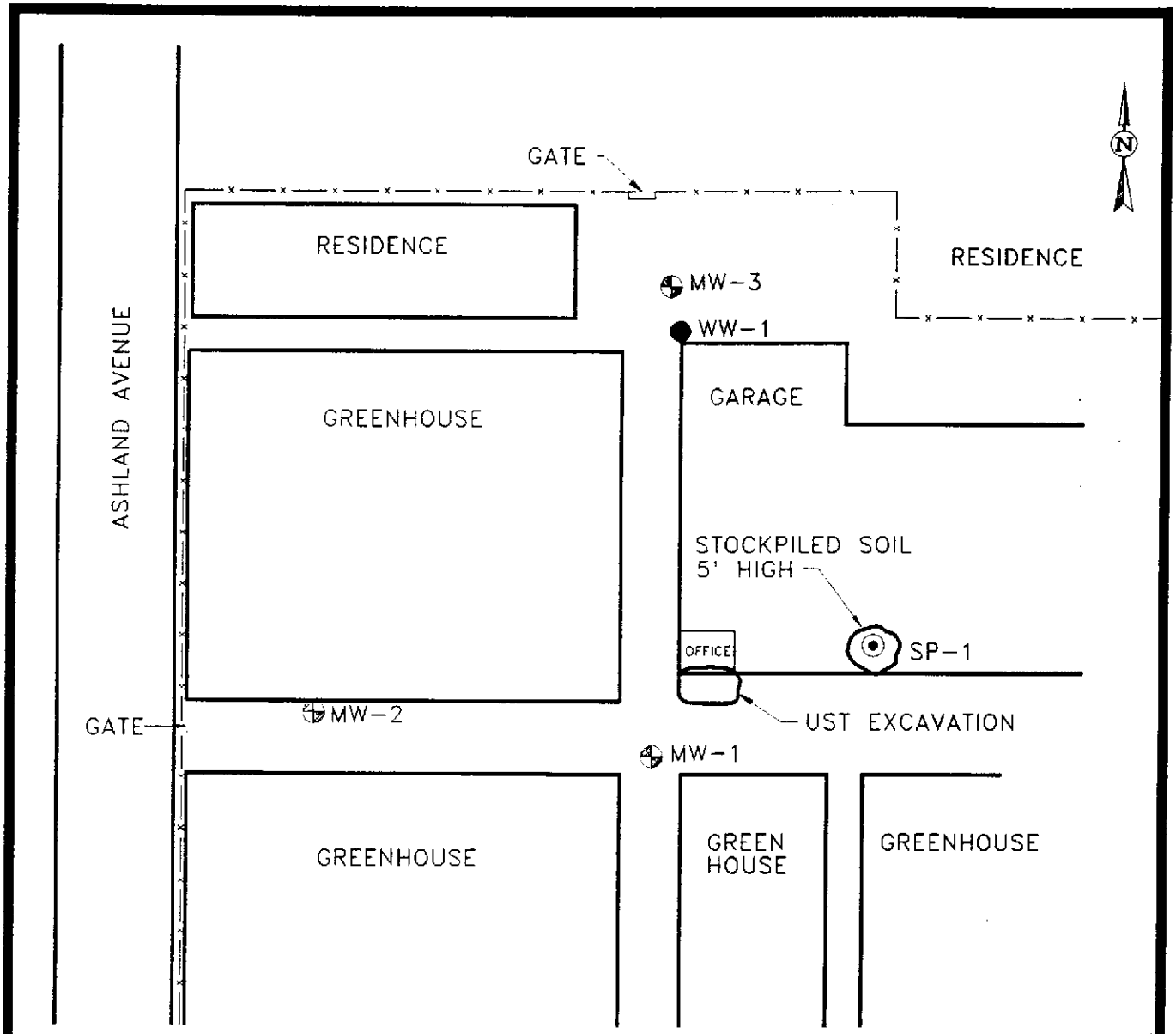
SITE LOCATION MAP

KAWAHARA NURSERY
16550 ASHLAND AVE.
SAN LORENZO, CA

FIGURE 1



BLYMER ENGINEERS, INC. (BEI)	LEGEND	SITE PLAN	FIGURE
BEI JOB NO. 94015 / DATE 4/29/94	⊕ = MONITORING WELL ⊙ = SOIL SAMPLE LOCATION ● = WATER WELL UST = UNDERGROUND STORAGE TANK	KAWAHARA NURSERY 16550 ASHLAND AVE. SAN LORENZO, CA	2

