northgate
environmental
management, inc.

October 21, 2003

Ms. Donna Drogos
Alameda County Health Services Agency
1131 Harbor Way
Alameda, CA 94502

Re: 1304 First Street, Livermore, California
Project No.: 1114.01

Dear Ms. Drogos:

This letter presents the results of a review of soil and groundwater quality conditions at, and around, 1304 First Street in Livermore, California (the site). The purpose of the review has been to determine a likely source of methyl tert-butyl ether (MTBE) detected in water samples collected at the site. The investigation includes a review Phase I and Phase II environmental assessments performed at the site in 2003, and a review of regulatory agency files for known leaking underground storage tank (LUST) sites in the near vicinity. In summary, MTBE has been detected in groundwater at the subject site. However, based on our review, it is our opinion that the MTBE originates from an off-site source. We are requesting your written concurrence with this opinion, as this MTBE issue is holding up a real estate loan for purchase of the property.

Summary of Site Conditions

The subject site consists of an approximate 0.6-acre parcel located just north of the intersection of First and Holmes Streets in Livermore, California. A site location map is shown on Figure 1. The site is presently developed as a restaurant, with associated paved parking and landscape areas. A Phase I environmental assessment performed for the site in April 2003 by M.J. Kloberdanz and Associates of Modesto, California indicates that beginning in the 1930s, the site was occupied by a residence and an automobile repair garage that also sold gasoline. According to the property owner, petroleum was not available for resale during World War II, but the facility resumed sales of gasoline after the war in 1945, and gasoline was sold at the site through the late 1950s. Available information indicates that the residence and garage were demolished in 1972 to accommodate development of the site as a restaurant. The gasoline service station appears to have been removed prior to that time, although there are no records indicating when the underground storage tanks may have been removed.

In July and August 2003, AEI Consultants of Walnut Creek, California performed Phase II soil and groundwater quality investigations at the site. These investigations consisted of drilling

eight borings at the site at the approximate locations shown on Figure 2. During drilling, soil samples were collected for chemical analysis at various intervals to depths of 35 feet below the ground surface (bgs). Groundwater samples were collected at approximate depths of 38 feet bgs at borings SB-6, SB-7, and SB-8. Chemical test results for soil samples collected during these investigations are presented on Table 1. Of the 17 soil samples collected at the site, only one sample contained any measurable hydrocarbon compound. This sample (the sample from 16 feet bgs at SB-5) reportedly contained total petroleum hydrocarbons (TPH) as diesel at a concentration of 1.1 parts per million (ppm). None of the other samples contained TPH as diesel or gasoline, benzene, toluene, ethylbenzene, or MTBE at concentrations above the laboratory method reporting limits (MRLs).

Groundwater sample test results are shown on Table 2. As shown on the table, none of the samples contained TPH as diesel or gasoline, benzene, ethylbenzene, or xylenes above the laboratory MRLs. However, the samples from SB-6 and SB-7 contained toluene at concentrations of 0.99 and 0.59 parts per billion (ppb), respectively. In addition, MTBE was measured in all three samples, with measured concentrations of 11 ppb in SB-6, 0.75 ppb in SB-7, and 1,400 ppb in SB-8.

The presence of MTBE in groundwater at these concentrations appears unrelated to any current or previous use of the site, given that gasoline was not reportedly sold at the site since the late 1950s, and MTBE was not used as a gasoline additive prior to the 1970s. In addition, MTBE or other gasoline components were not measured in any of the soil samples collected at the site. These conditions indicate that the MTBE measured in groundwater at the site originates from an off-site source. Accordingly, a review of information pertaining to known area LUST sites was performed to evaluate potential off-site contamination sources. The review indicated the presence of two existing and one former gasoline service station in the area immediately upgradient of the subject site. The locations of the sites are shown on Figure 3. Regional groundwater flow is toward the northwest, based on groundwater elevation data presented in engineering reports for these sites. A summary of environmental conditions at each of the site is presented below.

