

**QUARTERLY
GROUNDWATER MONITORING REPORT
FIRST QUARTER 1999
FRIESMAN RANCH PROPERTY
LIVERMORE, CALIFORNIA**

June 1999

June 11, 1999

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KLEINFELDER

An employee owned company

June 11, 1999

File No.: 10-3006-13/103

Ms. Eva Chu
Alameda County Health
Care Services Agency
1131 Harbor Bay parkway, Suite 250
Alameda, California 94502-9335

**Subject: First Quarter Groundwater Monitoring Report for Friesman Ranch
Property, Livermore, California**

Dear Ms. Chu:

Attached is the First Quarter 1999 Groundwater Monitoring Report for the Friesman Ranch Property, 1600 Friesman Road, Livermore, California (site). The results of this report are consistent with the results of the previous groundwater monitoring events that have been performed at the site, with chemicals of concern only being detected in monitoring wells KMW-6 and KMW-7. No chemicals of concern were detected in the other wells or creek water samples collected.

Kleinfelder, Inc. is planning to perform the next groundwater monitoring event during the week of June 21 through 25, 1999. I will call you next week to provide you with a more definitive date. During this upcoming event, we plan to collect samples from the eight onsite wells and analyze them for chemicals of concern. Only wells KMW-6 and KMW-7 will be analyzed for polynuclear aromatic hydrocarbons and dissolved lead. In addition, we are not planning to collect creek samples for this event.

We trust that the attached submittal meets your requirements. Should you require any additional information and/or clarification, please call.

Very truly yours,

KLEINFELDER, INC.

Neal E. Siler, R. E. A.
Project Manager

Attachment

cc: Mr. George Kwong, Children's Hospital Medical Foundation
Ms. Leah Goldberg, Hansen, Bridgett, Marcus, Vlahos and Rudy, LLP

A Report Prepared for:

Children's Hospital Medical Foundation
5225 Dover Street
Oakland, California 94609

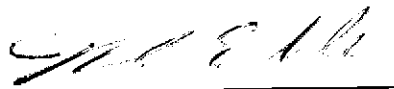
**QUARTERLY GROUNDWATER MONITORING REPORT
FIRST QUARTER 1999
FRIESMAN RANCH PROPERTY
LIVERMORE, CALIFORNIA**

Kleinfelder Job No. 10-3006-13/013

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June 11, 1999

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1. INTRODUCTION

This report describes the results of the First Quarter 1999 Groundwater Monitoring Event performed at the Friesman Ranch Property, Livermore, California (Plate 1). The First Quarter 1999 Groundwater Monitoring Event is the second quarterly monitoring event performed under the current scope of work.

The work performed was based on our report entitled *Remedial Investigation, RBCA Tier 2 Evaluation and Remedial Action Plan, Friesman Ranch Property, Livermore, California* dated October 17, 1997 (our Report), the Alameda County Health Care Services Agency, Environmental Health Services Division's (ACHCSA's) letter regarding *Additional Investigations at 1600 Friesman Road, Livermore, CA* dated July 29, 1998 (ACHCSA, 1998). Also the ACHCSA requested that samples collected from monitoring wells be analyzed for additional parameters and that creek water samples be collected from Arroyo de Las Positas (ACHCSA, 1999). Preparation of this report is a key task of our Workplan dated November 18, 1998 [Kleinfelder, Inc. (Kleinfelder), 1998]

1.1 OBJECTIVES AND SCOPE OF WORK

The objectives of the activities performed were to:

- Continue a regularly scheduled groundwater monitoring program initiated in December 1998 to track spatial and temporal variations in groundwater conditions; and
- Evaluate the potential for groundwater to impact the adjacent Arroyo de Las Positas (creek).

To meet these objectives, the following scope of work was implemented:

- Implementation of a regularly scheduled groundwater monitoring event;
- Implementation of a creek sampling event; and
- Preparation of this quarterly groundwater monitoring report.

2. FIELD ACTIVITIES

2.1 INTRODUCTION

This section summarizes the field activities performed for the quarterly groundwater monitoring program. All field activities were performed on March 25 and March 26, 1999. Plate 2 shows the locations of the existing groundwater monitoring wells and the creek sampling locations.

2.2 GROUNDWATER MONITORING ACTIVITIES

The eight wells (KMW-1 through -8) were monitored. The goal of these activities were to measure water levels and free-product thickness, and collect water quality samples that accurately represent stabilized aquifer conditions in the vicinity of each well. To this end, the wells were purged until stabilization of aquifer parameters was achieved.

Prior to sampling, field instrumentation was calibrated and/or checked before opening the monitoring wells. All instruments were successfully calibrated or checked (Appendix A).

2.2.1 Water Level Measurement

All wells were opened and ventilated for a minimum of 0.5 hour. Prior to purging, the depth to water was measured in each well to the nearest 0.01 foot using a clean, calibrated electronic water-level indicator. Water-level data were used to calculate the required purge volumes for sampling. Measurements were recorded on Water-Level Measurement Records and Well Development and Sampling Logs (Appendix A).

2.2.2 Free-Product Thickness Measurement

On March 25, 1999, prior to purging each well, the free-product thickness was measured using a clean oil/water interface probe (Appendix A).

2.2.3 Groundwater Sample Collection

Upon completion of the water-level measurements, Kleinfelder purged the monitoring wells by bailing them with dedicated polyvinyl chloride (PVC) bailers. During purging, aquifer parameters (hydrogen ion index [pH], temperature, and electrical conductivity) were measured to evaluate whether the water in each well had stabilized prior to sampling (Appendix A). The wells were purged until a minimum of three casing volumes of water were removed, aquifer parameters appeared to stabilize, and water levels were allowed to recover to near static levels before sampling. After sampling a dedicated bailer was hung inside each well in order to be used for the next sampling event.

Water from each well was collected using the same new dedicated PVC bailer used for purging. Groundwater monitoring well samples were placed in appropriate containers (either 40-milliliter

[ml] glass volatile organic analysis [VOA] vials, 1-liter amber glass bottles and/or 500-ml polyethylene bottles), labeled and the containers were then placed in Ziploc™ plastic bags. The samples were then placed in an ice chest packed with loose water-based ice to 4 +/- 2 degrees Celsius (°C) for delivery to the laboratory.

2.3 CREEK WATER SAMPLING ACTIVITIES

Creek samples were collected in order to obtain representative samples in three locations, one up-gradient, one adjacent and one down-gradient of the source area. Prior to collecting the samples the sampling locations were selected with the concurrence of ACHCSA personnel. Sampling protocol consisted of submerging the sample containers directly into the creek to collect a representative sample at the specified location.

Creek samples were collected in appropriate containers (40-ml VOA vials, 1-liter amber bottles and/or 500-ml polyethylene bottles) labeled and then containers were then placed in Ziploc™ plastic bags. The samples were then placed in an ice chest packed with loose water-based ice to 4 +/- 2 degrees °C for delivery to the laboratory.

2.4 ANALYTICAL LABORATORY PARAMETERS

Groundwater monitoring well samples and creek samples were analyzed for the following parameters:

- Total petroleum hydrocarbons as gasoline (TPH-g) using Modified United States Environmental Protection Agency (EPA) Method 8015;
- Total petroleum hydrocarbons as diesel (TPH-d) using Modified EPA Method 8015 following filtering with a 0.45-micron filter and preparation using silica-gel cleanup;
- Benzene, toluene, ethylbenzene and total xylenes (BTEX) using EPA Method 8020;
- Methyl tertiary-butyl ether (MTBE) using EPA Method 8020. Any detections of MTBE were to be confirmed using EPA Method 8260;
- Polynuclear aromatic hydrocarbons (PAHs) using EPA Method 8270 (KMW-6, KMW-7, Creek 1 and Creek 2 only); and
- Dissolved lead using EPA Method 6010/7000 (KMW-6 and KMW-7 only) following filtering with a 0.45-micron filter.

2.5 QUALITY ASSURANCE/QUALITY CONTROL SAMPLE COLLECTION

Normal quality assurance/quality control (QA/QC) sampling activities includes the laboratory preparation and analysis of a trip blank that accompanies the ice chest to and from the laboratory. In addition, a blind duplicate and an equipment rinsate blank are collected and analyzed. All of these samples are analyzed for TPH-g and BTEX.

For this event, the following QA/QC samples were prepared or collected:

- A trip blank; and
- A blind duplicate.

Because only dedicated equipment was used to purge the wells and collect the samples, no equipment blank was collected.

2.6 INVESTIGATION-DERIVED WASTE HANDLING PROCEDURES

Investigation-derived wastes (IDW – purge water and decontamination rinsate liquids) were containerized onsite in labeled, United States Department of Transportation (DOT)-approved 55-gallon drums.

Drums were inspected prior to use for physical integrity and condition. Each drum was labeled to identify the waste source location, physical contents, date collected and generator's name. A total of four drums (four containing monitoring well purge water and decontamination rinsate liquids) of IDW were generated during this quarters monitoring activities.

2.7 SITE RESTORATION

Following completion of monitoring activities, the work area was left in a presentable and workable condition as near as practicable to original conditions.