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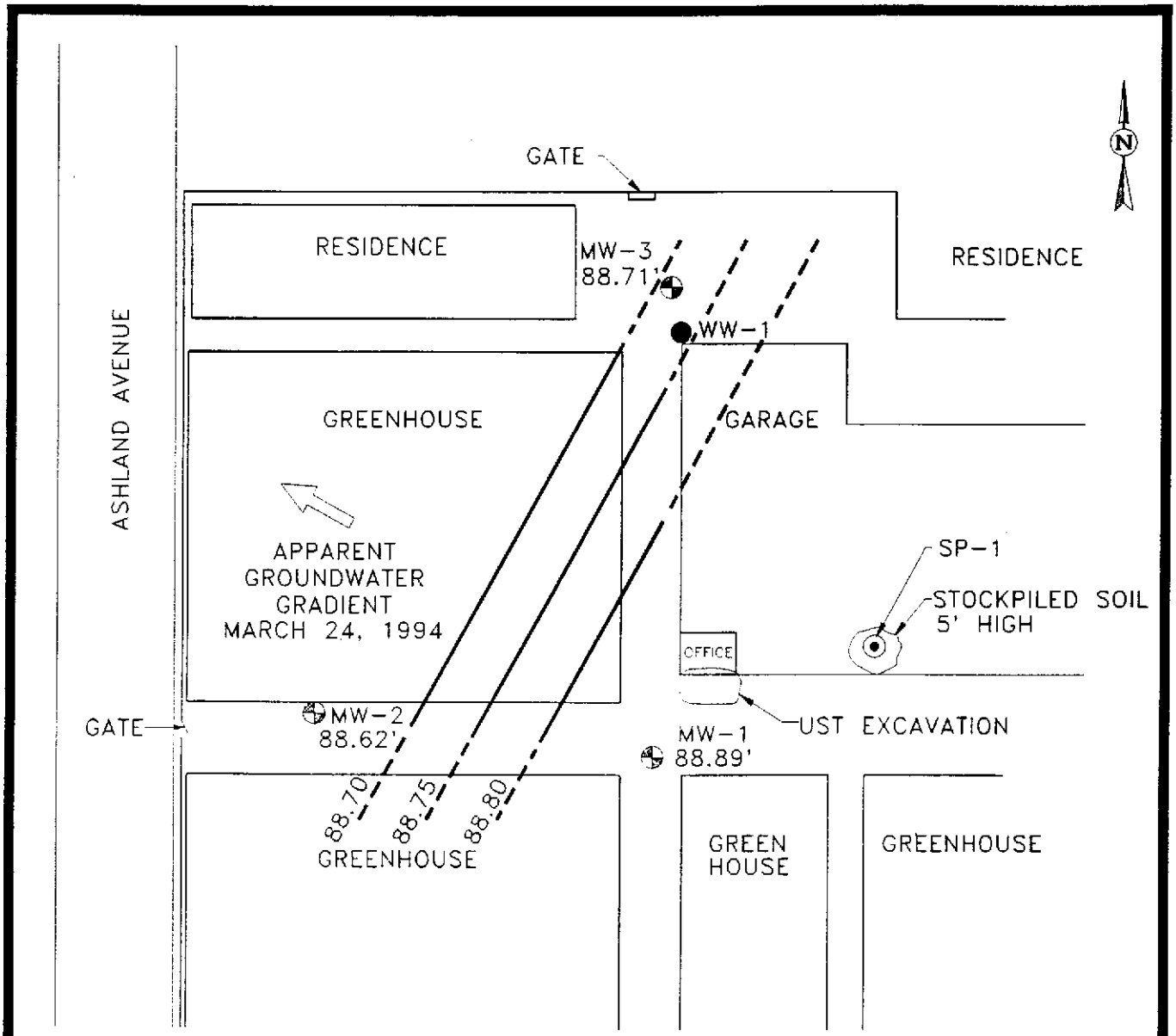

BLYMYER ENGINEERS, INC. (BEI)	LEGEND	GROUNDWATER GRADIENT MAP MARCH 24, 1994	FIGURE
BEI JOB NO. 94015 / DATE 4/27/94	= MONITORING WELL = SOIL SAMPLE LOCATION = WATER WELL 88.89' = GROUNDWATER ELEVATION = GROUNDWATER CONTOUR UST = UNDERGROUND STORAGE TANK	KAWAHARA NURSERY 16550 ASHLAND AVE. SAN LORENZO, CA	3