160 Holmes Street

The Livermore Gas and Mini Mart (160 Holmes Street) is located approximately 250 feet south-southeast of the subject site. Investigations performed at the Holmes Street site following removal of three 10,000-gallon USTs in April 1999 indicate that MTBE is present in groundwater at the site at concentrations up to 290,000 ppb. As shown on Figure 3, groundwater grab samples collected in a roadway median area approximately 150 feet northwest of the Holmes Street site contained MTBE at 3,800 ppb, 6,000 ppb, and 16,000 ppb (borings B-3, B-4, and B-5, respectively on Figure 3). However, groundwater samples collected from a monitoring well subsequently installed in the middle of these three borings (well MW-4) reportedly does not

contain MTBE above the laboratory MRL of 1 ppb. The reason for this discrepancy is not known with certainty, however, our review indicates that the grab samples were collected from borings drilled to depths of 28 to 32 feet bgs, whereas groundwater monitoring well MW-4 (and associated wells MW-5 and MW-6) are screened between the depths of 20 to 50 feet bgs. It should be noted that monitoring wells installed on the 160 Holmes Street site (wells MW-1, MW-2, and MW-3 on Figure 3), which contain MTBE at concentrations of up to 220,000 ppb, are screened only between the depths of 15 and 30 feet bgs. Thus, the apparent discrepancy between MTBE concentrations measured in the grab samples collected from borings B-3, B-4, and B-5 and groundwater-monitoring wells MW-4, MW-5, and MW-6 appears to be related to the screen interval of the wells and the depth at which the grab samples were collected. This is also reflected in the reports that the shallow on-site wells (which contain the highest levels of MTBE) are periodically dry, whereas the deeper wells (which contain significantly lower concentrations of MTBE) are not.

The apparent presence of distinct water-bearing zones in the shallow depth intervals is also reported in engineering reports for a Unocal service station located at 1771 First Street (approximately 1,500 feet east (cross-gradient) of the subject site: just off the edge of Figure 3 to the east). A workplan for installation of monitoring wells and an ozone microsparging system for the Unocal site dated November 27, 2001 proposed to perform ozone microsparging in two distinct zones: a shallow parched zone present at a depths of 20 to 25 feet bgs "above the clay layer" (quoted from the workplan) and in a second water-bearing zone present at approximately 45 feet bgs. This information suggests that the Hydropunch grab samples collected in the Holmes Avenue median strip (samples B-3, B-4, and B-5) may be representative of MTBE concentrations in a shallower permeable zone, and that MTBE concentrations measured in the more deeply-screened monitoring wells (wells MW-4, MW-5, and MW-6) may be more representative of a deeper stratigraphic unit. This also suggests that the MTBE plume originating from the 160 Holmes Avenue site may extend much further downgradient than the area indicated by monitoring results from wells MW-4, MW-5, and MW-6. Indeed it seems highly unlikely that wells located on the 160 Holmes Avenue property could contain MTBE at 290,000 ppb (MW-1), and wells located only 150 feet downgradient contain MTBE at concentrations of <1 to 170 ppb (wells MW-4, 5, and 6).

Former Chevron Station, 1334 First Street, Livermore, California

A Chevron Service Station was formerly located at 1334 First Street, immediately adjacent to the subject site on the east (Figure 3). Available regulatory agency files indicate that three 10,000 gallon fuel USTs and a 1,000 gallon waste oil UST were removed from the site in March 1994. Soil samples collected during the tank removal indicated the presence of hydrocarbons in soil in the vicinity of the waste oil tank. Three groundwater-monitoring wells were installed at the site in September 1994 at the approximate locations shown on Figure 3. The wells were screened between the depths of 25 and 60 feet bgs. The well located near the waste oil tank (CW-3 on

Figure 3) reportedly contained hydrocarbons as gasoline at 220 ppb, benzene at 67 ppb, toluene and 2.4 ppb, ethylbenzene at 2.5 ppb, and xylenes at 11 ppb. The remaining two wells did not contain petroleum hydrocarbons. However, none of the other wells appear to have actually been located downgradient of the former USTs. None of the wells were analyzed for MTBE with the exception of well CW-3, which was sampled for MTBE twice: in August 1995 (<2.5 ppb) and September 1995 (5.7 ppb). The wells were last sampled for hydrocarbons in September 1995, and abandoned in 1996. A replacement well for CW-3 was subsequently installed and sampled for MTBE in 1996. In two sampling events, MTBE was reported at 3.7 ppb (June 1996) and at <2.5 ppb (August 1996). This well was also abandoned, and the site has been closed by the ACHSA.

