ALLTERRA

**Site Conceptual Model**
**for**
**Livermore Gas and Minimart**
**160 Holmes Street**
**Livermore, California**

Prepared by: Greg L. Nolen, Project Manager, and Michael Killoran, Professional Geologist

August 10, 2005
Project No.: 015-01-003
Manwel and Samira Shuwayhat
54 Wolfe Canyon Road
Kentfield, CA 94904

I. General Site Info

The site, an active fuel station, is triangularly-shaped, and is located at the intersection of Holmes and Second Streets in Livermore, CA. The topography of the site slopes at about 0.0125 ft/ft to the northwest. The general groundwater gradient has been to the northwest as well.

II. Subsurface conditions

1. Site and Regional Geology

a. Site Geology

Site geology, as described by previous consultants, consists primarily of clayey sand and silty clay fill material from surface grade to approximately 8 feet bgs. Underlying the fill material, silty clay occurs to approximately 11 feet bgs and is in turn underlain by sandy silt and silty sand to approximately 28 feet bgs. Beneath the silts and sands, silty clay occurs to the total depth investigated (approximately 31.5 feet bgs). A cross-section prepared by Allterra, based on the limited information supplied by state well forms for wells installed at and near the site, is attached. New data from Allterra's forthcoming investigation, such as buried utilities, newly discovered water-bearing zones, and previously unidentified strata, will be incorporated into a new geologic cross-section, as part of the effort to maintain an evolving, up-to-date SCM.

Groundwater occurs at depths between approximately 11 and 13 feet bgs and is inferred to flow toward San Francisco Bay to the north as depicted in Figure 3. (GET and ETIC). This flow direction is consistent with regional groundwater flow in the area that includes the site, according to groundwater flow maps prepared by Zone 7 Water Agency.

b. Regional Geology

The Livermore Valley formed between the southward movement of Mt. Diablo and the northward movement of the Diablo Range. The Diablo Range exerted the primary control on the structure and stratigraphy in the Livermore Basin. Large north flowing streams from the Diablo Range contributed the majority of groundwater basin sediments. The northward range movement created oblique slip and thrust faults within the southern part of the basin. Development of these faults controlled stream and groundwater flow patterns within the basin. The southward growth of the Mt. Diablo frontal thrusts overrode the northern part of the original Livermore basin but created few structures within the remaining basin. Mt. Diablo was not a significant source of basin sediments. The primary effect of Mt. Diablo growth was the deflection, blocking, and rerouting of the streams that flowed north out of the Diablo Range. (Sands, 2005)

c. Graphical Representations

1. Cross-sections – A-A'/B-B'/C-C'

2. Technical references

(**FIGUERS, Sands**, Norfleet Consultants, 6430 Preston Ave., Suite A, Livermore, CA 94550, Geological Society of America *Abstracts with Programs*, Vol. 37, No. 4, p. 35, April 29, 2005).

2. Sensitive Receptors

a. Water supply wells – Zone 7 and State Water

b. Private wells per AEI's mass mailing

c. Exposure evaluation

Human exposure to COC at the site appears to be minimal, because the exposure pathway, as well as the transport mechanism, appears to be groundwater. Any lead that might be present in soil is covered by asphalt or concrete, eliminating dermal and ingestion exposure routes. No excessive VOCs were detected in the latest round of groundwater monitoring, so air does not appear to be a significant exposure route. Exposure evaluation will be updated if new data indicates that an exposure pathway poses a health hazard.

Impacts to humans in buildings at properties within 200 feet of the site are even less likely. by vapors (hospitals, residences, etc.)

3. Release history

Allterra has prepared tables of current and historical groundwater contaminant concentrations, and will plot this data against time and distance from the source. This data, combined with future well logs and well construction data, will provide a more detailed subsurface configuration. Furthermore, additional data may reveal data gaps that need to be filled.

Impacted groundwater was discovered when a soil boring was advanced on February 26, 1999 about 10 feet from the sidewalk along 1st Street near the northern border of the site. A grab groundwater sample from the boring was found to be impacted with concentrations of TPH-g (100,000 µg/kg), benzene (6100 µg/kg), and MTBE (60,000 µg/kg). Historical groundwater elevation data and groundwater analytical results are attached are attached as Tables 1 and 2 respectively.

On April 5, 1999, three gasoline and one diesel USTs and associated structures were removed. Following overexcavation of soil in the tank pit, soil samples were collected from native material. Analytical results from the soil stockpile generated during over-excavation activities indicated TPHd at a concentration of 61 milligrams per kilogram (mg/kg), TPHg at 80 mg/kg, and MTBE up to 110 mg/kg.

On May 20, 1999, soil samples were collected from below the dispenser islands. TPHg was detected beneath the east dispenser at a maximum concentration of 6,500 mg/kg. TPHd was detected beneath the diesel dispenser at a 1,300 mg/kg. No MTBE was detected at or above laboratory detection limits in samples collected from beneath the dispenser.

On July 26, 2000, three soil borings were drilled onsite to about 30 feet bgs. After collecting soil samples, the borings were converted into 2-inch diameter groundwater monitoring wells – MW-1, MW-2, and MW-3. The slotted interval of the PVC well casing was installed from 15 to 30 feet bgs. Analytical results of water samples from these wells indicated significant impact from petroleum hydrocarbons, especially in well MW-1, located directly downgradient from the contaminant source. Sample results from water samples in this well showed TPH-g and MTBE at concentrations of 170,000 µg/L and 320,000 µg/l, respectively.

Subsequent quarterly groundwater monitoring events have revealed significant petroleum hydrocarbon impact. Analytical results and site activities are summarized below:

- On October 19, 2000, analytical results of quarterly groundwater monitoring, as summarized in Geo-Environmental Technology's (GET's) March 31, 2001 report, revealed TPH-g and MTBE concentrations of 170,000 µg/l and 200,000 µg/l, respectively, in downgradient well MW-1.
- The February 22, 2001 sampling event revealed TPH-g and MTBE concentrations of 11,000 µg/l and 190,000 µg/l, respectively, in downgradient well MW-1.
- In the May and August 2001 sampling events, all three wells were found to be dry.
- Three additional monitoring and one extraction well were installed shortly before the November 14, 2001 sampling event. Analytical results of water sampling indicated offsite impact. Well EX1, located directly downgradient of the source, had 2,000 µg/l TPH-g and 2,200 µg/l MTBE.
- In 2002, three monitoring events were conducted. TPH-g in well EX1 ranged from 3,000 µg/l to 7,700, and MTBE ranged from 1,200 to 6,200.Well MW1 had a maximum TPH-g concentration of 130,000 µg/l and MTBE was below the detection limit of 5,000 µg/l.
- In 2003, four monitoring events were conducted. TPH-g in well MW1 ranged from 37,000 to 180,000 µg/l; MTBE ranged from 150,000 to 210,000 µg/l. EX1 concentrations of TPH-g ranged from 120 to 260 µg/l, and MTBE concentrations ranged from 260 to 1200 µg/l. MW-2 had 240 µg/l of TPH-g and 1200 µg/l MTBE in the December event.
- On August 7, 2003, Donna Drogos of the ACEH requested a workplan for additional site investigation using a multiple well point system to monitoring different aquifer levels beneath the site.
- On March 10, 2004, samples from wells MW1 and MW2 contained concentrations of TPHg at 72,000 and 280 µg/l, respect5ively, and concentrations of MTBE at 260,000 and 1400 µg/l, respectively.

  The June 15, 2004 monitoring event showed a northerly groundwater flow direction, consistent with previous monitoring events. MW1 remained highly impacted. In well MW1, TPHg was detected at 42,000 µg/l, MTBE was found at 210,000 µg/l, and BTEX was detected at the respective concentrations of 5,000, 1,800, 3,700, and 6,000 µg/l. MW2 contained 150 µg/l TPHd, 150 µg/l TPHg, and 1,500 MTBE, and trace levels of BTEX. Wells MW3, MW4, MW5, and MW6 had no detectable concentrations of hydrocarbons, except for MTBE in well MW4 at 7.4 µg/l, and 750 µg/l in well MW5.

4. Soil contamination

   a. Primary source (see "Release History," #3)

   b. Secondary sources – To be determined in Allterra's forthcoming investigation.

