

GROUND ZERO ANALYSIS, INC.

1714 Main Street
Escalon, California 95320-1927
Telephone: (209) 838-9888
Facsimile: (209) 838-9883

FILE

CORRECTIVE MEASURES STUDY REPORT

Prepared for

**FORMER PURE-ETCH, CO. FACILITY
1031 INDUSTRIAL WAY
SALINAS, CALIFORNIA 93906**

Prepared by

ORIGINAL SIGNED BY

John P. Lane
CA Registered Geologist No. 6795



April 10, 2006



TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	SITE BACKGROUND AND PHYSICAL SETTING	1
2.3	CONTAMINATION INVESTIGATION, REGULATORY ENFORCEMENT AND INTERIM ACTIONS	1
2.3.1	<i>Underground Storage Tank Investigations</i>	1
2.3.2	<i>Subsurface Investigations</i>	1
2.3.3	<i>Interim Remedial Actions</i>	4
2.0	DESCRIPTION OF CURRENT CONDITIONS.....	4
2.1	PROPERTY USE.....	4
2.2	PHYSICAL SETTING	5
2.3	PHYSICAL CONDITIONS	6
3.2	DISTRIBUTION OF RESIDUAL PETROLEUM HYDROCARBONS IN THE SUBSURFACE.....	8
3.2.1	<i>Extent of Hydrocarbons in Soil</i>	8
3.2.2	<i>Extent of Hydrocarbons in Groundwater</i>	9
3.0	CORRECTIVE ACTION OBJECTIVES	10
4.0	IDENTIFICATION AND SCREENING OF CORRECTIVE MEASURES	11
5.0	CORRECTIVE MEASURE ALTERNATIVE DEVELOPMENT	12
5.1	VADOSE ZONE SOILS	12
5.2	SATURATED ZONE (GROUNDWATER).....	13
6.0	EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES.....	14
6.1	VADOSE ZONE SOILS	14
6.2	SATURATED ZONE (GROUNDWATER).....	15
6.2.1	<i>Monitored Natural Attenuation</i>	15
6.2.2	<i>Groundwater Extraction, Treatment, and Discharge</i>	16
6.2.3	<i>Chemical Oxidation/Enhanced Biodegradation</i>	18
6.2.4	<i>Dual-phase Extraction</i>	20
7.0	RECOMMENDED CORRECTIVE MEASURE ALTERNATIVE	22
8.0	SUMMARY OF RECOMMENDED CORRECTIVE MEASURE.....	24
9.0	REFERENCES.....	26

TABLE OF CONTENTS
(continued)

Figures

- 1: Site Location Map
- 2: Site Plan
- 3: Aerial Photomap (Areas of Concern)
- 4: Site Plan Borings, Wells, and Section Lines
- 5: Stratigraphic Cross Section A-A'
- 6: Stratigraphic Cross Section B-B'
- 7: Potentiometric Surface Map, July 14, 2005

Tables

- 1: Proposed Preliminary Remedial Goals (PRGs)
- 2: Screening of Applicable Treatment Technologies and Process Options
- 3: Screening of Specific Remedial Action Alternatives
- 4: Comparative Ranking of Alternatives for Groundwater Remediation
- 5: Summary of Preliminary Costs

Appendices

- A: Data Summary Tables from Site Characterization
- B: Contaminant Mass Calculations and Associated Figures

CORRECTIVE MEASURES STUDY REPORT
Former Pure-Etch, Co. Facility
1031 Industrial Way
Salinas, California 93901

1.0 INTRODUCTION

The purpose of this corrective measures study is to develop and evaluate potential corrective measures, or a single corrective measure, that may be taken at the Facility to address releases of petroleum hydrocarbons and to recommend the corrective measures to be taken at the Facility that are protective of human health and the environment.

2.0 SITE BACKGROUND AND PHYSICAL SETTING

2.3 Contamination Investigation, Regulatory Enforcement and Interim Actions

Investigations related to contamination from the UST began at the property in 1997.

2.3.1 *Underground Storage Tank Investigations*

A previous owner operated one underground storage tank (UST) on the Site. The steel UST was used for storage of gasoline fuel. Previous owners of the property closed the tank in place in 1985 under a permit issued by the Monterey County Environmental Health Department by filling it with concrete. The tank was reportedly not used for 10 to 25 years prior to being closed.

2.3.2 *Subsurface Investigations*

Soil and groundwater investigation was initiated in 1997 at the request of DTSC and MCDEH as a precursor to plant closure. Three borings were advanced in the vicinity of the closed UST. Two of the borings located within 10 feet of the UST, BH-1 and BH-2, exhibited elevated levels of gasoline constituents. Soil vapor samples were collected from each boring at a depth of approximately 15 feet below ground surface (bgs). Each of the three samples contained gasoline constituents, with the sample collected from BH-1 recording the highest level at 18,000 µg/L total petroleum hydrocarbons as gasoline (TPHg).

*Revised Corrective Measures Study Report
Former Pure-Etch Facility, Salinas, CA*

Groundwater was not encountered during the 1997 investigation. The drilling was terminated at approximately 40 feet bgs.

In response to a Corrective Action Consent Agreement (Consent Agreement) between Pure-Etch and the DTSC signed on February 14, 2000, Pure-Etch authorized an additional investigation in order to determine the lateral and vertical extent of impact to soil and to determine if there has been an impact to groundwater. Seven additional soil borings were advanced in July and August 2000 by Ground Zero. Three borings located within 20 feet of the UST (BH-6, BH-8, BH-10) exhibited elevated levels of gasoline constituents in the vadose zone and at the capillary fringe, three borings located east (BH-5) and south (BH-4 and BH-7) of the former UST exhibited elevated levels of gasoline constituents primarily at the capillary fringe, and one boring north of the UST (BH-9) exhibited no evidence of gasoline contamination. Soil vapor samples collected from the boring located nearest the UST from a permeable sand zone at a depth of approximately 16 feet bgs contained concentrations of gasoline constituents five orders of magnitude greater than those detected in the vapor sample collected from the silt/clay unit at 7 feet bgs. These results suggest that the upper clay/silt unit is an effective barrier to upward migration of hydrocarbon vapors to the atmosphere. Discrete groundwater samples collected from borings BH-4 through BH-9 indicated that the highest concentrations of dissolved gasoline constituents were present in areas south and east of the former UST.

At the direction of DTSC, five groundwater monitoring wells (MW1 through MW5) were installed at the Site in June 2002 to characterize hydrology and water quality of shallow groundwater beneath the site. The investigation confirmed that soil contamination at the Site is generally limited to a relatively small area in the vicinity of the UST and lies primarily within the upper clay/silt unit and the upper sand unit to a depth of approximately 40-45 feet bgs. Based upon initial groundwater monitoring data, shallow groundwater beneath the site flows generally in a southeasterly direction. Free petroleum product measuring 1.42 feet thick was present in well MW1, located south of the UST, and elevated dissolved gasoline constituents were present in well MW4, located southeast of the UST.

*Revised Corrective Measures Study Report
Former Pure-Etch Facility, Salinas, CA*

Additional investigation was conducted in order to estimate the lateral extent of documented dissolved gasoline constituents in shallow groundwater beneath the site, to determine if previously documented free-phase gasoline had migrated downgradient of well MW1, to obtain sufficient additional contaminant concentration data in soil gas and physical characteristics of soil beneath the site to evaluate contaminant migration pathways and the potential exposure to on-site and nearby workers, and to obtain sufficient information on physical characteristics of soil and groundwater beneath the site to evaluate potential remediation measures. Ground Zero directed the installation of six additional groundwater monitoring wells (MW6 through MW11), a soil vapor extraction test well (VW1), and six soil vapor probes (within the annular space of wells MW6, MW9, and MW11). The additional investigation determined that the downgradient extent of groundwater contamination was limited to within site boundaries, as no petroleum hydrocarbon constituents were detected in downgradient wells MW8, MW9, and MW10.

Figure 4 presents the locations of soil borings and monitoring wells drilled at the site. Summary tables of soil, groundwater, and soil vapor samples collected at the site are included in Appendix A along with a summary of groundwater elevation data. Detailed summaries of subsurface investigations conducted at the site are contained in the following reports:

- *Underground Storage Tank Site Investigation Report, prepared for Pure-Etch Company, 1031 Industrial Way, Salinas, California 93901, April 1997, prepared by CapRock.*
- *Phase II RCRA Facility Investigation, Former Pure Etch Facility, 1031 Industrial Way, Salinas, CA 93906, February 16, 2001, prepared by Ground Zero and Lee & Pierce, Inc.*
- *Revised Phase II RCRA Facility Investigation Report, Former Pure-Etch Facility, 1031 Industrial Way, Salinas, CA 93906, July 19, 2002, prepared by Ground Zero.*
- *Phase III RCRA Facility Investigation Status Report, Former Pure-Etch Facility, 1031 Industrial Way, Salinas, CA 93906, March 23, 2004, prepared by Ground Zero.*

2.3.3 Interim Remedial Actions

Well MW1 contained more than one foot of free-phase gasoline in the well casing on June 18, 2002. Ground Zero initiated bi-weekly free product monitoring and removal on October 24, 2002. Field technicians hand bailed free product from well MW1 on nine occasions between October 24, 2002 and October 14, 2003. No measurable free product was present in well MW1 between January 6, 2003 and July 17, 2003. Less than one inch of free product was measured in the well between August 19, 2003 and October 14, 2003. No free product has been measured in well MW1 since October 14, 2003. A total of approximately 2.15 gallons of product/water mixture has been removed from the well. No indication of free-phase gasoline has been observed in any other site well.

2.0 DESCRIPTION OF CURRENT CONDITIONS

2.1 Property Use

The Site is located at 1031 Industrial Way, Salinas, California. The Site occupies approximately 1.25 acres in an industrial area of Salinas at the southeast corner of Industrial Way and Vertin Avenue. Surrounding property use is commercial and industrial. The nearest surface water body is Alisal Slough, located more than 2000 feet southwest of the Site. The Site location is shown on Figure 1.

The Site is currently occupied by Trécé Inc., which manufactures insect monitoring products, and an automobile towing company. The Site was previously operated as an etchant recycling facility by Pure-Etch from approximately 1994 to 1998. Pure-Etch obtained the property from Georgia Pacific Corporation in 1993. Prior to Pure-Etch's purchase of the Site, previous owners had legally closed a 1000-gallon underground storage tank (UST) in place in 1985 by filling it with concrete. The tank had reportedly not been in use for 10 to 25 years prior to its closure in 1985. Pure-Etch did not operate any underground storage tanks. The Site is entirely covered with relatively impermeable materials, which include concrete slab structures over approximately 80% of the Site and asphalt or concrete over the remaining 20%. A rail spur enters the southwest portion of the Site from the west.

A site plan is presented on Figure 2.

In 1997 the State of California Department of Toxic Substance Control (DTSC) and the Monterey County Department of Environmental Health (MCDEH) requested that Pure-Etch undertake an investigation to determine if any fuel had leaked from the tank.

2.2 Physical Setting

The Site is located in the Salinas Valley, in the central portion of the Coast Ranges physiographic province of California. The Valley is defined by the Gabilan Range to the east and the Santa Lucia Range to the west. The Salinas Valley is underlain by the Salinas Ground Water Basin, created by regional downwarping and localized reverse and strike slip faulting along the eastern range front of the Santa Lucia Range. This basin is post-Miocene synclinal graben-trough with a repository of thick mid-late Cenozoic sediments up to 8,000 feet thick (Bowen, 1965).

The Salinas Valley Ground Water Basin contains a series of productive aquifers, which are mined intensively to supply water for agricultural, domestic, and industrial purposes. The northern end of the Valley has two major low permeability confining strata which separate the alluvial fill into three water bearing units: an unconfined zone, the 180-foot aquifer, and the 400-foot aquifer. The 180-foot and 400-foot aquifers are highly developed sources of water for irrigation and domestic use. A deeper, 900-foot aquifer has also been identified regionally. The unconfined zone yields water slowly, is of poor quality, and is rarely tapped as a water source (Showalter, 1984). The shallowest aquifer underlying Salinas is the unconfined "A-aquifer," composed of interbedded and interfingering sands, gravels, silts, and clays. This aquifer is underlain by a relatively continuous impermeable blue clay layer at approximately 180 feet (California Department of Water Resources, 1973).

Since perched groundwater is present in the shallow, unconfined zone, depth to first groundwater is variable across the City of Salinas. Regional groundwater flow direction across the Salinas area is generally west-northwest towards the Pacific Ocean. The shallow aquifer has been encountered at

*Revised Corrective Measures Study Report
Former Pure-Etch Facility, Salinas, CA*

the Granite Construction Company site (1161 Abbott Street) in a sand aquifer at a depth of 80 to 100 feet bgs. The Granite Construction Company has monitoring wells less than 1,500 feet southwest of the Pure-Etch property (ASE Environmental, December 15, 1993 Remedial Action Plan). According to Mr. John Goni of the RWQCB, the groundwater flow direction at the Granite Construction site has varied considerably and it has been difficult to determine a predominant local groundwater flow direction.

A nearby water supply well is located at the Shippers Development Company site at 634 South Sanborn Road less than 1,000 feet north (upgradient) of the Pure-Etch site. The upper perforations of the water supply well reportedly begin at 235 feet bgs.

VISTA Information Solutions, Inc. conducted a search of regulatory documentation designed to identify sites within one mile of the Site on March 9, 2000. The search identified 25 sites within ¼ mile of the Site as having USTs. Five of these identified sites, as well as 13 others within ½ mile of the Site, are listed as having had leaking USTs (LUSTs). At least two of the LUST sites are located within 1/8 mile of the Site. A copy of the VISTA report was presented in the April 12, 2000 *Workplan for Investigation of Soil and Groundwater Contamination from Former Gasoline Storage UST at 1031 Industrial Street, Salinas, California*, submitted by Lee & Pierce Inc.

A further review of documents at the MCDEH was conducted on sites identified in the VISTA report. Significant findings include the presence of free-phase petroleum product at the Granite Construction site (1161 Abbott Street) approximately 1,000 feet southeast of the Site, and an on-going investigation for gasoline constituents in groundwater at the Mitchell Silliman site, located approximately 1/3 mile southeast of the Site. Figure 3 presents an aerial photograph showing these properties in relation to the Site.

2.3 Physical Conditions

Soil stratigraphy encountered during subsurface investigations can generally be divided into the following laterally continuous units:

*Revised Corrective Measures Study Report
Former Pure-Etch Facility, Salinas, CA*

Upper clay/silt unit: extends from the ground surface to approximately 14/16 feet bgs and consists primarily of lean to fat clay with silt (with no coarse material). According to the results of physical testing conducted by Cooper Testing Laboratory, the upper clay unit has an average permeability of 9.E-08 cm/sec, an average moisture content of 30%, and an average organic content of 2.5%.

Upper sand unit: consists of well to poorly graded sand extending from approximately 14/16 feet bgs to 36/44 feet bgs. According to the results of physical testing conducted by Cooper Testing Laboratory, the upper sand unit has an average permeability of 4.E-03 cm/sec, an average moisture content of 5.3%, and an average organic content of 0.5%.

Middle clay unit: consists primarily of lean to fat clay with some silt and extends from approximately 36/44 feet bgs to approximately 55 feet bgs.

Lower silt unit: consists of silt with less than 5% sand and generally extends from approximately 55 feet bgs to approximately 61/64 feet bgs. This unit appears to be thinner in boring BH-6 compared to other site borings. Poorly graded sand was encountered in the upper portion of this unit from approximately 55 to 58/59 feet in borings BH-6 and BH-10, but does not appear to be laterally significant. Wells MW8 through MW11 in the southern and eastern portions of the site did not contain this lower silt unit. Wells MW8, MW9, and MW11 instead transitioned from clay or silty clay directly to a well graded sand approximately 2-5 feet thick at approximately 61/64 feet bgs, which was also encountered in wells MW5 and MW7. No sand or silt was encountered in this unit in well MW10.

Lower clay unit: consists of lean to fat clay and extends from approximately 61/64 feet bgs to the bottom of each well (70-80 feet bgs). Site stratigraphy is graphically represented in cross section on Figures 5 and 6.

*Revised Corrective Measures Study Report
Former Pure-Etch Facility, Salinas, CA*

Petroleum hydrocarbon odors within the vadose zone were noted in borings drilled in the immediate vicinity of the UST, including in borings BH1, BH2, BH3, BH6, BH8, and BH10, and during drilling of wells MW1, MW6, and VW1. Gasoline odors were noted at the capillary fringe in these borings and also in borings BH4, BH5, BH7, and wells MW4 and MW7. No odors were noted during drilling of borings BH9 or wells MW2, MW3, MW8, MW9, MW10, or MW11.

The static depth to groundwater beneath the site has ranged from 55.7 to 66.4 feet below the tops of the casings (btoc) in Site wells. Free petroleum product was measured in well MW1, with a maximum thickness of approximately 1.4 feet when the well was installed in June 2001. No free-phase petroleum product has been detected in well MW1 since October 2003. No free-phase petroleum product has ever been encountered in any other site well.

The shallow groundwater gradient beneath the site in the vicinity of the UST generally flows southeast at a gradient between approximately 0.006 ft/ft and 0.012 ft/ft (~31-60 ft/mile). The potentiometric surface appears to be somewhat irregular across the site, however, with an apparent mounding effect beneath the southeastern portion of the site near well MW10 and a groundwater depression near well MW11, which is located inside the warehouse facility. A table of historic groundwater elevations in Site wells is included in Appendix A. A potentiometric surface map generated using the July 2005 well monitoring data is depicted on Figure 7.

3.2 Distribution of Residual Petroleum Hydrocarbons in the Subsurface

3.2.1 Extent of Hydrocarbons in Soil

Laboratory analyses of soil samples collected from borings near the former tank/excavation pit have defined the lateral extent of soil contamination in the vadose zone. Vadose soil contamination of significance was identified in BH1, BH2, BH3, BH6, BH8, BH10, MW1, MW6, and VW1, each of which was drilled within approximately 25 feet of the UST. Soil samples from peripheral borings did not contain contaminants in the vadose zone, although BH5 contained high levels and BH4, MW2, MW4, and MW7 contained low levels of hydrocarbons in soil samples collected from the

capillary fringe zone.

The estimated extent of subsurface contamination is shown on the cross sections of Figures 5 and 6 and in Figures B1 through B6 in Appendix B. Ground Zero has estimated that approximately 24,600 pounds of gasoline (as TPHg) are present in the vadose zone soils between the depths of 12 and 52 feet bgs, and approximately 2,500 pounds of gasoline are present in capillary fringe zone and saturated soils between the depths of 52 and 65 feet bgs. By contrast, it appears that the majority of speciated benzene in soil occurs in the capillary fringe and saturated zone. The estimated mass of benzene in the vadose and capillary fringe/saturated zones are 18.5 pounds and 35.5 pounds, respectively. A summary of mass calculations and associated figures are included in Appendix B.

3.2.2 Extent of Hydrocarbons in Groundwater

Analytical results of groundwater samples collected from Site wells in January 2005 indicated that dissolved gasoline constituents are present in wells MW1, MW4, MW6, and MW7 within the Site's boundaries, and at lower levels in off site wells MW2 and MW5. The wells with greatest impact are wells MW1 and MW6, with moderate levels in wells MW2, MW4, and MW7, and very low levels in well MW5. No gasoline constituents have been detected in upgradient well MW3, downgradient wells MW8, MW9, and MW10, or cross gradient well MW11.

Figures B7 and B8 in Appendix B depict the estimated lateral extent of groundwater contamination as of the January 2005 sampling round. The apparent impacted area measures approximately 33,000 square feet and the leading edge of the main plume extends approximately 140 to 150 feet downgradient of the source area. The gasoline plume appears to be migrating off-site to the west and southwest as indicated by the increasing trend of dissolved contaminants in well MW2.

The volume of impacted groundwater and the mass of dissolved contaminant were estimated by assuming an affected saturated interval of 15 feet (58-73 ft bgs), a total porosity of 30% and estimating the areas of various concentration levels. It is estimated that approximately 1.1 million gallons of groundwater has been affected by dissolved gasoline constituents in the main plume and

that the mass of dissolved gasoline (as TPHg) contained therein is approximately 56 pounds. The estimated mass of benzene in the dissolved groundwater plume is 4.9 pounds.

3.0 CORRECTIVE ACTION OBJECTIVES

To evaluate risks at the site and to develop corrective action objectives, Ground Zero conducted a Health Risk Assessment (HRA), which was summarized in a report to DTSC dated June 24, 2005. Ground Zero adopted a tiered approach in conducting the HRA, first conducting a conservative screening evaluation pursuant to DTSC's Preliminary Endangerment Assessment (PEA) Guidance Manual (DTSC, 1994), then conducting a receptor-based exposure assessment that evaluates site specific factors in establishing exposure pathways and risk/hazard equation parameters.

Although the results of the PEA compliant risk screening evaluation suggests that subsurface contamination beneath the Site represent unacceptable risk/hazard in a residential setting, it is clear that the risk screening evaluation is a conservatively biased estimate of the upper bound of exposure. Actual site conditions, including its location, zoning, and the regional hydrogeology of the Salinas area, result in the elimination of direct dermal exposure and ingestion of soil or groundwater as exposure pathways.