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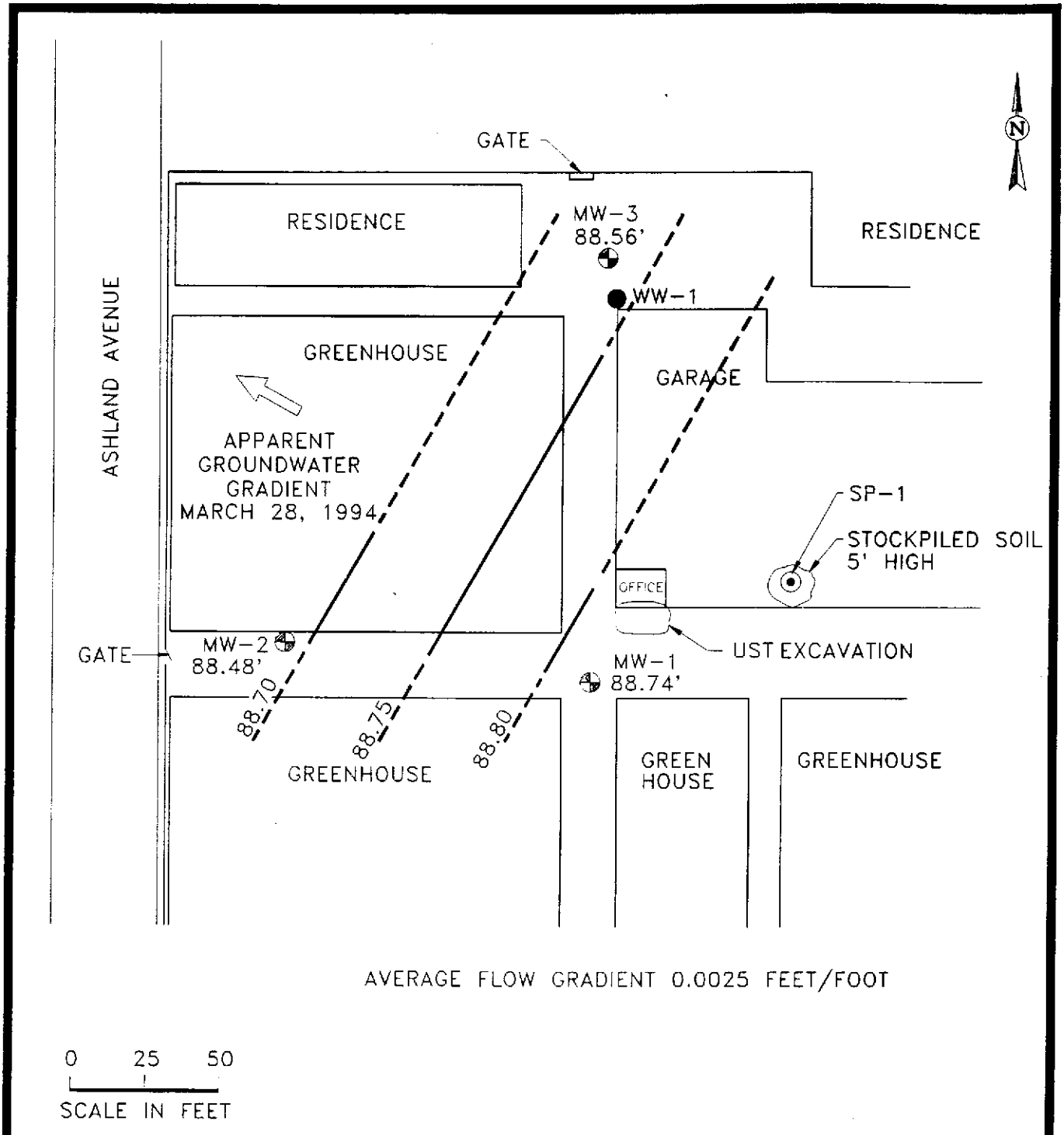

BLYMYER ENGINEERS, INC. (BEI)	LEGEND = MONITORING WELL = SOIL SAMPLE LOCATION = WATER WELL 88.74' = GROUNDWATER ELEVATION = GROUNDWATER CONTOUR UST = UNDERGROUND STORAGE TANK	GROUNDWATER GRADIENT MAP MARCH 28, 1994 KAWAHARA NURSERY 16550 ASHLAND AVE. SAN LORENZO, CA	FIGURE 4	
BEI JOB NO. 94015	DATE 4/27/94			