3. SUMMARY OF RESULTS

3.1 INTRODUCTION

Water-level and free-product thickness measurements were recorded on March 25, 1999. Groundwater samples were collected from each of the eight monitoring wells and creek samples were collected from Arroyo de Las Positas on March 25 and March 26, 1999, and submitted for analysis. The monitoring well and creek samples were analyzed at McCampbell Analytical, Inc., a laboratory certified by the California Environmental Protection Agency (Cal/EPA), Department of Health Services (DHS) Environmental Laboratory Accreditation Program (ELAP) for the specific analyses performed.

Tables 1 through 4 summarize the data measure and/or analyzed. Appendix B contains certified analytical laboratory reports and chain-of-custody records. Appendix C contains historical water level and free-product thickness measurements. Historical hydrochemical data for the wells are contained in Appendix D.

3.2 WATER LEVELS

As part of the groundwater monitoring event, water levels were measured in the eight monitoring wells on March 25, 1999. Depths to water ranged from 11.59 to 13.27 feet bgs (Table 1). These represent the shallowest depths to water levels since the first monitoring event in September 1997. In March 1999, groundwater flow was to the northwest with a hydraulic gradient of 0.006 feet per foot (ft/ft). These results are consistent with the previous groundwater monitoring event in December 1998 (Appendix C) (Kleinfelder, 1999).

3.3 FREE-PRODUCT THICKNESS

No sheen was observed on any of the samples; however, a strong hydrocarbon odor was noted in wells KMW-6 and KMW-7. No measurable free product was detected using either a bailer or the oil/water interface probe. Historically, no free product has been detected in any of the wells (Appendix C).

3.4 GROUNDWATER MONITORING WELL SAMPLES

A total of eight wells (KMW-1 through KMW-8) were sampled and analyzed for TPH-g, TPH-d, BTEX, MTBE. Two of these wells (KMW-6 and KMW-7) were additionally analyzed for total lead and PAHs. These results are summarized in Table 2. Certified analytical laboratory reports are included in Appendix B. Historical groundwater monitoring analytical results are contained in Appendix D.

3.4.1 Total Petroleum Hydrocarbons as Gasoline

TPH-g was detected at concentrations of 7,000 micrograms per liter ($\mu\text{g/L}$) in KMW-6 and 4,300 $\mu\text{g/L}$ in KMW 7, but was not detected in any of the other wells sampled. These results are consistent with historical concentrations detected (Appendix D).

3.4.2 Total Petroleum Hydrocarbons as Diesel

TPH-d was detected at concentrations of 1,700 $\mu\text{g/L}$ in KMW-6 and 1,200 $\mu\text{g/L}$ in KMW-7. It was not detected in any of the other wells sampled. Historical groundwater monitoring analytical results are contained in Appendix D.

3.4.3 Aromatic Hydrocarbons

Aromatic hydrocarbons were detected in monitoring wells KMW-6 and KMW-7, but were not in any of the other wells sampled. Benzene was detected in excess of its drinking water maximum contaminant level (MCL), 1 $\mu\text{g/L}$, at concentrations of 160 $\mu\text{g/L}$ in KMW-6 and 19 $\mu\text{g/L}$ in KMW-7. Toluene was detected below its MCL (150 $\mu\text{g/L}$) at concentrations of 5.1 $\mu\text{g/L}$ in KMW-6 and 16 $\mu\text{g/L}$ in KMW-7. Ethylbenzene was detected below its MCL (700 $\mu\text{g/L}$) at concentrations of 270 $\mu\text{g/L}$ in KMW-6 and 56 $\mu\text{g/L}$ in KMW-7. Total xylenes was detected below the MCL (1,750 $\mu\text{g/L}$) at concentrations of 200 $\mu\text{g/L}$ in KMW-6 and 270 $\mu\text{g/L}$ in KMW-7. Historical groundwater monitoring analytical results are contained in Appendix D.

3.4.4 Methyl Tertiary-Butyl Ether

MTBE was not detected in any of the wells. The reporting limit was raised to 100 $\mu\text{g/L}$ for KMW-6 to 100 $\mu\text{g/L}$ and for KMW-7 due to interference from other petroleum hydrocarbons. These results are consistent with historical concentrations detected (Appendix D).

3.4.5 Polynuclear Aromatic Hydrocarbons

Naphthalene was the only PAH detected at concentrations of 100 $\mu\text{g/L}$ in KMW-6 and 23 $\mu\text{g/L}$ in KMW-7. The remaining wells were not sampled for PAHs.

3.4.6 Dissolved Lead

This event marks the first time that dissolved lead (samples filtered with a 0.45-micron filter prior to analysis) was analyzed for in samples collected from KMW-6 and KMW-7. It was detected at a concentration of 22 $\mu\text{g/L}$ in KMW-7 and was not detected in KMW-6. The 22 $\mu\text{g/L}$ detected in KMW-7 is in excess of the MCL for lead (15 $\mu\text{g/L}$).

3.5 CREEK SAMPLES

A total of three creek samples (Creek-1 through 3) were sampled and analyzed for TPH-g, TPH-d, BTEX and MTBE. Two of these creek samples (Creek-1 and -2) were also analyzed for PAHs. These results were all below reporting limits and are presented in Table 3. Certified analytical laboratory reports are included in Appendix B.

3.6 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

The QA/QC samples collected and analyzed for this groundwater monitoring event included a trip blank and a blind duplicate sample. The results for these QA/QC samples are summarized on Table 4 and certified analytical laboratory reports are contained in Appendix B.

3.6.1 Trip Blank

One trip blank was prepared and analyzed for the March 1999 groundwater monitoring event. The trip blank contained no detectable concentrations of TPH-g, TPH-d, MTBE or BTEX.

3.6.2 Blind Duplicate Sample

One blind duplicate sample (KMW-6A) was collected from monitoring well KMW-6 on March 26, 1999. This duplicate sample was analyzed for TPH-g, TPH-d, BTEX, MTBE and PAHs.

The Relative Percent Differences (RPD) for TPH-g, TPH-d, benzene, toluene, ethylbenzene, total xylenes and naphthalene (the analytes detected) were 4.4, 0.0, 6.0, 24.1, 0.0, 0.0 and 0.0 percent, respectively (Table 4). The only RPD that exceeded the typical QA/QC goal of less than 20 percent was that for toluene. The difference may be attributed to volatilization of the sample during sampling and/or transit to the laboratory as well as differences between laboratory instruments.

4. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The summary and conclusions presented in this section are based on research implemented, information collected, and interpretations developed during this and previous investigations performed at the property. The information evaluated in this report was collected by Kleinfelder during March 1999. The summary and conclusions that follow are presented in the categories of field activities, groundwater levels and free-product thickness, and groundwater chemistry.

4.1 FIELD ACTIVITIES

- Field activities performed consisted of the first quarterly groundwater monitoring event for 1999;
- Water level and free-product thickness measurements and the collection of water quality samples were conducted. The samples collected were analyzed for TPH-g, TPH-d, BTEX, MTBE, PAHs, and dissolved lead;
- Prior to the initiation of field activities, and between sampling locations, all equipment was decontaminated.
- Purge water and decontamination rinsate liquids were containerized and stored on-site in DOT-approved 55-gallon drums;
- Following completion of field activities the work area was left in a presentable and workable condition, as nearly as practicable to original conditions.

4.2 GROUNDWATER CHEMISTRY

- Only two groundwater monitoring well samples (KMW-6 and KMW-7) contained detectable concentrations of petroleum hydrocarbon compounds. None of the other groundwater samples contained detectable concentrations of petroleum hydrocarbon compounds;
- TPH-g was detected at 7,000 µg/L in KMW-6 and 4,300 µg/L in KMW-7. TPH-d was detected at 1,700 µg/L in KMW-6 and 1,200 µg/L in KMW-7. Benzene was detected in excess of its MCL at 160 µg/L in KMW-6 and 19 µg/L in KMW-7. Toluene was detected below its MCL (150 µg/L) at 5.1 µg/L in KMW-6 and in KMW-7 16 µg/L. Ethylbenzene was detected below its MCL (700 µg/L) in KMW-6 at 270 µg/L and in KMW-7 at 56 µg/L. Total xylenes was detected below the MCL (1,750 µg/L) in KMW-6 at 200 µg/L and in KMW-7 at 270 µg/L. Naphthalene was the only PAH detected at 100 µg/L in KMW-6 and 23 µg/L in KMW-7. MTBE was not detected in any of the groundwater monitoring well samples;
- Dissolved lead was only detected in KMW-7 at 22 µg/L, which is in excess of its MCL. KMW-6 and KMW-7 were the only two wells sampled for total lead.

4.3 CREEK CHEMISTRY

TPH-g, TPH-d, BTEX, MTBE and PAHs were not detected in any of the creek samples collected. Thus, it appears that the petroleum hydrocarbons detected in the groundwater has not impacted Arroyo de Las Positas.

4.4 RECOMMENDATIONS

Kleinfelder makes the following recommendations concerning further investigations and remedial actions at the property:

- The regularly scheduled groundwater monitoring program should be continued, with the next event being implemented in June 1999;
- Water levels and free-product thickness should be measured in and groundwater quality samples should be collected from the eight monitoring wells;
- Groundwater quality samples collected from the eight monitoring wells should be analyzed for TPH-g, TPH-d, BTEX and MTBE. Samples collected from KMW-6 and KMW-7 should be analyzed for PAHs and dissolved lead.
- Collection of additional creek water samples during the next scheduled event are not warranted at this time.