For industrial Site use, site specific risk assessment suggests that, from a receptor-based standpoint, no further action at the site is warranted. However, Ground Zero recommended that corrective measures should be implemented to reduce residual hydrocarbons in soil to prevent continued degradation of shallow groundwater beneath the site and to control the off-site migration of the dissolved petroleum hydrocarbon plume.

Ground Zero initially proposed the adoption of PRGs for soil and groundwater as summarized in *Health Risk Assessment Report, June 24, 2005*. For soil PRGs, Ground Zero adopted the values established by USEPA Region IX PRGs for industrial Site use (EPA, October 2004). For groundwater, Ground Zero proposed PRGs based upon a 95% reduction of the current concentrations of constituents of concern. If the calculated PRG for a particular constituent was

below the primary Maximum Contaminant Level (MCL) for drinking water, then the proposed PRG was adjusted to the primary MCL, as in the case for xylenes. For EDB and 1,2-DCA, which were detected in site perimeter wells in what should be considered background concentrations, PRGs were proposed based upon these background concentrations. Since no primary MCL has been established for naphthalene, the taste and odor threshold was selected as the proposed Site PRG for naphthalene.

However, In a memorandum dated August 2, 2005, which was included with correspondence dated August 5, 2005, DTSC disagreed with Ground Zero's proposed PRGs for benzene, toluene, 1,2-dichloroethane (1,2-DCA), and ethylene dibromide (EDB) in groundwater, and recommended that they be reduced to their respective primary Maximum Contaminant Levels (MCLs) established by the State of California. Revised PRGs are listed in Table 1.

4.0 IDENTIFICATION AND SCREENING OF CORRECTIVE MEASURES

A general screening of potentially applicable technologies and process options is presented in Table 2. This initial list of potential technologies has been developed based on the following:

1. The impacted media (soil and groundwater);
2. The nature and extent of contamination;
3. The chemical and physical properties of the constituents of concern (primarily gasoline constituents);
4. The relevant site hydrogeologic conditions;
5. Professional experience regarding applicability to site contaminants and conditions.

The list in Table 2 is categorized by impacted media and the general response action to be implemented. Table 3 summarizes specific corrective measure alternatives that were considered based upon the initial screening of technologies summarized in Table 2.

The selected corrective measure alternative would be implemented to control plume migration

and to greatly reduce the mass of contaminants in the subsurface to a point where it would not be cost-effective to continue active remediation, at which time monitored natural attenuation (MNA) would be utilized to obtain closure criteria.

5.0 CORRECTIVE MEASURE ALTERNATIVE DEVELOPMENT

The corrective measure alternatives discussed below have been divided into those appropriate for vadose zone soil and those for groundwater.

5.1 Vadose Zone Soils

Three approaches have been considered for remediation of gasoline constituents present in vadose zone soils at the site. They are:

1. Monitored natural attenuation (MNA) – this alternative would include no active remediation, but would instead rely solely on natural attenuation processes.
2. Excavation and off-site disposal – this alternative would consist of the excavation and disposal of gasoline hydrocarbon impacted soil from the subject Site. The estimated total volume of impacted vadose soil is 5,900 cubic yards between the depths of approximately 10 and 52 feet.
3. Soil Vapor Extraction – this alternative would involve connecting existing and possibly additional vapor extraction wells to a vacuum blower to evacuate soil vapor that is then treated with vapor-phase carbon, converted via catalytic oxidizer, or combusted via thermal oxidizer.

Table 3 shows an initial screening of the alternatives completed on the basis of technical feasibility and site access constraints. Only those alternatives that pass this initial screening are given further consideration.

5.2 Saturated Zone (Groundwater)

Several approaches have been considered for remediation of gasoline constituents in groundwater beneath the site. They are:

1. Monitored natural attenuation – this alternative would include no active remediation, but would instead rely solely on natural attenuation processes.
2. In-situ air sparging with vapor recovery by soil vapor extraction – introduction of compressed air into the saturated zone through sparge points installed in the area targeted for treatment. Air is injected in the lower portion of the contaminated zone so that it moves upward through the plume, stripping volatile contaminants from the groundwater. Vapor extraction wells and/or vent wells are installed in the vadose zone to recover the VOCs and direct them to an off-gas treatment technology, such as vapor-phase carbon, or catalytical/thermal oxidation.
3. Groundwater extraction, treatment, and discharge – this alternative includes pumping groundwater from extraction wells within the plume and directing the extracted groundwater to aboveground treatment technologies, such as air stripping or liquid-phase carbon. The treated groundwater would be discharged to the sanitary sewer under permit from the City of Salinas.
4. Chemical Oxidation – in this alternative oxidizing chemicals are added into the contaminated zone to effect a reaction that destroys the contaminants. Because the reagents are generally not selective, they react with other materials in the soil matrix as well, such as naturally occurring organic material or metals. Typical reagents used in this process include Fenton’s reagent (with hydrogen peroxide), ozone, potassium permanganate, hydrogen peroxide, and “modified” Fenton’s reagent. Each reagent has advantages and disadvantages specific to site geochemistry. Potential negative impacts include possible mobilization of species that are more soluble when oxidized (such as chromium III to hexavalent chromium), reductions in permeability to precipitation of by-products (such as iron oxides), and the addition of potential significant by-products to the groundwater.

5. Dual-phase extraction – this alternative entails lowering the water table to treat the upper saturated zone via soil vapor extraction. This is generally accomplished in the same manner as soil vapor extraction, except that extraction wells are incorporated into the design to lower the water table. Extracted groundwater is routed through a separate aboveground treatment process such as air stripping or liquid-phase carbon.

6.0 EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES

The criteria used to evaluate remedial action alternatives are:

- Short-term Effectiveness – evaluation of possible threats to the safety of nearby communities, workers, and environmentally sensitive areas during construction and startup of the corrective measure;
- Long-term Effectiveness – evaluation of possible threats to the safety of nearby communities, workers, and environmentally sensitive areas during operation of the corrective measure;
- Reduction of Toxicity, Mobility, and Volume – evaluation of how much the corrective measure alternative will reduce the waste toxicity, volume and/or mobility of contaminants;
- Long-term Reliability – evaluation of operation and maintenance issues related to success of technology at analogous sites, flexibility to deal with changing conditions, and reliability of equipment/replacement expenses;
- Implementability – addresses the technical and administrative feasibility of implementing a corrective measure alternative and the availability of services and materials needed during implementation;
- Preliminary Cost – estimates capital and operation and maintenance costs, including net present value for each corrective measure.

6.1 Vadose Zone Soils

Based upon discussions with the regulatory agencies, monitored natural attenuation was rejected as a

viable remediation alternative due to the relatively high mass of contaminants remaining in the soil and the extended timeframe necessary for the contaminants to degrade naturally. Due to the depth that soil contaminants persist in soil beneath the site (at least 52 feet bgs), soil excavation was also rejected due to implementability and cost. Additional evaluation of these alternatives was therefore not necessary. Soil vapor extraction is the presumptive remedy for VOC contamination where soil conditions support its use. Since a large percentage of subsurface soil directly beneath the UST is generally sandy, soil vapor extraction is recommended as the primary remediation alternative for the site. The preliminary estimated cost for soil vapor extraction over a period of three years is \$405,400, a net present value of \$367,327. The estimated total cost of remediation at the site is the sum total of soil vapor extraction and the selected groundwater remediation alternative. A summary of preliminary costs for each of the considered remedial options is presented in Table 5.

6.2 Saturated Zone (Groundwater)

The following sections discuss the criteria listed above with regard to the potential groundwater remediation alternative listed in section 5.2. Air sparging was eliminated from further discussion due to feasibility problems related to low-permeability soils in the saturated zone. Table 4 shows a comparative ranking of screened alternatives based upon the above criteria.

6.2.1 Monitored Natural Attenuation

Short-term Effectiveness

Since the facility is entirely paved, there is no short-term threat to site occupants or individuals in the immediate vicinity of the site. However, MNA will take an extended period of time to reduce contaminant mass in the subsurface.

Long-term Effectiveness

The long-term effectiveness of MNA is good. This alternative would reduce the toxicity and volume of the contaminants in the groundwater by natural biodegradation, however, the time frame to achieve site cleanup goals would be many years. The potential long-term effectiveness has a high

degree of uncertainty due to the potential off-site migration of contaminants.

Reduction of Toxicity, Mobility, and Volume of Contaminants

MNA would reduce the existing levels and volume of impacted groundwater over time by natural degradation. The timeframe to reduce contaminant concentrations to below regulatory levels is expected to be measured in decades.

Long-term Reliability

Although there is no equipment or material expenses, there is a high level of uncertainty regarding the necessary time frame for MNA to achieve site remediation goals.

Implementability

Although MNA is the simplest alternative to implement insofar as installation and/or equipment, this alternative has generally been rejected by the regulatory agencies.

Preliminary Cost

There are no capital costs associated with MNA. Primary costs associated with MNA are continued groundwater sampling and analysis costs. In our preliminary cost estimate, we have assumed that MNA would require quarterly groundwater sampling for a period of five years, followed by semi-annual sampling for a period of five years and annual sampling for an additional five years. Site closure activities would include well destruction and restoring the asphalt surface.

The preliminary cost estimate for MNA, including ongoing groundwater monitoring costs is \$305,000 over a period of fifteen years, a net present value of \$210,600.

6.2.2 Groundwater Extraction, Treatment, and Discharge

Short-term Effectiveness

This alternative would be more effective than natural attenuation in reducing the volume of contamination in the groundwater in the short-term, although extraction rates are likely to be limited by the low-permeability of the water-bearing zone. Certain hazards associated with construction

activities would increase initially. Since extracted groundwater would be treated prior to discharge to the sanitary sewer, potential contact with contaminated groundwater by site occupants would be limited to the remediation train between the down-hole pump and the remediation equipment, which would be enclosed in a fenced compound.

Long-term Effectiveness

The long-term effectiveness for groundwater extraction and treatment is considered good, although the rate of removal could be limited by site conditions. This alternative would ultimately reduce the time-frame to achieve groundwater restoration but an actual timeline is difficult to quantify. This alternative should effectively limit off-site migration of the dissolved contaminant plume and therefore minimize exposure to off-site receptors.

Reduction of Toxicity, Mobility, and Volume of Contaminants

Groundwater extraction and treatment would reduce the toxicity, mobility and volume of contaminants in the groundwater at the site at a greater rate than natural attenuation alone. However, experience at other sites in which significant quantities of gasoline hydrocarbons are bound to saturated soils suggests that desorption will tend to continue to recontaminate groundwater despite the extraction of many pore volumes.

Long-term Reliability

The overall long-term reliability of groundwater extraction is good. Groundwater extraction and treatment has been used effectively at many UST sites, even though it is widely recognized as being relatively inefficient. If sustainable pumping rates are possible along the plume margins, then groundwater extraction can effectively control the migration of the contaminant plume. Additional extraction points could be added to increase the area of influence of plume migration. We would expect that groundwater extraction at the site would continue for a period of between 2 and 4 years. Modern equipment is generally very reliable but certain components, such as submersible pumps and transfer pumps may require replacement after several years. In addition, regular operation and maintenance of the equipment will be required to keep all components in proper operating condition

and free of hard water deposits.

Implementability

Groundwater extraction and treatment will have a significant administrative component. Permits will include authority to construct/permit to operate from the local air district, City building permits, perhaps installation of a power pole and control panel as well as propane and/or natural gas hookups, and a sewer discharge permit. Since extracted groundwater will undergo pretreatment prior to discharge, no NPDES or WDRs should be required. However, since the site is currently in use, there may be some issues siting a remediation compound.

Preliminary Cost

This alternative will involve significant capital costs in the form of process equipment, installation of sub-grade piping and appurtenances, obtain a separate power panel, and permitting. Ongoing operation and maintenance costs will include labor and equipment, sample collection and analysis, and equipment replacement costs over an expected operational period of 2-4 years, followed by groundwater monitoring and site closure activities.

The preliminary cost estimate for groundwater extraction and treatment, including ongoing groundwater monitoring costs, is \$509,400 over a period of 9 years, a net present value of \$433,000.

6.2.3 Chemical Oxidation/Enhanced Biodegradation

Short-term Effectiveness

Chemical oxidation also could be effective in immediately reducing chemical concentrations, but would likely be limited by low-permeability saturated soils. The injection of the chemicals into the saturated zone may pose a moderate short-term risk to site workers conducting the application because of the risk of handling large quantities of oxidizing agents for injection.

Long-term Effectiveness

Chemical oxidation/enhanced biodegradation was ranked highest in this category due to an expected reducing (oxidizing) environment created through injection of chemicals. However, multiple

applications would likely be necessary due to low-permeability saturated soils. As stated in the previous section, a moderate risk to site workers may be present while handling oxidizing agents during injection.

Reduction of Toxicity, Mobility, and Volume of Contaminants

Chemical oxidation/enhanced biodegradation has successfully reduced concentrations of contaminants in groundwater in a number of sites. However, multiple applications would likely be necessary due to the low-permeability soils in the saturated zone. A general rule of thumb is a reduction in contaminant mass of approximately 90% per application. Based upon current concentrations in groundwater, we would expect up to 3-5 applications would be necessary at this site.

Long-term Reliability

Chemical oxidizers, such as Fenton's Reagent, have long been used in the wastewater treatment industry. In government-sponsored studies, the in-situ injection of Fenton's Reagent has been shown to be effective in oxidizing organic contaminants such as fuel hydrocarbons and chlorinated solvents. The low permeability soil in the saturated zone will likely necessitate multiple injections of an oxidizing agent, but there is essentially no ongoing maintenance of equipment.

Implementability

The oxidizing strength of Fenton's Reagent (or similar oxidizers) has the potential to alter the valence of metallic ions and halogens. Certain regulatory agencies have expressed particular concern about the possibility of oxidizing trivalent chromium to the more toxic and mobile hexavalent species and/or oxidizing bromide to the +5 valence state creating the toxic bromate ion. Hence, bench testing is typically required before permitting the injection of oxidizers into contaminated aquifers. Depending upon the results of the bench testing, injection may be permitted with or without Waste Discharge Requirements, or may be forbidden altogether.

*Revised Corrective Measures Study Report
Former Pure-Etch Facility, Salinas, CA*

The actual injection of the oxidizing agent is generally straightforward with only short-term disruption of site activities. If injection is necessary in off-site portions of the plume, then a City encroachment permit and traffic plan would be required and traffic necessarily altered during injection. The surface streets in the immediate vicinity of the site are relatively low traffic areas, however, and could be managed without much difficulty.

Preliminary Cost

Costs associated with this alternative include purchase of the oxidizing agent, drilling contractors/materials, permit fees, and field labor associated with injection activities, as well as ongoing groundwater monitoring and site closure costs.

The preliminary cost estimate for groundwater extraction and treatment, including ongoing groundwater monitoring costs is \$450,000 over a period of 5 years (four applications), a net present value of \$388,800.

6.2.4 Dual-phase Extraction

Short-term Effectiveness

This alternative is essentially the same groundwater extraction, but would be conducted concurrent with vapor extraction. This alternative would be more effective than natural attenuation in reducing the volume of contamination in the groundwater in the short-term, although extraction rates are likely to be limited by the low permeability of the water-bearing zone. However, certain hazards associated with construction activities would increase initially. Since extracted groundwater would be treated prior to discharge to the sanitary sewer, potential contact with contaminated groundwater by site occupants would be limited to the remediation train between the down-hole pump and the remediation equipment, which would be enclosed in a fenced compound.

Long-term Effectiveness

In conjunction with soil vapor extraction, the long-term effectiveness of groundwater extraction and treatment (dual-phase) is considered slightly better than groundwater extraction alone, because the

dewatered portion of saturated soil around each extraction well will be subject to accelerated desorption via vapor extraction. However, the rate of removal could be limited by site conditions. This alternative would ultimately reduce the time frame to achieve groundwater restoration but an actual timeline is difficult to quantify. This alternative should effectively limit off-site migration of the dissolved contaminant plume and therefore minimize exposure to off-site receptors.

Reduction of Toxicity, Mobility, and Volume of Contaminants

Dual-phase extraction should reduce the toxicity, mobility and volume of contaminants in the groundwater at the site at a somewhat greater rate than groundwater extraction alone. The removal of hydrocarbons (desorption) from soil dewatered by the pumping depression will be accelerated by vapor extraction.

Long-term Reliability

The overall long-term reliability of groundwater extraction is good. Groundwater extraction and treatment has been used effectively at many UST sites, even though it is widely recognized as being relatively inefficient. If sustainable pumping rates are possible along the plume margins, then dual-phase extraction can effectively control the migration of the contaminant plume. Additional extraction points could be added to increase the area of influence of plume migration. We would expect that dual-phase extraction at the site would continue for a period of between 2 and 4 years. Modern equipment is generally very reliable but certain components, such as submersible pumps and transfer pumps may require replacement after several years. In addition, regular operation and maintenance of the equipment will be required to keep all components in proper operating condition and free of hard water deposits.

Implementability

Dual-phase extraction and treatment will have a significant administrative component. Permits will include authority to construct/permit to operate from the local air district, City building permits, perhaps installation of a power pole and control panel as well as propane and/or natural gas hookups, and a sewer discharge permit. Since extracted groundwater will undergo pretreatment prior to

discharge, no NPDES or WDRs should be required. However, since the site is currently in use, there may be some issues siting a remediation compound.

Preliminary Cost

This alternative will involve significant capital costs in the form of process equipment, installation of sub-grade piping and appurtenances, obtain a separate power panel, and permitting. Ongoing operation and maintenance costs will include labor and equipment, sample collection and analysis, and equipment replacement costs over an expected operational period of 2-4 years, followed by groundwater monitoring and site closure activities.

The preliminary cost estimate for groundwater extraction and treatment, including ongoing groundwater monitoring costs is \$515,400 over a period of 9 years, a net present value of \$438,700.

7.0 RECOMMENDED CORRECTIVE MEASURE ALTERNATIVE

Soil vapor extraction is the presumptive remedy for VOC contamination where soil conditions support its use. Since a large percentage of subsurface soil directly beneath the UST is generally sandy, soil vapor extraction is recommended as the primary soil remedial alternative for the site.

For groundwater remediation, Alternative 3 (Chemical Oxidation) and Alternative 4 (Dual-phase extraction) had the highest scores in the comparative ranking presented in Table 5. Each of these alternatives has been successfully utilized at a number of sites, as evidenced in the literature. Site conditions that could limit the effectiveness of either of these alternatives include the low-permeability soils in the saturated zone as well as off-site access to that portion of the plume that has migrated off-site (MW2). Dual-phase extraction will require substantial administrative activities such as obtaining appropriate permits as well as implementability issues due to initial disruption of the site during construction. Chemical oxidation will necessitate conducting a bench scale test to evaluate whether by-products of the reactions may pose additional risks. Although the preliminary cost of chemical oxidation is lower than that of dual-phase extraction, there is a greater degree of uncertainty associated with the technology and implementability.

Based on our analysis, Ground Zero recommends dual-phase extraction as the preferred corrective measure. Pursuant to DTSC guidelines, the selected corrective measure must meet the following corrective action standards:

- a) Protect human health and the environment – dual-phase extraction will accomplish this through appropriate permitting and engineering controls (auto-shutoff features, etc.) during construction and initial startup of the system, and by removing contaminant mass and controlling plume migration during the remediation phase.
- b) Attain corrective action objectives including media cleanup standards – dual-phase extraction will effectively remove contaminants from the subsurface but may be limited by subsurface soils as to the degree of efficacy. In our experience with vapor extraction, the contaminants in the vadose zone will be reduced by approximately 90% percent within the first 6-12 months of operation and then continue to decline slowly or stabilize. The efficacy of remedial actions will be evaluated regularly to determine the cost benefit of continuing active remediation. If such analysis indicates dual-phase extraction is no longer cost-effective, then we would recommend discontinuing active remediation. At that time additional risk assessment would be conducted to evaluate if a risk-based closure is warranted.
- c) Control the source(s) of releases so as to reduce or eliminate, to the extent practicable, further releases of hazardous wastes (including hazardous constituents) that may pose a threat to human health and the environment – dual-phase extraction will remove or reduce the secondary source of contamination present in the form of contaminated soil in the source area and help control migration of the dissolved contaminant plume. Proper engineering controls will prevent any release of contaminated groundwater during treatment.
- d) Comply with any applicable Federal, State, and local standards for management of wastes – all appropriate permits will be obtained prior to construction and implementation. Associated

permits include building permits, ATC/PTO from the local air district, and sewer discharge permit. Any solid waste generated during drilling will be handled appropriately.

8.0 SUMMARY OF RECOMMENDED CORRECTIVE MEASURE

The major components of the dual-phase treatment system are: 1) submersible pumps for extracting groundwater from extraction well(s); 2) an air-stripper or granular activated carbon to remove contaminants from the extracted groundwater; 3) a liquid ring blower system for drawing vapors from soil; 4) a condensate removal system for removing trapped condensate in the vapor extraction piping; 3) a thermal oxidizer/catalytic oxidizer unit for treating vapors; 4) collection system piping, other associated piping, control valves and instrumentation; and 5) supplemental fuel source such as natural gas or propane for the thermal oxidizer. As vapor concentrations decline, the vapor extraction system would be converted to a catalytic oxidizer and the supplemental fuel requirement would be reduced.

The sections below describe the anticipated tasks associated with the proposed dual-phased extraction system.