Beacon Station, 1619 First Street, Livermore, California

A Beacon Station is located approximately 1,000 feet southeast of the subject site as shown on Figure 3. As shown on the Figure, a gasoline release at the Beacon Station resulted in a groundwater contamination plume that extends approximately 500 feet downgradient of the service station. This site is described in this letter to demonstrate the general length of MTBE plumes in this area of Livermore. A similar situation is present at another site located at South L and First Street (the B&C Mini Mart, not shown on Figure 3) where an MTBE plume extends over 1,000 feet from the source area. The MTBE concentrations in groundwater on these sites are in the general range of 300 to 5,000 ppb.

Conclusions

Based on the information reviewed during our investigation, it is our opinion that the MTBE measured in groundwater at 1304 First Street almost certainly originates from the Livermore Gas & Mini Mart site, located at 160 Holmes Street. MTBE is present in groundwater at 160 Holmes Street at concentrations up to 290,000 ppb. MTBE was measured at concentration of 16,000 ppb, 6,000 ppb, and 3,800 ppb in groundwater grab samples collected at approximate distances of 100, 150, and 200 feet, respectively, downgradient of the 160 Holmes site. Groundwater samples collected from monitoring wells installed in the vicinity of these borings show much lower levels of MTBE, however, our review indicates that the grab samples were collected from much shallower depths than those monitored by the wells. MTBE was measured at 1,400 ppb in a groundwater grab sample collected at 1304 First Street (the subject site) at an approximate distance of 400 feet downgradient of 160 Holmes. This progression of decreasing MTBE concentrations downgradient of the 160 Holmes site is entirely consistent with the expected migration of MTBE from that site. In our opinion, the presence and concentration of MTBE measured in groundwater at the subject site is consistent with a release at 160 Holmes Street, based on comparison to the length of MTBE plumes documented at other service station sites in the general vicinity.

Available information indicates gasoline was sold at the subject site from the 1920s to the late 1950s. However, gasoline was not sold at the site after the late 1950s. Based on the reported dates of gasoline sales at the site, it is highly unlikely that the 1,400 ppb of MTBE measured in groundwater at the subject site is related to gasoline storage from the 1950s. MTBE is generally documented to have been used in gasoline beginning in the 1970s, and used heavily in the 1990s. The elevated concentrations of MTBE measured at and around the subject site are entirely consistent with more recent releases to the environment.

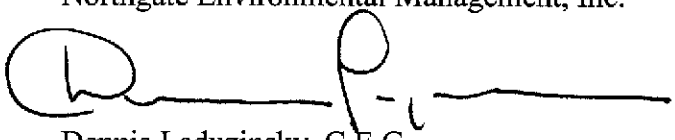
Closing

We appreciate your time in reviewing this summary. We respectfully request your written concurrence with the opinion expressed in this letter.

We are available to meet with you to discuss the details of our review. Please don't hesitate to call if you have any questions or require additional information.

Sincerely,

Northgate Environmental Management, Inc.



Dennis Laduzinsky, C.E.G.
Associate

cc: Brad Hirst
Carlos Ratinho

Table 1
On-Site Soil Sample Analytical Results
1304 First Street
Livermore, California

Sample Location and Depth (ft)	TPH-d (EPA 8015)	TPH-g (EPA 8015)	Benzene (EPA 8021)	Toluene (EPA 8021)	Ethyl-benzene (EPA 8021)	Xylenes (EPA 8021)	MTBE (EPA 8021)
SB1-8	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.05
SB1-16	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.05
SB2-8	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.05
SB2-16	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.05
SB3-8	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.05
SB3-16	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.05
SB4-8	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.05
SB4-16	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.05
SB5-8	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.05
SB5-16	**1.1**	<1	<0.005	<0.005	<0.005	<0.005	<0.05
SB5-20	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.05
SB6-20	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.005*
SB6-35	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.005*
SB7-20	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.005*
SB7-30	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.005*
SB8-20	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.005*
SB8-30	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.005*

NOTES:

Results reported in parts per million (mg/kg)

TPH-d: Total petroleum hydrocarbon as diesel

TPH-g: Total petroleum hydrocarbon as gasoline

MTBE: Methyl-tert-Butyl Ether

*: Sample analyzed using EPA 8260

Table 2
On-Site Groundwater Sample Analytical Results
1304 First Street
Livermore, California

Sample Location	Sample Depth (ft bgs)	TPH-d (EPA 8015)	TPH-g (EPA 8015)	Benzene (EPA 8260)	Toluene (EPA 8260)	Ethyl-benzene (EPA 8260)	Xylenes (EPA 8260)	MTBE (EPA 8260)
SB-6	38	<50	<50	<0.5	**0.99**	<0.5	<0.5	**11**
SB-7	38	<50	<50	<0.5	**0.59**	<0.5	<0.5	**0.75**
SB-8	38	<50	<50	<25	<25	<25	<25	**1400**