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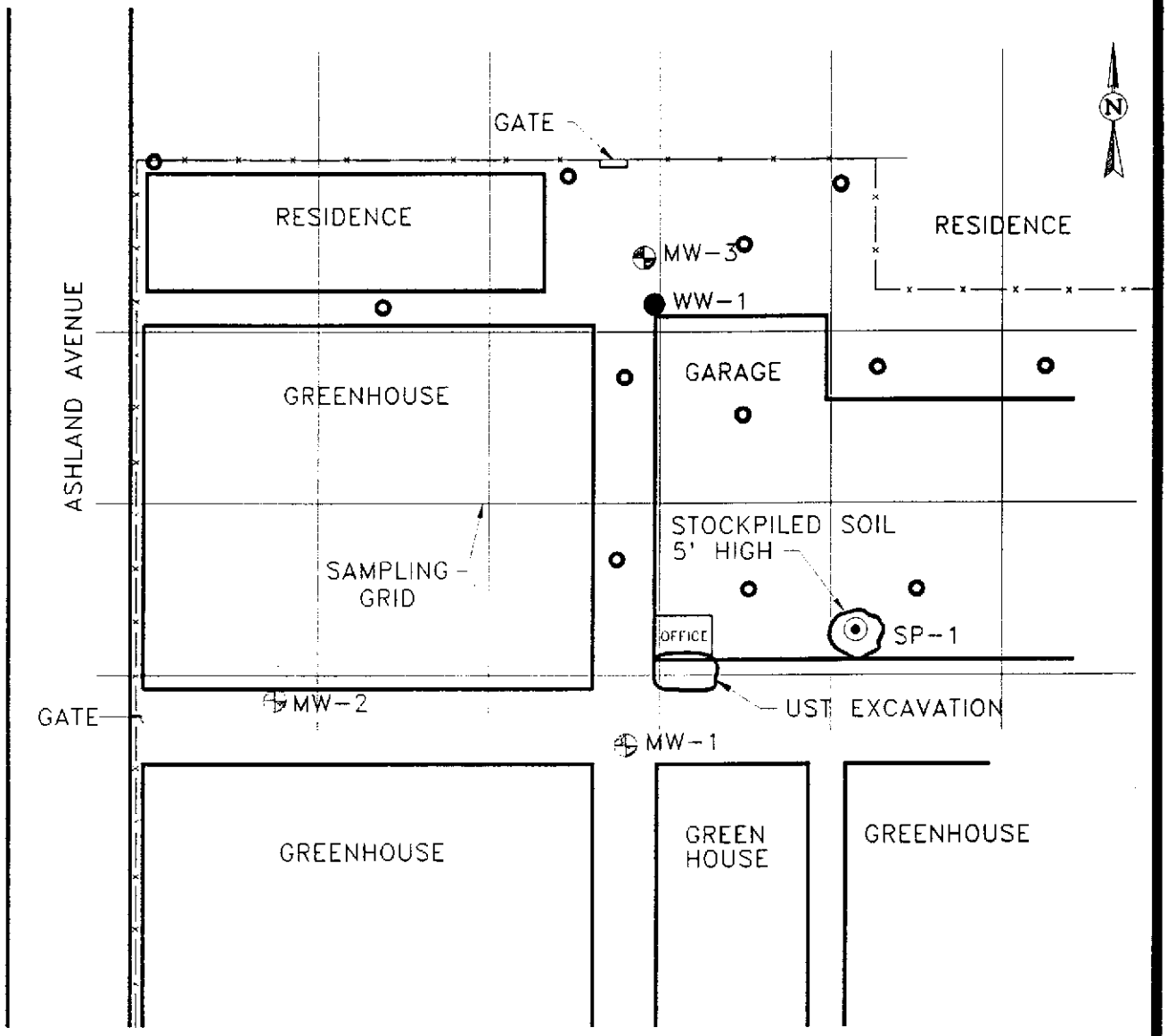

BLYMER ENGINEERS, INC. (BEI)	LEGEND	SOIL GAS SAMPLE LOCATION MAP	FIGURE
BEI JOB NO. 94015 / DATE 4/29/94	= MONITORING WELL = SOIL SAMPLE LOCATION = WATER WELL = PROPOSED SOIL GAS SAMPLE LOCATION	KAWAHARA NURSERY 16550 ASHLAND AVE. SAN LORENZO, CA	5

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BLYMYER
ENGINEERS, INC.

March 10, 1994
BEI Job No. 94015

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

Subject: Subsurface Investigation Letter Revised Workplan
Kawahara Nursery
16550 Ashland Avenue
San Lorenzo, CA

Dear Ms. Shin:

Blymyer Engineers, Inc., on behalf of Kawahara Nursery, is pleased to present this letter workplan to help assess the extent of petroleum hydrocarbon contamination in soil and groundwater at the above referenced site. Petroleum hydrocarbon contamination was discovered in the soil and groundwater at the site following the removal of a gasoline/diesel fuel underground storage tank (UST). The proposed investigation addresses the concerns presented by the Alameda County Health Care Services Agency in a letter to Mr. Sam Kawahara, dated August 27, 1993 and following a review of the *Preliminary Site Assessment Phase I Subsurface Investigation* report, dated July 28, 1993, completed by Blymyer Engineers.

Background

On December 1, 1992, one steel 5,000-gallon diesel underground storage tank (UST) was removed from the property owned by Kawahara Nursery, located at 16550 Ashland Avenue, San Lorenzo, California, by tank Protect Engineering of Northern California. Ms. Pamela Evans of the Alameda County Health Care Services Agency (ACHCSA) was on site during the excavation of the UST. Ms. Evans indicated on the *Hazardous Materials Inspection Form* for the site that the UST appeared to be in good condition with no visible evidence of holes at the time of removal. The Excavated soil was stockpiled at the site in two distinct piles and a composite soil sample was collected from each pile. Verification soil samples were collected from the southeastern wall beneath the former UST fill port (sample identification: SE) and the southwestern wall (sample identification: SW) of the excavation. No water was observed in the excavation during the removal of the UST.

The soil samples were analyzed by Trace Analysis Laboratory, Inc., a California-certified laboratory, for Total Petroleum Hydrocarbons (TPH) as diesel. Soil sample SE, collected from the southeastern wall of the excavation, contained 5,000 milligrams per kilogram (mg/kg) TPH

as diesel. The composite soil sample SP-1 collected from the soil excavated from the southeastern portion of the excavation contained 210 mg/kg TPH as diesel.