System Design

The design of the system will include engineering calculations; a list of equipment, materials, and instrumentation; preparation of construction plans and specifications including site and remediation compound layouts; trench and section details if appropriate; wellhead piping details; a process and instrumentation diagram; and plan check and review. We anticipate utilizing a low-profile air stripper to removed VOCs from extracted groundwater and a trailer mounted catalytical/thermal oxidizer with a capacity of at least 300 CFM and a vacuum of up to 25" mercury, a positive displacement or liquid ring blower, and an entrained liquid separator to treat extracted vapors.

Permitting

Several permits will likely be required for the proposed system: building permits from the City of Salinas for constructing a treatment system compound and utility connections, Authority to

*Revised Corrective Measures Study Report
Former Pure-Etch Facility, Salinas, CA*

Construct and Permit to Operate (ATC/PTO) from the Monterey Bay Unified Air Pollution Control District (APCD), and a discharge permit from the Monterey Regional Water Pollution Control Agency (MRWPCA) to discharge to the sanitary sewer.

Construction and Installation

After construction plans and specifications are completed and approved, system installation can begin. This would include installation of submersible pumps, an air stripper and vapor extraction unit off-gas abatement device within a fenced treatment compound, trenching and installation of piping, control valves, and electrical/instrumentation, and installation of additional groundwater/vapor extraction wells as needed. This task will also include any other construction management activities to manage and expedite the installation and startup of the remediation system, such as systems inspections and power hook-ups.

System Startup and Source Testing

After the system is installed, a source test should be performed in accordance with APCD guidelines to verify proper operation. Startup procedures should include system monitoring, maintenance, and sampling in accordance with any APCD and/or MRWPCA permits.

System Operation, Maintenance, Monitoring and Reporting

Site operations and monitoring should include adjustment of system parameters to optimize extraction and treatment, and thus site cleanup efficiency; periodic sampling and field monitoring of influent and effluent groundwater and vapor as required by the associated permits; and other periodic maintenance procedures including inspection and cleaning of all lines, process equipment, and instrumentation. Parameters to be monitored and adjusted in the field should include groundwater and vapor extraction flow rates, drawdown/radius of influence of groundwater extraction, induced vacuum responses at vapor monitoring points, and groundwater and vapor concentrations.

On a monthly basis, samples from the influent and effluent groundwater/vapor streams will be

*Revised Corrective Measures Study Report
Former Pure-Etch Facility, Salinas, CA*

collected and analyzed for constituents of concern. Monthly analysis of the influent and effluent will be required to calculate the removal rate and destruction efficiency of the system. Operation and maintenance data will be included in quarterly monitoring and sampling reports submitted to DTSC.

If at any time laboratory analytical results or field monitoring readings show air emission limits to be exceeded, a confirmation air sample should be collected in accordance with permit requirements.

Groundwater and vapor extraction will continue until the vapor concentration decline has become asymptotic and the mass removal rate has reached a point where continued operation would be inordinately expensive for the incremental benefit derived. A report will then be prepared for submittal to DTSC recommending ending active remediation, if appropriate.

Drilling and Installation of Additional Extraction Well(s)

We anticipate 1-2 additional groundwater extraction wells and 1-2 additional vapor extraction wells will be installed near the former UST location to more effectively remove and treat contaminated groundwater and vapors in the source area. The wells will be installed by a C57 licensed drilling contractor under the supervision of an experienced geologist. The well borings will be advanced using a drilling rig equipped with 10-inch diameter hollow stem augers to the desired depth. The wells will be constructed of 4-inch diameter, Schedule 40 PVC casing and slotted screen. The wells will be completed at the ground surface with a flush-mount, watertight, traffic-rated well box and locking well cap.

9.0 REFERENCES

- CapRock, 02/97: *Workplan, Underground Storage Tank Investigation*, prepared for Pure-Etch Company, 1031 Industrial Way, Salinas, California 93901, February 1997.
- CapRock, 04/97: *Underground Storage Tank Site Investigation Report*, prepared for Pure-Etch Company, 1031 Industrial Way, Salinas, California 93901, April 1997.
- CRWQCB, 01/94: *Interim Guidance for Soil Gas Investigation*, California Regional Water Quality Control Board, Los Angeles Region, February 25, 1997

*Revised Corrective Measures Study Report
Former Pure-Etch Facility, Salinas, CA*

- DTSC, 01/94: *Preliminary Endangerment Assessment Guidance Manual*, Cal EPA, Department of Toxic Substances Control, January 1994
- DTSC, 01/00: *Corrective Action Consent Agreement for the Pure-Etch Company*, Cal EPA, Department of Toxic Substances Control correspondence, January 31, 2000
- DTSC, 01/03: *Advisory – Active Soil Gas Investigations*, Cal EPA, Department of Toxic Substances Control and California Regional Water Quality Control Board, Los Angeles Region, January 28, 2003
- DTSC, 12/04: *Interim Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air*, Cal EPA, Department of Toxic Substances Control, December 15, 2004 (Revised February 7, 2005)
- EPA, 11/86: *Test Methods for Evaluating Solid Waste*, SW-846, US EPA, November 1986
- EPA, 04/88: *Superfund Exposure Assessment Manual*, PB89-135859, US EPA, April, 1988
- EPA, 10/88: *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, OSWER Directive 9355.3-01, EPA/540/6-89/004, US EPA, October 1988
- EPA, 03/89: *Risk Assessment Guidance for Superfund*, 540-1-89-001, US EPA, March, 1989
- EPA, 10/04: *US EPA Region 9 Preliminary Remediation Goals (PRGs) Table*, US EPA, October, 2004
- GSI, 1998: *Guidance Manual for RBCA Tool Kit for Chemical Releases*, Groundwater Services, Inc. (GSI), 1998
- GZA, 02/01: *Phase II RCRA Facility Investigation, Former Pure-Etch Facility, 1031 Industrial Way, Salinas, CA 93906, February 16, 2001*, prepared by Ground Zero Analysis, Inc. (GZA) with Lee & Pierce, Inc. (L&P)
- GZA, 01/02: *Revised Addendum to Workplan for Investigation of Soil and Groundwater Contamination from Former Gasoline Storage UST, 1031 Industrial Way, Salinas, CA 93906*, prepared by Ground Zero Analysis, Inc., January 30, 2002

*Revised Corrective Measures Study Report
Former Pure-Etch Facility, Salinas, CA*

- GZA, 07/02: *Revised Phase II RCRA Facility Investigation Report, 1031 Industrial Way, Salinas, CA 93906, prepared by Ground Zero Analysis, Inc., July 17, 2002*
- GZA, 05/03: *Groundwater Sampling and Analysis Plan, UST Contamination Investigation, Former Pure-Etch Company Site, 1031 Industrial Way, Salinas, CA 93906, prepared by Ground Zero Analysis, Inc., May 15, 2003*
- GZA, 05/03: *Phase III RCRA Facility Investigation Workplan, Former Pure-Etch, Co. Facility, 1031 Industrial Way, Salinas, CA 93906, prepared by Ground Zero Analysis, Inc., May 15, 2003*
- GZA, 05/03: *Site Safety and Health Plan, Pure-Etch, Company, 1031 Industrial Street, Salinas, California, prepared by Ground Zero Analysis, Inc., May 2003*
- GZA, 06/05: *Health Risk Assessment Report, Pure-Etch, Company, 1031 Industrial Street, Salinas, California, prepared by Ground Zero Analysis, Inc., June 2005*
- GZA, 01/06: *Corrective Measures Study Report, Pure-Etch, Company, 1031 Industrial Street, Salinas, California, prepared by Ground Zero Analysis, Inc., January 2006*
- GZA, 04/06: *Revised Health Risk Assessment Report, Pure-Etch, Company, 1031 Industrial Street, Salinas, California, prepared by Ground Zero Analysis, Inc., April 2006*
- L&P, 04/00: *Workplan for Investigation of Soil and Groundwater Contamination from Former Gasoline Storage UST, 1031 Industrial Street, Salinas, CA 93906, April 12, 2000*
- OEHHA, 11/04: *Human-Exposure-Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil, Cal/EPA, Integrated Risk Assessment Section, Office of Environmental Health Hazard Assessment, November 2004 (January 2005 Revision)*
- Showalter, P.,
Akers, J.P.,
and Swain, L.A.: *Design of a Groundwater-Quality Monitoring Network for the Salinas River Basin, California: U.S. Geological Survey Water-Resources Investigations Report 83-4049, 74p., 1984*

TABLE 1
PROPOSED PRELIMINARY REMEDIAL GOALS
Former Pure-Etch Facility, Salinas, CA

PROPOSED PRELIMINARY REMEDIAL GOALS FOR SOIL						
COMPOUND	Proposed PRG ¹ (mg/kg)	Risk - Industrial (inhalation)	Hazard - Industrial (inhalation)	Risk - Industrial (dermal/ingestion)	Hazard - Industrial (dermal/ingestion)	DTSC Concurrence?
Benzene	1.4	5.E-08	6.5E-04	Not considered a completed exposure pathway for industrial Site use.		Yes
Toluene	520		3.6E-03			Yes
Ethylbenzene	400		5.6E-03			Yes
Xylenes	420		2.9E-03			Yes
1,2-dichloroethane	0.6	1.E-08	2.8E-05			Yes
Ethylene dibromide	0.073	1.E-07	1.1E-05			Yes
Naphthalene	4.2	2.E-07	1.7E-04			Yes
CUMULATIVE RISK/HAZARD		4.E-07	1.3E-02			

PROPOSED PRELIMINARY REMEDIAL GOALS FOR GROUNDWATER							
COMPOUND	Initial Proposed PRG ² (ug/L)			Risk - Industrial (dermal/ingestion)	Hazard - Industrial (dermal/ingestion)	DTSC Concurrence?	Revised PRG Required by DTSC ³ (ug/L)
Benzene	340			Not considered a completed exposure pathway for industrial Site use.		No	1
Toluene	1,050					No	150
Ethylbenzene	700					No	300
Xylenes	1,750					Yes	1,750
1,2-dichloroethane	21					No	0.5
Ethylene dibromide	8					No	0.05
Naphthalene	21					Yes	21

NOTES:

Site specific risk assessment determined that only VOC inhalation air pathway is complete for industrial Site use.

¹ = Proposed soil PRGs are adopted from USEPA Region IX PRGs established for industrial Site use.

² = Initial proposed groundwater PRGs for BTEX constituents were selected based upon 95% reduction in current groundwater contamination or 100X the current drinking water MCL, whichever was less. Initial proposed groundwater PRGs for EDB and 1,2-DCA reflected maximum background concentrations, based upon detected concentrations in upgradient and downgradient wells not impacted by gasoline constituents. Since no MCLs have been established for Naphthalene in groundwater, the Taste and Odor Threshold was selected as the initial proposed PRG.

³ = DTSC requires that groundwater PRGs be reduced to the levels of their corresponding MCLs.

TABLE 2
SCREENING OF APPLICABLE
TREATMENT TECHNOLOGIES AND PROCESS OPTIONS
Former Pure Etch Facility
1031 Industrial Avenue, Salinas, CA

TREATMENT TECHNOLOGIES	PROCESS OPTIONS
VADOSE ZONE SOIL EX-SITU	
Excavation	Removing contaminated soil with backhoe/track excavator
Treatment	Removal of VOCs through venting, biodegradation, incineration, or some other destruction process
Disposal	Transportation to landfill
VADOSE ZONE SOIL IN-SITU	
Soil Vapor Extraction	Exert vacuum on wells to remove contaminated vapor through piping and destruction equipment
Off-gas Treatment	Thermal incineration, catalytic oxidizer, vapor phase granular activated carbon
GROUNDWATER ZONE EX-SITU	
Extraction	Down-well pumps to remove groundwater through piping and treatment equipment
Treatment	Air stripper or granular activated carbon to remove contaminants from groundwater
Discharge	Permitted discharge to sanitary sewer (to WWTP), storm sewer (NPDES permit), or ground surface (WDRs)
GROUNDWATER ZONE IN-SITU	
Air injection	In-situ air sparging by direct injection of air/ozone, in-well air stripping and recharge, typically multiple treatment points
Chemical Destruction	Injection of strong oxidizing agent such as ozone, peroxide, Fenton's reagent, or modified Fenton's reagent; typically includes multiple injection points
Enhanced biological degradation	Injection of substrate nutrients/oxygen to stimulate biodegradation of contaminants
Monitored Natural Attenuation (MNA)	Monitoring contaminant trends to illustrate that natural attenuation/degradation processes will eventually reduce contaminants to below site cleanup goals.

TABLE 3
SCREENING OF SPECIFIC
REMEDIAL ACTION ALTERNATIVES
Former Pure Etch Facility
1031 Industrial Avenue, Salinas, CA

Remedial Action Alternative	Alternative Description	Feasibility	Access	Pass/Fail
Vadose Zone Soil				
Excavation	Remove contaminated soil and transport off site for disposal in licensed landfill	Would require excavation to at least 50 feet, which is too deep given the location near the building	Access not feasible in off-site/margin areas	Fail due to infeasibility and access issues
Soil Vapor Extraction	Wells drilled in the vadose zone and capillary fringe zone; wells connected through subgrade piping and manifold where vapor are directed for treatment	Sandy zones with considerable contamination do exist in the vadose zone, although contamination in fine-grained soils would be removed at slower rate	On-site/margin access is feasible for vertical wells	Pass
Monitored Natural Attenuation	No active remediation efforts	Easily implemented but due to extent of contamination would not be acceptable to regulatory agencies	None needed	Fail

TABLE 3
SCREENING OF SPECIFIC
REMEDIAL ACTION ALTERNATIVES
Former Pure Etch Facility
1031 Industrial Avenue, Salinas, CA

Remedial Action Alternative	Alternative Description	Feasibility	Access	Pass/Fail
Saturated Zone (Groundwater)				
Monitored Natural Attenuation	Plume would be allowed to attenuate naturally and periodic sampling would monitor progress	Would not be accepted by regulatory agencies since groundwater sampling to date has shown no marked decrease of contaminants in key wells	No access issues	Fail as a stand alone process; may be implemented after active remediation
Groundwater Extraction/Treatment	Pump and treat system consisting of down-well pumps, treatment through air stripping or granular activated carbon, and discharge to sanitary sewer	Although purge logs indicated low permeability in existing site wells, low-flow extraction and/or intermittent extraction should remove the most highly contaminated portion of the plume	No access issues, assuming discharge permit can be obtained from regional WWTP	Pass
In-situ Oxidation/Enhanced Biodegradation	Vertical and/or angled injection points would be installed within plume area and at the downgradient extent of the plume to introduce a strong oxidizing agent or substrated/nutrients to stimulate breakdown of Contaminants	Application/injection of oxidizer/substrate is feasible, but would likely require multiple applications due to low permeability soils in saturated zone	On-site access okay, off-site access (in street) should be obtainable	Conditional pass, dependent upon bench scale test, or in conjunction with other alternative(s)
Dual-phase Extraction	Pump and treat system combined with vapor extraction system to remove contaminated groundwater and also extract vapors from vadose zone and dewatered plume	Low-permeable soils in saturated zone would limit the pumping rate and the rate of vapor removal, but still feasible if vapor extraction is the preferred alternative for vadose zone	No on-site/margin access issues	Conditional pass, if vapor extraction is selected for treating vadose zone

TABLE 4
COMPARATIVE RANKING OF ALTERNATIVE
FOR GROUNDWATER REMEDIATION
Former Pure Etch Facility
1031 Industrial Avenue, Salinas, CA

Alternative	Short-term Effectiveness	Long-term Effectiveness	Reduction of Toxicity, Mobility, and Volume	Long-term Reliability	Implementability	Preliminary Cost	Overall Ranking (sum)
Monitored Natural Attenuation	1	1	1 over time	1	1	4 lowest cost	9
Groundwater Extraction, Treatment, Discharge	3	3	3	3	3	2	17
Chemical Oxidation or Enhanced Biological Degradation	3	4 best redox environment over time	3	3	2	3	18
Dual-phase Extraction	4 most comprehensive	3	3	4 most comprehensive	3	1	18

Relative Rankings Used

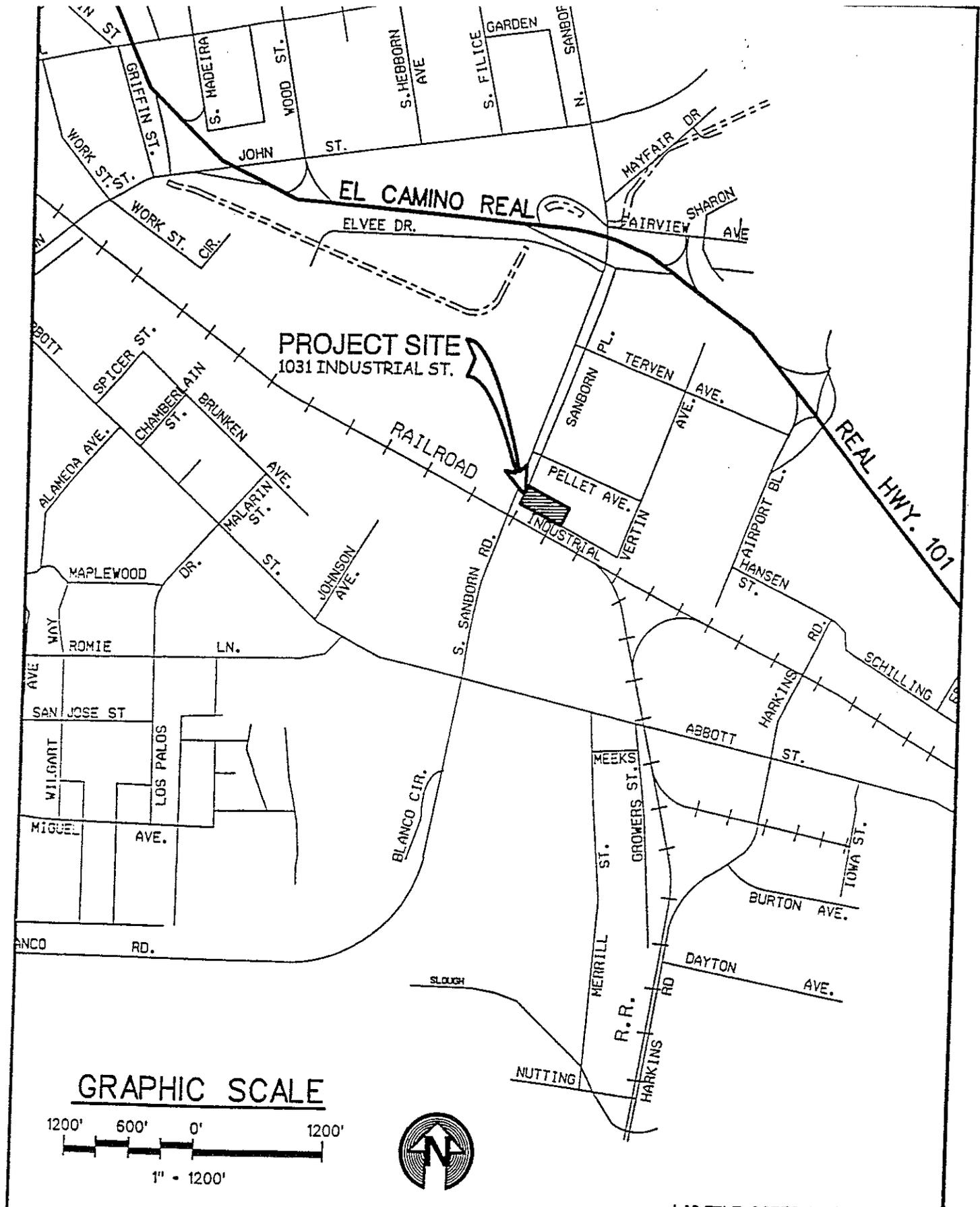
Highest	= 4	Meeting all requirements and ranking the highest of alternatives
High	= 3	Meeting all requirements
Medium	= 2	Meeting all requirements but requires additional procedures or extended timeframe
Low	= 1	Lowest rank, marginally meeting requirements or significant uncertainty

TABLE 5
SUMMARY OF PRELIMINARY COSTS
Former Pure Etch Facility
1031 Industrial Avenue, Salinas, CA