5. LIMITATIONS

The scope of services described here is not intended to be inclusive, to identify all potential concerns, or to eliminate the possibility of environmental problems. Within current technology, no level of assessment can show conclusively that a property or its structures are completely free of contaminated and/or hazardous substances. Therefore, Kleinfelder cannot offer a certification that the recommendations made in this report will clear the property of environmental liability.

During the course of the performance of Kleinfelder's services, contaminated and/or hazardous materials were discovered. Our client or the property owner are solely responsible for notifying all governmental agencies, and the public at large, of the existence, release, treatment or disposal of any contaminated and/or hazardous materials observed at the project site, either before or during performance of Kleinfelder's services. Kleinfelder will assume no responsibility or liability whatsoever for any claim, loss of property value, damage, or injury which results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials.

Kleinfelder performed the investigative activities and evaluations in accordance with generally accepted standards of care that existed in Northern California at the time the work was performed. No warranty, expressed or implied, is made.

6. REFERENCES

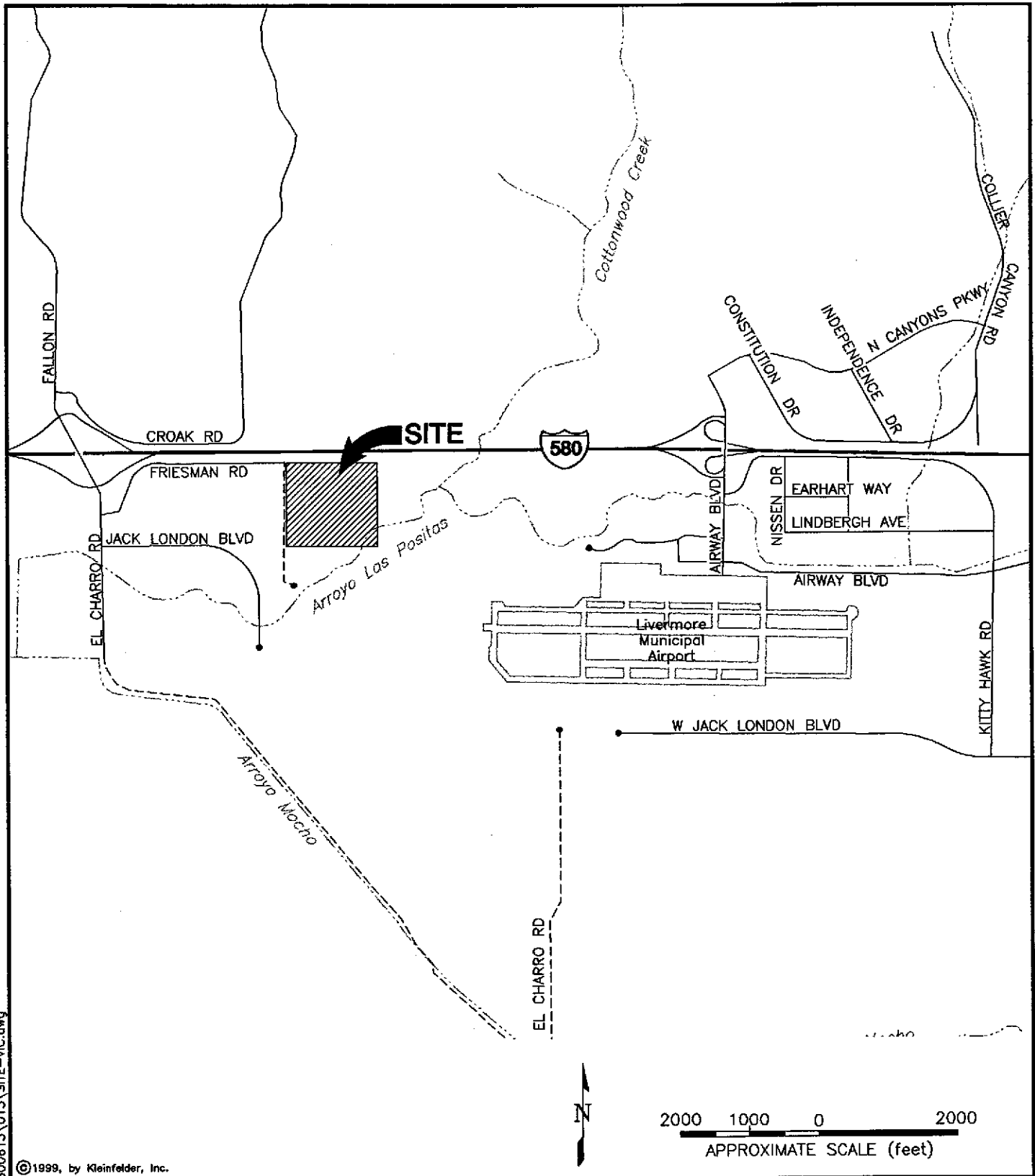
Alameda County Health Care Services Agency, 1998, Letter from Ms. Eva Chu of Alameda County Health Care Services Agency to Ms. Leah Goldberg of Hanson, Bridgett, Marcus Vlahos and Rudy – LLP Regarding *Additional Investigations at 1600 Friesman Road, Livermore, CA*. July 29

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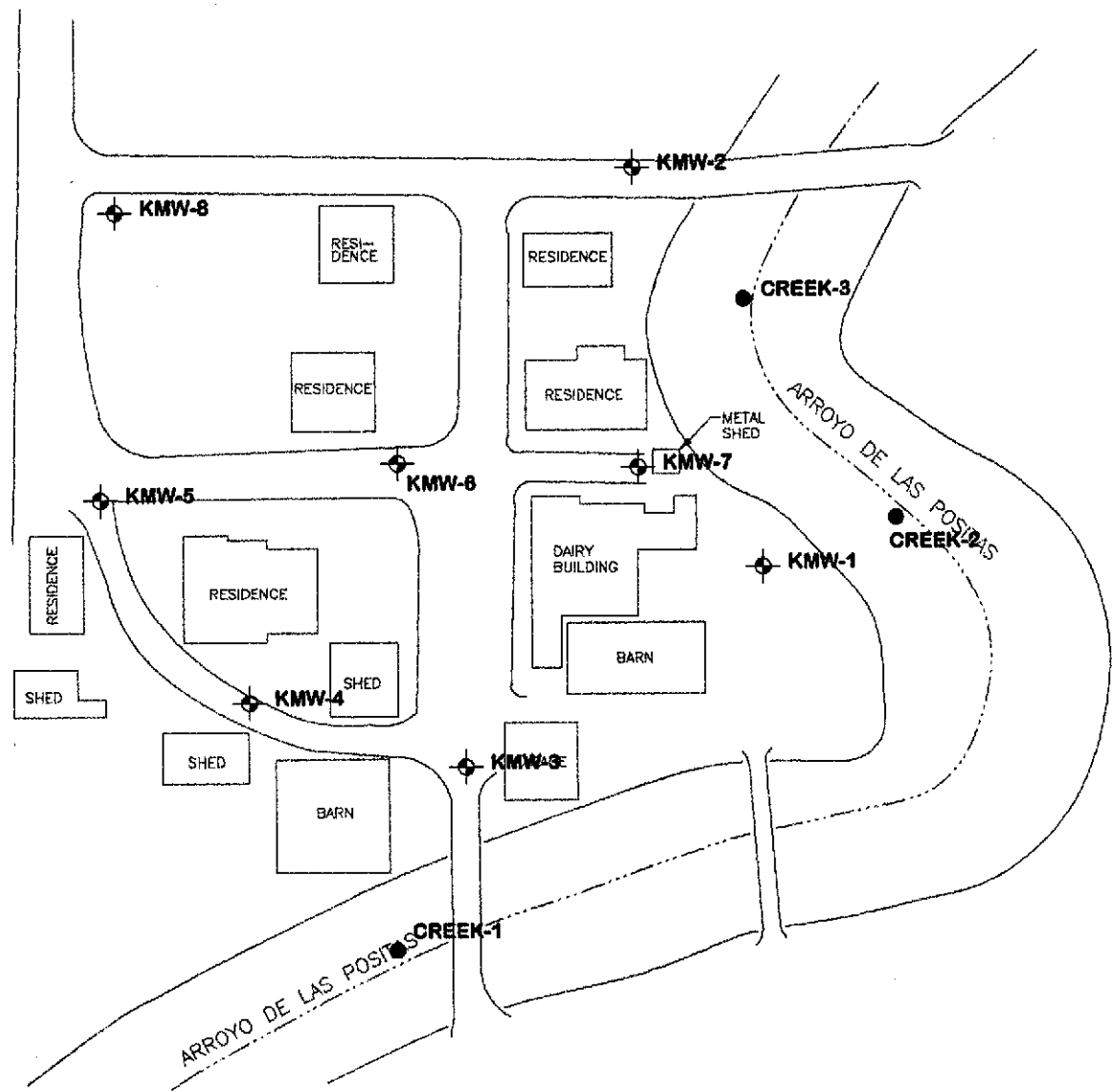
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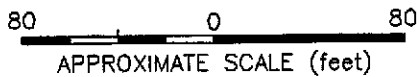
 KLEINFELDER	SITE VICINITY MAP	PLATE
	FRIESMAN RANCH PROPERTY 1600 FRIESMAN ROAD LIVERMORE, ALAMEDA COUNTY, CALIFORNIA	1
DRAFTED BY: L. Sue DATE: 4-21-99 CHECKED BY: N. Siler DATE: 4-21-99	PROJECT NO. 10-300613-013	

LEGEND

- 
 GROUNDWATER MONITORING WELL
- 
 CREEK SAMPLE



NOTES:
1. Locations are approximate.