5. Groundwater contamination

a. Quarterly groundwater monitoring

Quarterly groundwater monitoring has been taken over and conducted by Allterra beginning with the second quarter, 2005. Future events will also include analysis for fuel oxygenates and additives, isocontour maps, timelines for future site activities, remedial activities and summary of activities to date, and conclusions and recommendations (i.e., assessment of data gaps identified, and how we intend to fill them) and the typical data that is included in all groundwater monitoring reports.

The forthcoming investigation will include replacement multiple well point groundwater monitoring wells that allow depth-discrete sampling of individual water-bearing zones, providing more detailed subsurface assessment, including characterization of individual aquifers and vertical gradients.

a. Plume configuration and migration

Factors affecting contaminant migration will be addressed based on the data that will be obtained from the forthcoming the on- and off-site soil and groundwater investigation, as outlined in AEI's workplan. Items may include updated primary as well as secondary source areas, preferential pathways (e.g., wells utilities, buried stream channels, etc.), and risk assessment, plume migration and migration ("temporal") changes, and possible threats to downgradient receptors such as drinking water wells and other municipal wells.

The attached isoconcentration map of dissolved MTBE concentrations shows the estimated MTBE plume, based on the latest quarterly groundwater monitoring analytical results. Following re-installation of monitoring wells, depth discrete sampling of groundwater will be performed to provide a more precise assessment of MTBE concentrations within the plume.

Allterra conducted a survey of all wells within a 2000 foot radius of the site. The findings of the survey, to be outlined in Allterra's forthcoming report, included delineation of utilities at an in the immediate vicinity of the site, the discovery that no wells were reported as a result of Allterra's mass mailing efforts, and the establishment of previously known public water supply well – 3S/2E-08P01 or State Well No. 0110003-006, owned by the California Water Service –located about 1500 feet from the site, downgradient relative to the Site, as well as other wells that were not identified in terms of their use (e.g., municipal, monitoring, etc.).

b. Possible contributing offsite sources

The regional plume may differ due to contributing offsite sources, such as nearby closed gasoline stations. Many of these were formerly located along 1st Street, the nearest being at 1336 1st Street, according to historical telephone directories reviewed by Allterra.

c. Aquifer #1 contamination and characteristics

Each aquifer will be assessed in terms of contamination and hydrologic characteristics, as data from the forthcoming soil and groundwater investigation becomes available. Multiple well point replacement groundwater monitoring wells will allow depth-discrete sampling of individual water-bearing zones, providing more detailed subsurface assessment, including characterization of individual aquifers and vertical gradients.

d. Aquifer #2 contamination and characteristics

Each aquifer will be assessed in terms of contamination and hydrologic characteristics, as data from the forthcoming soil and groundwater investigation becomes available. Multiple well point replacement groundwater monitoring wells will allow depth-discrete sampling of individual water-bearing zones, providing more detailed subsurface assessment, including characterization of individual aquifers and vertical gradients.

e. Horizontal migration

The topography of the site slopes at about 0.0125 ft/ft to the northwest. The general groundwater flow is roughly parallel, to the northwest. A rose diagram of groundwater gradient over time would likely produce a preponderance of vectors to the northwest.

f. Vertical migration

Following installation of properly screened wells that reflect the multiple water-bearing zones, an assessment of vertical hydraulic gradients will be made, in addition to the normal ("horizontal") hydraulic gradient assessed.

6. Remediation

a. Assessment of soil and groundwater conditions and degree and nature of contamination to determine feasibility of remedial method

b. Review feasibility of various methods

c. Pilot Study

d. Implement remediation

e. Reporting

f. Site closure – based on assessment of groundwater contamination/conditions/use of water

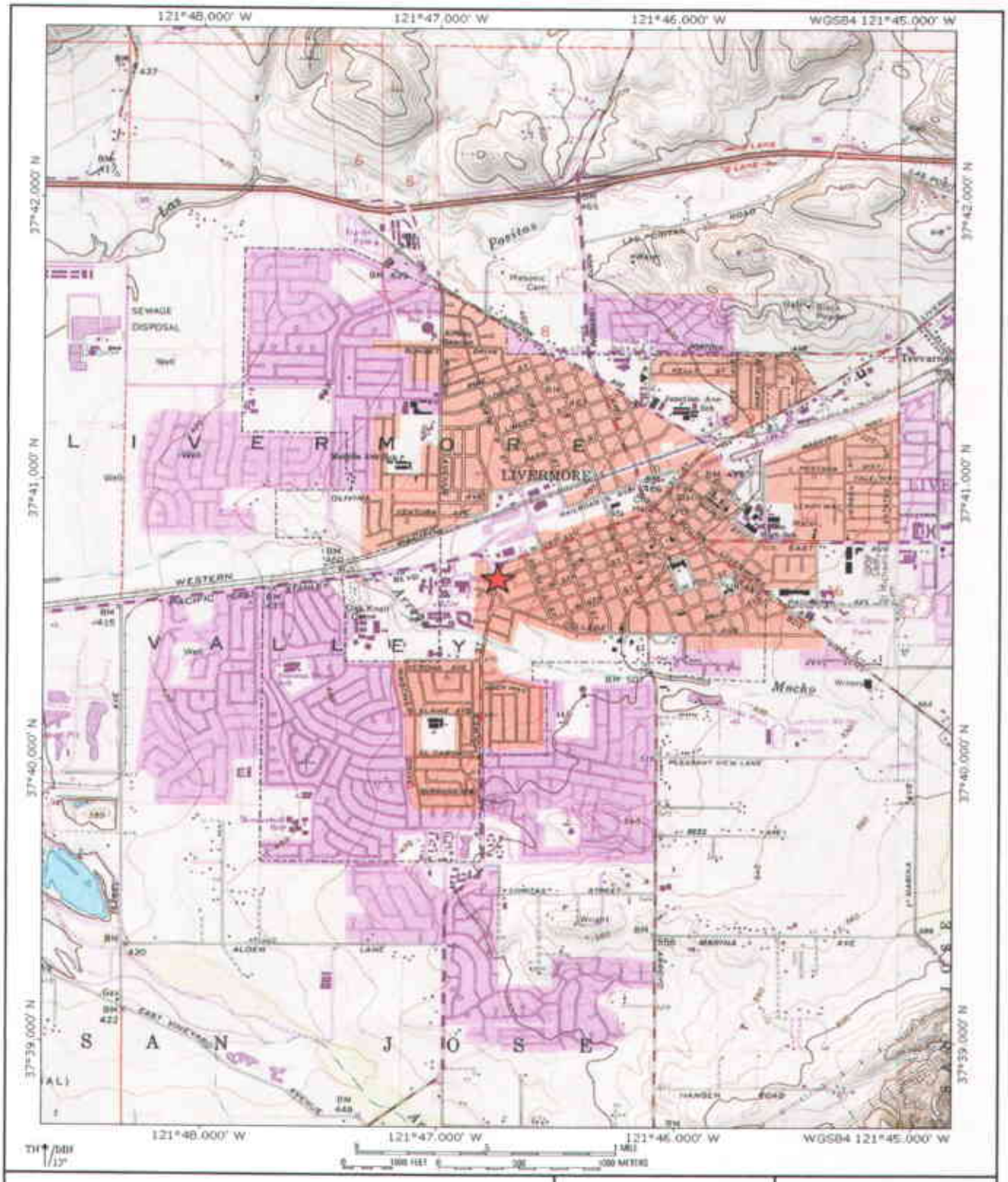
**References**

ACEH directive letter - Fuel Leak Case No. RO0000324, Livermore Gas and Mini-Mart, 160 Holmes St., Livermore, California – Work Plan Request dated March 29, 2005