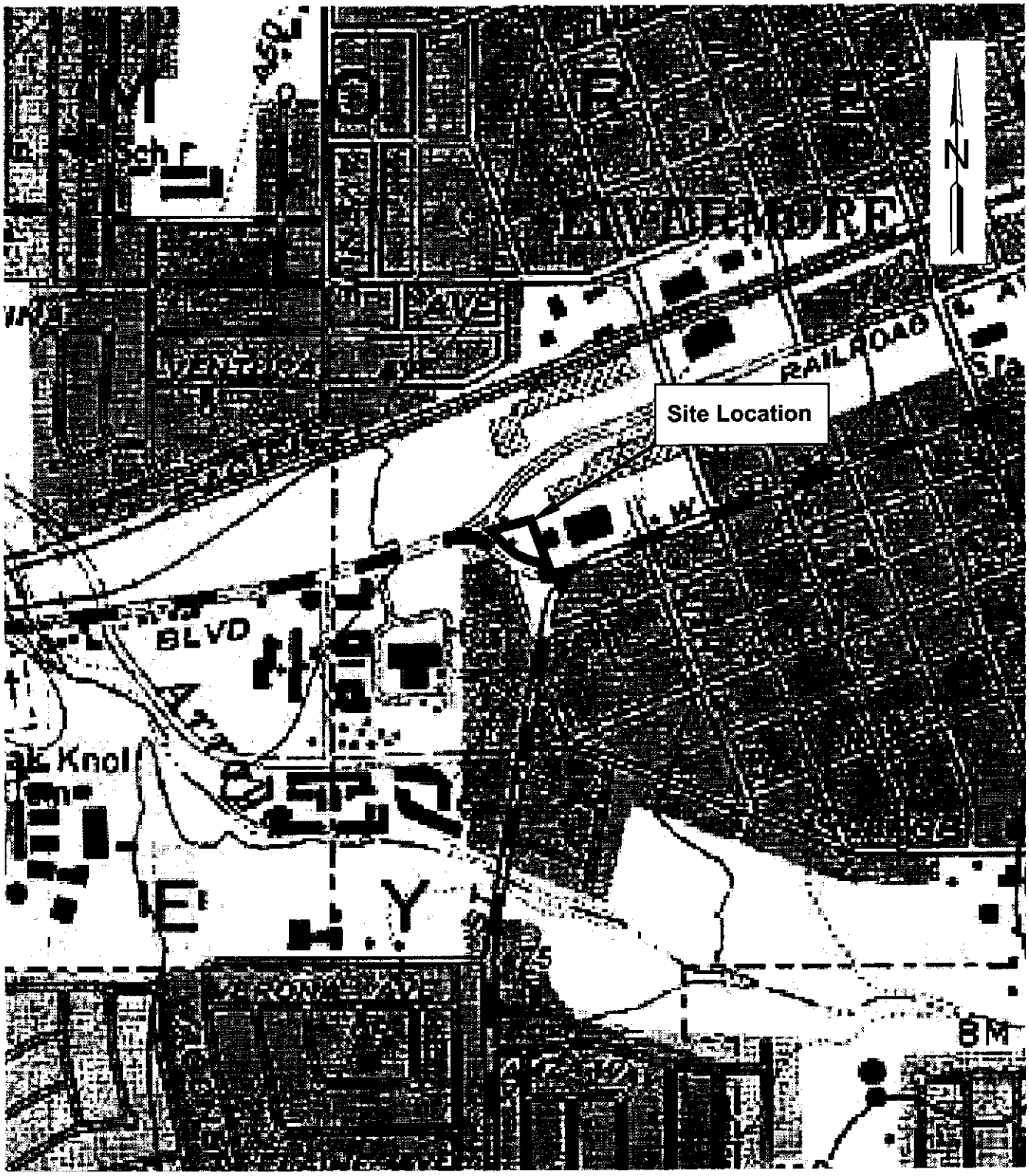
NOTES:

Results reported in parts per billion (ug/l)