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CAD FILE: C:\PROJECTS\10300613\013\SITEPLAN.dwg


 KLEINFELDER	SAMPLING LOCATIONS	PLATE
	FRIESMAN RANCH PROPERTY FRIESMAN RANCH ROAD LIVERMORE, ALAMEDA COUNTY, CALIFORNIA	2
DRAFTED BY: L. Sue DATE: 4-21-99 CHECKED BY: N. Siler DATE: 4-21-99	PROJECT NO. 10-300613-013	

TABLE 1
GROUNDWATER ELEVATION DATA
FRIESMAN RANCH PROPERTY
LIVERMORE, ALAMEDA COUNTY, CALIFORNIA
MARCH 1999

PERSONNEL: M. MAHONEY

DATE: March 25, 1999

WELL NUMBER	WATER LEVEL FROM T.O.C. (feet)	FREE-PRODUCT THICKNESS (feet)	WELL DEPTH FROM T.O.C. (feet)	G.S. HEIGHT FROM T.O.C. (feet)	WATER LEVEL FROM G.S. (feet)	T.O.C. ELEV. USGS Datum (Ft. Above MSL)	GROUNDWATER ELEVATIONS USGS Datum (Ft. Above MSL)
KMW-1	11.99	0.00	23.47	0.53	12.52	370.12	358.13
KMW-2	13.19	0.00	23.57	0.43	13.62	370.72	357.53
KMW-3	11.59	0.00	23.46	0.54	12.13	369.10	357.51
KMW-4	12.89	0.00	23.69	0.31	13.20	369.80	356.91
KMW-5	13.27	0.00	23.58	0.42	13.69	369.52	356.25
KMW-6	13.22	0.00	23.47	0.53	13.75	370.08	356.86
KMW-7	12.12	0.00	23.70	0.58	12.70	370.04	357.92
KMW-8	12.48	0.00	23.90	0.58	13.06	368.61	356.13

NOTES:

G.S. = Ground Surface

T.O.C. = Top of casing. All measurements in feet relative to top of casing.

USGS = United States Geological Survey

All wells have 4" ID casing = 0.65 gallon per casing length (foot).

TABLE 2
GROUNDWATER MONITORING WELL SAMPLE ANALYTICAL RESULTS
FRIESMAN RANCH PROPERTY
LIVERMORE, ALAMEDA COUNTY, CALIFORNIA

WELL NUMBER	SAMPLE COLLECTION DATE	TPH-D (µg/L)	TPH-G (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL BENZENE (µg/L)	TOTAL XYLENES (µg/L)	MTBE (µg/L)	PAHs (µg/L)	LEAD (µg/L)
KMW-1	3/25/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	-
KMW-2	3/25/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	-
KMW-3	3/25/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	-
KMW-4	3/25/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	-
KMW-5	3/25/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	-
KMW-6	3/26/99	1,700, d,b	7,000, a	160	5.1	270	200	<100**	100*	<5.0
KMW-7	3/25/99	1,200 d,b	4,300, a,h	19	16	56	270	<70**	23*	22
KMW-8	3/25/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	-
MCL		--	--	1.0	150	700	1,750	--	--	15***

Notes:

- TPH-D Total Petroleum Hydrocarbons as Diesel
- TPH-G Total Petroleum Hydrocarbons as Gasoline
- MTBE Methyl Tertiary-Butyl Ether
- PAHs Polynuclear Aromatic Hydrocarbons
- MCL Cal/EPA Maximum Contaminant Level
- µg/L Micrograms per Liter (approx. equal to parts per billion)
- <0.5 Not detected at or above the laboratory method reporting limit
- a Unmodified or weakly modified gasoline is significant
- d Gasoline range compounds are significant
- h Lighter than water immiscible sheen is present
- * Naphthalene only, all other chemicals were <20 µg/L
- ** Reporting limit raised due to interference of petroleum hydrocarbons
- *** Federal MCL

TABLE 3
CREEK SAMPLE ANALYTICAL RESULTS
FRIESMAN RANCH PROPERTY
LIVERMORE, ALAMEDA COUNTY, CALIFORNIA

WELL NUMBER	SAMPLE COLLECTION DATE	TPH-D (µg/L)	TPH-G (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL BENZENE (µg/L)	TOTAL XYLENES (µg/L)	MTBE (µg/L)	PAHs (µg/L)	LEAD (µg/L)
Creek-1	3/26/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	-
Creek-2	3/26/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	-
Creek-3	3/26/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	-
MCL		--	--	1.0	150	700	1,750	--	--	15***

Notes:

- TPH-D Total Petroleum Hydrocarbons as Diesel
- TPH-G Total Petroleum Hydrocarbons as Gasoline
- MTBE Methyl Tertiary-Butyl Ether
- PAHs Polynuclear Aromatic Hydrocarbons
- MCL Cal/EPA Maximum Contaminant Level
- µg/L Micrograms per Liter (approx. equal to parts per billion)
- <0.5 Not detected at or above the laboratory method reporting limit
- *** Federal MCL

TABLE 4
QUALITY ASSURANCE/QUALITY CONTROL SAMPLE ANALYTICAL RESULTS
FRIESMAN RANCH PROPERTY
LIVERMORE, ALAMEDA COUNTY, CALIFORNIA

QA/QC SAMPLE TYPE	SAMPLE ID	SAMPLE COLLECTION DATE	TPH-D (µg/L)	TPH-G (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL BENZENE (µg/L)	TOTAL XYLENES (µg/L)	MTBE (µg/L)	PAHs (µg/L)	LEAD (µg/L)
Primary Sample	KMW-6	3/26/99	1,700, d,b	7,000, a	160	5.1	270	200	<100**	100*	<5.0
Duplicate Sample	KMW-6A	3/26/99	1,700, d,b	6,700, a	170	6.5	270	200	<100**	100*	-
Trip Blank		3/25/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	<5.0
	RPD		0.0%	4.4%	6.0%	24.1%	0.0%	0.0%	NC	0.0%	NC

Notes:

- TPH-D Total Petroleum Hydrocarbons as Diesel
- TPH-G Total Petroleum Hydrocarbons as Gasoline
- MTBE Methyl Tertiary-Butyl Ether
- PAHs Polynuclear Aromatic Hydrocarbons
- RPD Relative Percent Difference
- µg/L Micrograms per Liter (approx. equal to parts per billion)
- <0.5 Not detected at or above the laboratory method reporting limit
- a Unmodified or weakly modified gasoline is significant
- d Gasoline range compounds are significant
- h Lighter than water immiscible sheen is present
- * Naphthalene only, all other chemicals were <0.5 µg/L
- ** Reporting limit raised due to high presence of TPH-g
- NC Not calculable

APPENDIX A – FIELD MONITORING NOTES

**RECORD OF WATER LEVEL MEASUREMENTS –
MARCH 25, 1999**

KA KLEINFELDER

RECORD OF WATER LEVEL MEASUREMENTS

Date: 3/25/99 Weather: clear Sheet 1 of 1
 Project: _____ Submitted By: _____ Date: _____
 Project No.: _____ Reviewed By: _____ Date: _____

Instrument Number: _____

Well Number	Time (opened/measured) (24-hr)	Sensitivity Setting (est. %)	Measuring Point (M.P.)	Measurement 1	Replicate Measurements (if requested)		Notes	(locked?)
					2	3		
MW-8	9:36			12.48			no oil	
MW-5	10:00			13.27			no oil	
MW-4	10:08			12.89			no oil	
MW-3	10:14			11.59			no oil	
MW-1	10:21			11.99			no oil	
- MW-6	11:20			13.22			no oil	
- MW-7	11:35			12.12			no oil	
MW-2	9:50			13.19			no oil	

M.P.: TOC, GS, Cover ring, Other: _____ All Wells Locked -- YES / NO

**WELL DEVELOPMENT AND SAMPLING LOGS –
MARCH 25, 1999**

KA KLEINFELDER

WELL DEVELOPMENT & SAMPLING LOG

WELL NO. 8

Date: 3/24/99 Weather: _____ Sheet of
 Project: Friesman Ranch Submitted By: _____ Date: _____
 Project No.: 10-3006-13/012 Reviewed By: _____ Date: _____
 Purpose of Log Development Sampling

Equipment & Decontamination	Purging Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u>Dedicated Bailer</u>		
	Sampling Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u> </u>		
	Test Equipment	Water Level		pH		Conductivity		Turbidity	
	Meter No.			KA 90575		90293			
	Calibration Date/Time	NA		3/25/99		3/25/99			
	Decontamination Methods	Wash		Rinse I		Rinse II		Rinse III	
	TSP	DI Tap	Steam Hot	DI Tap	Steam Hot	DI Tap	Steam Hot	DI Tap	Steam Hot
	Alconox	Other	Cool	Other	Cool	Other	Cool	Other	Cool
	Other:								
	Vol. (gal):			NA					
Source:									
Decon. Notes:									