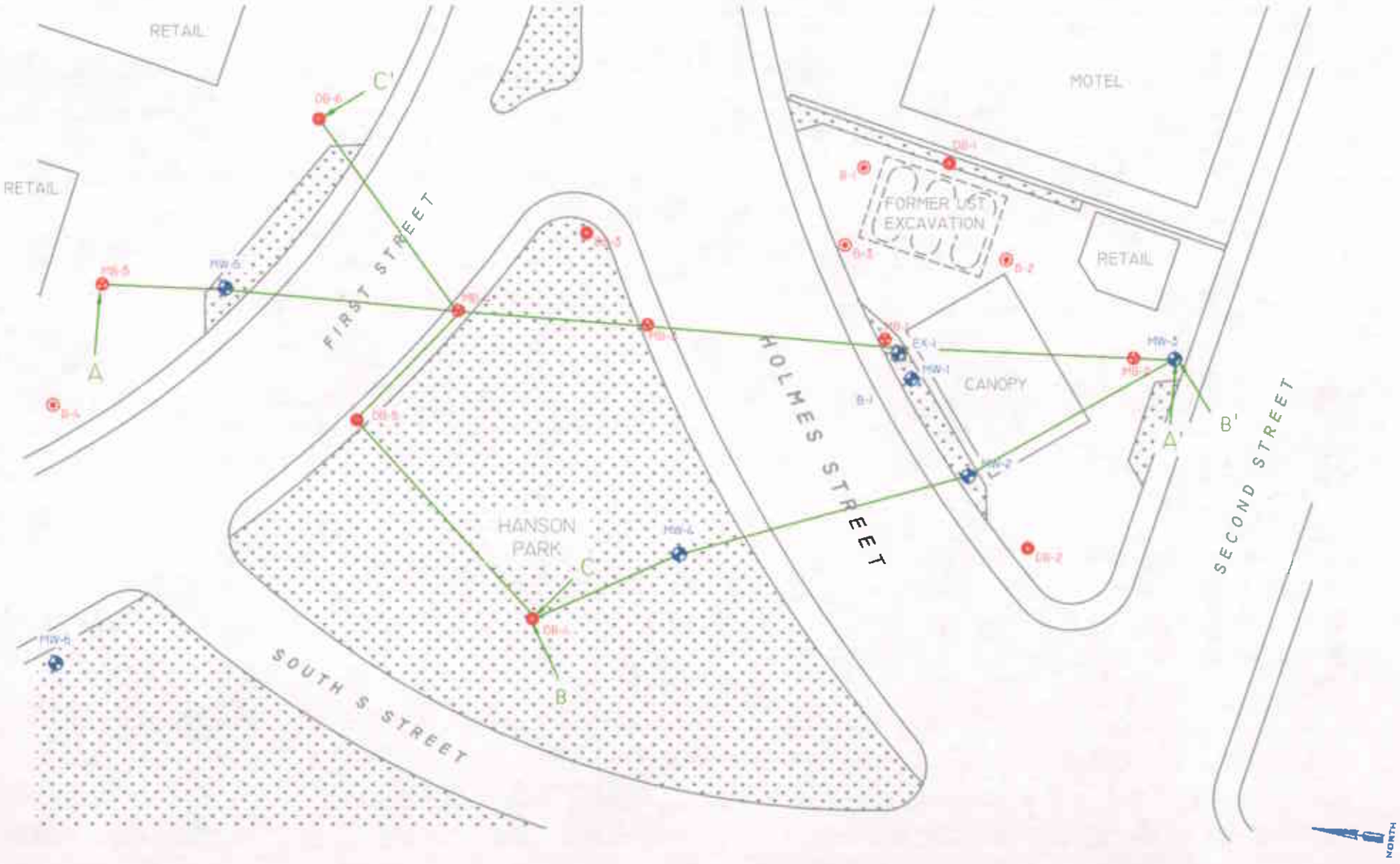
GET – First Quarterly Groundwater Monitoring Report 4/14/05

Allterra Inc., Third Quarter 2005 Groundwater Monitoring Report, June 15, 2005

**FIGUERS, Sands,** Norfleet Consultants, 6430 Preston Ave., Suite A, Livermore, CA 94550, Geological Society of America *Abstracts with Programs*, Vol. 37, No. 4, p. 35, April 29, 2005).




| | | |
|---|---|---|
| **Vicinity Map**<br>Livermore Gas and Minimart<br>160 Holmes Street<br>Livermore, California | Figure 1 | 6/28/2005 |
| | ALLTERRA<br>849 Almar Avenue, Suite C, No. 281<br>Santa Cruz, California<br>http://www.allterraenv.com | |



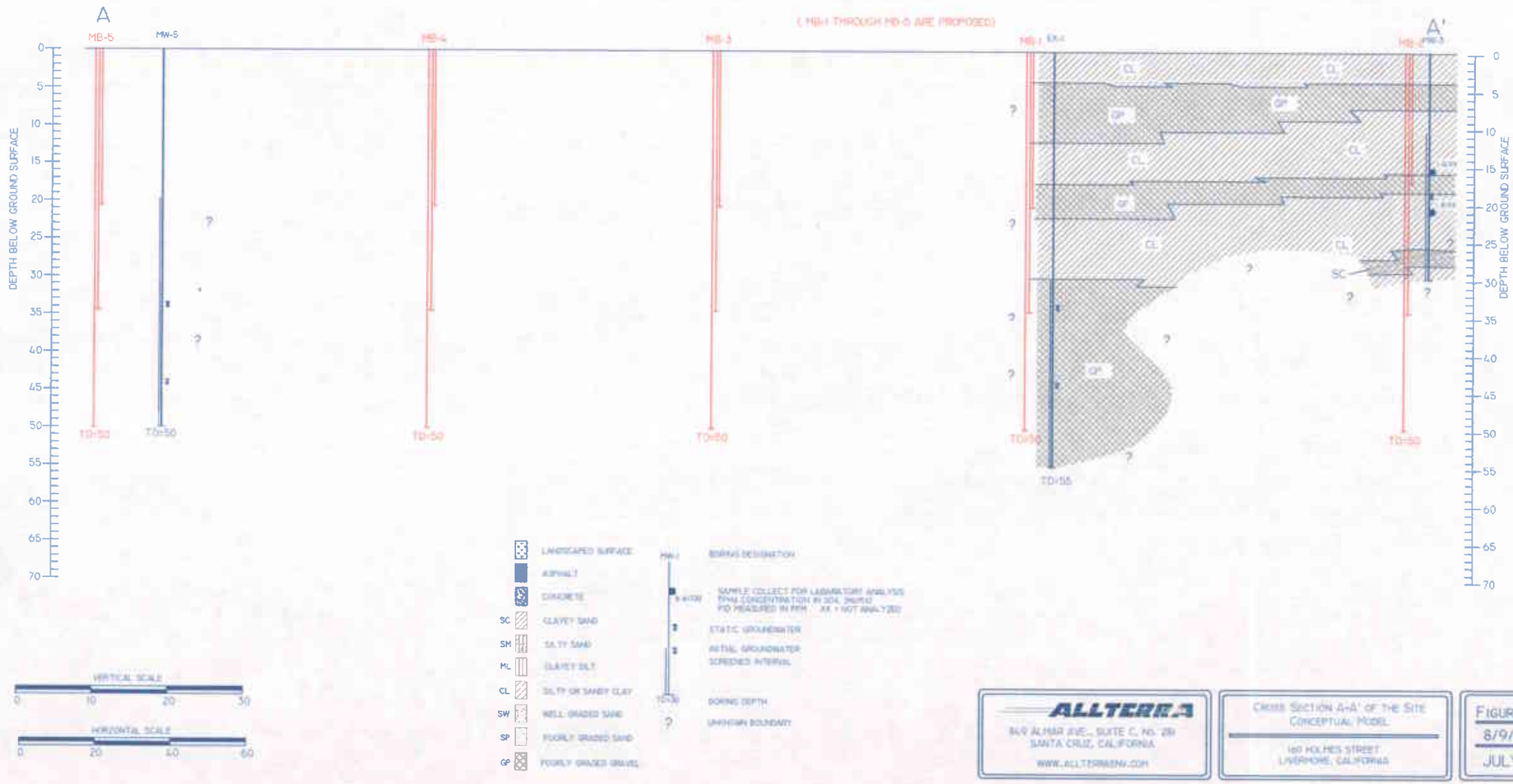

LEGEND:

- MW-4 — MONITORING WELL LOCATION
- EX-1 — EXTRACTION WELL LOCATION
- B-1 — PROPOSED SOIL BORING
- DB-1 — PROPOSED DEEP SOIL BORING
- MB-1 — PROPOSED MULTI-POINT SOIL BORING