	Alternative 1-Soil Soil Vapor Extraction	Alternative 1-Water Monitored Natural Attenuation	Alternative 2-Water Groundwater Extraction & Treatment	Alternative 3-Water Chemical Oxidation	Alternative 4-Water Dual Phased Extraction
CAPITAL COSTS					
Well Installation	\$ 30,000	\$ -	\$ 30,000	\$ -	\$ 30,000
Design/Planning/Permitting	\$ 10,000	\$ -	\$ 10,000	\$ 10,000	\$ 10,000
Equipment and Materials	\$ 80,000	\$ -	\$ 30,000	\$ 60,000	\$ 35,000
Delivery and Installation	\$ 10,000	\$ -	\$ 10,000	\$ -	\$ 10,000
Sub-grade piping and installations	\$ 30,000	\$ -	\$ 20,000	\$ -	\$ 20,000
Waste Management	\$ 5,000	\$ -	\$ 5,000	\$ -	\$ 5,000
Initial Inspections and Startup/testing	\$ 2,500	\$ -	\$ 2,500	\$ -	\$ 2,500
Contingency (20%)	\$ 33,500	\$ -	\$ 21,500	\$ 14,000	\$ 22,500
Subtotal Capital	\$ 201,000	\$ -	\$ 129,000	\$ 84,000	\$ 135,000
ANNUAL OPERATION AND MAINTENANCE					
Inspections and Maintenance	\$ 35,000	\$ -	\$ 35,000	\$ -	\$ 35,000
Laboratory Analyses	\$ 12,000	\$ -	\$ 12,000	\$ -	\$ 12,000
Materials	\$ 3,000	\$ -	\$ 1,500	\$ 60,000	\$ 1,500
Utilities	\$ 2,000	\$ -	\$ 1,000	\$ -	\$ 1,000
Permit Fees	\$ 2,000	\$ -	\$ 2,000	\$ -	\$ 2,000
Contingency (20%)	\$ 10,800	\$ -	\$ 10,300	\$ 12,000	\$ 10,300
Subtotal Year 1	\$ 64,800	\$ -	\$ 61,800	\$ 72,000	\$ 61,800
Subtotal Year 2	\$ 64,800	\$ -	\$ 61,800	\$ 72,000	\$ 61,800
Subtotal Year 3	\$ 64,800	\$ -	\$ 61,800	\$ 72,000	\$ 61,800
Subtotal Operation and Maintenance	\$ 194,400	\$ -	\$ 185,400	\$ 216,000	\$ 185,400

TABLE 5
SUMMARY OF PRELIMINARY COSTS
Former Pure Etch Facility
1031 Industrial Avenue, Salinas, CA

	Alternative 1-Soil Soil Vapor Extraction	Alternative 1-Water Monitored Natural Attenuation	Alternative 2-Water Groundwater Extraction & Treatment	Alternative 3-Water Chemical Oxidation	Alternative 4-Water Dual Phased Extraction
GROUNDWATER MONITORING/SAMPLING					
Quarterly Year 1	\$ -	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000
Quarterly Year 2	\$ -	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000
Quarterly Year 3	\$ -	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000
Quarterly Year 4	\$ -	\$ 30,000	\$ -	\$ -	\$ -
Quarterly Year 5	\$ -	\$ 30,000	\$ -	\$ -	\$ -
Semiannually Year 1	\$ -	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000
Semiannually Year 2	\$ -	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000
Semiannually Year 3	\$ -	\$ 15,000	\$ 15,000	\$ -	\$ 15,000
Semiannually Year 4	\$ -	\$ 15,000	\$ -	\$ -	\$ -
Semiannually Year 5	\$ -	\$ 15,000	\$ -	\$ -	\$ -
Annually Year 1	\$ -	\$ 10,000	\$ 10,000	\$ -	\$ 10,000
Annually Year 2	\$ -	\$ 10,000	\$ 10,000	\$ -	\$ 10,000
Annually Year 3	\$ -	\$ 10,000	\$ -	\$ -	\$ -
Annually Year 4	\$ -	\$ 10,000	\$ -	\$ -	\$ -
Annually Year 5	\$ -	\$ 10,000	\$ -	\$ -	\$ -
Subtotal Groundwater Monitoring/Sampling	\$ -	\$ 275,000	\$ 155,000	\$ 120,000	\$ 155,000
SITE CLOSURE					
Decommission Equipment	\$ 5,000	\$ -	\$ 5,000	\$ -	\$ 5,000
Well Destuction	\$ 5,000	\$ 30,000	\$ 35,000	\$ 30,000	\$ 35,000
Subtotal Site Closure	\$ 10,000	\$ 30,000	\$ 40,000	\$ 30,000	\$ 40,000
TOTAL PRELIMINARY COST	\$ 405,400	\$ 305,000	\$ 509,400	\$ 450,000	\$ 515,400
NET PRESENT VALUE	\$ 367,327	\$ 210,563	\$ 432,986	\$ 388,811	\$ 438,700

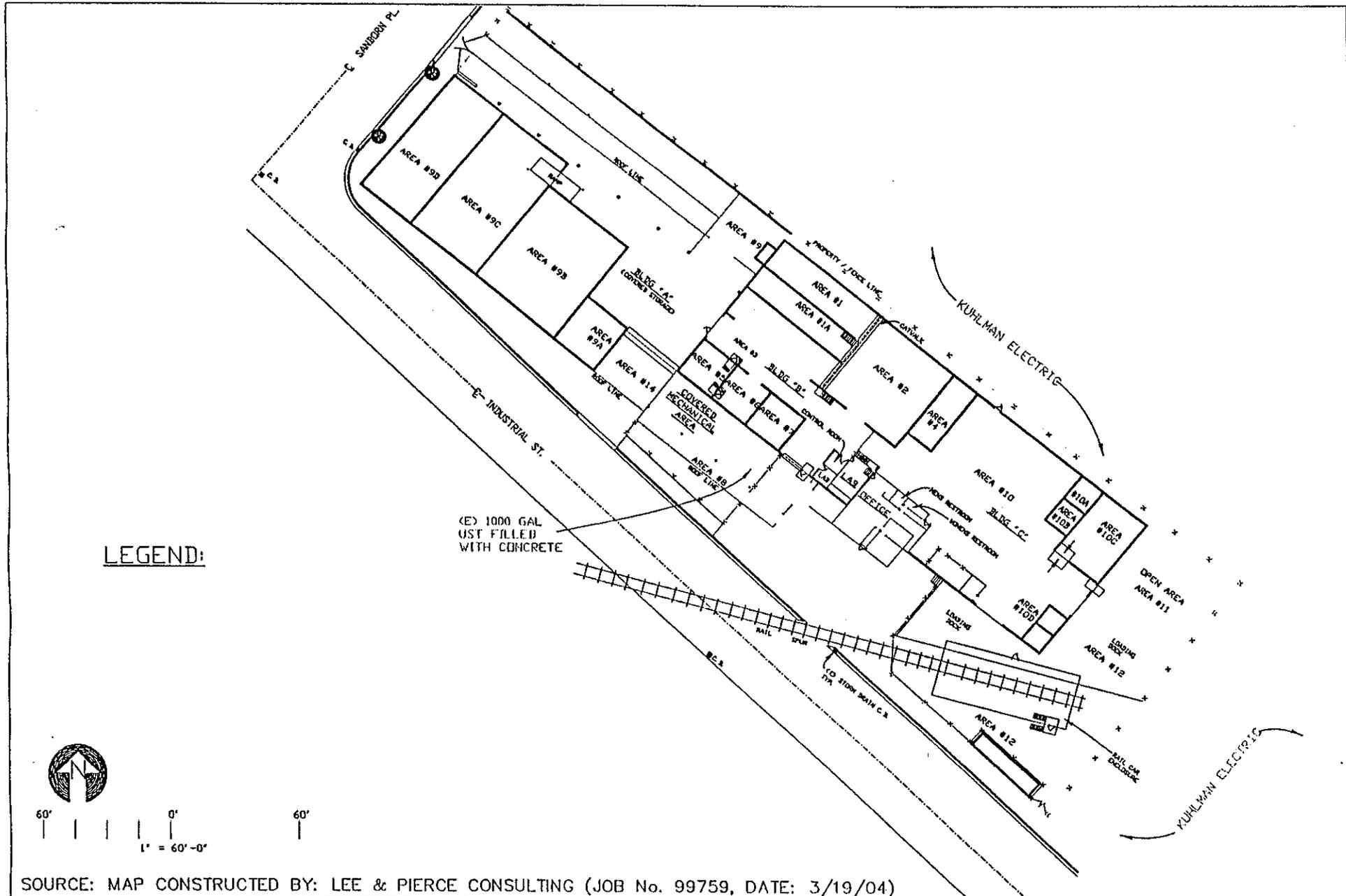


LOCATION MAP
 PURE ETCH
 SALINAS, CALIFORNIA

LEE & PIERCE, inc.
 consulting engineers
 546 ABBOTT ST. SUITE 20
 SALINAS, CA 93901

JOB No. 99759	SHT No
DATE: 04-12-00	
BY: DP	

FIGURE 1



LEGEND:

(E) 1000 GAL UST FILLED WITH CONCRETE



60' 0' 60'
1" = 60'-0"

SOURCE: MAP CONSTRUCTED BY: LEE & PIERCE CONSULTING (JOB No. 99759, DATE: 3/19/04)

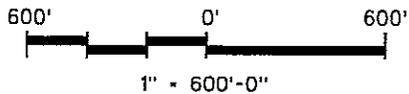
GROUND ZERO ANALYSIS

SITE PLAN
 PURE ETCH COMPANY
 1031 INDUSTRIAL ST.,
 SALINAS, CALIFORNIA

FIGURE
 2
 FN: 0605/365S



© CROP IMAGE, 1999



L&P FILE: 99759-03.dgn

AERIAL PHOTOMAP
 PURE ETCH
 SALINAS, CALIFORNIA

LEE & PIERCE, inc.
 consulting engineers
 546 ABBOTT ST., SUITE 20
 SALINAS, CA 93901

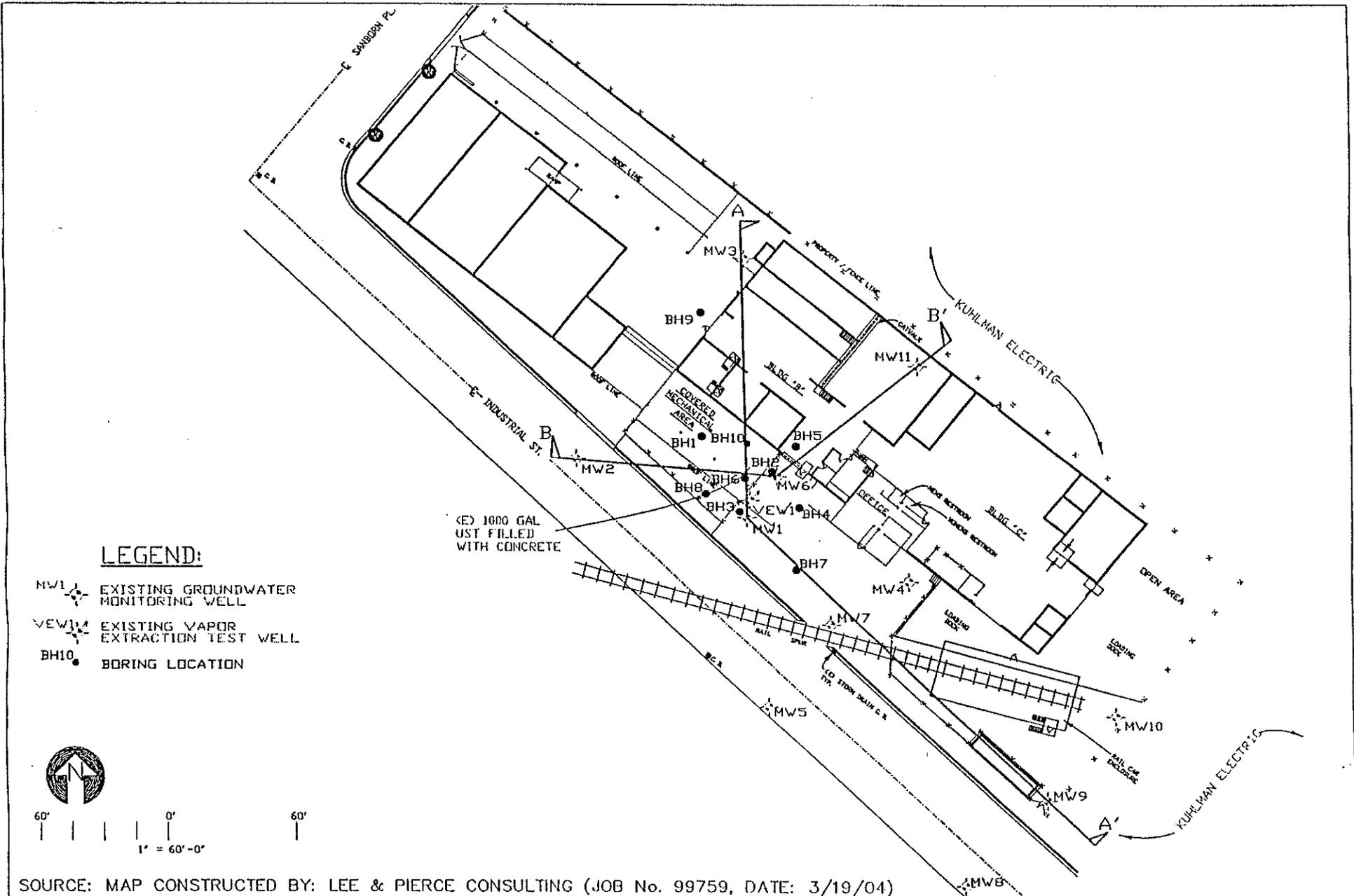
JOB No. 00759

DATE: 04-13-00

BY: DP

SHT No

FIGURE 3



LEGEND:

- MW1 EXISTING GROUNDWATER MONITORING WELL
- VEW1 EXISTING VAPOR EXTRACTION TEST WELL
- BH10 BORING LOCATION

(E) 1000 GAL (UST FILLED) WITH CONCRETE



60' | 0' | 60'
1" = 60'-0"

SOURCE: MAP CONSTRUCTED BY: LEE & PIERCE CONSULTING (JOB No. 99759, DATE: 3/19/04)

GROUND ZERO ANALYSIS	LOCATIONS OF BORINGS, MONITORING WELLS, AND LINES OF SECTION PURE ETCH COMPANY 1031 INDUSTRIAL ST., SALINAS, CALIFORNIA	FIGURE 4 FN: 0605/365S
----------------------	--	------------------------------

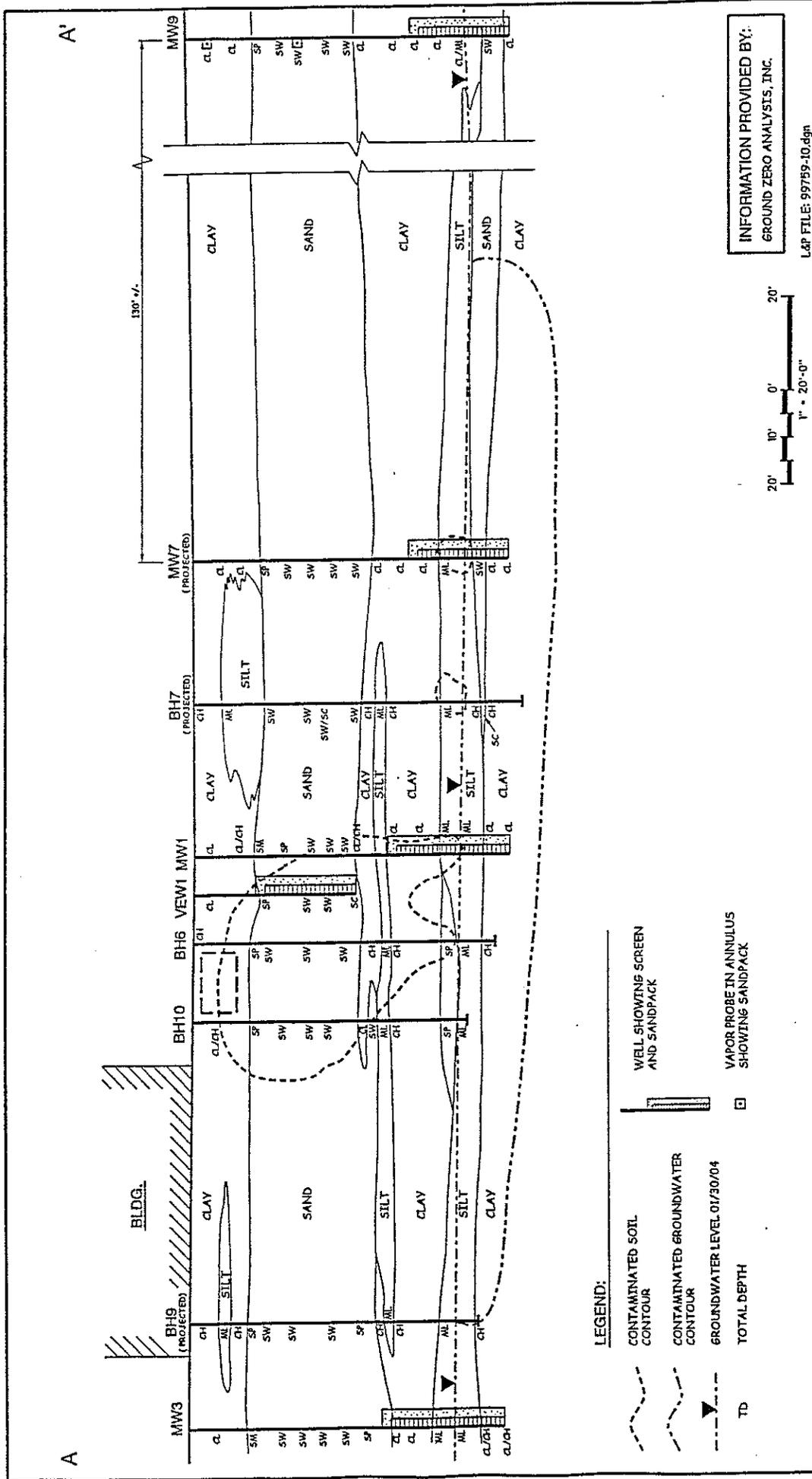
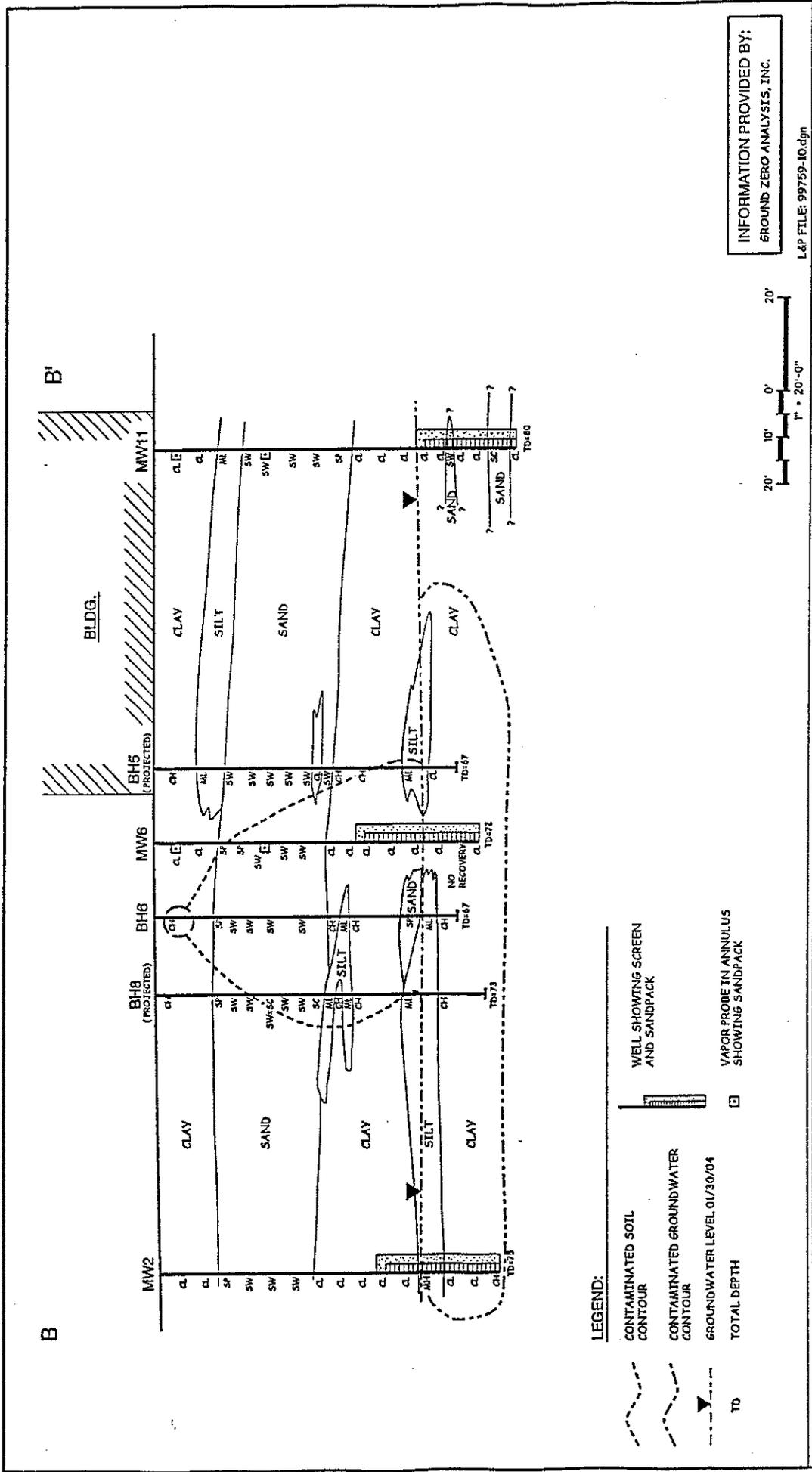
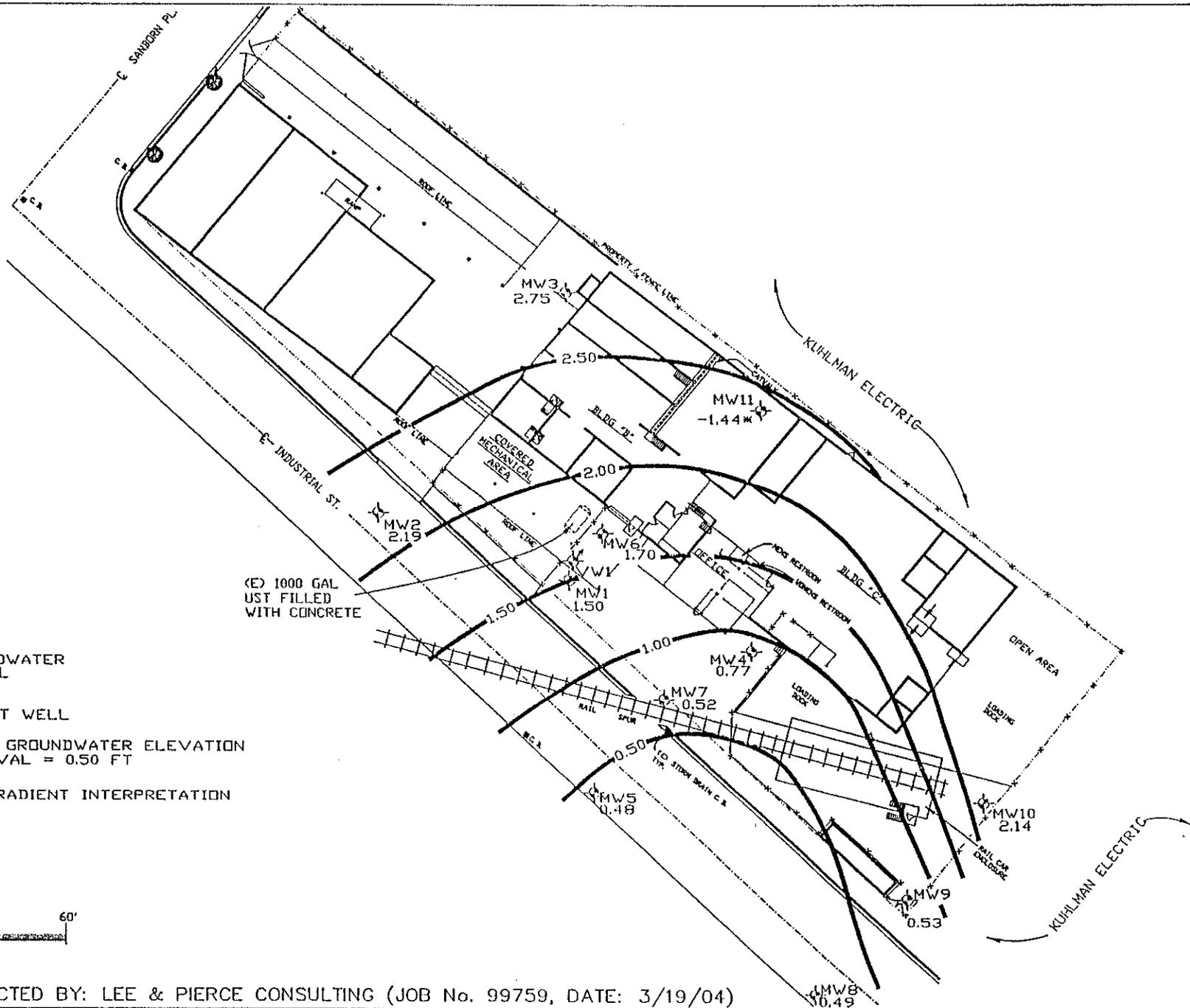