Well Security: <u>good</u> fair poor	Well Integrity: <u>good</u> fair poor	Locked: <u>yes</u> (no)						
Purge Volume (CV) T.D. - DTW * Factor * 1 C.V. = <u>7.6</u> gal								
Well Diam.: $\text{D } 2" \times 4" \text{ } 23.9 \text{ ft.}$ - <u>12.48</u> ft. * $\begin{matrix} r=0.125 \\ r=0.665 \end{matrix}$ * <u> </u> = <u>22.8</u> gal								
Free Product?: Odor: <u>no</u> yes Floating Product: <u>none</u> sheen film <u> </u> feet thick								
Time (24-hr)	10:00	10:20	10:28	10:40				Replicate Goals
Gallons Purged	0	7.6	15.2	22.8				(dev. only)
Surged (minutes)	↑	NA	NA	NA				±0.10
pH	S	6.99	7.12	7.14				±1°C
Temperature (°C)	T	17	16	17				±10%
Cond. (µmhos/cm)	A	11020	11010	11010				±10%
Salinity (‰)	R	1.2	1.2	1.3				<50 NTUs
Turbidity (NTU's)	T	NA	NA	NA				Colorless
Color	↓							±0.01'
Depth to Water				<u>12.51</u>				
Reference Point:	TOC	Other: _____						

Sample #	Time	Quantity	Volume	Type	Preserv.	Filtration	Analysis	Lab
KMW-8		3	40 ml	VOAs	Ø		TPH-g, BTEX, MTRE	McCameh cell
KMW-8		1	1 liter	Amber	Ø		TPH-d	↓

Other Observations: _____

Final Check: VOAs free of bubbles? yes / no / NA Well Locked? yes / no / NA

KA KLEINFELDER

WELL DEVELOPMENT & SAMPLING LOG

WELL NO. 5

Date: 3/24/99 Weather: _____ Sheet of
 Project: Friesman Ranch Submitted By: _____ Date: _____
 Project No.: 10-3006-13/012 Reviewed By: _____ Date: _____
 Purpose of Log Development Sampling

Equipment & Decontamination	Purging Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u>Dedicated Bailer</u>		
	Sampling Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u>11</u>		
	Test Equipment	Water Level		pH		Conductivity		Turbidity	
	Meter No.			KA 90575					
	Calibration Date/Time	NA							
	Decontamination Methods	Wash		Rinse I		Rinse II		Rinse III	
	TSP	DI Tap	Steam Hot	DI Tap	Steam Hot	DI Tap	Steam Hot	DI Tap	Steam Hot
	Alconox	Other	Cool	Other	Cool	Other	Cool	Other	Cool
	Other:								
	Vol. (gal):			NA					
Source:									
Decon. Notes:									

Development / Purge Record	Well Security: <u>good</u> fair poor	Well Integrity: <u>good</u> fair poor			Locked: yes <u>no</u>	
	Purge Volume (CV) T.D. - DTW × Factor × 1 C.V. = <u>6.8</u> gal					
	Well Diam.: □ 2" × 4" <u>23.58</u> ft. - <u>13.27</u> ft. × $\frac{2}{3} = 0.175$ × $\frac{4}{3} = 0.663$ = <u>20.4</u> gal					
	Free Product?: Odor: <u>no</u> yes Floating Product: <u>none</u> sheen film	feet thick				
	Time (24-hr)	11:30	11:45	11:50	11:56	Replicate Goals
	Gallons Purged	0	6.8	13.6	20.4	(dev. only)
	Surged (minutes)	↑	NA			±0.10
	pH	S	7.27	7.20	7.18	±1°C
	Temperature (°C)	T	17.9	17.9	18.0	±10%
	Cond. (µmhos/cm)	A	1350	1320	1320	±10%
Salinity (%)	R	1.1	1.1	1.1	<50 NTUs	
Turbidity (NTUs)	T	NA			Colorless	
Color	↓	brunish			±0.01'	
Depth to Water				<u>13.35</u>		
Reference Point:	TOC	Other:				

Sample #	Time	Quantity	Volume	Type	Preserv.	Filtration	Analysis	Lab
KMW-5		3	60 ml	VOAS	Ø		TPH-g, BTEX, MTBE	McCampbell
KMW-5		1	1 liter	Amber	Ø		TPH-d	↓

Other Observations: _____
 Final Check: VOAs free of bubbles? yes / no / NA Well Locked? yes / no / NA

KA KLEINFELDER

WELL DEVELOPMENT & SAMPLING LOG **WELL NO. 4**

Date: 3/24/99 Weather: _____ Sheet of

Project: Friesman Ranch Submitted By: Michele Mahoney Date: _____

Project No.: 10-3000-13/012 Reviewed By: _____ Date: _____

Purpose of Log Development Sampling

Equipment & Decontamination	Purging Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other:	<u>Dedicated Bailer</u>	
	Sampling Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other:	<u> </u>	
	Test Equipment	Water Level		pH		Conductivity		Turbidity	
	Meter No.	NA		KA 90575					
	Calibration Date/Time	NA							
	Decontamination Methods	Wash		Rinse I		Rinse II		Rinse III	
	DI	Steam	DI	Steam	DI	Steam	DI	Steam	
	TSP	Hot	Tap	Hot	Tap	Hot	Tap	Hot	
	Alconox	Cool	Other	Cool	Other	Cool	Other	Cool	
	Other:								
Vol. (gal):			NA						
Source:									
Decon. Notes:									

Development / Purge Record	Well Security: <u>good</u> fair poor	Well Integrity: <u>good</u> fair poor	Locked: <u>yes</u> (no)			
	Purge Volume (CV) T.D. - DTW × Factor × 1 C.V. = <u>7.2 gal</u>	Well Diam.: □ 2" × 4" <u>23.69 ft.</u> - <u>12.89 ft.</u> × <u>2"=0.175</u> × <u>4"=0.665</u> = <u>21.6 gal</u>	Free Product?: Odor: <u>no</u> yes	Floating Product: <u>none</u> sheen film		
	Time (24-hr)	<u>1230</u>	<u>1237</u>	<u>1242</u>	<u>1247</u>	Replicate Goals
	Gallons Purged	<u>0</u>	<u>7.2</u>	<u>14.4</u>	<u>21.6</u>	(dev. only)
	Surged (minutes)	<u>↑</u>	<u>NA</u>	<u> </u>	<u> </u>	±0.10
	pH	<u>S</u>	<u>7.23</u>	<u>7.13</u>	<u>7.17</u>	±1°C
	Temperature (°C)	<u>T</u>	<u>17.1</u>	<u>16.9</u>	<u>16.5</u>	±10%
	Cond. (µmhos/cm)	<u>A</u>	<u>990</u>	<u>1050</u>	<u>1050</u>	±10%
	Salinity (‰)	<u>R</u>	<u>0.9</u>	<u>0.9</u>	<u>0.9</u>	<50 NTUs
	Turbidity (NTU's)	<u>T</u>	<u>NA</u>	<u> </u>	<u> </u>	Colorless
Color	<u>↓</u>	<u>brownish</u>	<u> </u>	<u> </u>	±0.01'	
Depth to Water			<u>13.82'</u>			
Reference Point:	<u>TOC</u>		Other: <u> </u>			

Sample #	Time	Quantity	Volume	Type	Preserv.	Filtration	Analysis	Lab
KMW-4		<u>3</u>	<u>40ml.</u>	<u>VOAS</u>	<u> </u>		<u>TPH-g, BTEX, MTBE</u>	<u>McCampbell</u>
KMW-4		<u>1</u>	<u>1 liter</u>	<u>Amber</u>	<u> </u>		<u>TPH-d</u>	<u> </u>

Other Observations: _____

Final Check: VOAs free of bubbles? yes / no / NA Well Locked? yes / (no) / NA

KA KLEINFELDER

WELL DEVELOPMENT & SAMPLING LOG **WELL NO. 3**

Date: _____ Weather: _____ Sheet of

Project: Friesman Ranch Submitted By: Michelle Mahoney Date: _____

Project No.: 10-3006-13/012 Reviewed By: _____ Date: _____

Purpose of Log Development Sampling

Equipment & Decontamination	Purging Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u>Disposable Bailer</u>		
	Sampling Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u> </u>		
	Test Equipment	<u>Water Level</u>		<u>pH</u>		<u>Conductivity</u>		<u>Turbidity</u>	
	Meter No.			KA 90575					
	Calibration Date/Time	NA							
	Decontamination Methods	<u>Wash</u>		<u>Rinse I</u>		<u>Rinse II</u>		<u>Rinse III</u>	
	TSP	DI	Steam	DI	Steam	DI	Steam	DI	Steam
	Alconox	Tap	Hot	Tap	Hot	Tap	Hot	Tap	Hot
	Other:	Other	Cool	Other	Cool	Other	Cool	Other	Cool
	Vol. (gal):								
Source:									
Decon. Notes:									