TPH-d: Total petroleum hydrocarbon as diesel

TPH-g: Total petroleum hydrocarbon as gasoline

MTBE: Methyl-tert-Butyl Ether



Base map from USGS: Livermore, California, 2001

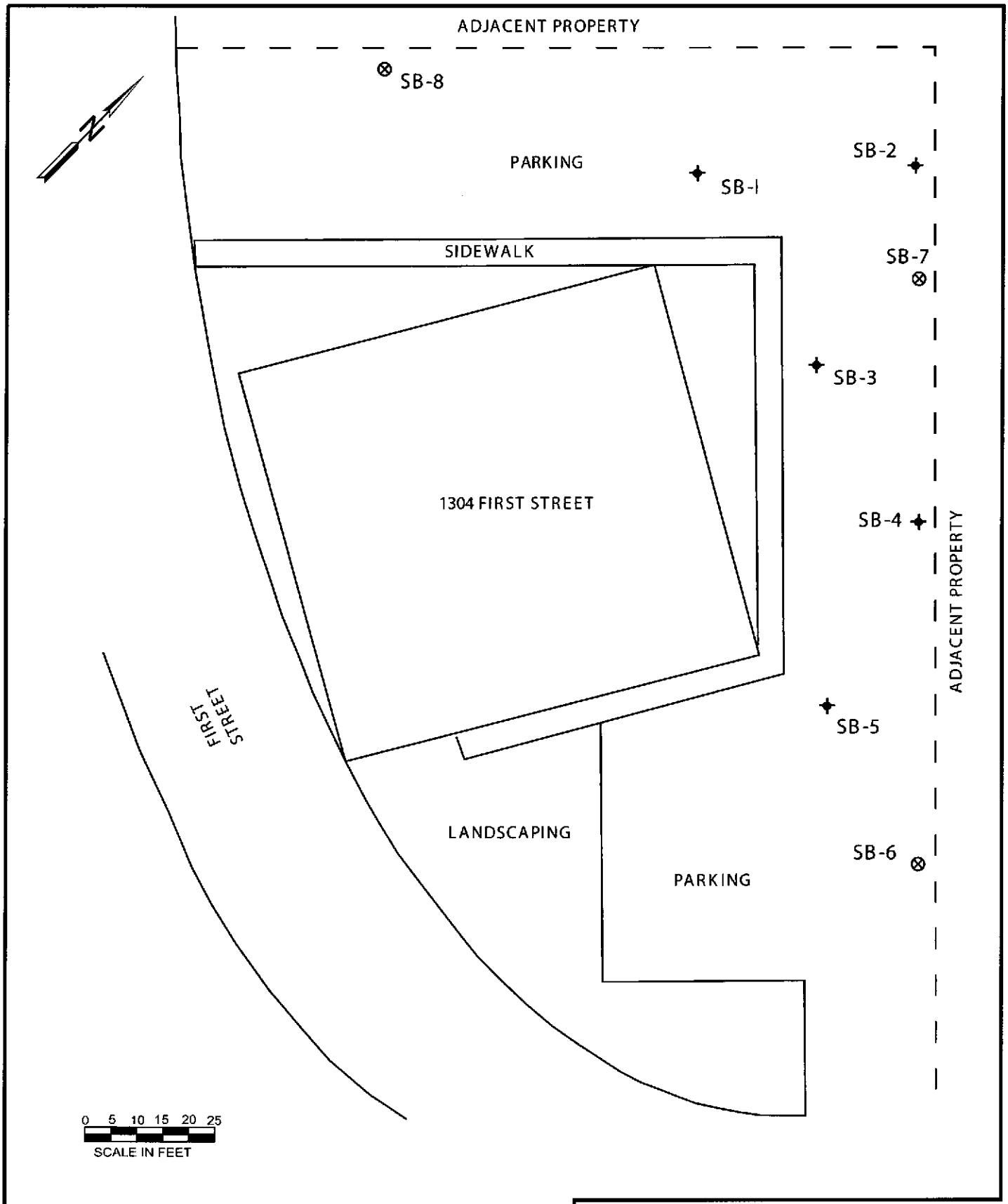
0 250 500 750

SCALE 1:750 FEET

Figure 1
Site Location Map

northgate environmental management, inc

1304 First Street
Livermore, California
October 2003
Proj. No. 1114.01

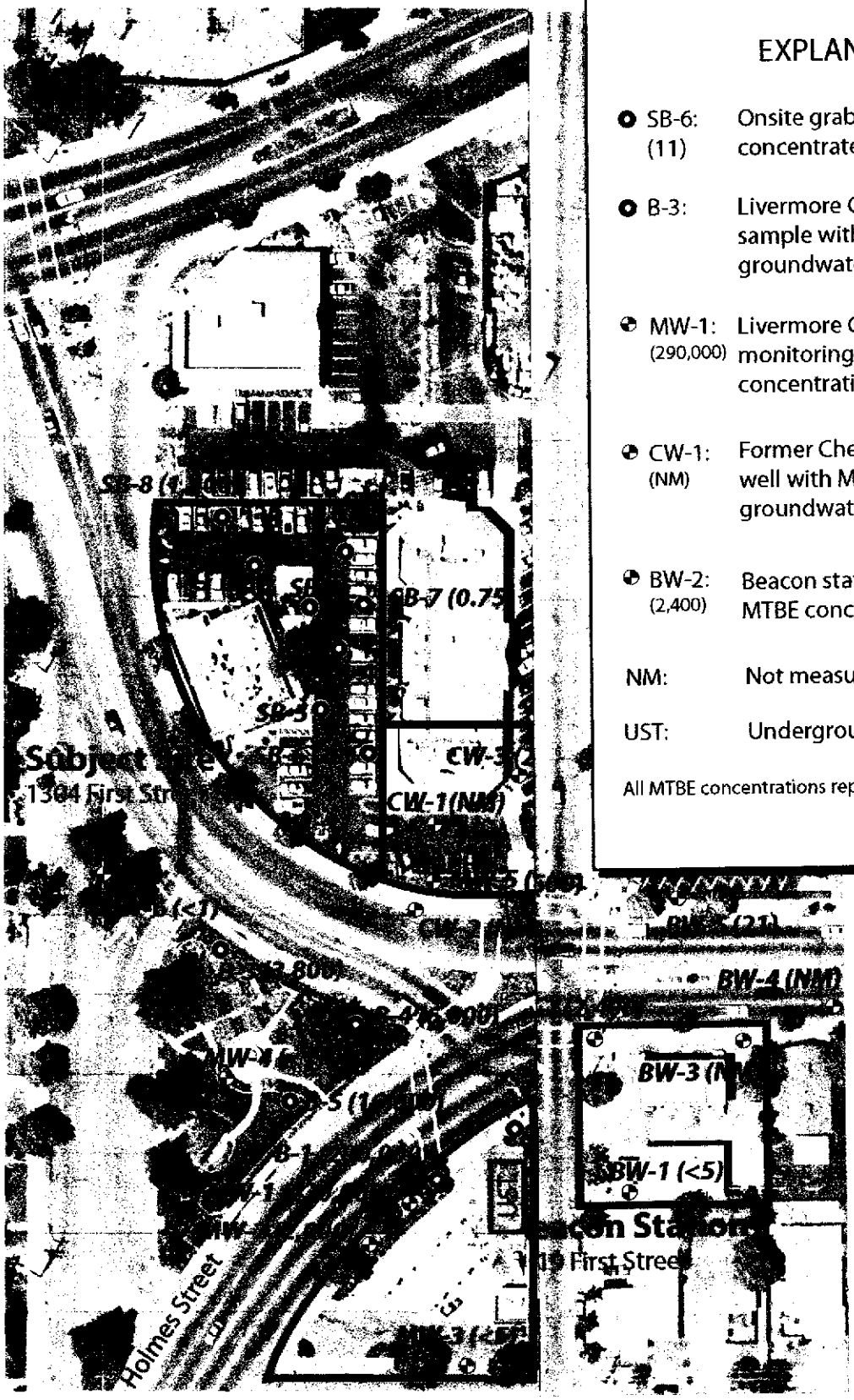


Source: after AEI Consultants, 2003

Figure 2
Site Plan

1304 First Street
Livermore, California
October 2003
Proj. No. 1114.01

northgate environmental management, inc



EXPLANATION

- SB-6: (11) Onsite grab sample with MTBE concentrate in groundwater.
- B-3: Livermore Gas and Mini Mart grab sample with MTBE concentration in groundwater.
- MW-1: (290,000) Livermore Gas and Mini Mart monitoring well with MTBE concentration in groundwater.
- CW-1: (NM) Former Chevron station monitoring well with MTBE concentration in groundwater.
- BW-2: (2,400) Beacon station monitoring well with MTBE concentration in groundwater.

NM: Not measured for MTBE

UST: Underground storage tank

All MTBE concentrations reported in parts per billion.

FIGURE 3
Regional Conditions
October 2003

Project 1114.01

northgate environmental management, inc.