FIGURE 5



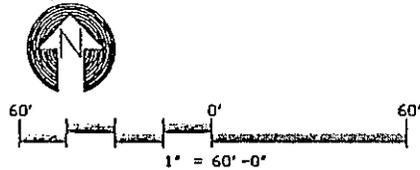
LEE & PIERCE, Inc. consulting engineers 546 ABBOTT ST., SUITE 20 SALINAS, CA 93901		JOB No. 99759 DATE: 03-19-04 BY: DP	SHT No
--	--	---	--------

FIGURE 6



LEGEND:

- MW1 EXISTING GROUNDWATER MONITORING WELL
- VW1 EXISTING VAPOR EXTRACTION TEST WELL
- 2.00 LINE OF EQUAL GROUNDWATER ELEVATION CONTOUR INTERVAL = 0.50 FT
- * NOT USED IN GRADIENT INTERPRETATION



SOURCE: MAP CONSTRUCTED BY: LEE & PIERCE CONSULTING (JOB No. 99759, DATE: 3/19/04)

GROUND ZERO ANALYSIS

POTENTIOMETRIC SURFACE MAP
 JULY 13, 2005
 PURE ETCH COMPANY
 1031 INDUSTRIAL ST.,
 SALINAS, CALIFORNIA

FIGURE
 7
 FN: 1105/365S

APPENDIX A

**DATA SUMMARY TABLES FROM SITE
CHARACTERIZATION**

TABLE 1

SOIL ANALYTICAL RESULTS
 Concentration in samples expressed as ug/g (ppm)
 March 27, 1997

Sample I.D. Depth in feet	TPHd	TPEg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Lead - EPA Method 5010A
E1-13'	ND	8,200	ND	170	140	810	ND	38.5
E1-31'	ND	1,100	ND	17	9	110	ND	1.7
E1-40'	ND	34	.72	3.8	.38	4.8	ND	7.7
E2-13'	ND	10,000	ND	69	39	640	ND	3.2
E2-34'	ND	2,200	ND	39	23	170	ND	13.2
E2-40'	ND	4,200	ND	150	64	340	ND	4.1
E3-16'	NA	NA	NA	NA	NA	NA	NA	2.4
E3-19'	ND	ND	ND	ND	ND	ND	ND	2.5
E3-37'	ND	6.8	ND	.22	ND	1.5	ND	1.6
E3-40'	ND	ND	ND	ND	.05	.2	ND	7.3

Notes:

1. Xylenes reported as total of Ortho, Meta and Para isomers.
2. Gasoline reported as total volatile petroleum hydrocarbons.
3. Extractable petroleum hydrocarbons in the boiling range of Diesel, calculated as Diesel.
4. MTBE = Methyl-tert-Butyl Ether.
5. ND = None detected at or above the practical quantitation limit.
6. TPHg = Total Petroleum Hydrocarbons as gasoline..
7. TPHd = Total Petroleum Hydrocarbons as diesel.
8. NA = Not analyzed

TABLE 3
SOIL ANALYTICAL RESULTS
JULY-AUGUST 2000
Concentrations in ug/g (ppm)

DATE	SAMPLE ID	TPHG	B	T	E	X	MTBE
08/02/00	BH4-22	<5.0	<0.05	0.12	<0.05	0.07	<0.05
08/02/00	BH4-40	5.5	<0.05	0.09	0.06	0.28	<0.05
08/02/00	BH4-63	<5.0	<0.05	0.06	0.17	0.05	<0.05
08/02/00	BH4-67	<5.0	<0.05	0.05	<0.05	<0.05	<0.05
07/18/00	BH5-10	<5.0	<0.05	<0.05	<0.05	<0.05	<0.05
07/18/00	BH5-19	<5.0	<0.05	<0.05	<0.05	<0.05	<0.05
07/18/00	BH5-25	<5.0	<0.05	<0.05	<0.05	<0.05	<0.05
07/18/00	BH5-31	<5.0	<0.05	<0.05	<0.05	<0.05	<0.05
07/18/00	BH5-37	<5.0	<0.05	<0.05	<0.05	<0.05	<0.05
07/18/00	BH5-49	<5.0	0.78	<0.05	0.15	<0.05	<0.1
07/18/00	BH5-58	3,700	8.5	110	54	210	<25
07/18/00	BH5-67	<5.0	<0.05	<0.05	<0.05	<0.05	<0.05
07/17/00	BH6-16	6,500	<2.5	44	36	470	<2.5
07/17/00	BH6-46	57	7.3	12	0.83	3.6	<0.5
07/17/00	BH6-55	2,400	27	150	35	150	<12
07/17/00	BH6-58	12	0.61	1.7	0.17	0.83	<0.1
07/17/00	BH6-61	<5.0	0.27	0.09	0.2	0.12	<0.05
07/17/00	BH6-64	<5.0	<0.05	<0.05	<0.05	<0.05	<0.5
07/17/00	BH6-67	<5.0	<0.05	<0.05	<0.05	<0.05	<0.5
08/03/00	BH7-40	<5.0	<0.05	<0.05	<0.05	<0.05	<0.05
08/03/00	BH7-55	360	<0.5	2.9	3.3	11	<0.5
08/03/00	BH7-63	15	1.9	2.7	0.28	0.95	<0.05
08/03/00	BH8-20	<5.0	<0.05	<0.05	<0.05	0.09	<0.05
08/03/00	BH8-30	1,300	<0.6	1.9	0.92	43	<0.6
08/03/00	BH8-40	1,600	6.2	100	31	150	<0.5
08/03/00	BH8-50	440	8.0	33	6.9	32	<2.0
08/03/00	BH8-60	<5.0	0.47	<0.05	0.3	0.1	<0.05
08/03/00	BH8-70	<5.0	<0.05	<0.05	<0.05	<0.05	<0.05
08/04/00	BH9-58	<5.0	<0.05	<0.05	<0.05	<0.05	<0.05
08/04/00	BH9-64	<5.0	<0.05	<0.05	<0.05	<0.05	<0.05
07/17/00	BH10-10	3,900	<2.5	42	31	250	<2.5
07/17/00	BH10-25	8,500	<20	31	34	410	<20
07/18/00	BH10-32	<5.0	<0.05	<0.05	<0.05	0.07	<0.05
07/18/00	BH10-40	12	<0.05	<0.05	<0.05	1.6	<0.05
07/18/00	BH10-58	<5.0	0.23	0.32	0.15	0.42	<0.05
07/18/00	BH10-61	11	0.7	1.2	0.45	0.57	<0.1

Notes

TPHg = Total Petroleum Hydrocarbons as Gasoline (EPA 8015M)
 B = Benzene (EPA 8020)
 T = Toluene (EPA 8020)
 E = Ethylbenzene (EPA 8020)
 X = Xylenes (EPA 8020)
 MTBE = Methyl tert Butyl Ether (EPA 8020)

TABLE 6
SOIL ANALYTICAL RESULTS
PETROLEUM HYDROCARBON CONSTITUENTS

JUNE 2002

Concentrations in mg/kg (ppm)

Page 1 of 2

DATE	SAMPLE ID	TPIID	TPIIK	TPIIG	B	T	E	X	Lead	CB	DCB	DCA	EDB	TBA	MTBE	DIPE	ETBE	TAME	
06/05/02	MW1-5	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	8.7	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW1-10	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	7.7	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW1-15	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<3.0	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW1-20	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<3.0	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW1-25	1.3b	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<3.0	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW1-30	8.1b	8.8	<1.0	<0.005	<0.005	<0.005	0.078	<3.0	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW1-35	6.7c	11	12a	0.022	0.78	0.21	2.2	6.2	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW1-40	5.1c	7.9	13a	0.15	0.74	0.42	1.8	4.5	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW1-45	24c	27	160a	0.05	0.31	2.5	9.7	7.3	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW1-50	2.5c	3.6	20a	2.7	0.036	0.63	1.2	5.3	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW1-55	130c	160	110a	5.3	15	1.9	8.7	7.0	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW1-60	2.7c	4.0	14a	2.2	5.3	0.60	1.3	<3.0	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW1-65	<1.0	<1.0	<1.0	<0.005	<0.005	0.0096	<0.005	7.7	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005
	MW1-70	<1.0	<1.0	<1.0	0.0066	0.019	<0.005	0.0054	7.9	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005
06/03/02	MW2-50	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	8.7	<0.005	<0.005	0.0092	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW2-55	65c	64	370b,d	0.14	2.5	2.9	10	4.6	<0.40	<0.40	<0.40	<0.40	<4.0	<0.40	<0.40	<0.40	<0.40	
	MW2-60	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	6.1	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW2-65	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	8.8	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW2-70	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	8.1	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW2-75	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	8.3	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW3-45	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	7.6	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
06/06/02	MW3-50	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	6.6	<0.005	<0.005	0.012	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW3-55	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	4.0	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW3-60	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	7.1	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW3-65	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	6.3	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW3-70	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	5.4	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW4-45	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	6.7	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW4-50	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	10	<0.005	<0.005	0.013	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
06/04/02	MW4-55	4.3c	4.6	21a	0.70	6.5	0.80	3.3	3.5	<0.24	<0.24	<2.4	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	
	MW4-60	1.4c	1.4	4.3a	0.62	0.32	0.31	0.16	5.0	<0.094	<0.094	<0.94	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	
	MW4-65	<1.0	<1.0	<1.0	<0.005	0.017	<0.005	<0.005	6.0	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	
	MW4-70	<1.0	<1.0	<1.0	<0.005	0.017e	<0.005	0.00759e	4.9	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005	

TABLE 6
SOIL ANALYTICAL RESULTS
PETROLEUM HYDROCARBON CONSTITUENTS

JUNE 2002

Concentrations in mg/kg (ppm)

Page 2 of 2

DATE	SAMPLE ID	TPHD	TPHK	TPHG	B	T	E	X	Lead	CB	DCB	DCA	EDB	TBA	MTBE	DIPE	ETBE	TAME
06/04/02	MW5-45	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	5.6	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005
	MW5-50	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	5.5	<0.005	<0.005	0.0071	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005
	MW5-55	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	4.7	<0.005	<0.005	0.0058	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005
	MW5-60	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	3.1	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005
	MW5-65	<1.0	<1.0	<1.0	0.015	<0.005	<0.005	<0.005	<3.0	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005
	MW5-70	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	6.3	<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005	<0.005	<0.005

Notes

TPHD	=	Total Petroleum Hydrocarbons as Diesel by EPA 8015C	DCB	=	Dichlorobenzenes by EPA 5035/8260B
TPHK	=	Total Petroleum Hydrocarbons as Kerosene by EPA 8015C	DCA	=	1,2-Dichloroethane by EPA 5035/8260B
TPHg	=	Total Petroleum Hydrocarbons as Gasoline by EPA 8015Cm	EDB	=	Ethylene Dibromide by EPA 5035/8260B
B	=	Benzene by EPA 8021B	TBA	=	t-Butyl Alcohol by EPA 5035/8260B
T	=	Toluene by EPA 8021B	MTBE	=	Methyl-t-Butyle Ether by EPA 5035/8260B
E	=	Ethylbenzene by EPA 8021B	DIPE	=	Di-Isopropyl Ether by EPA 5035/8260B
X	=	Xylenes by EPA 8021B	ETBE	=	Ethyl-t-Butyl Ether by EPA 5035/8260B
Lead	=	Lead by EPA 6010C	TAME	=	t-Amyl Methyl Ether by EPA 5035/8260B
CB	=	Chlorobenzene by EPA 5035/8260B	NA	=	t-Amyl Methyl Ether by EPA 5035/8260B
a	=	Unmodified or weakly modified gasoline is significant			
b	=	Diesel range compounds are significant; no recognizable pattern			
c	=	Gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?			
d	=	No recognizable pattern			
e	=	Result is from EPA 5035/8260B; Method EPA 8021B was non-detect for all analytes			

TABLE 7
SOIL ANALYTICAL RESULTS
VOLATILE ORGANIC COMPOUNDS
EPA METHOD 5035/8260B
 Concentrations in mg/kg (ppm)

Page 1 of 2

DATE	SAMPLE ID	Benzene	n-Butyl benzene	1,1-DCE	Ethyl-benzene	4-Isopropyl toluene	Napth	Toluene	1,2,4-TMB	Xylenes	1,2-DCA	Isopropyl benzene	n-Propyl benzene	1,3,5-TMB
06/05/02	MW1-5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW1-10	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW1-15	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW1-20	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW1-25	<0.005	<0.005	<0.005	<0.005	<0.005	<0.019	<0.005	<0.005	0.036	<0.005	<0.005	<0.005	<0.005
	MW1-30	<0.005	0.028	<0.005	0.016	0.0074	0.091	0.021	0.29	0.20	<0.005	<0.005	<0.005	0.012
	MW1-35	<0.10	<0.10	<0.10	0.21	<0.10	0.49	0.62	1.1	2.1	<0.10	<0.10	<0.10	0.075
	MW1-40	0.10	<0.10	<0.10	0.31	<0.10	0.22	0.57	0.93	1.3	<0.10	<0.10	<0.10	0.28
	MW1-45	0.69	0.74	<0.40	1.9	<0.40	1.3	<0.40	9.8	7.1	<0.40	<0.40	<0.40	0.24
	MW1-50	2.3	<0.10	<0.10	0.51	<0.10	0.22	<0.10	0.82	0.90	0.19	<0.10	<0.10	1.3
06/03/02	MW1-55	2.6	<0.50	<0.50	1.4	<0.50	<1.0	3.5	6.2	0.97	<0.50	<0.50	<0.20	1.1
	MW1-60	1.2	<0.20	<0.20	0.46	<0.20	<0.40	4.0	0.57	0.20	<0.20	<0.20	<0.20	<0.20
	MW1-65	0.014	<0.005	<0.005	0.320	<0.005	<0.010	0.034	0.044	0.14	0.029	<0.005	0.0087	0.026
	MW1-70	0.0088	<0.005	<0.005	<0.005	<0.005	<0.010	0.033	<0.005	0.0098	<0.005	<0.005	<0.005	<0.005
	MW2-50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0092	<0.005	<0.005	<0.005
	MW2-55	<0.40	1.6	<0.40	2.6	0.46	1.5	1.2	14	8.5	<0.40	0.54	2.4	4.8
	MW2-60	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW2-65	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW2-70	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW2-75	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
06/06/02	MW3-45	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW3-50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW3-55	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW3-60	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW3-65	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW3-70	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW4-45	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
06/04/02	MW4-50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW4-55	0.60	<0.24	<2.4	0.62	<0.24	<0.48	6.0	0.69	2.3	0.13	<0.005	<0.005	<0.005
	MW4-60	0.50	<0.094	<0.094	0.20	<0.094	<0.19	0.23	<0.094	<0.094	<0.094	<0.094	<0.094	<0.24
	MW4-65	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.094
	MW4-70	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.017	<0.005	0.00759	<0.005	<0.005	<0.005	<0.005

TABLE 7
SOIL ANALYTICAL RESULTS
VOLATILE ORGANIC COMPOUNDS
EPA METHOD 5035/8260B
Concentrations in mg/kg (ppm)
 Page 2 of 2

DATE	SAMPLE ID	Benzene	n-Butyl benzene	1,1-DCE	Ethyl-benzene	4-Isopropyl toluene	Naphth	Toluene	1,2,4-TMB	Xylenes	1,2-DCA	Isopropyl benzene	n-Propyl benzene	1,3,5-TMB
06/04/02	MW5-45	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW5-50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0071	<0.005	<0.005	<0.005
	MW5-55	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0058	<0.005	<0.005	<0.005
	MW5-60	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW5-65	0.021	<0.005	0.0061	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW5-70	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Notes

DCE	=	Dichloroethene	Naphth	=	Napthalene	TMB	=	Trimethylbenzene
DCA	=	Dichloroethane						

TABLE 12
SOIL ANALYTICAL RESULTS
PETROLEUM HYDROCARBON CONSTITUENTS
DECEMBER 2003
 Concentrations in mg/kg (ppm)
 Page 1 of 2