Development / Purge Record	Well Security: <u>(good)</u> fair poor	Well Integrity: <u>(good)</u> fair poor	Locked: yes <u>(no)</u>			
	Purge Volume (CV) T.D. - DTW x Factor x 1 CV = <u>7.66 gal</u>	Well Diam.: \square 2" \times 4" <u>23.46ft.</u> - <u>11.59 ft.</u> x $\frac{2-0.175}{4-0.663}$ x <u>3</u> = <u>23.61 gal</u>	Free Product?: Odor: <u>(no)</u> yes	Floating Product: <u>(none)</u> sheen film feet thick		
	Time (24-hr)	<u>12:12</u>	<u>12:18</u>	<u>12:24</u>	<u>13:32</u>	Replicate Goals
	Gallons Purged	<u>0</u>	<u>7.8</u>	<u>15.6</u>	<u>23.6</u>	(dev. only)
	Surged (minutes)	<u>↑</u>	<u>NA</u>	<u>→</u>	<u>→</u>	±0.10
	pH	<u>S</u>	<u>7.20</u>	<u>7.19</u>	<u>7.26</u>	±1°C
	Temperature (°C)	<u>T</u>	<u>16.5</u>	<u>15.5</u>	<u>15.4</u>	±10%
	Cond. (µmhos/cm)	<u>A</u>	<u>1150</u>	<u>1120</u>	<u>1120</u>	±10%
	Salinity (%)	<u>R</u>	<u>0.9</u>	<u>0.9</u>	<u>0.9</u>	<50 NTUs
	Turbidity (NTU's)	<u>T</u>	<u>NA</u>	<u>→</u>	<u>→</u>	Colorless
Color	<u>↓</u>				±0.01'	
Depth to Water				<u>(12.15)</u>		
Reference Point:	TOC	Other:				

Sample Log	Sample #	Time	Quantity	Volume	Type	Preserv.	Filtration	Analysis	Lab
	KMW-3		3	40 ml.	VOAs	Ø		TPH-g, BTEX, MTBE	McCampbell
	KMW-3		1	1 liter	Amber	Ø		TPH-d	↓

Other Observations: _____

Final Check: VOAs free of bubbles? yes / no / NA Well Locked? yes / (no) / NA

KA KLEINFELDER

WELL DEVELOPMENT & SAMPLING LOG

WELL NO. 2

Date: 3/24/99 Weather: _____ Sheet of

Project: Fricsman Ranch Submitted By: Michele Mahoney Date: _____

Project No.: W-3006-13/012 Reviewed By: _____ Date: _____

Purpose of Log Development Sampling

Equipment & Decontamination	Purging Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u>Dedicated Bailer</u>	
	Sampling Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u> </u>	
	Test Equipment	<u>Water Level</u>		<u>pH</u>		<u>Conductivity</u>		<u>Turbidity</u>
	Meter No.			KA 90575				
	Calibration Date/Time	NA						
	Decontamination Methods	<u>Wash</u>		<u>Rinse I</u>		<u>Rinse II</u>		<u>Rinse III</u>
	TSP	DI Tap	Steam Hot	DI Tap	Steam Hot	DI Tap	Steam Hot	DI Tap
	Alconox	Other	Cool	Other	Cool	Other	Cool	Other
	Other:							
	Vol. (gal):			NA				
Source:								
Decon. Notes:								

Development / Purge Record	Well Security: <u>good</u> fair poor	Well Integrity: <u>good</u> fair poor	Locked: yes <u>(no)</u>							
	Purge Volume (CV)	T.D.	-	DTW	x	Factor	x	1 C.V.	=	<u>6.9 gal</u>
	Well Diam.: \square 2" \times 4"	<u>23.57 ft.</u>	-	<u>13.19 ft.</u>	x	$\frac{2}{3} = 0.175$ $\frac{4}{3} = 0.663$	x		=	<u>20.7 gal</u>
	Free Product?: Odor: <u>no</u> yes	Floating Product: <u>none</u>	sheen	film						feet thick
	Time (24-hr)	<u>1435</u>	<u>1445</u>	<u>1450</u>	<u>1500</u>					Replicate Goals
	Gallons Purged	<u>0</u>	<u>6.9</u>	<u>13.8</u>	<u>20.7</u>					(dev. only)
	Surged (minutes)	<u>↑</u>	<u>NA</u>	<u> </u>	<u> </u>					
	pH	<u>S</u>	<u>7.18</u>	<u>7.15</u>	<u>7.24</u>					±0.10
	Temperature (°C)	<u>T</u>	<u>15.1</u>	<u>15.1</u>	<u>15.0</u>					±1°C
	Cond. (µmhos/cm)	<u>A</u>	<u>1490</u>	<u>1430</u>	<u>1400</u>					±10%
Salinity (‰)	<u>R</u>	<u>1.1</u>	<u>1.1</u>	<u>1.1</u>					±10%	
Turbidity (NTU's)	<u>T</u>	<u>NA</u>	<u> </u>	<u> </u>					<50 NTU's	
Color	<u>↓</u>								Colorless	
Depth to Water				<u>13.29</u>					±0.01'	
Reference Point:	TOC	Other: _____								

Sample Log	Sample #	Time	Quantity	Volume	Type	Preserv.	Filtration	Analysis	Lab
	KMW-2		3	40 ml.	VOAs	Ø		BTEX, MTBE, TPHd	McC Campbell
	KMW-2		1	1 liter	Amber	Ø		TPH-d	↓

Other Observations: _____

Final Check: VOAs free of bubbles? yes / no / NA

Well Locked? yes / (no) / NA

KA KLEINFELDER

WELL DEVELOPMENT & SAMPLING LOG

WELL NO. 7

Date: _____ Weather: _____ Sheet of

Project: Friesman Ranch Submitted By: _____ Date: _____

Project No.: 10-3006-13/012 Reviewed By: _____ Date: _____

Purpose of Log Development Sampling

Equipment & Decontamination	Purging Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u>Dedicated Bailer</u>	
	Sampling Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u> </u>	
	Test Equipment	Water Level		pH		Conductivity		Turbidity
	Meter No.			KA 90575				
	Calibration Date/Time	NA						
	Decontamination Methods	Wash		Rinse I		Rinse II		Rinse III
	TSP	DI Tap	Steam Hot	DI Tap	Steam Hot	DI Tap	Steam Hot	DI Tap
	Alconox	Other	Cool	Other	Cool	Other	Cool	Other
	Other:			NA				
	Vol. (gal):							
Source:								
Decon. Notes:								

Well Security:	<u>good</u>	fair	poor	Well Integrity:	<u>good</u>	fair	poor	Locked:	yes (no)
Purge Volume (CV)	T.D.	-	DTW	x	Factor	x	1 C.V.	=	7.7 gal
Well Diam.: <input type="checkbox"/> 2" <input type="checkbox"/> 4"	<u>23.7 ft.</u>	-	<u>12.12 ft.</u>	x	$2 \sim 0.175$ $4 \sim 0.663$	x	<u>3</u>	=	23.1 gal
Free Product?:	Odor: <u>no</u>	yes	Floating Product:	<u>none</u>	sheen	film			feet thick
Time (24-hr)	1615	1625	1630						Replicate Goals
Gallons Purged	0	7.7	15.4	23.1					(dev. only)
Surged (minutes)	↑	NA		↓					±0.10
pH	S	7.02	7.04	7.04					±1°C
Temperature (°C)	T	15.9	15.9	15.9					±10%
Cond. (µmhos/cm)	A	1410	1410	1410					±10%
Salinity (‰)	R	1.1	1.1	1.1					<50 NTUs
Turbidity (NTU's)	T	NA							Colorless
Color	↓	grayish							±0.01'
Depth to Water				<u>14.09</u>					
Reference Point:	TOC	Other:							

Sample Log	Sample #	Time	Quantity	Volume	Type	Preserv.	Filtration	Analysis	Lab
	KMW-7			3	40ml	VOAs	Ø		TPH-g, BTEX, MTBE
KMW-7			1	1 liter	Amber	Ø		TPH-d	↓
KMW-7			1	500ml	Poly	HNO ₃		Total lead	↓
KMW-7			1	1 liter	Amber	Ø		PAHs	

Other Observations: Strong odor

Final Check: VOAs free of bubbles? yes / no / NA

Well Locked? yes / (no) / NA

KA KLEINFELDER

WELL DEVELOPMENT & SAMPLING LOG

WELL NO. 6

Date: _____ Weather: _____ Sheet of
 Project: Friesman Ranch Submitted By: _____ Date: _____
 Project No.: 10-3006-13/012 Reviewed By: _____ Date: _____

Purpose of Log Development Sampling

Equipment & Decontamination	Purging Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u>Submersible Bailer</u>		
	Sampling Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u>Dedicated Bailer</u>		
	Test Equipment	Water Level		pH		Conductivity		Turbidity	
	Meter No.			KA 90575					
	Calibration Date/Time	NA							
	Decontamination Methods	Wash		Rinse I		Rinse II		Rinse III	
	TSP	DI	Steam	DI	Steam	DI	Steam	DI	Steam
	Alconox	Tap	Hot	Tap	Hot	Tap	Hot	Tap	Hot
	Other:	Other	Cool	Other	Cool	Other	Cool	Other	Cool
	Vol. (gal):			NA					
Source:									
Decon. Notes:									

Well Security: <u>good</u> fair poor	Well Integrity: <u>good</u> fair poor	Locked: yes <u>(no)</u>							
Purge Volume (CV) T.D. - DTW x Factor x 1 CV =									
Well Diam.: \square 2" \square 4" <u>23.47ft.</u> - <u>13.22ft.</u> x <u>2=0.175</u> x <u> </u> = <u>6.79gal</u>									
Free Product?: Odor: <u>(no)</u> yes Floating Product: <u>(none)</u> sheen film = <u>20.37gal</u>									
Time (24-hr)	10:15	10:20	10:25	10:30					Replicate
Gallons Purged	0	6.79	13.58	20.37					Goals
Surged (minutes)	↑	NA							(dev. only)
pH	S	6.65	6.69	6.71					±0.10
Temperature (°C)	T	20.5	20.5	20.5					±1°C
Cond. (µmhos/cm)	A	1810	1810	1760					±10%
Salinity (‰)	R	1.7	1.5	1.5					±10%
Turbidity (NTUs)	T	NA							<50 NTUs
Color	↓								Colorless
Depth to Water									±0.01'
Reference Point:	TOC	Other:							