ALLTERRA
869 ALMAR AVE., SUITE C, NO. 89
SANTA CRUZ, CALIFORNIA
WWW.ALLTERRAENV.COM

PROPOSED BORING AND SECTION LOCATION MAP
160 HOLMES STREET
LIVERMORE, CALIFORNIA

FIGURE
8/9/05

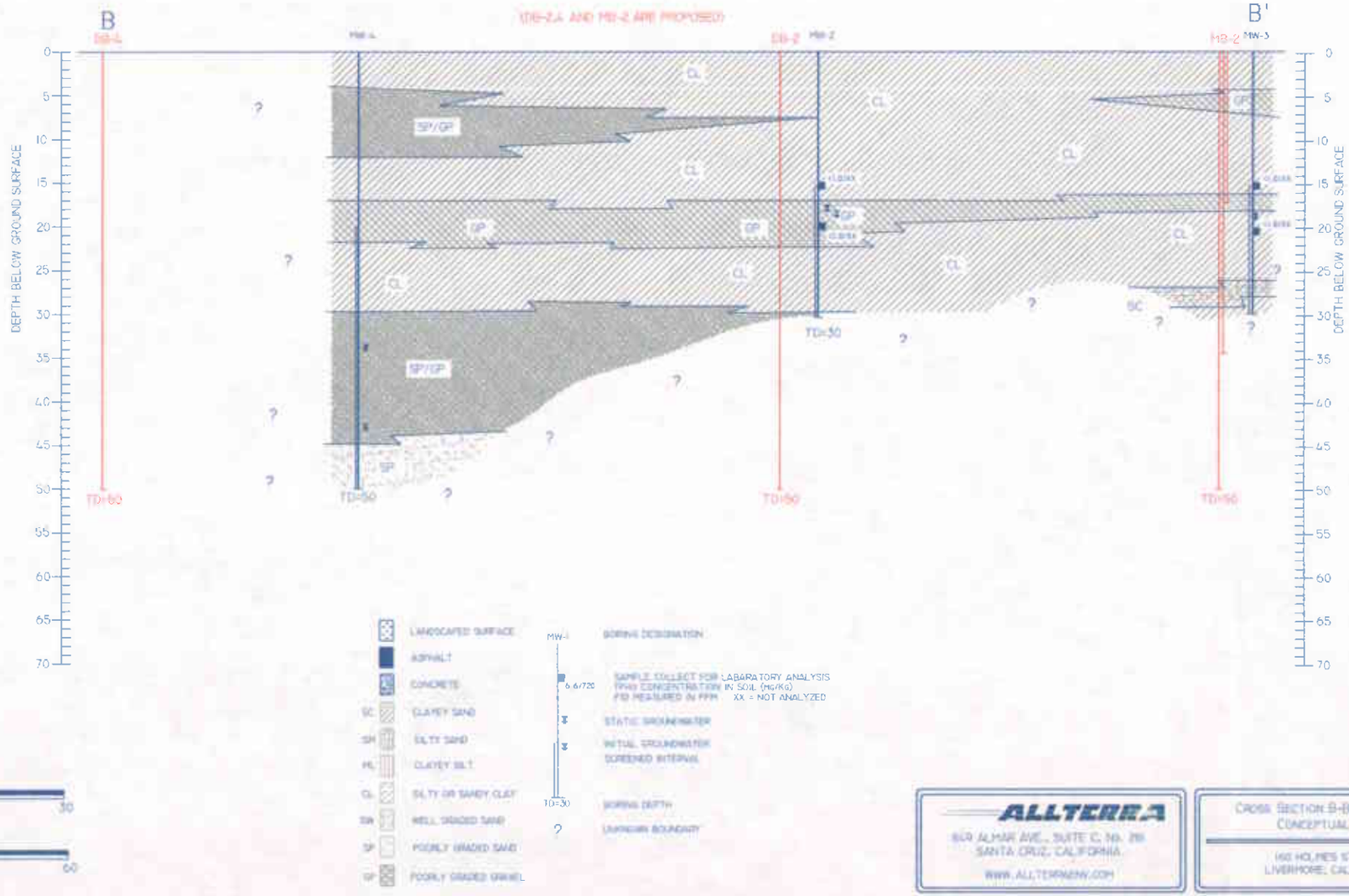



ALLTERRA
849 ALMAR AVE., SUITE C, NO. 281
SANTA CRUZ, CALIFORNIA
WWW.ALLTERRAENV.COM

CROSS SECTION A-A' OF THE SITE CONCEPTUAL MODEL

160 HOLMES STREET
LIVERMORE, CALIFORNIA

FIGURE
8/9/05
JULY







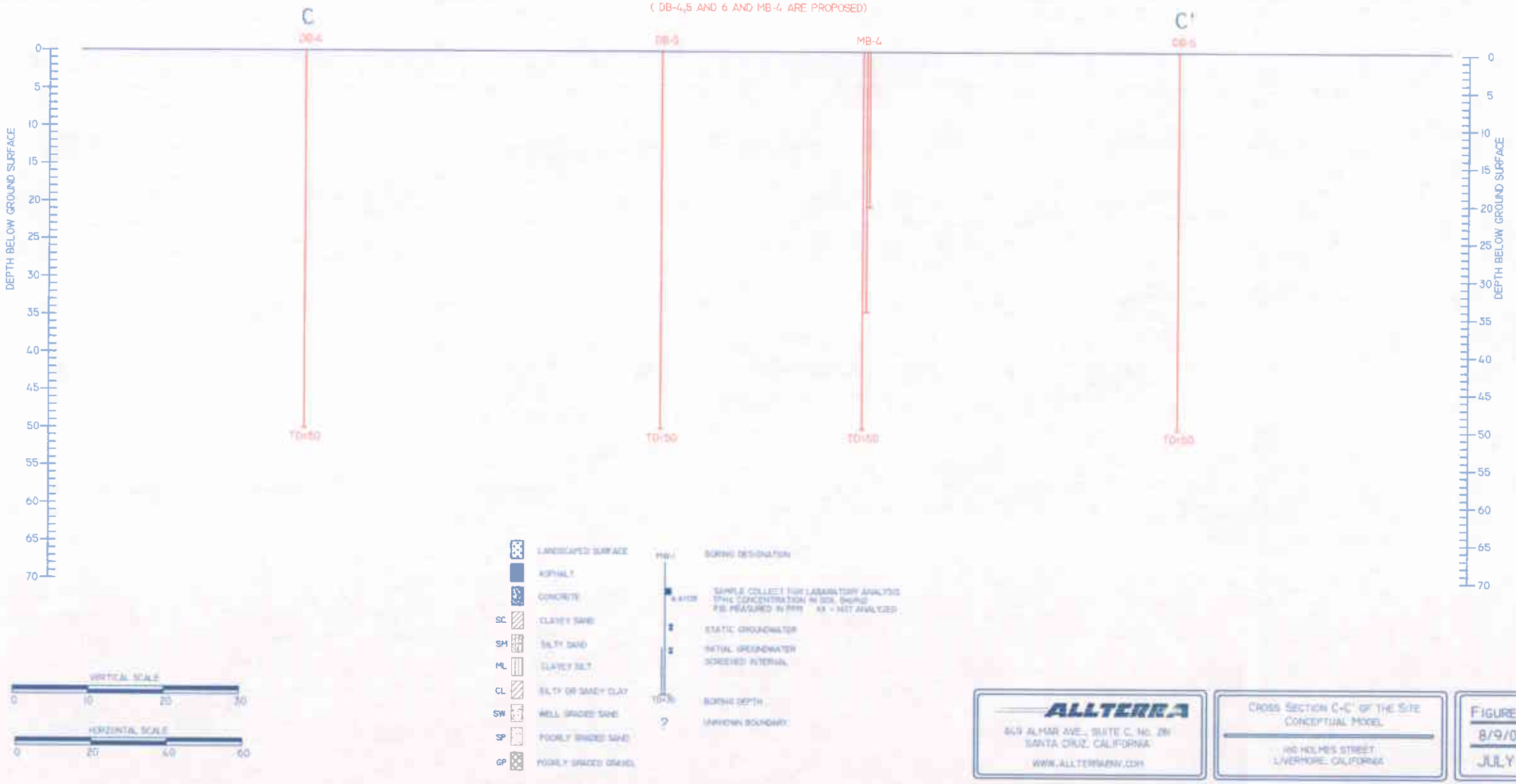

ALLTERRA
619 ALMAR AVE., SUITE C, No. 219
SANTA CRUZ, CALIFORNIA
WWW.ALLTERRAENV.COM

CROSS SECTION B-B' OF THE SITE CONCEPTUAL MODEL

160 HOLMES STREET
LIVERMORE, CALIFORNIA

FIGURE
8/9/05
JULY

( DB-4,5 AND 6 AND MB-4 ARE PROPOSED)