DATE	SAMPLE ID	TPHG	B	T	E	X	CB	DCB	DCA	EDB	TBA	MTBE	DIPE	ETBE	TAME
12/17/03	MW6-5	<0.54	<0.0027	<0.0027	<0.0027	<0.0027	<0.0055	<0.0055	<0.0055	<0.0055	<0.027	<0.0055	<0.0055	<0.0055	<0.0055
	MW6-10	<0.51	<0.0026	<0.0026	<0.0026	<0.0026	<0.0059	<0.0059	<0.0059	<0.0059	<0.030	<0.0059	<0.0059	<0.0059	<0.0059
	MW6-15	610g,b	<0.057	0.20	0.93	56	<2.5	<2.5	<2.5	<2.5	<12	<2.5	<2.5	<2.5	<2.5
	MW6-20	370g,b	<0.060	0.070	<0.060	22	<2.9	<2.9	<2.9	<2.9	<15	<2.9	<2.9	<2.9	<2.9
	MW6-25	1.6g	<0.0030	0.0037	<0.0030	0.065	<0.0059	<0.0059	<0.0059	<0.0059	<0.029	<0.0059	<0.0059	<0.0059	<0.0059
	MW6-30	1.9g,b	<0.0031	0.0066	<0.0031	0.16	<0.012	<0.012	<0.012	<0.012	<0.059	<0.012	<0.012	<0.012	<0.012
	MW6-35	3.1g	<0.0028	0.0090	<0.0028	0.32	<0.0057	<0.0057	<0.0057	<0.0057	0.041	<0.0057	<0.0057	<0.0057	<0.0057
	MW6-40	13a	0.20	0.65	0.91	1.9	<0.041	<0.041	0.057	0.056	<0.20	<0.041	<0.041	<0.041	<0.041
	MW6-45	3.8a	0.084	0.017	0.19	0.028	<0.005	<0.005	0.22	<0.005	<0.25	<0.005	<0.005	<0.005	<0.005
	MW6-50	4.0a	0.082	0.016	0.16	0.096	<0.005	<0.005	0.12	<0.005	<0.025	<0.005	<0.005	<0.005	<0.005
	MW6-55	750a	11	69	16	69	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
	MW6-60	23a	2.2	4.8	6.3	1.3	<0.20	<0.20	<0.20	<0.20	<0.98	<0.20	<0.20	<0.20	<0.20
	MW6-65	1.3a	0.049	0.25	0.28	0.10	<0.010	<0.010	<0.010	<0.010	<0.051	<0.010	<0.010	<0.010	<0.010
	MW6-72	<0.51	<0.0025	<0.0025	<0.0025	<0.0025	<0.032	<0.032	<0.032	<0.032	<0.16	<0.032	<0.032	<0.032	<0.032
12/17/03	MW7-50	<0.50	<0.0025	<0.0025	<0.0025	<0.0025	<0.0053	<0.0053	0.064	<0.0053	<0.026	<0.0053	<0.0053	<0.0053	<0.0053
	MW7-55	5.0a	0.0087	0.067	0.24	0.54	<0.020	<0.020	<0.020	<0.020	<0.10	<0.020	<0.020	<0.020	<0.020
	MW7-60	1.4a	0.34	0.013	0.97	0.034	<0.019	<0.019	<0.019	<0.019	<0.095	<0.019	<0.019	<0.019	<0.019
	MW7-65	<0.49	<0.0025	<0.0025	<0.0025	<0.0025	<0.005	<0.005	<0.005	<0.005	<0.025	<0.005	<0.005	<0.005	<0.005
	MW7-70	<0.48	<0.0024	<0.0024	<0.0024	<0.0024	<0.0051	<0.0051	<0.0051	<0.0051	<0.026	<0.0051	<0.0051	<0.0051	<0.0051
	MW8-50	<0.50	<0.0025	<0.0025	<0.0025	<0.0025	<0.005	<0.005	<0.005	<0.005	<0.025	<0.005	<0.005	<0.005	<0.005
	MW8-55	<0.53	<0.0027	<0.0027	<0.0027	<0.0027	<0.0051	<0.0051	<0.0051	<0.0051	<0.026	<0.0051	<0.0051	<0.0051	<0.0051
12/17/03	MW8-60	<0.49	<0.0024	<0.0024	<0.0024	<0.0024	<0.0047	<0.0047	<0.0047	<0.047	<0.024	<0.0047	<0.0047	<0.0047	<0.0047
	MW8-65	<0.48	<0.0024	<0.0024	<0.0024	<0.0024	<0.0055	<0.0055	<0.0055	<0.027	<0.027	<0.0055	<0.0055	<0.0055	<0.0055
	MW8-72	<0.50	<0.0025	<0.0025	<0.0025	<0.0025	<0.0052	<0.0052	<0.0052	<0.026	<0.026	<0.0052	<0.0052	<0.0052	<0.0052
	MW9-50	<0.49	<0.0025	<0.0025	<0.0025	<0.0025	<0.0052	<0.0052	<0.0052	<0.026	<0.026	<0.0052	<0.0052	<0.0052	<0.0052
	MW9-55	<0.51	<0.0026	<0.0026	<0.0026	<0.0026	<0.0051	<0.0051	<0.0051	<0.025	<0.025	<0.0051	<0.0051	<0.0051	<0.0051
	MW9-60	<0.49	<0.0024	<0.0024	<0.0024	<0.0024	<0.0049	<0.0049	<0.0049	<0.049	<0.025	<0.0049	<0.0049	<0.0049	<0.0049
	MW9-65	<0.48	<0.0024	<0.0024	<0.0024	<0.0024	<0.0046	<0.0046	<0.0046	<0.046	<0.023	<0.0046	<0.0046	<0.0046	<0.0046
12/15/03	MW10-50	<0.50	<0.0025	<0.0025	<0.0025	<0.0025	<0.0049	<0.0049	<0.0049	<0.049	<0.025	<0.0049	<0.0049	<0.0049	<0.0049
	MW10-55	<0.49	<0.0024	<0.0024	<0.0024	<0.0024	<0.005	<0.005	<0.005	<0.025	<0.025	<0.005	<0.005	<0.005	<0.005
	MW10-60	<0.52	<0.0026	<0.0026	<0.0026	<0.0026	<0.0056	<0.0056	<0.0056	<0.028	<0.028	<0.0056	<0.0056	<0.0056	<0.0056
	MW10-65	<0.49	<0.0024	<0.0024	<0.0024	<0.0024	<0.0053	<0.0053	<0.0053	<0.027	<0.027	<0.0053	<0.0053	<0.0053	<0.0053
	MW10-72	<0.55	<0.0027	<0.0027	<0.0027	<0.0027	<0.0050	<0.0050	<0.0050	<0.030	<0.030	<0.0050	<0.0050	<0.0050	<0.0050

TABLE 12
SOIL ANALYTICAL RESULTS
PETROLEUM HYDROCARBON CONSTITUENTS
DECEMBER 2003

Concentrations in mg/kg (ppm)

Page 2 of 2

DATE	SAMPLE ID	TPHG	B	T	E	X	CB	DCB	DCA	EDB	TBA	MTBE	DIPE	ETBE	TAME
12/19/03	MW11-60	<0.52	<0.0026	<0.0026	<0.0026	<0.0026	<0.0048	<0.0048	<0.0048	<0.0048	<0.024	<0.0048	<0.0048	<0.0048	<0.0048
	MW11-65	<0.49	<0.0025	<0.0025	<0.0025	<0.0025	<0.0083	<0.0083	<0.0083	<0.0083	<0.041	<0.0083	<0.0083	<0.0083	<0.0083
	MW11-70	<0.50	<0.0025	<0.0025	<0.0025	<0.0025	<0.005	<0.005	<0.005	<0.005	<0.025	<0.005	<0.005	<0.005	<0.005
	MW11-75	<0.43	<0.0021	<0.0021	<0.0021	<0.0021	<0.0045	<0.0045	<0.0045	<0.0045	<0.023	<0.0045	<0.0045	<0.0045	<0.0045
	MW11-80	<0.48	<0.0024	<0.0024	<0.0024	<0.0024	<0.0045	<0.0045	<0.0045	<0.0045	<0.023	<0.0045	<0.0045	<0.0045	<0.0045
12/18/03	VW1-5	<0.48	<0.0024	0.0041	<0.0024	0.0031	<0.0055	<0.0055	<0.0055	<0.0055	<0.027	<0.0055	<0.0055	<0.0055	<0.0055
	VW1-10	<0.50	<0.0025	<0.0025	<0.0025	<0.0025	<0.0047	<0.0047	<0.0047	<0.0047	<0.024	<0.0047	<0.0047	<0.0047	<0.0047
	VW1-15	2,100g,b	<0.49	1.1	1.3	210	<4.7	<4.7	<4.7	<4.7	<23	<4.7	<4.7	<4.7	<4.7
	VW1-20	500g,b	<0.11	0.23	<0.11	55	<6.2	<6.2	<6.2	<6.2	<31	<6.2	<6.2	<6.2	<6.2
	VW1-25	1,500g,b	<0.29	0.95	<0.29	140	<6.0	<6.0	<6.0	<6.0	<30	<6.0	<6.0	<6.0	<6.0
	VW1-30	1,100g,b	<0.26	0.71	<0.26	110	<5.5	<5.5	<5.5	<5.5	<28	<5.5	<5.5	<5.5	<5.5
	VW1-36	1,400g,b	<0.52	5.5	3.4	210	<5.7	<5.7	<5.7	<5.7	<28	<5.7	<5.7	<5.7	<5.7
	DUP	1,600g,b	<0.28	0.93	<0.28	160	<8.8	<8.8	<8.8	<8.8	<44	<8.8	<8.8	<8.8	<8.8

Notes

TPHD	=	Total Petroleum Hydrocarbons as Diesel by EPA 8015C	DCB	=	Dichlorobenzenes by EPA 5035/8260B
TPHK	=	Total Petroleum Hydrocarbons as Kerosene by EPA 8015C	DCA	=	1,2-Dichloroethane by EPA 5035/8260B
TPHg	=	Total Petroleum Hydrocarbons as Gasoline by EPA5035/8015Cm	EDB	=	Ethylene Dibromide by EPA 5035260B
B	=	Benzene by EPA 8021B	TBA	=	t-Butyl Alcohol by EPA 5035/8260B
T	=	Toluene by EPA 8021B	MTBE	=	Methyl-t-Butyle Ether by EPA 5035/8260B
E	=	Ethylbenzene by EPA 8021B	DIPE	=	Di-Isopropyl Ether by EPA 5035/8260B
X	=	Xylenes by EPA 8021B	ETBE	=	Ethyl-t-Butyl Ether by EPA 5035/8260B
Lead	=	Lead by EPA 6010C	TAME	=	t-Amyl Methyl Ether by EPA 5035/8260B
CB	=	Chlorobenzene by EPA 5035/8260B	NA	=	t-Amyl Methyl Ether by EPA 5035/8260B
a	=	Unmodified or weakly modified gasoline is significant			
b	=	Heavier gasoline range compounds are significant (aged gasoline?)			
g	=	Strongly aged gasoline or diesel range compounds are significant			

TABLE 13
 SOIL ANALYTICAL RESULTS
 VOLATILE ORGANIC COMPOUNDS
 EPA METHOD 5035/8260B
 DECEMBER 2003
 Concentrations in mg/kg (ppm)
 Page 1 of 2

ATE	SAMPLE ID	MEK	n-Butyl benzene	EDB	1,1-DCE	Ethyl- benzene	4-isopropyl toluene	Naphl	Toluene	1,2,4-TMB	Xylenes	TBA	sec-Butyl benzene	1,2-DCA	iso-propyl benzene	MIBK	n-Propyl	1,3,5-TM
1/17/03	MW6-5	<0.055	<0.011	<0.055	<0.055	<0.055	<0.055	<0.055	<0.055	<0.055	<0.055	<0.027	<0.055	<0.055	<0.055	<0.055	<0.055	<0.055
	MW6-10	<0.059	<0.012	<0.059	<0.059	<0.059	<0.059	<0.059	<0.059	<0.059	<0.059	<0.030	<0.059	<0.059	<0.059	<0.059	<0.059	<0.059
	MW6-15	<2.5	<4.9	<2.5	<2.5	<2.5	<2.5	7.6	<2.5	94	67	<12	<2.5	<2.5	<2.5	<2.5	<2.5	29
	MW6-20	<2.9	<5.8	<2.9	<2.9	<2.9	<2.9	18	<2.9	95	51	<15	<2.9	<2.9	<2.9	<2.9	<2.9	29
	MW6-25	<0.059	<0.012	<0.059	<0.059	<0.059	<0.059	0.11	<0.059	0.12	0.64	<0.29	<0.059	<0.059	<0.059	<0.059	<0.059	0.61
	MW6-30	<0.012	<0.024	<0.012	<0.012	<0.012	<0.012	0.072	<0.012	0.29	0.36	<0.59	<0.012	<0.012	<0.012	<0.012	<0.012	0.17
	MW6-35	<0.057	<0.011	<0.057	<0.057	<0.057	<0.057	0.010	<0.057	0.19	0.27	0.041	<0.057	<0.057	<0.057	<0.057	<0.057	0.086
	MW6-40	0.24	0.23	<0.041	0.056	<0.041	0.26	0.89	1.1	2.5	<0.20	<0.20	<0.041	0.057	<0.041	0.045	<0.041	0.39
	MW6-45	0.084	<0.010	0.016	<0.005	<0.005	<0.005	0.0056	0.031	0.030	0.085	<0.025	0.0065	0.22	0.033	<0.005	0.067	0.013
	MW6-50	0.13	<0.010	0.036	<0.005	<0.005	0.020	0.0061	<0.005	0.0096	<0.025	0.011	0.12	0.40	<0.005	0.094	0.014	
	MW6-55	13	<10	<5.0	<5.0	<5.0	7.4	110	47	83	<25	<5.0	<5.0	<5.0	<5.0	6.3	14	
	MW6-60	3.2	<0.39	<0.20	<0.20	<0.20	0.29	8.0	0.03	1.6	<0.98	<0.20	<0.20	<0.20	<0.20	<0.20	0.22	
	MW6-65	0.064	<0.021	<0.010	<0.010	<0.010	0.40	0.22	0.14	<0.51	<0.16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
	MW6-72	0.11	<0.065	0.048	<0.032	<0.032	0.049	0.04	0.53	0.68	<0.16	<0.032	<0.032	<0.032	<0.032	0.069	0.18	
1/17/03	MW7-50	<0.053	<0.011	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<0.026	0.0053	0.0053	0.0053	<0.053	<0.053	<0.053
	MW7-55	<0.020	<0.040	0.084	<0.020	0.42	0.020	0.083	0.082	0.77	0.84	<0.10	0.023	<0.020	<0.020	<0.020	0.17	0.18
	MW7-60	0.53	<0.038	<0.019	<0.019	0.17	<0.019	0.027	0.024	0.085	<0.073	<0.019	<0.019	<0.019	<0.019	<0.019	0.023	<0.019
	MW7-65	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW7-70	<0.051	<0.0102	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.026	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051
1/17/03	MW8-50	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW8-55	<0.0051	<0.0102	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.026	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047
	MW8-60	<0.0047	<0.0094	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.024	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047
	MW8-65	<0.0055	<0.011	<0.0055	<0.0055	<0.0055	<0.0055	<0.0055	<0.0055	<0.0055	<0.0055	<0.027	<0.0055	<0.0055	<0.0055	<0.0055	<0.0055	<0.0055
	MW8-72	<0.0052	<0.0104	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.026	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052
2/16/03	MW9-50	<0.0052	<0.010	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.026	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052
	MW9-55	<0.0051	<0.010	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.025	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051
	MW9-60	<0.0049	<0.0099	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.025	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049
	MW9-65	<0.0046	<0.0092	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.023	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046
	MW9-72	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

TABLE 13
 SOIL ANALYTICAL RESULTS
 VOLATILE ORGANIC COMPOUNDS
 EPA METHOD 5035/8260B
 DECEMBER 2003
 Concentrations in mg/kg (ppm)

Page 2 of 2

ATE	SAMPLE ID	Benzene	MEK	n-Butyl benzene	EDB	1,1-DCE	Ethyl-benzene	4-Isopropyl toluene	Naphth	Toluene	1,2,4-TMB	Xylenes	TBA	sec-Butyl benzene	1,2-DCA	Iso-propyl benzene	MIBK	n-Propyl benzene	1,3,5-TMB	
15/03	MW10-50	<0.0049	<0.0099	<0.0049	<0.0049	0.0087	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.025	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049
	MW10-55	<0.005	<0.010	<0.005	<0.005	0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW10-60	<0.0056	<0.011	<0.0056	<0.0056	<0.0056	<0.0056	<0.0056	<0.0056	<0.0056	<0.0056	<0.0056	<0.028	<0.0056	<0.0056	<0.0056	<0.0056	<0.0056	<0.0056	<0.0056
	MW10-65	<0.0053	<0.011	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.027	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053
	MW10-72	<0.0059	<0.012	<0.0059	<0.0059	<0.0059	<0.0059	<0.0059	<0.0059	<0.0059	<0.0059	<0.0059	<0.030	<0.0059	<0.0059	<0.0059	<0.0059	<0.0059	<0.0059	<0.0059
19/03	MW11-60	<0.0048	<0.0096	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.024	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048
	MW11-65	<0.0083	<0.017	<0.0083	<0.0083	<0.0083	<0.0083	<0.0083	<0.0083	<0.0083	<0.0083	<0.0083	<0.041	<0.0083	<0.0083	<0.0083	<0.0083	<0.0083	<0.0083	<0.0083
	MW11-70	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	MW11-75	<0.0045	<0.0091	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.023	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045
	MW11-80	<0.0045	<0.0091	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.023	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045
118/03	VW1-5	<0.0055	<0.011	<0.0055	<0.0055	<0.0055	<0.0055	<0.0055	0.0061	0.0072	0.0072	0.0062	<0.027	<0.0055	<0.0055	<0.0055	<0.0055	<0.0055	<0.0055	<0.0055
	VW1-10	<0.0047	<0.0094	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	0.0052	<0.0047	<0.024	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047
	VW1-15	<4.7	<9.4	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	180	120	<23	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	53
	VW1-20	<6.2	<12	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	94	59	<31	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	28
	VW1-25	<6.0	<12	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	160	110	<30	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	48
	VW1-30	<5.5	<11	<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	200	140	<28	<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	58
	VW1-36	<5.7	<11	<5.7	<5.7	<5.7	<5.7	<5.7	6.2	260	260	240	<28	<5.7	<5.7	<5.7	<5.7	<5.7	<5.7	74
	DUP	<8.8	<18	<8.8	<8.8	<8.8	<8.8	<8.8	<8.8	<8.8	170	110	<44	<8.8	<8.8	<8.8	<8.8	<8.8	<8.8	50

tes
 MEK = 2-Butanone
 Naphth = Naphthalene
 DCA = Dichloroethane
 EDB = Ethylene dibromide
 TMB = Trimethylbenzene
 MIBK = 4-Methyl-2-pentanone
 DCE = Dichloroethene
 TBA = 4-Methyl-2-pentanone

TABLE 3
GROUNDWATER ANALYTICAL RESULTS
 Concentrations in ug/L (ppb)
 Page 1 of 3

WELL	DATE	TPHD	TPHK	TPHG	B	T	E	X	Lead	CB	DCB	DCA	EDB	TBA	MTBE	DIPE	ETBE	TAME	
MW1	06/18/02								Not Sampled due to Free Product										
	09/20/03	NA	NA	57,000	6,000	7,000	500	1,700	NA	<40	<40	<40	44	<400	<40	<40	<40	<40	
	01/30/04	NA	NA	67,000	6,000	12,000	1,000	4,400	NA	<100	<100	140	<100	<1,000	<100	<100	<100	<100	
	04/22/04	NA	NA	41,000	4,800	8,900	530	2,100	NA	NA	NA	<100	<100	<1,000	<100	<100	<100	<100	
	07/29/04	NA	NA	56,000	6,700	15,000	1,200	4,900	NA	NA	NA	<100	<100	<1,000	<100	<100	<100	<100	
	10/27/04	NA	NA	77,000	6,800	21,000	2,800	12,000	NA	<100	<100	<100	<100	<1,000	<100	<100	<100	<100	<100
	01/14/05	NA	NA	77,000	6,100	18,000	2,300	9,800	NA	<200	<200	<200	<200	<2,000	<200	<200	<200	<200	
MW2	06/18/02	<50	<50	240	<0.5	<0.5	15	<1.0	<5	<2.0	<2.0	4.6	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	09/19/03	NA	NA	130	<0.5	<0.5	0.80	<1.0	NA	<2.0	<2.0	<2.0	4.9	<20	<2.0	<2.0	<2.0	<2.0	
	01/29/04	NA	NA	330	<0.5	<0.5	3.6	<1.0	NA	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	04/22/04	NA	NA	420	1.7	<0.5	7.6	<1.0	NA	NA	NA	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	07/29/04	NA	NA	390	2.2	<0.5	0.8	<1.0	NA	NA	NA	3.7	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	10/26/04	NA	NA	490	<0.5	<0.5	2.6	<1.0	NA	<2.0	<2.0	3.2	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	01/14/05	NA	NA	830	<0.5	0.9	12	1.8	NA	<2.0	<2.0	3.2	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
MW3	06/18/02	<50	<50	<50	<0.5	<0.5	<0.5	<1.0	<5	<2.0	<2.0	8.3	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	09/19/03	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	<2.0	7.9	<20	<2.0	<2.0	<2.0	<2.0	
	01/29/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	6.2	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	04/22/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	NA	NA	5.5	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	07/29/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	NA	NA	4.6	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	10/26/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	6.7	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	01/13/05	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	4.7	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
MW4	06/18/02	<50	<50	8,200	330	1,200	130	400	<5	<20	<20	<20	<20	<200	<20	<20	<20	<20	
	09/20/03	NA	NA	1,500	48	87	35	54	NA	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	01/30/04	NA	NA	1,200	65	110	28	57	NA	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	04/23/04	NA	NA	1,700	150	170	51	75	NA	NA	NA	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	07/29/04	NA	NA	1,200	89	130	43	79	NA	NA	NA	2.3	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	10/27/04	NA	NA	1,200	120	150	61	120	NA	<2.0	<2.0	3.9	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	01/14/05	NA	NA	2,100	260	290	100	200	NA	<2.0	<2.0	5.3	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
MW5	06/18/02	<50	<50	100	19	0.6	<0.5	<1.0	<5	<2.0	<2.0	18	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	09/19/03	NA	NA	<50	14	<0.5	<0.5	<1.0	NA	<2.0	<2.0	21	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	01/29/04	NA	NA	<50	2.0	<0.5	<0.5	<1.0	NA	<2.0	<2.0	11	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	04/22/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	NA	NA	7.5	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	07/29/04	NA	NA	<50	6.0	<0.5	<0.5	<1.0	NA	NA	NA	10	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	10/26/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	18	<2.0	<20	<2.0	<2.0	<2.0	<2.0	
	01/14/05	NA	NA	<50	3.3	<0.5	<0.5	<1.0	NA	<2.0	<2.0	13	<2.0	<20	<2.0	<2.0	<2.0	<2.0	