Sample #	Time	Quantity	Volume	Type	Preserv.	Filtration	Analysis	Lab
KMW-6		3	40ml	VOAS	Ø		TPH-g RTEX MTRF	McCampbell
KMW-6		1	1 liter	Amber	Ø		TPH-d	
KMW-6		1	500ml	Poly	HNO ₃		Total lead	↓
KMW-6		1	1 liter	Amber	Ø		PAHS	
KMW-6A		3	40ml	VOAS	Ø		TPH-g BTEX MTRF	
KMW-6A		1	1 liter	Amber	Ø		TPH-d	

Other Observations: _____

Final Check: VOAs free of bubbles? yes / no / NA Well Locked? yes / (no) / NA

KA KLEINFELDER

WELL NO. 1

WELL DEVELOPMENT & SAMPLING LOG

Date: _____ Weather: _____ Sheet of
 Project: Friesman Ranch Submitted By: Michelle Mahoney Date: _____
 Project No.: 10-3000-13/012 Reviewed By: _____ Date: _____
 Purpose of Log Development Sampling

Equipment & Decontamination	Purging Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u>Dedicated bailer</u>		
	Sampling Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u> </u>		
	Test Equipment	Water Level		pH		Conductivity		Turbidity	
	Meter No.			KA 90575		KA 90293			
	Calibration Date/Time	NA							
	Decontamination Methods	Wash		Rinse I		Rinse II		Rinse III	
	TSP	DI Tap Other	Steam Hot Cool	DI Tap Other	Steam Hot Cool	DI Tap Other	Steam Hot Cool	DI Tap Other	Steam Hot Cool
	Alconox								
	Other:								
	Vol. (gal):								
Source:									
Decon. Notes:									

Development / Purge Record	Well Security: <u>(good)</u> fair poor	Well Integrity: <u>(good)</u> fair poor	Locked: yes <u>(no)</u>			
	Purge Volume (CV) T.D. - DTW × Factor × 1 C.V. = <u>7.61 gal</u>					
	Well Diam.: □ 2" 4" <u>23.47 ft.</u> - <u>11.99 ft.</u> × $r=0.175$ $d=0.663$ = <u>22.83 gal</u>					
	Free Product?: Odor: <u>(no)</u> yes Floating Product: <u>(none)</u> sheen film					
	Time (24-hr)	<u>15:33</u>	<u>17.61 hr</u>	<u>15:25</u>	<u>22.83 hr</u>	Replicate Goals
	Gallons Purged	<u>0</u>	<u>15:38V</u>	<u>15:45V</u>	<u>15:50V</u>	(dev. only)
	Surged (minutes)	<u>↑</u>	<u>NA</u>			
	pH	<u>S</u>	<u>7.07</u>	<u>7.08</u>	<u>7.13</u>	±0.10
	Temperature (°C)	<u>T</u>	<u>15.0</u>	<u>14.9</u>	<u>15.0</u>	±1°C
	Cond. (µmhos/cm)	<u>A</u>	<u>1120</u>	<u>1120</u>	<u>1120</u>	±10%
Salinity (‰)	<u>R</u>	<u>0.9</u>	<u>0.9</u>	<u>0.9</u>	±10%	
Turbidity (NTU's)	<u>T</u>	<u>NA</u>			<50 NTUs	
Color	<u>↓</u>				Colorless	
Depth to Water				<u>12.24</u>	±0.01'	
Reference Point:	TOC	Other:				

Sample #	Time	Quantity	Volume	Type	Preserv.	Filtration	Analysis	Lab
KMW-1		3	VOAs		Ø		BTEX, MTBE, TPH-g	McC Campbell
KMW-1		1	Liter Amber		Ø		TPH-d	

Other Observations: _____

Final Check: VOAs free of bubbles? yes / no / NA Well Locked? yes / (no) / NA

**APPENDIX B – CHAIN OF CUSTODY RECORDS AND CERTIFIED
ANALYTICAL LABORATORY REPORTS**



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
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<http://www.mccampbell.com> E-mail: main@mccampbell.com

Kleinfelder, Inc. 7133 Koll Center Pkwy, #100 Pleasanton, CA 94566	Client Project ID: #10-3006-13 /012; Friesman Ranch	Date Sampled: 03/25-03/26/99
		Date Received: 03/26/99
	Client Contact: Neal Siler	Date Extracted: 03/26/99
	Client P.O:	Date Analyzed: 03/26/99

04/01/99

Dear Neal:

Enclosed are:

- 1). the results of 13 samples from your #10-3006-13 /012; Friesman Ranch project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,


Edward Hamilton, Lab Director

PROJECT NO. 10-3000-13/012		PROJECT NAME Friesman Ranch		NO. OF CONTAINERS	TYPE OF CONTAINERS	ANALYSIS										RECEIVING LAB McCampbell		
L.P. NO. (P.O. NO.)	SAMPLERS: (Signature/Number) Michelle Mahoney					TPH-g, BTEX, MPEC TPH-d * Total Lead ** PAHs only (8270)										INSTRUCTIONS/REMARKS		
DATE MM/DD/YY	SAMPLE I.D. TIME HH-MM-SS	SAMPLE I.D.	MATRIX															
3/25/99	10:45	KMW-8	water	4	Inter + VOAS	X	X											08086
3/25/99	12:10	KMW-5	water	4	Inter VOAS	X	X											08087
3/25/99	12:55	KMW-4	water	4	Inter VOAS	X	X											08088
↓	13:45	KMW-3		4	Inter VOAS	X	X											08089
↓	15:10	KMW-2		4	"	X	X											08090
3/25/99	15:58	KMW-1		4	"	X	X											08091
3/25/99	16:50	KMW-7	↓	6	Inter VOAS	X	X	X	X									08092
3/26/99	10:55	KMW-6	↓	6	"	X	X	X	X									08093
3/26/99	11:00	KMW-6A	↓	5		X	X		X									08094
3/26/99	11:15	Creek 1	↓	5		X	X		X									08095
3/26/99	11:20	Creek 2	↓	5		X	X		X									08096
3/26/99	11:20	Creek 3	↓	4	↓	X	X											08097
3/25/99		Trip Blank	↓	4	↓	X	X											08098
END																		

Relinquished by: (Signature) <i>Michelle Mahoney</i>	Date/Time 3/26/99 4:25	Received by: (Signature) <i>Michelle Mahoney</i>	Instructions/Remarks: * Filter and prep. w/silica gel cleanup prior to analysis ** Filter w/ 0.45 micron filter prior to analysis	Send Results To: <i>Neal Siler</i>
Relinquished by: (Signature)	Date/Time	Received by: (Signature)		KLEINFELDER 7133 KOLL CENTER PARKWAY SUITE 100 PLEASANTON, CA 94566 925 (510) 484-1700 fax 925-484-5838
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)		



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Kleinfelder, Inc. 7133 Koll Center Pkwy, #100 Pleasanton, CA 94566	Client Project ID: #10-3006-13 /012; Friesman Ranch	Date Sampled: 03/25-03/26/99
	Client Contact: Neal Siler	Date Received: 03/26/99
	Client P.O:	Date Extracted: 03/27-04/01/99
		Date Analyzed: 03/27-04/01/99

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*
 EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g)*	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	% Recovery Surrogate
08086	KMW-8	W	ND	ND	ND	ND	ND	ND	103
08087	KMW-5	W	ND	ND	ND	ND	ND	ND	102
08088	KMW-4	W	ND	ND	ND	ND	ND	ND	100
08089	KMW-3	W	ND	ND	ND	ND	ND	ND	101
08090	KMW-2	W	ND	ND	ND	ND	ND	ND	104
08091	KMW-1	W	ND	ND	ND	ND	ND	ND	104
08092	KMW-7	W	4300,a,h	ND<70	19	16	56	270	106
08093	KMW-6	W	7000,a	ND<100	160	5.1	270	200	105
08094	KMW-6A	W	6700,a	ND<100	170	6.5	270	200	106
08095	Creek 1	W	ND	ND	ND	ND	ND	ND	107
08096	Creek 2	W	ND	ND	ND	ND	ND	ND	104
08097	Creek 3	W	ND	ND	ND	ND	ND	ND	101
08098	Trip Blank	W	ND	ND	ND	ND	ND	ND	102
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W	50 ug/L	5.0	0.5	0.5	0.5	0.5	0.5	
	S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	0.005	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

cluttered chromatogram; sample peak coelutes with surrogate peak

*The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.



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Kleinfelder, Inc. 7133 Koll Center Pkwy, #100 Pleasanton, CA 94566	Client Project ID: #10-3006-13 /012; Friesman Ranch	Date Sampled: 03/25-03/26/99
	Client Contact: Neal Siler	Date Received: 03/26/99
	Client P.O:	Date Analyzed: 03/28-04/01/99
		Date Extracted: 03/26/99

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel with Silica Gel Clean-up*

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(d) [†]	% Recovery Surrogate
08086	KMW-8	W	ND	102
08087	KMW-5	W	ND	104
08088	KMW-4	W	ND	103
08089	KMW-3	W	ND	101
08090	KMW-2	W	ND	103
08091	KMW-1	W	ND	103
08092	KMW-7	W	1200,d,b,h	108
08093	KMW-6	W	1700,d,b	104
08094	KMW-6A	W	1700,d,b	102
08095	Creek 1	W	ND	104
08096	Creek 2	W	ND	97
08097	Creek 3	W	ND	
08098	Trip Blank	W	ND	105

All samples were centrifuged and decanted to avoid sediment prior to their extraction

Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W	50 ug/L
	S	1.0 mg/kg

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP / STLC / SPLP extracts in ug/L

[†] cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

[†]The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant; d) gasoline range compounds are significant; e) medium boiling point pattern that does not match diesel (?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.