The results of the UST closure were described in the *Underground Storage Tank Closure Report*, completed by Tank Protect Engineering. It is our understanding that a copy of this report was forwarded to the ACHCSA by Mr. Tom Kawahara. Following a review of the UST closure assessment results, the ACHCSA, in a letter dated January 27, 1993, requested that a Preliminary subsurface Investigation by completed at the site to ascertain the extent of soil and groundwater petroleum hydrocarbon contamination.

On June 10, 1993, Blymyer Engineers supervised the installation of three groundwater monitoring wells (MW-1, MW-2, and MW-3) at the site in the locations depicted on the enclosed Site Plan. Minor concentrations of petroleum hydrocarbons (1.9 ppm TPH as diesel in MW-2 at 5 feet bgs and 6.6 ppm BTEX in MW-3 at 15 feet bgs) were detected in the soil samples collected during the installation of soil bores. The groundwater sample collected from monitoring well MW-3, installed adjacent to an on-site groundwater well contained 120,000 micrograms per liter (µg/L) of TPH as gasoline, 170,000 µg/L of ethylbenzene, and 27,000 µg/L of total xylenes.

Blymyer Engineers also collected four discrete soil samples from the stockpile soil removed from the southeastern portion of the excavation and composited them into one sample. The results of the analysis of the composite soil sample did not indicate detectable concentrations of TPH as diesel.

Scope of Work

Blymyer Engineers recommends a phased approach to the groundwater investigation at the site. Following the completion of each phase, a more accurate assessment of additional investigative activities such as the necessity and placement of additional on and off site monitoring well can be evaluated.

The following proposed scope of work constitutes the initial phase of the investigation. This scope of work will provide the groundwater information necessary for the possible design of a more detailed subsurface investigation at the site. This scope of work will also provide information on the surrounding properties and, therefore, reveal possible off-site sources for the petroleum hydrocarbons detected in monitoring well MW-3.

1.0 Conduct an agency record search

- Available records pertaining to the site and vicinity will be reviewed to ascertain the presence of underground storage tanks (USTs) and reported leaking USTs or spills at or near the site that may have impacted the site. Historical aerial photographs of the site and vicinity will also be reviewed to determine the former uses of the site and vicinity and possible petroleum hydrocarbon sources.

2.0 Research well construction information

- Available information regarding the construction and pumping rates and history of pumping of the on-site irrigation well will be located and reviewed to determine the radius of influence of the well on the local groundwater flow, and to insure that the well construction does not allow the well to act as a conduit for the migration of petroleum hydrocarbons. The radius of influence of the irrigation well pump will be estimated by collecting depth to groundwater measurements in the on-site monitoring wells prior to the disengagement of the pump and then collecting additional depth to water measurements after the pump has been disengaged for at least 24 hours. This procedure will help determine the influence of pumping on the groundwater flow direction and gradient at the site.

3.0 Prepare a site-specific health and safety plan

- A site-specific health and safety plan will be prepared by Blymyer Engineers prior to the implementation of investigative activities at the site. The plan will address personnel and their responsibilities relative to health and safety, chemical and physical hazards, risk evaluation and management, personal protective equipment, and emergency procedures.

4.0 Disengage the on-site water well pump

- The on-site irrigation water well pump will be disengaged for approximately 48 hours prior to sampling of the wells.

5.0 Collect groundwater samples

- A groundwater sample will be collected from the irrigation water well prior to disengaging the pump. After the water well pump has been disengaged for at least 48 hours, the water level in each of the three site monitoring wells will be measured to determine the natural groundwater flow direction and gradient. A groundwater sample will be collected from each of the three monitoring wells.

At least three well casing volumes will be removed from each well prior to sampling. The physiological parameters of temperature, pH, and conductivity will be measured from each well initially and after the removal of each well volume. Each well will be sampled when these measurements are all within 15% of each other for three consecutive well volumes. The groundwater samples will be collected using a Teflon® bailer and placed in 40 ml septum sealed vials and 1 liter amber glass jars. The groundwater samples will be placed on ice and shipped to a California-certified laboratory for analysis of Total Petroleum Hydrocarbons (TPH) as diesel and TPH as gasoline by modified EPA Method 8015 and benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8020. A duplicate sample will be collected and submitted as a quality assurance/quality control check.

6.0 Collect samples from the stockpiled soil

- One discrete soil sample will be collected from soil stockpile SP-1 presently stored in the storage shed at the site. The soil sample will be collected by driving a 6-inch long brass sampling sleeve into the approximate center of the soil pile. The sample will be prepared for shipment by placing a Teflon® film over each end of the brass sleeve and sealing the ends with plastic end caps and silicon adhesiveless tape. The soil sample will be placed on ice for shipment to Sequoia Analytical Laboratory, a California-certified laboratory, for analysis of TPH as gasoline and TPH as diesel by modified EPA Method 8015 and benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8020.

7.0 Prepare a letter report

- A letter report will be prepared for submission to the ACHCSA which will document all work performed, including summaries of the data, with conclusion and recommendations for further work.