TABLE 3
GROUNDWATER ANALYTICAL RESULTS
 Concentrations in ug/L (ppb)
 Page 2 of 3

WELL	DATE	TPHD	TPHK	TPHG	B	T	E	X	Lead	CB	DCB	DCA	EDB	TBA	MTBE	DIPE	ETBE	TAME
MW6	01/30/04	NA	NA	28,000	1,700	4,400	230	1,800	NA	<2.0	<2.0	<2.0	5.7	<20	<2.0	<2.0	<2.0	<2.0
	04/23/04	NA	NA	29,000	2,200	5,500	320	1,300	NA	NA	NA	<40	<40	<400	<40	<40	<40	<40
	07/29/04	NA	NA	15,000	2,300	3,000	180	150	NA	NA	NA	<40	<40	<400	<40	<40	<40	<40
	10/27/04	NA	NA	11,000	1,900	2,300	310	730	NA	<40	<40	43	<40	<400	<40	<40	<40	<40
	01/14/05	NA	NA	8,400	1,400	1,500	200	440	NA	<20	<20	<20	<20	<200	<20	<20	<20	<20
MW7	01/30/04	NA	NA	260	6.9	3.2	1.4	3.7	NA	<2.0	<2.0	13	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	04/22/04	NA	NA	1,500	66	1.5	16	8.2	NA	NA	NA	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	07/29/04	NA	NA	1,400	50	1.3	4.2	5.6	NA	NA	NA	14	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	10/27/04	NA	NA	1,400	14	1.4	4.3	3.7	NA	<2.0	<2.0	14	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	01/14/05	NA	NA	1,600	23	1.0	2.4	1.9	NA	<2.0	<2.0	15	<2.0	<20	<2.0	<2.0	<2.0	<2.0
MW8	01/29/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	04/22/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	NA	NA	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	07/28/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	NA	NA	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	10/26/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	01/13/05	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
MW9	01/28/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	04/22/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	NA	NA	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	07/28/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	NA	NA	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	10/26/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	01/13/05	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
MW10	01/28/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	04/21/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	NA	NA	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	07/28/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	NA	NA	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	10/25/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	01/13/05	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0	<2.0	<2.0
MW11	01/29/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	4.8	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	04/22/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	NA	NA	3.3	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	07/28/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	NA	NA	14	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	10/26/04	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	20	<2.0	<20	<2.0	<2.0	<2.0	<2.0
	01/13/05	NA	NA	<50	<0.5	<0.5	<0.5	<1.0	NA	<2.0	<2.0	16	<2.0	<20	<2.0	<2.0	<2.0	<2.0

TABLE 3
GROUNDWATER ANALYTICAL RESULTS
 Concentrations in ug/L (ppb)
 Page 3 of 3

WELL	DATE	TPHD	TPHK	TPHG	B	T	E	X	Lead	CB	DCB	DCA	EDB	TBA	MTBE	DIPE	ETBE	TAME	
Notes																			
TPHD	=	Total Petroleum Hydrocarbons as Diesel by EPA Method 8015B									DCB	=	Dichlorobenzenes by EPA Method 8260B						
TPHK	=	Total Petroleum Hydrocarbons as Kerosene by EPA Method 8015B									DCA	=	1,2-Dichloroethane by EPA Method 8260B						
TPHg	=	Total Petroleum Hydrocarbons as Gasoline by EPA Method 8015B									EDB	=	Ethylene Dibromide by EPA Method 8260B						
B	=	Benzene by EPA Method 8021B									TBA	=	t-Butyl Alcohol by EPA Method 8260B						
T	=	Toluene by EPA Method 8021B									MTBE	=	Methyl-t-Butyle Ether by EPA Method 8260B						
E	=	Ethylbenzene by EPA Method 8021B									DIPE	=	Di-Isopropyl Ether by EPA Method 8260B						
X	=	Xylenes by EPA Method 8021B									ETBE	=	Ethyl-t-Butyl Ether by EPA Method 8260B						
Lead	=	Dissolved Lead by EPA Method 200.9									TAME	=	t-Amyl Methyl Ether by EPA Method 8260B						
CB	=	Chlorobenzene by EPA Method 8260B									NA	=	t-Amyl Methyl Ether by EPA Method 8260B						

TABLE
SOIL VAPOR ANALYTICAL RESULTS
Former Pure-etch Facility
 Concentrations in mg/m³

CONSTITUENT	A-15-B1	A-15-B2	A-15-B3	BH6-7	BH6-16	MW6-5	MW6-25 (pv 1)	MW6-25 (pv 2)	MW6-25 (pv 3)	MW6-25 (pv 7)	MW9-5	MW9-25	MW11-5	MW11-25
Methylene Chloride	--	--	--	0.037	<4.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	--	--	--	<0.0032	<5.4	<1.0	<1.0	<1.0	<1.0	<1.0	4.9	18	<1.0	2.9
1,1-Dichloroethane	--	--	--	<0.0032	<5.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.1	<1.0	2.5
cis-1,2-Dichloroethene	--	--	--	<0.0032	<5.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.1	<1.0	<1.0
1,1,1-Tetrachloroethane	--	--	--	<0.0044	<7.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.8	<1.0	<1.0
Benzene	ND	15	0.7	0.018	4.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	--	--	--	0.042	<7.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	860	750	9.2	0.063	1,100	<1.0	4.3	4.5	6.5	8.3	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	--	--	--	<0.0054	<9.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	1.3	3.5
Ethyl benzene	170	150	1,000	0.011	170	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
m,p-Xylene	1,300	1,000	22	0.043	1,900	10	130	140	170	190	2.5	<1.0	<1.0	<1.0
o-Xylene	--	--	--	0.014	510	5.8	79	82	100	120	1.7	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	--	--	--	0.01	70	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene	--	--	--	0.031	140	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	--	--	--	0.0052	<8.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acetone	--	--	--	0.24	<13	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Propanol	--	--	--	0.0081	<13	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Butanone	--	--	--	0.023	<16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hexane	--	--	--	0.047	<19	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cyclohexane	--	--	--	0.012	<19	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Ethyltoluene	--	--	--	0.025	260	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethanol	--	--	--	0.044	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl tert-Butyl Ether	--	--	--	0.038	<20	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Heptane	--	--	--	<0.013	310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

NOTES

A-15-B1, A-15-B2, A-15-B3 analyzed using Method 6010A, samples collected by CapRock March 1997
 BH6-7 and BH6-16 analyzed using Method EPA TO-14 by Air Toxics LTD., samples collected July 2000
 MW6-5, MW6-25, MW9-5, MW11-5, MW11-25 analyzed using Method EPA 8260B by Transglobal Environmental Geochemistry (TEG), samples collected March 2004
 pv = purge volume relative to probe casing volume

APPENDIX B

CONTAMINANT MASS CALCULATIONS AND ASSOCIATED FIGURES

CONTAMINANT MASS CALCULATIONS

Former Pure-Etch facility, Salinas, CA

Mass in soil.

Based on Concentrations from drilling investigations 1997 to 2003

mass = (Volume of impacted zone)(soil density)(Average Concentration)(E-6);

Volume in cu. ft.; Three Zones are 12-42', 42-52', 52-65'

Soil density assumed 45.5 kg/cu. ft. (100lb/cu. ft.);

Contaminant	Area (sq.ft.) ($\pi \times r_1 \times r_2$)	Height (feet)	Volume (cu. ft.) ($\pi \times r_1 \times r_2 \times h$)	Average Concentration (mg/kg)	Mass of Contaminant (kg)	Mass of Contaminant (lbs)
TPHG						
Zone 1 (12-42' bgs)						
TPHG 5,000+ ppm	377	30	11310	6400	3293.4	7245.5
TPHG 500-5,000 ppm	1979	30	59376	2750	7429.4	16344.7
TPHG 50-500 ppm	942	30	28274	275	353.8	778.3
TPHG 5-50 ppm	1100	30	32987	27.5	41.3	90.8
Total estimated mass of TPHG in Zone 1 =			131947		11117.9	24459.3
Zone 2 (42-52' bgs)						
TPHG 50+ ppm	471	10	4712	183	39.2	86.3
TPHG 5-50 ppm	2278	10	22777	27.5	28.5	62.7
Total estimated mass of TPHG in Zone 2 =			27489		67.7	149.0
Zone 3 (52-65' bgs)						
TPHG 500+ ppm	578	13	7515	1800	615.5	1354.0
TPHG 50-500 ppm A	647	13	8413	275	105.3	231.6
TPHG 50-500 ppm B	3770	13	49009	125	278.7	613.2
TPHG 5-50 ppm	9692	13	125993	27.5	157.6	346.8
Total estimated mass of TPHG in Zone 3 =					1157.1	2545.6
Total estimated mass of TPHG in Soil =					12342.7	27154.0
Benzene						
Zone 1 (12-42' bgs)						
Benzene 0.5+ ppm	1571	30	47124	2.1	4.5	9.9
Benzene 0.05-0.5 ppm	1728	30	51836	0.275	0.6	1.4
Total estimated mass of Benzene in Zone 1 =					5.2	11.3
Zone 2 (42-52' bgs)						
Benzene 5+ ppm	481	10	4807	6.8	1.5	3.3
Benzene 0.5-5 ppm A	877	10	8765	2.75	1.1	2.4
Benzene 0.5-5 ppm B	368	10	3676	2.75	0.5	1.0
Benzene 0.05-0.5 ppm	1810	10	18096	0.275	0.2	0.5
Total estimated mass of Benzene in Zone 2 =					3.3	7.2
Zone 3 (52-65' bgs)						
Benzene 5+ ppm	898	13	11680	6.9	3.7	8.1
Benzene 0.5-5 ppm	6170	13	80211	2.75	10.0	22.1
Benzene 5-50 ppm	14923	13	193993	0.275	2.4	5.3
Total estimated mass of Benzene in Zone 3 =					16.1	35.5
Total estimated mass of Benzene in Soil =					24.6	54.0

CONTAMINANT MASS CALCULATIONS

Former Pure-Etch facility, Salinas, CA

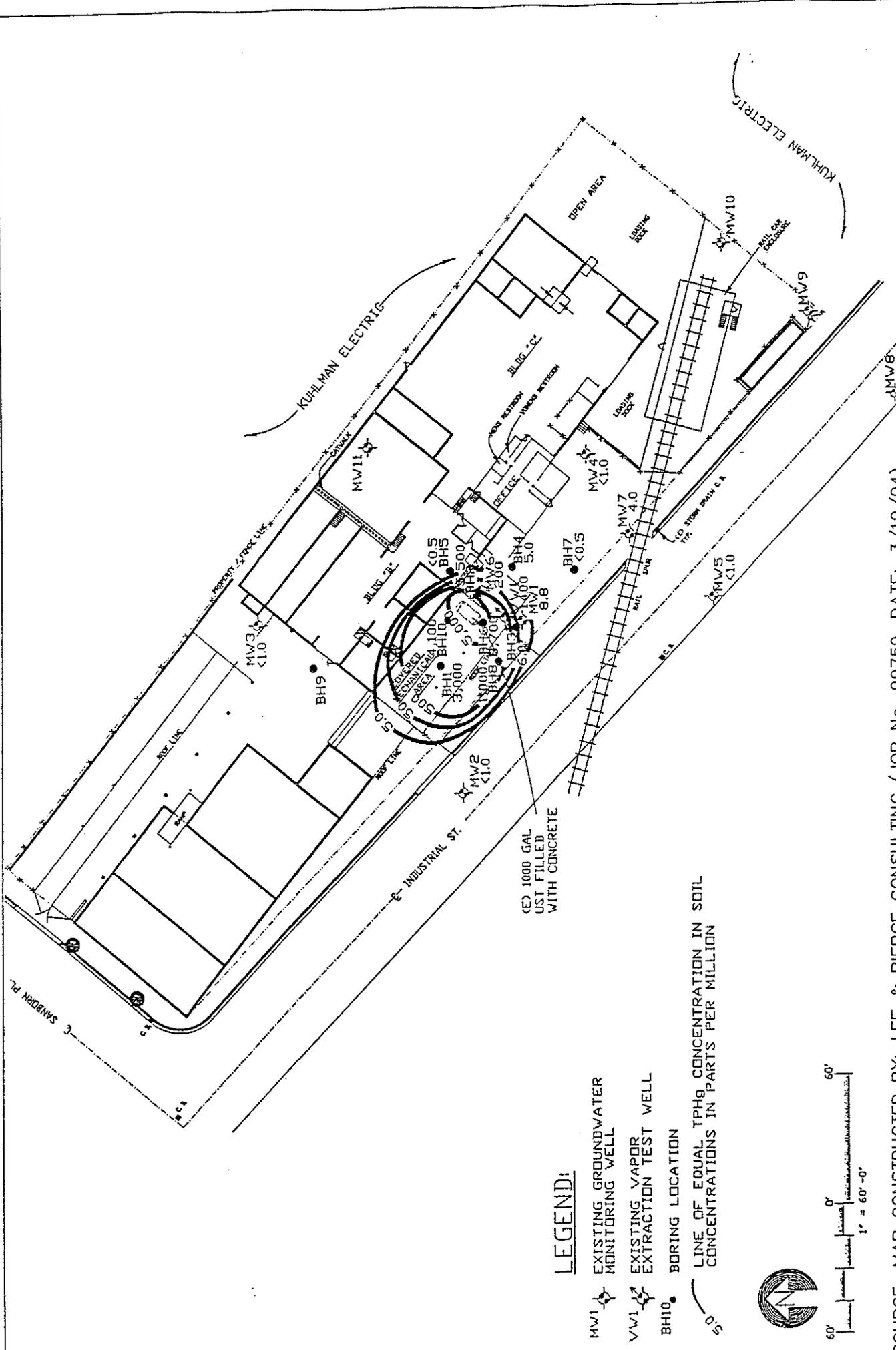
Mass in Groundwater April 2005

Based on isoconcentration contours April 2005

mass = (Volume in cu ft)(porosity)(Conc. in ppb)(E-9)(7.48 gal/cu ft)(8.34 lb/gal)(0.4536 kg/lb)

Thickness of aquifer is 15 feet; porosity is 0.30

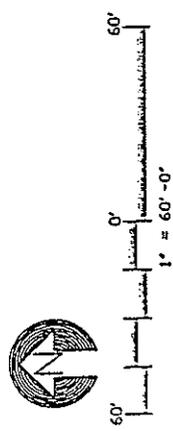
Contaminant	Area (sq.ft.)	Volume (cu. ft.)	Average Concentration (ug/l)	Mass of Contaminant (kg)	Mass of Contaminant (lbs)
TPHG 50000+ ppb	471	7069	63500	3.81	8.38
TPHG 5,000-50,000 ppb	4697	70450	27500	16.45	36.18
TPHG 500-5,000 ppb	13682	205224	2750	4.79	10.54
TPHG 50-500 ppb	14530	217948	275	0.51	1.12
Total Mass of dissolved TPHG in groundwater				25.6	56.2
Benzene 5,000+ ppb	471	7069	6000	0.36	0.79
Benzene 500-5,000 ppb	4555	68330	2750	1.60	3.51
Benzene 50-500 ppb	7069	106029	275	0.25	0.54
Benzene 5-50 ppb	7697	115453	28	0.03	0.06
Benzene 0.5-5 ppb	11310	169646	2.8	0.00	0.01
Total Mass of dissolved Benzene in groundwater				2.2	4.9



LEGEND:

- MW1 EXISTING GROUNDWATER MONITORING WELL
- VW1 EXISTING VAPOR EXTRACTION TEST WELL
- BH10 BORING LOCATION

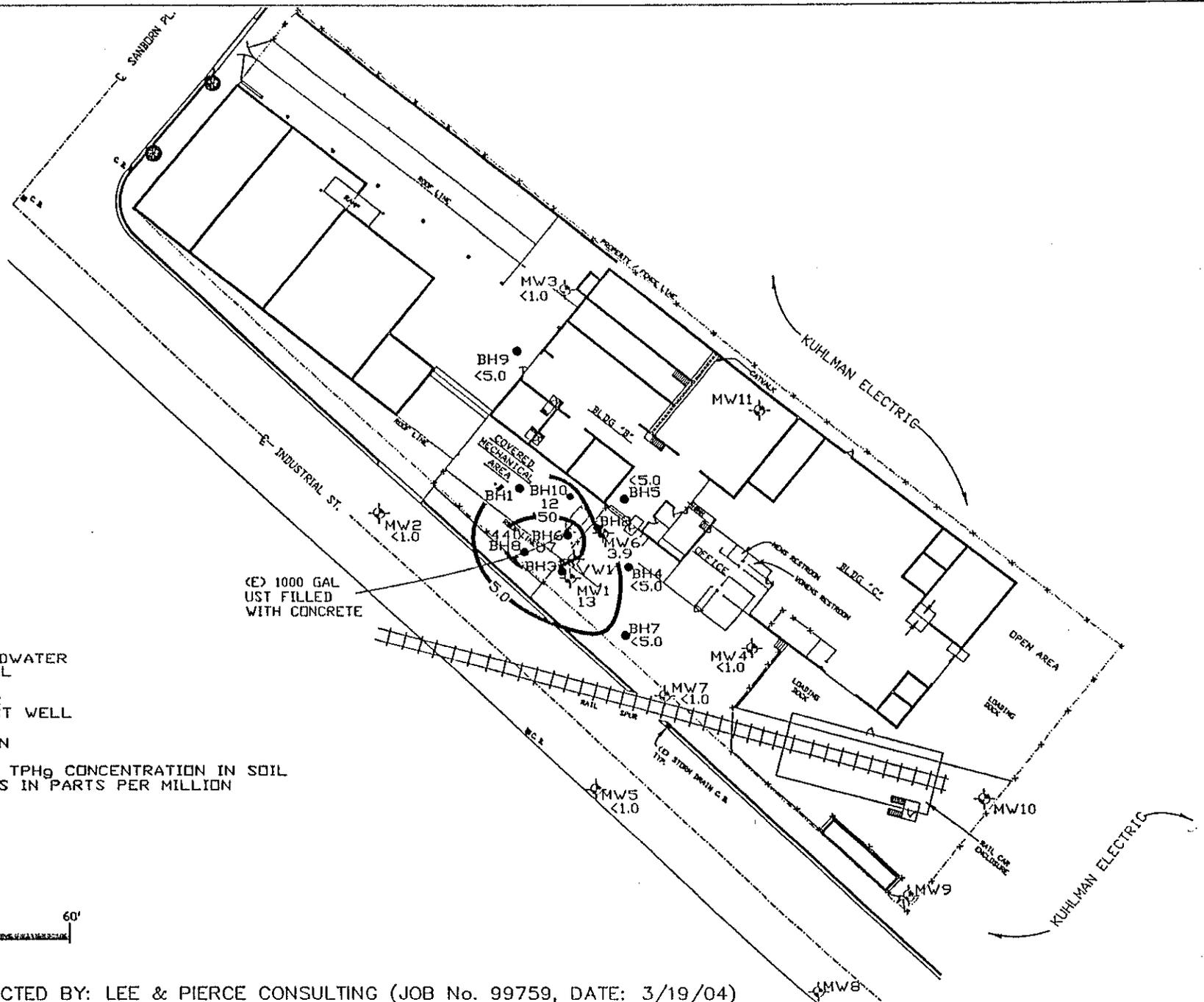
5.0' LINE OF EQUAL TPH₀ CONCENTRATION IN SOIL CONCENTRATIONS IN PARTS PER MILLION



SOURCE: MAP CONSTRUCTED BY: LEE & PIERCE CONSULTING (JOB No. 99759, DATE: 3/19/04)