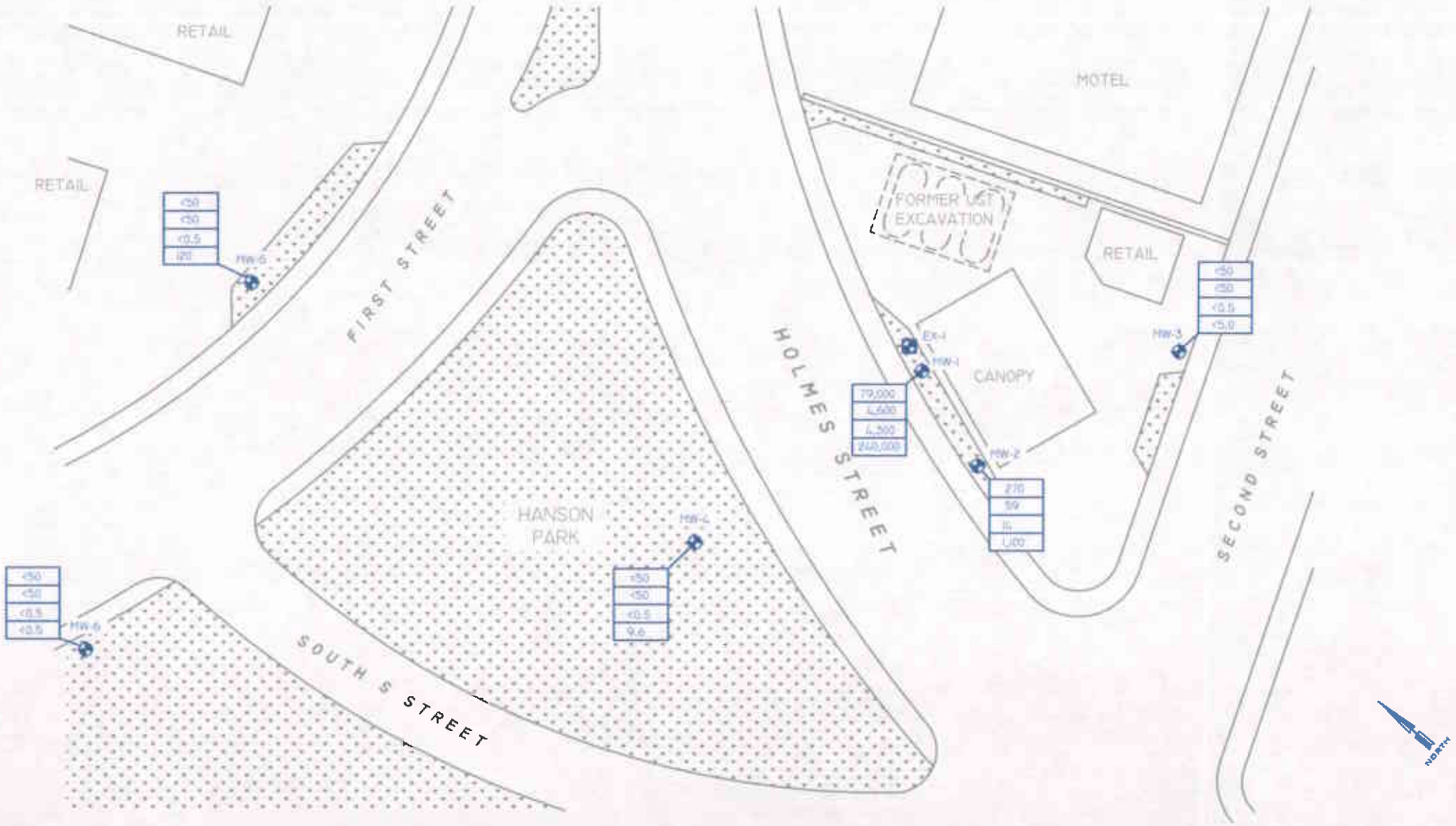



ALLTERRA
449 ALMAR AVE., SUITE C, No. 28
SANTA CRUZ, CALIFORNIA
WWW.ALLTERRAENV.COM

CROSS SECTION C-C' OF THE SITE CONCEPTUAL MODEL

190 HOLMES STREET
LIVERMORE, CALIFORNIA

FIGURE
8/9/05
JULY




LEGEND:

MW-4 MONITORING WELL LOCATION

EX-1 EXTRACTION WELL LOCATION

| | |
|---|---|
| <50 | TOTAL PETROLEUM HYDROCARBONS AS GASOLINE |
| <50 | TOTAL PETROLEUM HYDROCARBONS AS DIESEL |
| <0.5 | BENZENE |
| <0.5 | METHYL TERTIARY BUTYL ETHER |

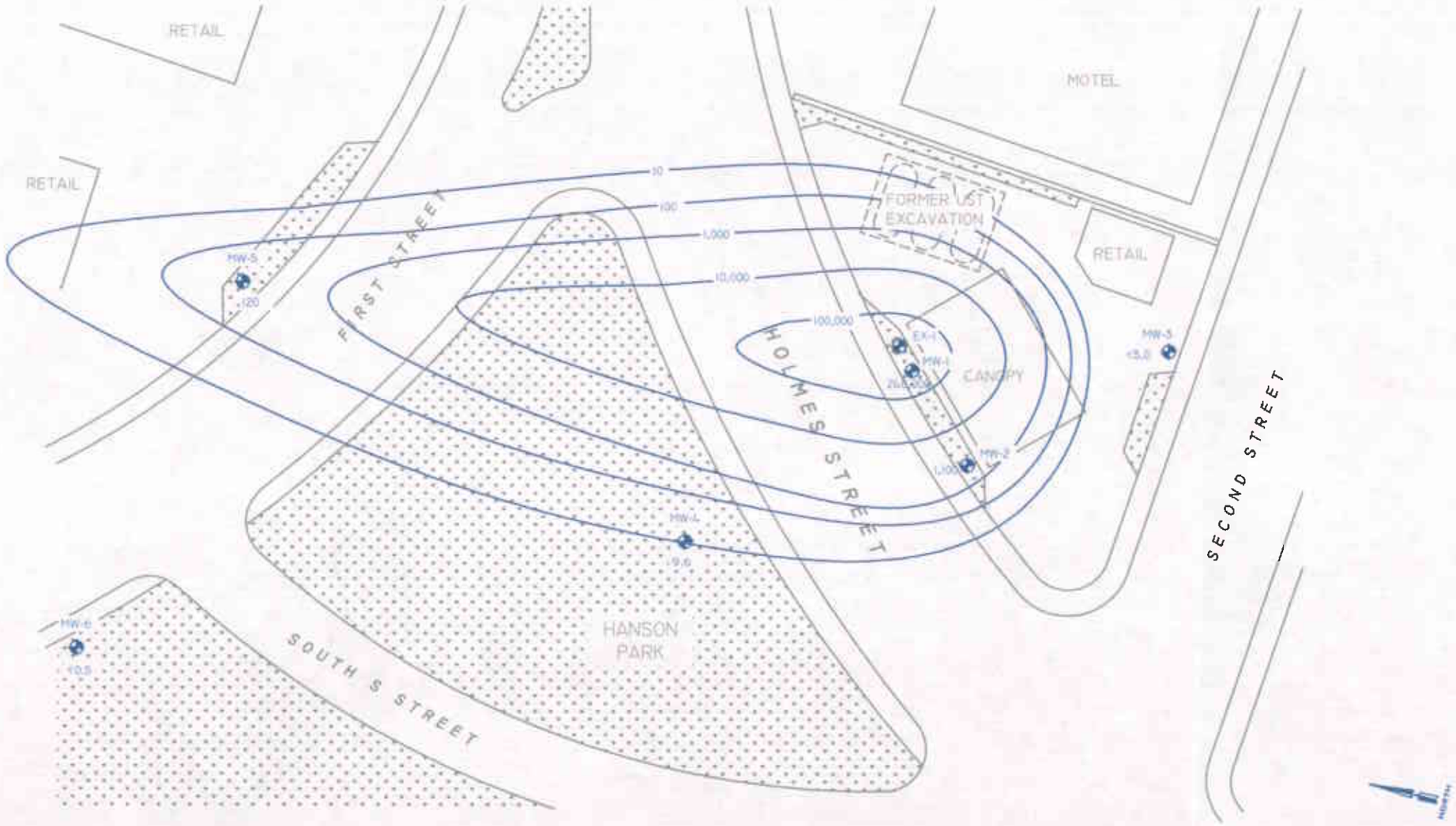
NOTES:

CONCENTRATIONS OF FUEL-RELATED COMPOUNDS ARE REPORTED IN MICROGRAMS PER LITER (UG/L)