Proposed Work Schedule

Following the completion of the proposed scope of work the information obtained will be evaluated and a determination of the necessity, and placement, of additional monitoring wells will be made. If additional investigative work is deemed necessary at the site, a second workplan will be prepared and submitted to the ACHCSA for approval within 45 days of the completion of the initial investigation. The installation of additional monitoring wells deemed necessary to fully delineate and characterize the petroleum-hydrocarbon-contaminated groundwater at the site will be completed within 30 days of the ACHCSA's approval of the submitted workplan.

Please call Laurie Buckman at (510) 521-3773 with any questions or comments regarding this project.

Sincerely,

Blymyer Engineers, Inc.

By: _____
Laurie A. Buckman
Project Geologist

And: _____
Mark Determan, C.E.G. 1788
Senior Geologist

Enclosure

cc: Mr. Sam Kawahara, Kawahara Nursery

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CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

Well Purging and Sampling Data

Date	3/28/94	Project Number	94015	Project Name	Kawahara
Well Number	MW-1	Boring Diameter	N/A	Casing Diameter	2"

Column of Liquid in Well		Volume to be Removed	
Depth to product	N/A	Gallons per foot of casing	= 0.17 gal/ft.
Depth to water	11.26 ft.	Column of water	x 8.24 ft.
Total depth of well	19.50 ft.	Volume of casing	= 1.4 gal.
Column of water	8.24 ft.	No. of volumes to remove	x 3
		Total volume to remove	= 4.2 gal.

Method of measuring liquid	Oil/water interface probe
Method of purging well	Disposable poly bailer
Method of decontamination	Liqui-nox and distilled water

Physical appearance of water (clarity, color, particulates, odor)	
Initial	Clear, no odor
During	Very silty, brown color, no odor
Final	Very silty, brown color, no odor

Field Analysis	Initial	During		Final
Time	09:20	09:25	09:30	09:35
Temperature (F)	62.5	62.5	62.4	62.5
Conductivity (us/cm)	1180	1160	1150	1170
pH	6.19	5.84	5.70	5.68
Method of measurement	Hydac meter			
Total volume purged	4.5 gal.			
Comments				

Sample Number	Amount of Sample
MW-1	3-40ml VOA w/ HCl
	2-1l amber bottles

Signed/Sampler	Steph W. Moore	Date	3/28/94
Signed/Reviewer	[illegible]	Date	4/27/94

Well Purging and Sampling Data

Date	3/28/94	Project Number	94015	Project Name	Kawahara
Well Number	MW-2	Boring Diameter	N/A	Casing Diameter	2"

Column of Liquid in Well		Volume to be Removed	
Depth to product	N/A	Gallons per foot of casing	= 0.17 gal/ft.
Depth to water	10.79 ft.	Column of water	x 8.54 ft.
Total depth of well	19.33 ft.	Volume of casing	= 1.5 gal.
Column of water	8.54 ft.	No. of volumes to remove	x 3
		Total volume to remove	= 4.5 gal.

Method of measuring liquid	Oil/water interface probe
Method of purging well	Disposable poly bailer
Method of decontamination	Liqui-nox and distilled water

Physical appearance of water (clarity, color, particulates, odor)	
Initial	Clear, no odor
During	Very silty, brown color, no odor
Final	Very silty, brown color, no odor

Field Analysis	Initial	During		Final
Time	10:20	10:25	10:30	10:40
Temperature (F)	64.1	63.5	64.4	64.2
Conductivity (us/cm)	1100	1110	1150	1160
pH	5.96	5.79	5.71	5.70
Method of measurement	Hydac meter			
Total volume purged	4.5 gal			
Comments				

Sample Number	Amount of Sample
MW-2	3-40ml VOA w/ HCl
	2-1l amber bottles

Signed/Sampler	Stephen W. Hill	Date	3/28/94
Signed/Reviewer	[illegible]	Date	4/27/94

Well Purging and Sampling Data

Date	3/28/94	Project Number	94015	Project Name	Kawahara
Well Number	MW-3	Boring Diameter	N/A	Casing Diameter	2"

Column of Liquid in Well		Volume to be Removed	
Depth to product	N/A	Gallons per foot of casing	= 0.17 gal/ft.
Depth to water	10.96 ft.	Column of water	x 8.29 ft.
Total depth of well	19.25 ft.	Volume of casing	= 1.4 gal.
Column of water	8.29 ft.	No. of volumes to remove	x 3
		Total volume to remove	= 4.2 gal.