GROUND ZERO ANALYSIS

TPHG 12-42' (PRIMARY SAND)
 PURE ETCH COMPANY
 1031 INDUSTRIAL ST.,
 SALINAS, CALIFORNIA



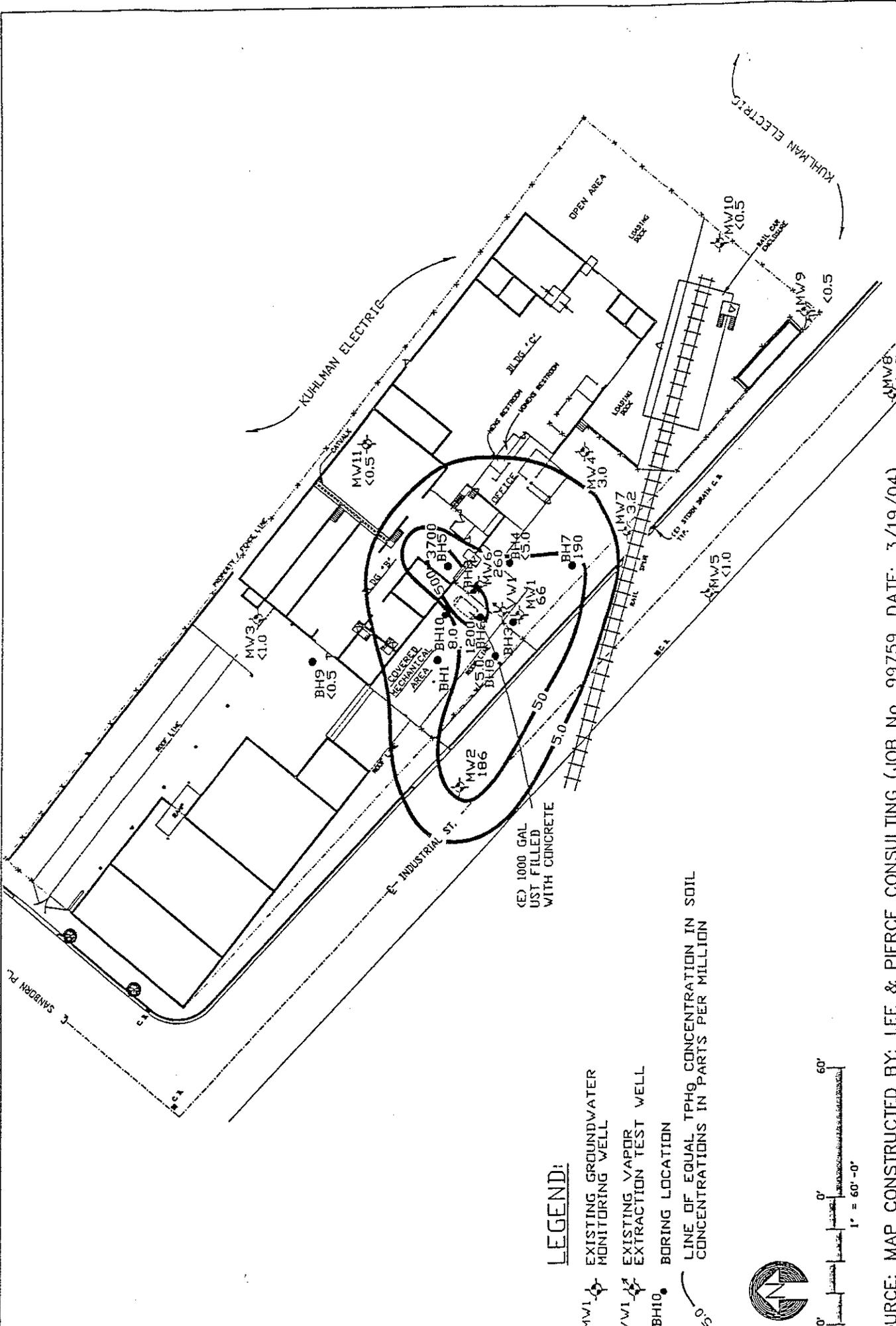
SOURCE: MAP CONSTRUCTED BY: LEE & PIERCE CONSULTING (JOB No. 99759, DATE: 3/19/04)

GROUND ZERO ANALYSIS

TPHG 42-52' (PRIMARYLY SAND)
 PURE ETCH COMPANY
 1031 INDUSTRIAL ST.,
 SALINAS, CALIFORNIA

FIGURE
 B2

FN: 1105/365S



LEGEND:

- MW1 EXISTING GROUNDWATER MONITORING WELL
- MW1 EXISTING VAPOR EXTRACTION TEST WELL
- BH10 BORING LOCATION

LINE OF EQUAL TPHg CONCENTRATION IN SOIL
CONCENTRATIONS IN PARTS PER MILLION



60' 60'
1" = 60'-0"

SOURCE: MAP CONSTRUCTED BY: LEE & PIERCE CONSULTING (JOB No. 99759, DATE: 3/19/04)

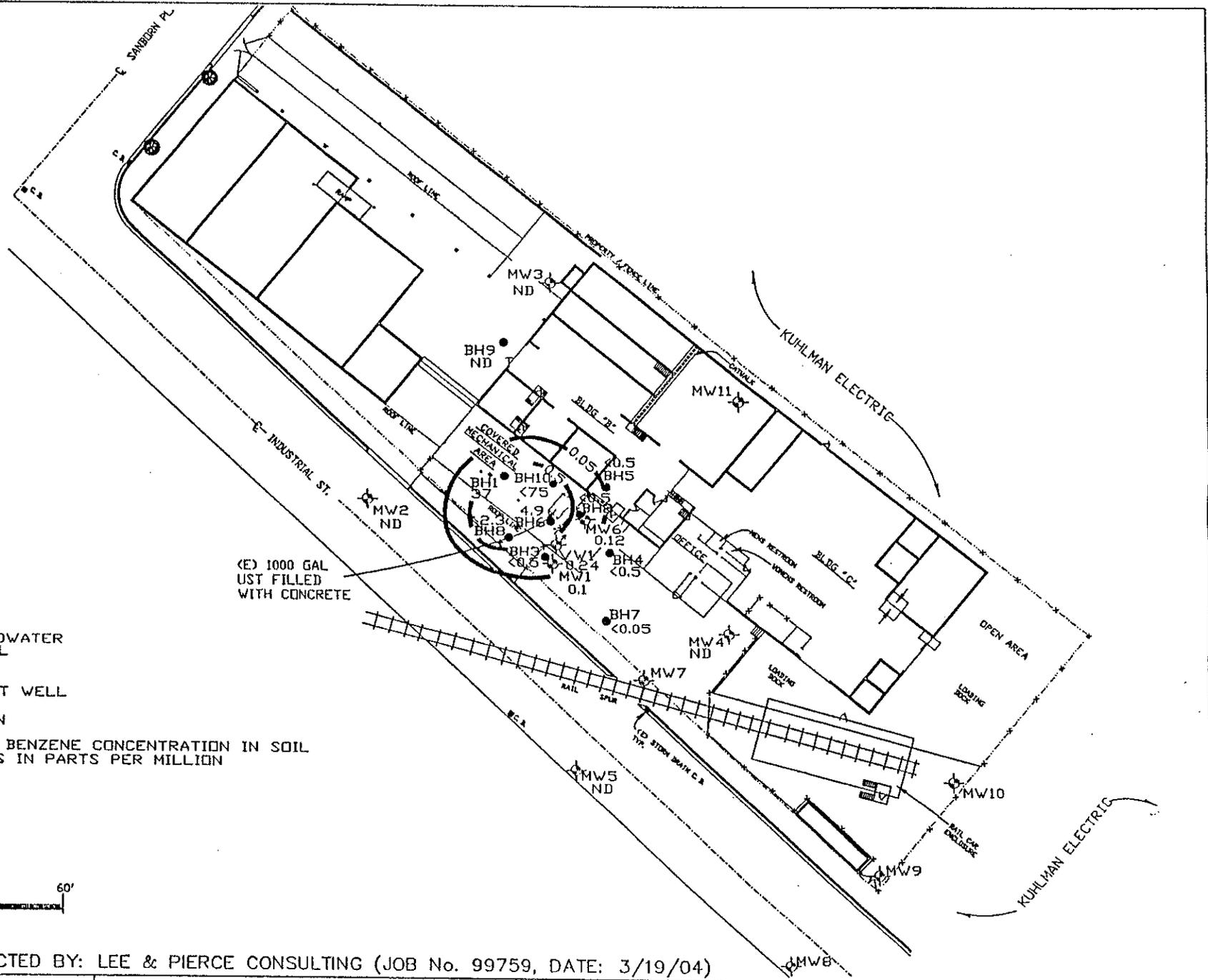
GROUND ZERO ANALYSIS

TPHG 52-65' (PRIMARY SAND)
PURE ETCH COMPANY
1031 INDUSTRIAL ST.,
SALINAS, CALIFORNIA

FIGURE

B3

FN: 1105/3655

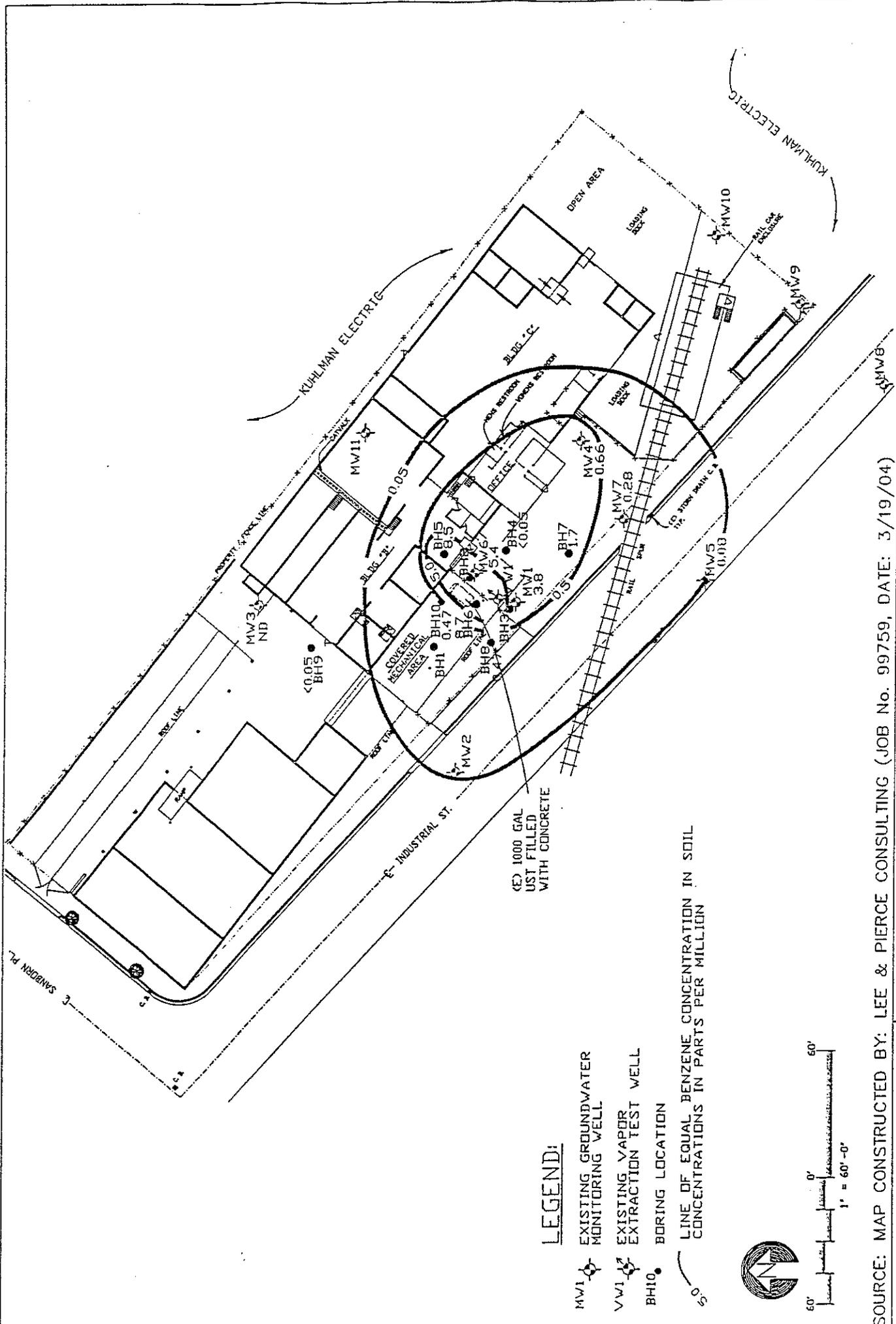


SOURCE: MAP CONSTRUCTED BY: LEE & PIERCE CONSULTING (JOB No. 99759, DATE: 3/19/04)

GROUND ZERO ANALYSIS

BENZENE IN SOIL 12-42'
 PURE ETCH COMPANY
 1031 INDUSTRIAL ST.,
 SALINAS, CALIFORNIA

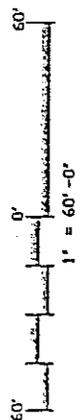
FIGURE
 B4
 FN: 1105/365S



LEGEND:

- MW1 EXISTING GROUNDWATER MONITORING WELL
- VW1 EXISTING VAPOR EXTRACTION TEST WELL
- BH10 BORING LOCATION

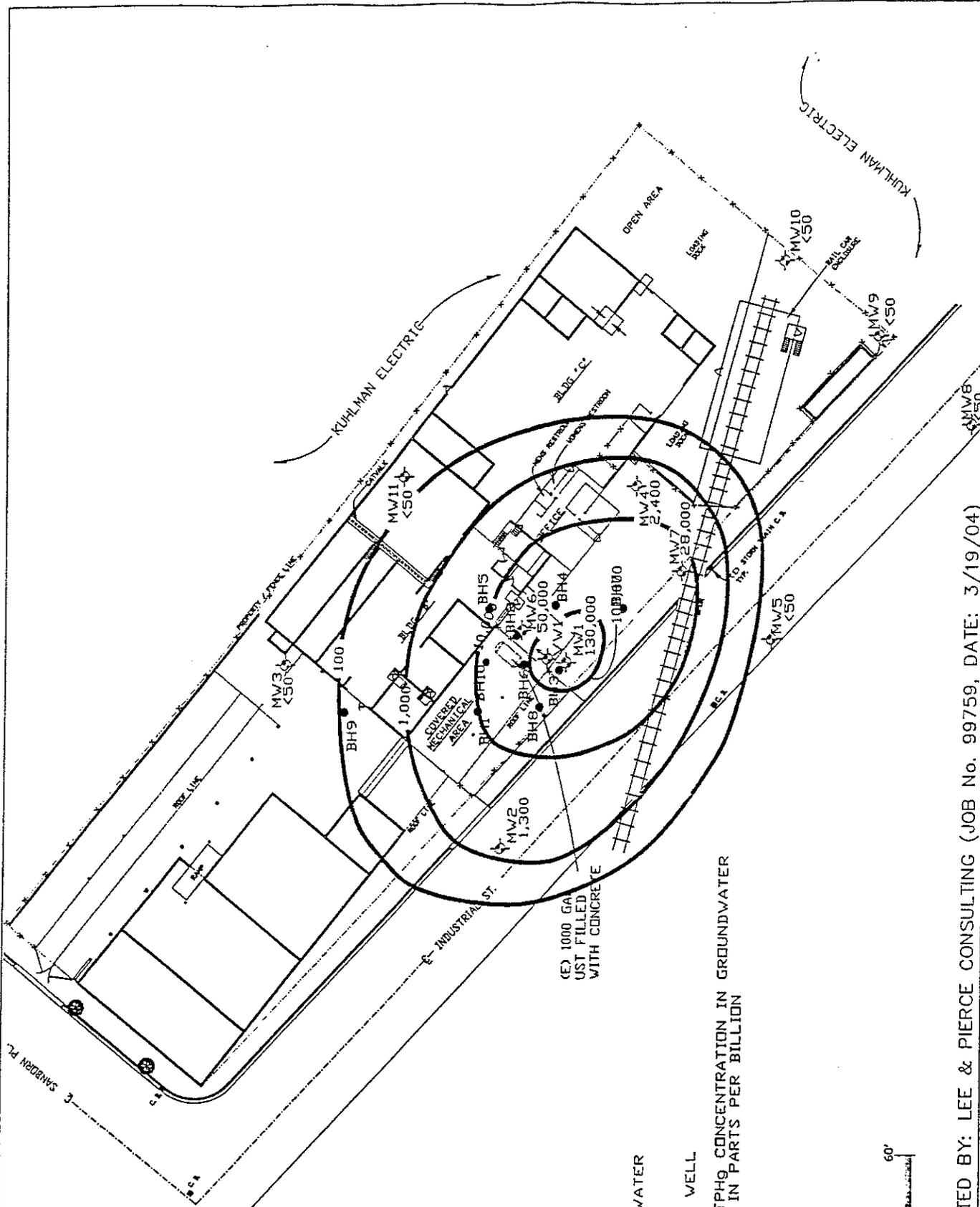
LINE OF EQUAL BENZENE CONCENTRATION IN SOIL CONCENTRATIONS IN PARTS PER MILLION



SOURCE: MAP CONSTRUCTED BY: LEE & PIERCE CONSULTING (JOB No. 99759, DATE: 3/19/04)

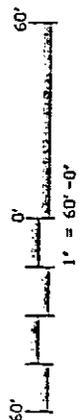
GROUND ZERO ANALYSIS

BENZENE IN SOIL 52--65'
 PURE ETCH COMPANY
 1031 INDUSTRIAL ST.,
 SALINAS, CALIFORNIA



LEGEND:

- MW1 EXISTING GROUNDWATER MONITORING WELL
- VW1 EXISTING VAPOR EXTRACTION TEST WELL
- BH10 BOREHOLE
- 100 CONCENTRATION IN GROUNDWATER CONCENTRATIONS IN PARTS PER BILLION



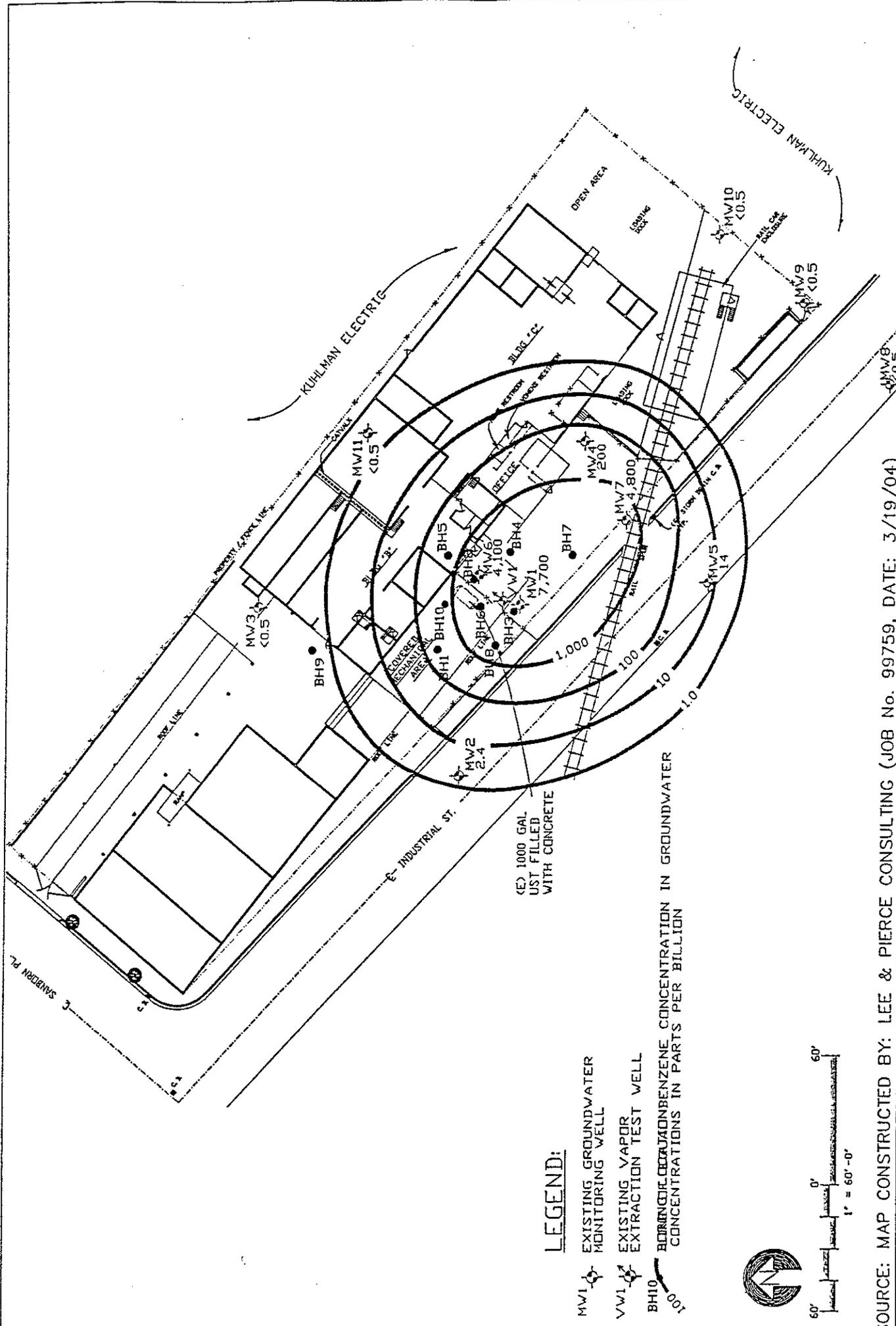
SOURCE: MAP CONSTRUCTED BY: LEE & PIERCE CONSULTING (JOB No. 99759, DATE: 3/19/04)

DISSOLVED TPHg ISOPLETH MAP
 JULY 14-15, 2005
 PURE ETCH COMPANY
 1031 INDUSTRIAL ST.
 SALINAS, CALIFORNIA

GROUND ZERO ANALYSIS

FIGURE
 B7

FN: 1105/3655



LEGEND:

- MW1 - EXISTING GROUNDWATER MONITORING WELL
- BH10 - EXISTING VAPOR EXTRACTION TEST WELL
- BH10 - 1000 GAL UST FILLED WITH CONCRETE
- 1.0 - DISSOLVED BENZENE CONCENTRATION IN GROUNDWATER CONCENTRATIONS IN PARTS PER BILLION



SOURCE: MAP CONSTRUCTED BY: LEE & PIERCE CONSULTING (JOB No. 99759, DATE: 3/19/04)

DISSOLVED BENZENE ISOPLETH MAP
 JULY 14-15, 2005
 PURE ETCH COMPANY
 1031 INDUSTRIAL ST.,
 SALINAS, CALIFORNIA

GROUND ZERO ANALYSIS

FIGURE
 B8

FN: 1105/3655