ALLTERRA
849 ALMAR AVE., SUITE C, NO. 291
SANTA CRUZ, CALIFORNIA
WWW.ALLTERRAENV.COM

CONCENTRATIONS OF FUEL-RELATED COMPOUNDS IN GROUNDWATER
160 HOLMES STREET
LIVERMORE, CALIFORNIA

FIGURE 4
6/16/05
2ND QTR




LEGEND:

| | | | |
|---|---|---|---|
| MW-4 | MONITORING WELL LOCATION | 1,000 | MTBE ISO-CONCENTRATION CONTOUR |
| EX-1 | EXTRACTION WELL LOCATION | 1,100 | MTBE CONCENTRATION IN GROUNDWATER (ug/L) |

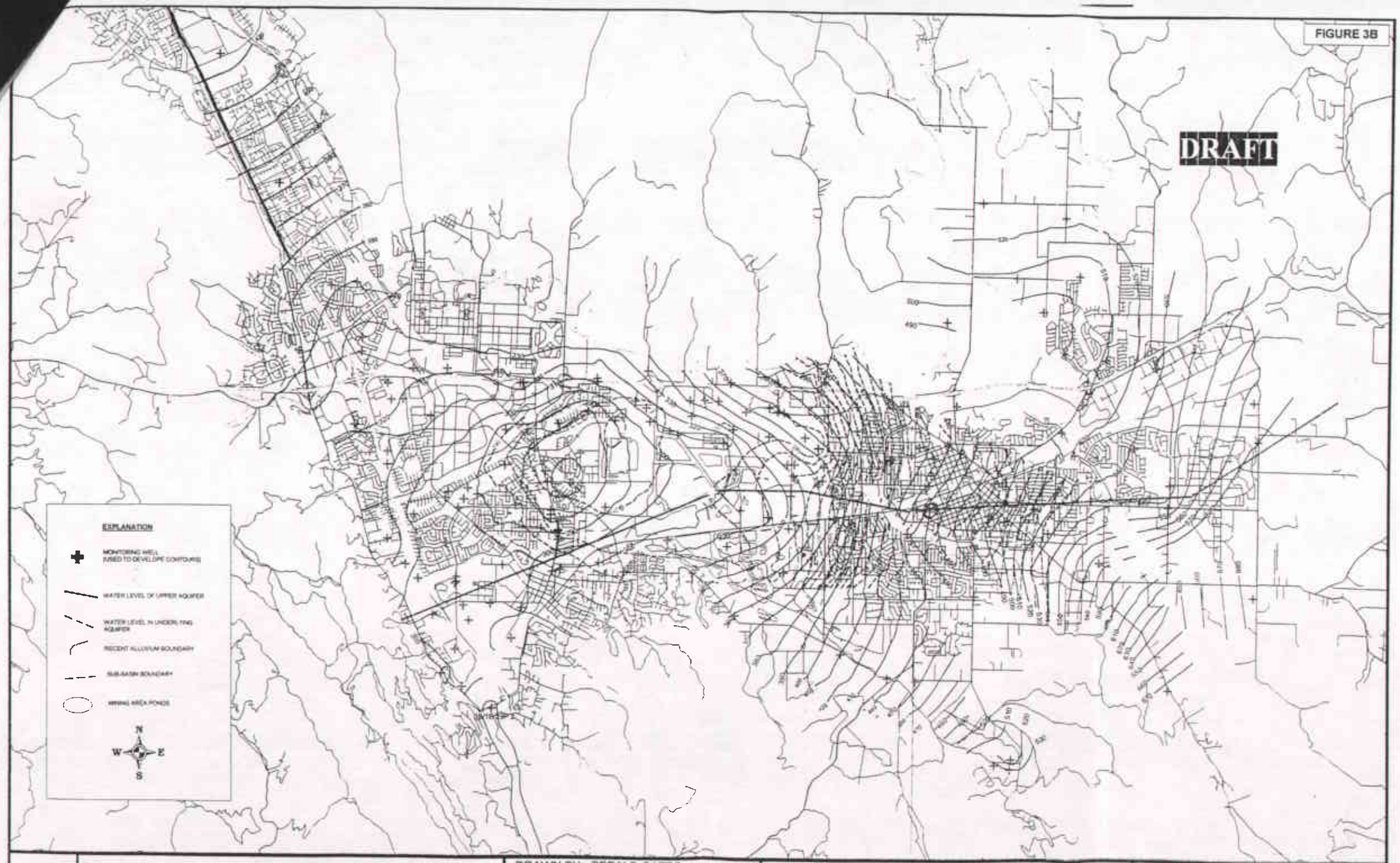
0 70 140
SCALE

ALLTERRA
849 ALMAR AVE., SUITE C, NO. 28
SANTA CRUZ, CALIFORNIA
WWW.ALLTERRACRW.COM

MTBE ISO-CONENTRATION MAP
FOR 5/27/05
160 HOLMES STREET
LIVERMORE, CALIFORNIA

FIGURE 5
6/16/05

FIGURE 3B




| | | | |
|---|---|---|---|
| ZONE 7 WATER AGENCY<br>5997 PARKSIDE DRIVE, PLEASANTON CA 94588 | DRAWN BY: GERALD GATES<br>DESIGNED BY: GERALD GATES<br>CHECKED BY:<br>APPROVED BY: | WATER RESOURCES ENGINEERING<br>GROUNDWATER LEVEL CONTOURS<br>SPRING 1999 | SCALE: 1" = 6000'<br>DATE: 10 JUNE 1999<br>FILE NO. E:\MONITOR\GM99\WYY\F99CNTRS.WOR |


LEGEND

- PRODUCTION WELL -
- UNKNOWN WELL
- MONITORING WELL
- ABANDONED WELL

# WELL LOCATION MAP

160 HOLMES STREET
LIVERMORE, CALIFORNIA

ALLTERRA
849 ALMARE AVENUE, SUITE C -281
SANTA CRUZ, CALIFORNIA 95060
www.allterraenv.com

Figure 2
6/16/05

# Table 1

## Groundwater Elevation Data

160 Holmes Street, Livermore

| Monitoring Well ID | Date | Top of Casing Elevation* (feet, msl) | Depth to Groundwater (feet) | Groundwater Elevation (feet, msl) |
|---|---|---|---|---|
| MW-1 | 8/11/2000 | 465.03 | NM | NC |
| | 10/19/2000 | 465.03 | 21.94 | 443.09 |
| | 2/22/2001 | 465.03 | 22.91 | 442.12 |
| | 5/30/2001 | 465.03 | Dry | NC |
| | 11/14/2001 | 465.03 | Dry | NC |
| | 5/7/2002 | 465.03 | Dry | NC |
| | 9/11/2002 | 465.03 | 26.16 | 438.87 |
| | 12/1/2002 | 465.03 | 27.55 | 437.48 |
| | 3/14/2003 | 465.03 | 22.63 | 442.40 |
| | 6/25/2003 | 465.03 | 22.10 | 442.93 |
| | 9/16/2003 | 465.03 | 24.91 | 440.12 |
| | 12/22/2003 | 465.03 | 21.75 | 443.28 |
| | 3/10/2004 | 465.03 | 17.45 | 447.58 |
| | 6/15/2004 | 465.03 | 22.38 | 442.65 |
| | 9/17/2004 | 465.03 | 25.61 | 439.42 |
| | 12/10/2004 | 465.03 | 22.18 | 442.85 |
| | 3/2/2005 | 465.03 | 16.95 | 448.08 |
| | **5/27/2005** | **465.03** | **18.42** | **446.61** |
| MW-2 | 8/11/2000 | 464.94 | NM | NC |
| | 10/19/2000 | 464.94 | 21.80 | 443.14 |
| | 2/22/2001 | 464.94 | 22.87 | 442.07 |
| | 5/30/2001 | 464.94 | Dry | NC |
| | 11/14/2001 | 464.94 | Dry | NC |
| | 5/7/2002 | 464.94 | 26.70 | 438.24 |
| | 9/11/2002 | 464.94 | 25.96 | 438.98 |
| | 12/11/2002 | 464.94 | 27.56 | 437.38 |
| | 3/14/2003 | 464.94 | 22.41 | 442.53 |
| | 6/25/2003 | 464.94 | 21.97 | 442.97 |
| | 9/16/2003 | 464.94 | 24.70 | 440.24 |
| | 12/22/2003 | 464.94 | 21.58 | 443.36 |
| | 3/10/2004 | 464.94 | 17.31 | 447.63 |
| | 6/15/2004 | 464.94 | 22.18 | 442.76 |
| | 9/17/2004 | 464.94 | 25.44 | 439.50 |
| | 12/10/2004 | 464.94 | 22.00 | 442.94 |
| | 3/2/2005 | 464.94 | 16.75 | 448.19 |
| | **5/27/2005** | **464.94** | **18.29** | **446.65** |