Method of measuring liquid	Oil/water interface probe
Method of purging well	Disposable poly bailer
Method of decontamination	Liqui-nox and distilled water

Physical appearance of water (clarity, color, particulates, odor)	
Initial	Clear, strong gasoline odor, heavy sheen in purge bucket
During	Very silty, dark gray color, strong gas odor, heavy sheen in purge bucket
Final	Very silty, dark gray color, strong gas odor, heavy sheen in purge bucket

Field Analysis	Initial	During		Final
Time	11:35	11:40	11:45	11:55
Temperature (F)	65.2	64.6	64.7	64.6
Conductivity (us/cm)	1470	1430	1370	1330
pH	5.63	5.40	5.36	5.31
Method of measurement	Hydac meter			
Total volume purged	6.0 gal.			
Comments	Strong gasoline odor, heavy sheen in purge bucket			

Sample Number	Amount of Sample
MW-3	3-40 ml VOA w/ HCl
	2-1l amber bottles

Signed/Sampler	Stephen W. Hill/Lowe	Date	3/28/94
Signed/Reviewer	[illegible]	Date	4/27/94

Sequoia Analytical

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Blymyer Engineers	Client Project ID:	94015	Sampled: Mar 28, 1994
1829 Clement Street	Sample Matrix:	Water	Received: Mar 28, 1994
Alameda, CA 94501-1396	Analysis Method:	EPA 3510/3520/8015 Mod.	Reported: Apr 13, 1994
Attention: Nicole Beck	First Sample #:	4CI5301	

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 4CI5301 MW-1	Sample I.D. 4CI5302 MW-2	Sample I.D. 4CI5303 MW-3	Sample I.D. 4CI5304 SW-1
Extractable Hydrocarbons	50	N.D.	N.D.	23,000	N.D.
Chromatogram Pattern:		--	--	Non-Diesel Mix <C16	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	10	1.0
Date Extracted:	4/4/94	4/4/94	4/4/94	4/4/94
Date Analyzed:	4/5/94	4/6/94	4/6/94	4/6/94
Instrument Identification:	GCHP-5B	GCHP-5B	GCHP-5A	GCHP-5A

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Andrea Fulcher

Sequoia Analytical

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Blymyer Engineers	Client Project ID:	94015	Sampled: Mar 28, 1994
1829 Clement Street	Sample Matrix:	Soil	Received: Mar 28, 1994
Alameda, CA 94501-1396	Analysis Method:	EPA 3550/8015	Reported: Apr 13, 1994
Attention: Nicole Beck	First Sample #:	4CI5305	

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit mg/kg	Sample I.D. 4CI5305 SP-1
Extractable Hydrocarbons	1.0	51
Chromatogram Pattern:		Non-Diesel Mix C16-C20

Quality Control Data

Report Limit Multiplication Factor:	5.0
Date Extracted:	4/4/94
Date Analyzed:	4/5/94
Instrument Identification:	GCHP-5B

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Andrea Fulcher

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Blymyer Engineers	Client Project ID:	94015	Sampled: Mar 28, 1994
1829 Clement Street	Sample Matrix:	Water	Received: Mar 29, 1994
Alameda, CA 94501-1396	Analysis Method:	EPA 5030/8015 Mod./8020	Reported: Apr 13, 1994
Attention: Nicole Beck	First Sample #:	4CE5301	

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 4CE5301 MW-1	Sample I.D. 4CE5302 MW-2	Sample I.D. 4CE5303 MW-3	Sample I.D. 4CE5304 SW-1
Purgeable Hydrocarbons	50	N.D.	N.D.	94,000	N.D.
Benzene	0.50	N.D.	N.D.	4,800	N.D.
Toluene	0.50	N.D.	N.D.	6,500	N.D.
Ethyl Benzene	0.50	N.D.	N.D.	3,000	N.D.
Total Xylenes	0.50	N.D.	N.D.	15,000	N.D.
Chromatogram Pattern:		--	--	Gas	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	200	1.0
Date Analyzed:	4/8/94	4/8/94	4/8/94	4/8/94
Instrument Identification:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	92	92	93	90

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, ELAP 1894

Andrea Fulcher
Project Manager

Sequoia Analytical

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Blymyer Engineers	Client Project ID:	94015	Sampled: Mar 28, 1994
1829 Clement Street	Sample Matrix:	Soil	Received: Mar 28, 1994
Alameda, CA 94501-1396	Analysis Method:	EPA 5030/8015 Mod./8020	Reported: Apr 13, 1994
Attention: Nicole Beck	First Sample #:	4CI5305	

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/kg	Sample I.D. 4CI5305 SP-1
Purgeable Hydrocarbons	1.0	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Total Xylenes	0.0050	N.D.
Chromatogram Pattern:		--

Quality Control Data

Report Limit Multiplication Factor:	1.0
Date Analyzed:	4/5/94
Instrument Identification:	GCHP-18
Surrogate Recovery, %: (QC Limits = 70-130%)	71

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Andrea Fulcher

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Blymyer Engineers
1829 Clement Street
Alameda, CA 94501-1396
Attention: Nicole Beck

Client Project ID: 94015
Matrix: Liquid
QC Sample Group: 4CI5301-04

Reported: Apr 13, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel
Method:	EPA 8015 Mod.
Analyst:	A. Nagra
MS/MSD Batch#:	4CI8102
Date Prepared:	4/4/94
Date Analyzed:	4/5/94
Instrument I.D.#:	GCHP-5A
Conc. Spiked:	600 µg/L
Matrix Spike % Recovery:	93
Matrix Spike Duplicate % Recovery:	93
Relative % Difference:	0.0
LCS Batch#:	NOT APPLICABLE
Date Prepared:	
Date Analyzed:	
Instrument I.D.#:	
LCS % Recovery:	
% Recovery Control Limits:	28-122