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Kleinfelder, Inc. 7133 Koll Center Pkwy, #100 Pleasanton, CA 94566	Client Project ID: #10-3006-13 /012; Friesman Ranch	Date Sampled: 03/25-03/26/99
	Client Contact: Neal Siler	Date Received: 03/26/99
	Client P.O:	Date Analyzed: 03/26/99
		Date Extracted: 03/26/99

Lead*

EPA analytical methods 6010/200.7, 239.2*

Lab ID	Client ID	Matrix	Extraction °	Lead*	% Recovery Surrogate
08092	KMW-7	W	Dissolved	0.022	NA
08093	KMW-6	W	Dissolved	ND	NA
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	S	TTLC		3.0 mg/kg	
	W	TTLC		0.005 mg/L	
	---	STLC,TCLP		0.2 mg/L	

* soil and sludge samples are reported in mg/kg, wipe samples in ug/wipe, and water samples and all STLC / SPLP / TCLP extracts in mg/L
 *Lead is analysed using EPA method 6010 (ICP)for soils, sludges, STLC & TCLP extracts and method 239.2 (AA Furnace) for water samples
 ° EPA extraction methods 1311(TCLP), 3010/3020(water,TTLC), 3040(organic matrices,TTLC), 3050(solids,TTLC); STLC - CA Title 22
 # surrogate diluted out of range; N/A means surrogate not applicable to this analysis
 & reporting limit raised due matrix interference
 i) liquid sample that contains greater than ~2 vol. % sediment; this sediment is extracted with the liquid, in accordance with EPA methodologies and can significantly effect reported metal concentrations.

McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553
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QC REPORT FOR HYDROCARBON ANALYSES

Date: 03/29/99

Matrix: WATER

Analyte	Concentration (ug/L)			Amount Spiked	% Recovery		RPD
	Sample (#05350)	MS	MSD		MS	MSD	
TPH (gas)	0.0	100.0	99.8	100.0	100.0	99.8	0.2
Benzene	0.0	9.6	9.3	10.0	96.0	93.0	3.2
Toluene	0.0	9.9	9.4	10.0	99.0	94.0	5.2
Ethyl Benzene	0.0	10.1	9.7	10.0	101.0	97.0	4.0
Xylenes	0.0	30.1	28.7	30.0	100.3	95.7	4.8
TPH(diesel)	0.0	8338	8132	7500	111	108	2.5
TRPH (oil & grease)	0	27400	26500	23700	116	112	3.3

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

QC REPORT FOR SVOCs (EPA 8270/625/525)

Date: 04/04/99-04/05/99

Matrix: WATER

Analyte	Concentration (ug/Kg, m)			Amount Spiked	% Recovery		RPD
	Sample (#04264)	MS	MSD		MS	MSD	
Phenol	0	49	44	100	49	44	21.5
2-Chlorophenol	0	44	35	100	44	35	22.8
1, 4-Dichlorobenzene	0	49	39	100	49	39	22.7
N-nitroso-di-n-propyl	0	50	40	100	50	40	22.2
1, 2, 4-Trichlorobenz	0	53	40	100	53	40	28.0
4-Chloro-3-methylphen	0	60	45	100	60	45	28.6
4-Nitrophenol	0	55	52	100	55	52	5.6
Acenaphthene	0	70	49	100	70	49	35.3
2, 4- Dinitrotoluene	0	43	34	100	43	34	23.4
Pentachlorophenol	0	49	48	100	49	48	2.1
Pyrene	0	67	63	100	67	63	6.2

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

QC REPORT FOR METALS

Date: 03/26/99

Matrix: WATER

Extraction:

DISSOLVED

Analyte	Concentration (mg/L)			Amount Spiked	% Recovery		RPD
	Sample	MS	MSD		MS	MSD	
Arsenic	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Selenium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Molybdenum	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Barium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nickel	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vanadium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Beryllium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Zinc	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Copper	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Antimony	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	0.0	4.9	5.0	5.0	99	100	1.8
Cadmium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cobalt	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mercury	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

APPENDIX C – HISTORICAL WATER LEVEL MEASUREMENTS

**HISTORICAL GROUNDWATER ELEVATION DATA
FRIESMAN RANCH PROPERTY
LIVERMORE, ALAMEDA COUNTY, CALIFORNIA**

WELL NUMBER	SAMPLING DATE	WATER LEVEL FROM T.O.C. (feet)	FREE-PRODUCT THICKNESS (feet)	GROUNDWATER ELEVATIONS USGS Datum (Ft. Above MSL)
KMW-1	3/25/99	11.99	0.00	358.13
	1/12/99	12.97	0.00	357.15
	12/28/98	12.72	0.00	357.40
	9/8/97	12.82	0.00	357.30
KMW-2	3/25/99	13.19	0.00	357.53
	1/12/99	14.32	0.00	356.40
	12/28/98	14.08	0.00	356.64
	9/8/97	14.28	0.00	356.44
KMW-3	3/25/99	11.59	0.00	357.51
	1/12/99	15.13	0.00	353.97
	12/28/98	12.39	0.00	356.71
	9/8/97	12.34	0.00	356.76
KMW-4	3/25/99	12.89	0.00	356.91
	1/12/99	14.40	0.00	355.40
	12/28/98	13.76	0.00	356.04
	9/8/97	13.76	0.00	356.04
KMW-5	3/25/99	13.27	0.00	356.25
	1/12/99	15.32	0.00	354.20
	12/28/98	14.17	0.00	355.35
	9/8/97	14.24	0.00	355.28
KMW-6	3/25/99	13.22	0.00	356.86
	1/12/99	14.47	0.00	355.61
	12/28/98	14.16	0.00	355.92
	9/8/97	14.28	0.00	355.80
KMW-7	3/25/99	12.12	0.00	357.92
	1/12/99	13.15	0.00	356.89
	12/28/98	12.91	0.00	357.13
KMW-8	3/25/99	12.48	0.00	356.13
	1/12/99	13.70	0.00	354.91
	12/28/98	13.37	0.00	355.24

NOTES:

G.S. = Ground Surface

T.O.C. = Top of casing. All measurements in feet relative to top of casing.

USGS = United States Geological Survey

All wells have 4" ID casing = 0.65 gallons per casing length (foot).

APPENDIX D – HISTORICAL GROUNDWATER CHEMISTRY

**HISTORICAL GROUNDWATER CHEMISTRY
FRIESMAN RANCH PROPERTY
LIVERMORE, ALAMEDA COUNTY, CALIFORNIA**

WELL NUMBER	SAMPLE COLLECTION DATE	TPH-D (µg/L)	TPH-G (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL BENZENE (µg/L)	TOTAL XYLENES (µg/L)	MIBE (µg/L)	PAHs (µg/L)	LEAD (µg/L)
KMW-1	3/25/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	-
dup.	12/28/98	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<10	7.8
	12/28/98	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<10	5.9
	9/8/97	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<10	-
KMW-2	3/25/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	-
	12/28/98	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<10	<5.0
	9/8/97	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<10	-
KMW-3	3/25/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	-
	12/28/98	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<10	<5.0
	9/8/97	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<10	-
KMW-4	3/25/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	-
	12/28/98	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<10	7.5
	9/8/97	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<10	-
KMW-5	3/25/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	-
	12/28/98	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<10	8.5
	9/8/97	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<10	-
	dup. 9/8/97	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<10	-
KMW-6	3/26/99	1,700, d,b	7,000, a	160	5.1	270	200	<100**	100*	<5.0
	dup. 3/26/99	1,700, d,b	6,700, a	170	6.5	270	200	<100**	100*	-
	12/28/98	1,800, d	3,200, a	86	3.6	140	90	<50**	130*	15
	9/8/97	3,200, d	13,000, a	250	14	560	490	<150**	140*	-
KMW-7	3/25/99	1,200 d,b	4,300, a,h	19	16	56	270	<70**	23*	22
	12/28/98	1,000, d,h	9,100, a,h	23	17	190	700	<70**	110*	38
KMW-8	3/25/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	-
	12/28/98	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<10	12

Notes:

TPH-D Total Petroleum Hydrocarbons as Diesel

TPH-G Total Petroleum Hydrocarbons as Gasoline
MTBE Methyl Tertiary-Butyl Ether
PAHs Polynuclear Aromatic Hydrocarbons
MCL Ca/EPA Maximum Contaminant Level
µg/L Micrograms per Liter (approx. equal to parts per billion)
<0.5 Not detected at or above the laboratory method reporting limit
a Unmodified or weakly modified gasoline is significant
d Gasoline range compounds are significant
h Lighter than water immiscible sheen is present
* Naphthalene only, all other chemicals were <20 µg/L
** Reporting limit raised due to high presence of TPH-g
- Not analyzed

Wells KMW-7 and KMW-8 installed on December 23, 1998