# Table 1

## Groundwater Elevation Data

160 Holmes Street, Livermore

| Monitoring Well ID | Date | Top of Casing Elevation* (feet, msl) | Depth to Groundwater (feet) | Groundwater Elevation (feet, msl) |
|---|---|---|---|---|
| MW-3 | 8/11/2000 | 465.84 | NM | NC |
| | 10/19/2000 | 465.84 | 22.45 | 443.39 |
| | 2/22/2001 | 465.84 | 23.51 | 442.33 |
| | 5/30/2001 | 465.84 | Dry | NC |
| | 11/14/2001 | 465.84 | Dry | NC |
| | 5/7/2002 | 465.84 | Dry | NC |
| | 9/11/2002 | 465.84 | 26.61 | 439.23 |
| | 12/11/2002 | 465.84 | 28.18 | 437.66 |
| | 3/14/2003 | 465.84 | 23.04 | 442.80 |
| | 6/25/2003 | 465.84 | 22.59 | 443.25 |
| | 9/16/2003 | 465.84 | 25.33 | 440.51 |
| | 12/22/2003 | 465.84 | 22.37 | 443.47 |
| | 3/10/2004 | 465.84 | 17.88 | 447.96 |
| | 6/15/2004 | 465.84 | 22.82 | 443.02 |
| | 9/17/2004 | 465.84 | 26.09 | 439.75 |
| | 12/10/2004 | 465.84 | 22.65 | 443.19 |
| | 3/5/2005 | 465.84 | 17.33 | 448.51 |
| | **5/27/2005** | **465.84** | **18.89** | **446.95** |
| MW-4 | 11/14/2001 | 465.15 | 33.84 | 431.31 |
| | 5/7/2002 | 465.15 | 26.75 | 438.40 |
| | 9/11/2002 | 465.15 | 26.66 | 438.49 |
| | 12/11/2002 | 465.15 | 28.39 | 436.76 |
| | 3/14/2003 | 465.15 | 23.14 | 442.01 |
| | 6/25/2003 | 465.15 | 22.72 | 442.43 |
| | 9/16/2003 | 465.15 | 25.39 | 439.76 |
| | 12/22/2003 | 465.15 | 22.42 | 442.73 |
| | 3/4/2004 | 465.15 | 18.20 | 446.95 |
| | 6/15/2004 | 465.15 | 22.95 | 442.20 |
| | 9/17/2004 | 465.15 | 26.12 | 439.03 |
| | 12/10/2004 | 465.15 | 22.73 | 442.42 |
| | 3/2/2005 | 465.15 | 17.60 | 447.55 |
| | **5/27/2005** | **465.15** | **19.14** | **446.01** |

# Table 1

## Groundwater Elevation Data

160 Holmes Street, Livermore

| Monitoring Well ID | Date | Top of Casing Elevation* (feet, msl) | Depth to Groundwater (feet) | Groundwater Elevation (feet, msl) |
|---|---|---|---|---|
| MW-5 | 11/14/2001 | 464.65 | 34.94 | 429.71 |
| | 5/7/2002 | 464.65 | 27.90 | 436.75 |
| | 9/11/2002 | 464.65 | 27.99 | 436.66 |
| | 12/11/2002 | 464.65 | 29.50 | 435.15 |
| | 3/14/2003 | 464.65 | 24.26 | 440.39 |
| | 6/25/2003 | 464.65 | 24.01 | 440.64 |
| | 9/16/2003 | 464.65 | 26.83 | 437.82 |
| | 12/22/2003 | 464.65 | 23.68 | 440.97 |
| | 3/10/2004 | 464.65 | 19.22 | 445.43 |
| | 6/15/2004 | 464.65 | 24.20 | 440.45 |
| | 9/17/2004 | 464.65 | 27.68 | 436.97 |
| | 12/10/2004 | 464.65 | 23.93 | 440.72 |
| | 3/2/2005 | 464.65 | 18.56 | 446.09 |
| | **5/27/2005** | **464.65** | **20.15** | **444.50** |
| MW-6 | 11/14/2001 | 464.13 | 33.88 | 430.25 |
| | 5/7/2002 | 464.13 | 27.01 | 437.12 |
| | 9/11/2002 | 464.13 | 27.03 | 437.10 |
| | 12/11/2002 | 464.13 | 28.77 | 435.36 |
| | 3/14/2003 | 464.13 | 23.46 | 440.67 |
| | 6/25/2003 | 464.13 | 23.08 | 441.05 |
| | 9/16/2003 | 464.13 | 25.77 | 438.36 |
| | 12/22/2003 | 464.13 | 22.59 | 441.54 |
| | 3/10/2004 | 464.13 | 18.65 | 445.48 |
| | 6/15/2004 | 464.13 | 23.31 | 440.82 |
| | 9/17/2004 | 464.13 | 26.56 | 437.57 |
| | 12/10/2004 | 464.13 | 23.09 | 441.04 |
| | 3/2/2005 | 464.13 | 18.04 | 446.09 |
| | **5/27/2005** | **464.13** | **19.57** | **444.56** |

# Table 1

## Groundwater Elevation Data

160 Holmes Street, Livermore

| Monitoring Well ID | Date | Top of Casing Elevation* (feet, msl) | Depth to Groundwater (feet) | Groundwater Elevation (feet, msl) |
|---|---|---|---|---|
| EX-1 | 11/14/2001 | 465.30 | 33.41 | 431.89 |
| | 5/7/2002 | 465.30 | 27.58 | 437.72 |
| | 9/11/2002 | 465.30 | NM | NC |
| | 12/11/2002 | 465.30 | 27.98 | 437.32 |
| | 3/14/2003 | 465.30 | 23.02 | 442.28 |
| | 6/25/2003 | 465.30 | 22.41 | 442.89 |
| | 9/16/2003 | 465.30 | 24.65 | 440.65 |
| | 3/10/2004 | 465.30 | 17.99 | 447.31 |
| | 6/15/2004 | 465.30 | 22.48 | 442.82 |
| | 9/17/2004 | 465.30 | 25.91 | 439.39 |
| | 12/10/2004 | 465.30 | NM | NC |
| | 3/2/2005 | 465.30 | NM | NC |
| | **5/27/2005** | **465.30** | **18.68** | **446.62** |