SEQUOIA ANALYTICAL

Andrea Fulcher
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

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Blymyer Engineers
1829 Clement Street
Alameda, CA 94501-1396
Attention: Nicole Beck

Client Project ID: 94015
Matrix: Liquid
QC Sample Group: 4CI5305

Reported: Apr 13, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel
Method:	EPA 8015 Mod.
Analyst:	A. Nagra
MS/MSD Batch#:	BLK040194
Date Prepared:	4/1/94
Date Analyzed:	4/1/94
Instrument I.D.#:	GCHP-5A
Conc. Spiked:	15 mg/kg
Matrix Spike % Recovery:	80
Matrix Spike Duplicate % Recovery:	80
Relative % Difference:	0.0
LCS Batch#:	NOT APPLICABLE
Date Prepared:	
Date Analyzed:	
Instrument I.D.#:	
LCS % Recovery:	
% Recovery Control Limits:	38-122

SEQUOIA ANALYTICAL

Andrea Fulcher
Project Manager

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Blymyer Engineers
1829 Clement Street
Alameda, CA 94501-1396
Attention: Nicole Beck

Client Project ID: 94015
Matrix: Water
QC Sample Group: 4CI5301-04

Reported: Apr 13, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	P.M.	P.M.	P.M.	P.M.
MS/MSD Batch#:	4040088	4040088	4040088	4040088
Date Prepared:	4/8/94	4/8/94	4/8/94	4/8/94
Date Analyzed:	4/8/94	4/8/94	4/8/94	4/8/94
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	10 µg/L
Matrix Spike % Recovery:	100	106	98	110
Matrix Spike Duplicate % Recovery:	95	105	94	101
Relative % Difference:	5.1	1.0	4.2	8.5
LCS Batch#:	MB040894	MB040894	MB040894	MB040894
Date Prepared:	4/8/94	4/8/94	4/8/94	4/8/94
Date Analyzed:	4/8/94	4/8/94	4/8/94	4/8/94
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
LCS % Recovery:	90	90	91	98
% Recovery Control Limits:	80-120	80-120	80-120	80-120

SEQUOIA ANALYTICAL

Andrea Fulcher
Project Manager

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Blymyer Engineers
1829 Clement Street
Alameda, CA 94501-1396
Attention: Nicole Beck

Client Project ID: 94015
Matrix: Solid
QC Sample Group: 4CI5305

Reported: Apr 13, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Maralit	A. Maralit	A. Maralit	A. Maralit
MS/MSD Batch#:	4C95701	4C95701	4C95701	4C95701
Date Prepared:	4/4/94	4/4/94	4/4/94	4/4/94
Date Analyzed:	4/4/94	4/4/94	4/4/94	4/4/94
Instrument I.D.#:	GCHP-18	GCHP-18	GCHP-18	GCHP-18
Conc. Spiked:	0.20 mg/kg	0.20 mg/kg	0.20 mg/kg	0.60 mg/kg
Matrix Spike % Recovery:	100	100	100	102
Matrix Spike Duplicate % Recovery:	100	100	105	103
Relative % Difference:	0.0	0.0	4.9	1.0

LCS Batch#: NOT APPLICABLE

Date Prepared:
Date Analyzed:
Instrument I.D.#:

LCS % Recovery:

% Recovery Control Limits:	55-145	47-149	47-155	56-140

SEQUOIA ANALYTICAL

Andrea Fulcher
Project Manager

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BLYMYER
ENGINEERS, INC.
1829 Clement Avenue
Alameda, CA 94501 (510) 521-3773 FAX (510) 865-2594

CHAIN OF CUSTODY RECORD

JOB # 94015

PROJECT NAME/LOCATION: Kawahara/San Lorenzo, CA

SAMPLERS (SIGNATURE): Stephen W Moore

TURNAROUND TIME: Standard DAY(S)

REMARKS:

DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION	# OF CONTAINERS	TPH AS GASOLINE + BTXE (MOD EPA 8015/8020)	TPH AS DIESEL (MOD EPA 8015)	VOC (EPA 624/8240)	SEMI-VOC (EPA 625/8270)	TRPH (EPA 418.1)	BTXE (EPA 8020/602)	HOLD	REMARKS
3/28/94	0955		X	MW-1	5	X	X						9403I53 01
3/28/94	1050		X	MW-2	5	X	X						02
3/28/94	1215		X	MW-3	5	X	X						03
3/28/94	1245		X	SW-1	5	X	X						04
3/28/94	1255		X	SP-1	1	X	X						-05

REQUESTED BY: Laurie Buckman

RESULTS AND INVOICE TO: Blymyer Engineers, Inc

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
Stephen W Moore	3/29/94 | 1030 Am	PRIME #1867
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)
#807 Prime	3/29 | 1230 PM	

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
DATE / TIME	REMARKS:	
03/29/94 | 218	SEQUOIA	