MSL: Mean sea level

bgs: Below ground surface

NA: well not accessible

NC: elevation not calculated

NM: well not measured

# Table 2
## Groundwater Analytical Results
160 Holmes Street, Livermore

| Monitoring Well ID | Date Collected | Total Petroleum Hydrocarbons as (µg/L) | | Aromatic Volatile Organic Compounds (µg/L) | | | | Fuel Oxygenates (µg/L) |
|---|---|---|---|---|---|---|---|---|
| | | Gasoline | Diesel | Benzene | Toluene | Ethyl-benzene | Total Xylenes | MTBE |
| MW-1 | 8/11/2000 | 170,000 | 57,000 | 6,400 | 7,600 | 4,200 | 9,700 | 320,000 |
| | 10/19/2000 | 170,000 | 17,000 | 8,400 | 3,200 | 2,700 | 10,000 | 200,000 |
| | 2/22/2001 | 82,000 | 11,000 | 5,100 | 1,000 | 13,000 | 8,700 | 190,000 |
| | 5/30/2001 | not sampled - well dry | | | | | | |
| | 11/14/2001 | not sampled - well dry | | | | | | |
| | 5/7/2002 | not sampled - well dry | | | | | | |
| | 9/11/2002 | 130,000 | NA | 7,700 | 1,100 | 4,500 | 1,500 | <5000 |
| | 12/1/2002 | NS | NS | NS | NS | NS | NS | NS |
| | 3/14/2003 | 180,000 | 3,800 | 7,100 | 3,200 | 4,300 | 6,000 | 220,000 |
| | 6/25/2003 | 71,000 | 3,100 | 7,500 | 4,700 | 4,800 | 8,900 | 210,000 |
| | 9/16/2003 | 37,000 | 3,600 | 4,600 | 220 | 3,600 | 930 | 150,000 |
| | 12/22/2003 | 44,000 | 4,000 | 6,800 | 1,500 | 4,000 | 3,800 | 180,000 |
| | 3/10/2004 | 72,000 | 3,100 | 6,000 | 11,000 | 3,900 | 10,000 | 260,000 |
| | 6/15/2004 | 42,000 | 4,300 | 5,000 | 1,800 | 3,700 | 6,000 | 210,000 |
| | 9/17/2004 | 24,000 | 2,900 | 2,800 | <33 | 2,900 | 500 | 83,000 |
| | 12/10/2004 | 31,000 | 2,700 | 4,600 | 190 | 4,400 | 2,800 | 200,000 |
| | 3/2/2005 | 58,000 | 2,800 | 4,000 | 2,500 | 4,500 | 7,800 | 230,000 |
| | **5/27/2005** | **79,000** | **4,600** | **4,300** | **6,200** | **5,100** | **13,000** | **240,000** |
| MW-2 | 8/11/2000 | 4,500 | 1,900 | 220 | 52 | 160 | 170 | 3,000 |
| | 10/19/2000 | 3,400 | 1,300 | 150 | 21 | 100 | 70 | 1,900 |
| | 2/22/2001 | 7,600 | 880 | 25 | <10 | 69 | 25 | 2,200 |
| | 5/30/2001 | not sampled - well dry | | | | | | |
| | 11/14/2001 | not sampled - well dry | | | | | | |
| | 5/7/2002 | 400 | 86 | 5.4 | <0.5 | 1.9 | 2.3 | 230 |
| | 9/11/2002 | 260 | NA | 1.3 | <0.5 | 0.57 | 0.77 | 200 |
| | 12/11/2002 | 250 | 120 | 7.9 | 1.6 | 13 | 9.9 | 180 |
| | 3/14/2003 | 830 | 110 | 56 | <0.5 | <0.5 | <1.0 | 1,200 |
| | 6/25/2003 | 260 | 180 | 0.92 | 2.9 | 3.1 | 8.1 | 2,000 |
| | 9/16/2003 | 420 | 260 | 3.6 | 3.4 | 5.2 | 2.4 | 1,300 |
| | 12/22/2003 | 240 | 120 | 0.82 | 3.1 | 7.8 | 3.9 | 1,400 |
| | 3/10/2004 | 280 | 210 | 9.4 | 4.2 | 14 | 11 | 1,400 |
| | 6/15/2004 | 150 | 150 | 2.1 | 2.4 | 2.2 | 1.3 | 1,500 |
| | 9/17/2004 | 61 | 70 | <0.5 | 1.0 | <0.5 | <0.5 | 730 |
| | 12/10/2004 | 84 | 110 | <0.5 | 1.2 | <0.5 | 1.5 | 1,300 |
| | 3/2/2005 | 63 | 91 | 0.55 | <0.5 | 0.63 | 0.51 | 1,000 |
| | **5/27/2005** | **270** | **59** | **14** | **3.9** | **19** | **6.8** | **1,100** |

# Table 2
## Groundwater Analytical Results
160 Holmes Street, Livermore

| Monitoring Well ID | Date Collected | Total Petroleum Hydrocarbons as (µg/L) | | Aromatic Volatile Organic Compounds (µg/L) | | | | Fuel Oxygenates (µg/L) |
|---|---|---|---|---|---|---|---|---|
| | | Gasoline | Diesel | Benzene | Toluene | Ethyl-benzene | Total Xylenes | MTBE |
| MW-3 | 8/11/2000 | 59 | 260 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 10/19/2000 | <50 | <65 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 2/22/2001 | <50 | 100 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 5/30/2001 | not sampled - well dry | | | | | | |
| | 11/14/2001 | not sampled - well dry | | | | | | |
| | 5/7/2002 | not sampled - well dry | | | | | | |
| | 9/11/2002 | <50 | NA | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 12/11/2002 | | NS | | | | | |
| | 3/14/2003 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 6/25/2003 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 9/16/2003 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 12/22/2003 | <50 | 69 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 3/10/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 6/15/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 9/17/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 12/10/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 7.6 |
| | 3/5/2005 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | **5/27/2005** | **<50** | **<50** | **<0.5** | **<0.5** | **<0.5** | **<0.5** | **<5.0** |
| MW-4 | 11/14/2001 | 510 | 90 | 4.0 | <0.5 | <0.5 | <0.5 | 14 |
| | 5/7/2002 | 150 | <50 | 3.5 | 0.5 | <0.5 | <0.5 | 48 |
| | 9/11/2002 | <50 | NA | <0.5 | <0.5 | <0.5 | <0.5 | 15 |
| | 12/11/2002 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 24 |
| | 3/14/2003 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <1.0 |
| | 6/25/2003 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <1.0 |
| | 9/16/2003 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 12/22/2003 | <50 | 69 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 3/4/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 37 |
| | 6/15/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 7.4 |
| | 9/17/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 12/10/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 3/2/2005 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 14 |
| | **5/27/2005** | **<50** | **<50** | **<0.5** | **<0.5** | **<0.5** | **<0.5** | **9.6** |
| MW-5 | 11/14/2001 | <50 | <66 | <0.5 | <0.5 | <0.5 | <0.5 | 8.2 |
| | 5/7/2002 | 140 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 110 |
| | 9/11/2002 | <50 | NA | <0.5 | <0.5 | <0.5 | <0.5 | 6.3 |
| | 12/11/2002 | 73 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 160 |
| | 3/14/2003 | 110 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 170 |
| | 6/25/2003 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 89 |
| | 9/16/2003 | 630 | <50 | <0.5 | 3.5 | <0.5 | 2.6 | 1500 |
| | 12/22/2003 | <0.5 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 630 |
| | 3/10/2004 | 57 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 1100 |
| | 6/15/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 750 |
| | 9/17/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 780 |
| | 12/10/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 120 |
| | 3/2/2005 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 320 |
| | **5/27/2005** | **<50** | **<50** | **<0.5** | **<0.5** | **<0.5** | **<0.5** | **120** |

# Table 2
## Groundwater Analytical Results
160 Holmes Street, Livermore

| Monitoring Well ID | Date Collected | Total Petroleum Hydrocarbons as (µg/L) | | Aromatic Volatile Organic Compounds (µg/L) | | | | Fuel Oxygenates (µg/L) |
|---|---|---|---|---|---|---|---|---|
| | | Gasoline | Diesel | Benzene | Toluene | Ethyl-benzene | Total Xylenes | MTBE |
| MW-6 | 11/14/2001 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 5/7/2002 | <50 | <67 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 9/11/2002 | <50 | NA | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 12/11/2002 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <1.0 |
| | 3/14/2003 | <50 | <50 | <0.5 | <0.5 | <0.5 | <1.0 | <1.0 |
| | 6/25/2003 | <50 | <50 | <0.5 | <0.5 | <0.5 | <1.0 | <1.0 |
| | 9/16/2003 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 12/22/2003 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 3/10/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 6/15/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 9/17/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 12/10/2004 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | 3/2/2005 | <50 | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5.0 |
| | **5/27/2005** | **<50** | **<50** | **<0.5** | **<0.5** | **<0.5** | **<0.5** | **<5.0** |
| EX-1 | 11/14/2001 | 13,000 | 2,000 | 180 | 1,000 | 330 | 3,200 | 2,200 |
| | 5/7/2002 | 7,700 | 560 | 320 | <25 | 66 | 150 | 6,200 |
| | 9/11/2002 | 2,800 | NA | 32 | <13 | 14 | <13 | 2,500 |
| | 12/11/2002 | 3,000 | 100 | 81 | <0.5 | 44 | <1.0 | 4,800 |
| | 3/14/2003 | 750 | 50 | <0.5 | <0.5 | 7.7 | 13 | 1,200 |
| | 6/25/2003 | 120 | <50 | 3.2 | 3.7 | 4.2 | 7.6 | 260 |
| | 9/16/2003 | 170 | <50 | 0.5 | 1.5 | <0.5 | 0.9 | 1,600 |
| | 3/10/2004 | | NS | | | | | |
| | 6/15/2004 | | NS | | | | | |
| | 9/17/2004 | | NS | | | | | |
| | 12/10/2004 | | NS | | | | | |
| | 3/2/2005 | | NS | | | | | |
| | **5/27/2005** | | **NS** | | | | | |

**Notes:**

-- = not applicable
µg/L = micrograms per liter
NS = Not Sampled
NA = Not Analyzed
MTBE = methyl tertiary butyl ether