

December 13, 2006
Project SJ89-99S-1
SAP: 135244

RECEIVED

By dehloptoxic at 10:24 am, Dec 14, 2006

Mr. Jerry Wickham
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: Work Plan
Shell-branded Service Station
8999 San Ramon Road
Dublin, California

Dear Mr. Wickham,

Delta Consultants (Delta), on behalf of Shell Oil Products US (Shell), has prepared a work plan for the site referenced above (Figure 1). The responses in this work plan were requested in a letter from the Alameda County Health Care Services Agency (ACHCSA) to Shell dated October 20, 2006.



BACKGROUND

The subject property is located on the east side of the intersection of Alcosta Boulevard and San Ramon Road intersection in Dublin, California (Figure 2). The property is currently the site of an active Shell-branded service station.

The Shell service station has four 10,000-gallon gasoline underground storage tanks (USTs), three fuel dispenser islands with a total of seven separate fuel dispensers, a carwash, and a kiosk (Figure 2). The site is located in an area characterized as commercial.

Additional site background is detailed in Delta's Electronic Site Conceptual Model (SCM) dated September 27, 2005.

On September 27, 2005 Delta submitted a work plan to the ACHCSA to address data gaps in the above mentioned SCM. The following sections summarize the work that was done on February 21, February 22, and July 26 through July 28, 2006.

CPT GROUNDWATER INVESTIGATION

On February 22, July 26, and July 27, 2006, Delta performed groundwater sampling at three locations (CPT-2 through CPT-4, Figure 2) using CPT equipment provided by Gregg In Situ, Inc. (License C57- 656407). The goal of the CPT investigation was to define the vertical extent of MTBE and TBA previously detected in first encountered groundwater in the 25- to 30-foot depth interval. All work was performed under the direction and supervision of a California Certified Hydrogeologist.

CPT SOIL PROFILING

Borings CPT-2 and CPT-3 were advanced to a total depth of 75 feet bg. Boring CPT-4 met refusal at a total depth of 69 feet bg. Each CPT location consisted of two separate boreholes – one for stratigraphic profiling and a second for collecting discrete soil and groundwater samples. At each CPT location, the initial boring was advanced to define the underlying soil profile. Soil classifications were based on the cone penetration resistance, sleeve friction, and friction ratio. A soil classification graph was generated during the advancement of the CPT borehole. Grout was pumped into the initial borehole behind the cone by using a grout collar (retraction grouting).

The CPT boreholes generally encountered silt, silty clay, and clayey silt to a depth of approximately 75 feet bg. Scattered thin sand layers (less than 1 foot thick) appear to be interbedded with the silts and clays at depths between 45 and 70 feet bg based on the pore pressure and tip resistance graphs generated from the CPT borings.

CPT GROUNDWATER SAMPLING AND ANALYSIS

A second CPT borehole was drilled at each location for collection of depth discrete groundwater samples. A Delta field geologist determined appropriate depths from which to collect discrete groundwater samples by interpreting the initial soil classification print out for each CPT location. To collect discrete groundwater samples, a sealed PVC hydropunch screen was pushed to the desired sampling depth. The push rod was then retracted exposing the hydropunch screen. Groundwater, when available, flowed hydrostatically from the formation into the sampler. A small diameter stainless steel bailer was lowered through the hollow push rods, into the screen section for sample collection.

The groundwater samples were transferred to 40-milliliter glass VOA bottles. The bottles were placed on ice for transportation to the laboratory. Groundwater samples were analyzed for total petroleum hydrocarbons as gas (TPH-G); benzene, toluene, ethylbenzene, and xylenes (BTEX compounds), and fuel oxygenates MTBE and TBA by EPA Method 8260B. Groundwater samples from CPT-3 and CPT-4 were additionally analyzed for TPH-D.

Identified sandy zones were selected for groundwater sampling. These zones potentially could provide for the migration of fuel oxygenates and petroleum hydrocarbons within coarse-grained preferential pathways. In Boring CPT-2 three groundwater samples were collected at intervals of 53 to 57 feet bg, 65 to 69 feet bg, and 71 to 75 feet bg. Three groundwater samples were collected from Boring CPT-3 at the intervals of 45 to 50 feet bg, 59 to 63 feet bg, and 67 to 72 feet bg. Three groundwater samples were also collected from Boring CPT-4 at the intervals of 45 to 49 feet bg, 54 to 58 feet bg, and 64 to 69 feet bg.

Groundwater was successfully collected by Delta at each attempted location. Sufficient groundwater was generally available to be collected within approximately 5 to 15 minutes at sample locations collected at depth intervals between 53 to 58 feet bg and 64 to 69 feet bg in CPT-2 and CPT-4. Delta waited approximately one hour for sufficient groundwater to be available in all other CPT sample intervals.

The maximum concentrations of TPH-G, TPH-D, MTBE, and TBA were detected at depths between 59 to 72 feet bg in off-site CPT-3 located downgradient of the UST complex. MTBE was detected at 59 to 63 feet bg and 67 to 72 feet bg at 2,000 micrograms per liter (ug/l) and 2,400 ug/l, respectively. MTBE was detected in downgradient CPT-4 at a maximum 2.8 ug/l. TBA was not detected in samples from CPT-4. Benzene was detected in site boring CPT-2 at a maximum concentration of 0.8 ug/l. All other analytes were below the laboratory reporting limit.

GROUNDWATER MONITORING WELL INSTALLATIONS

On February 21 and July 26 through 28, 2006, Delta directed the installation of two on-site monitoring wells (MW-6 and MW-10) and five off-site monitoring wells (MW-5, MW-7, MW-8, MW-9, and MW-11) at the locations shown on Figure 2. Well MW-6 is located northwest and upgradient of the UST complex. Wells MW-5 and MW-7 through MW-11 are located downgradient and to the southeast of the UST complex. The proposed location of Well MW-8 was unable to be cleared at its originally planned location and was moved to its present location shown on Figure 2.

Wells MW-5 through MW-10 were installed using 10-inch diameter hollow-stem auger drilling equipment operated by Gregg Drilling (License C57- 485165). Well MW-11 was installed using 8-inch diameter hollow-stem auger drilling equipment. All boreholes were then sampled at 5-foot intervals with a split-spoon sample barrel equipped with brass liners from 10 feet bg to a total depth of approximately 30 feet bg. A Delta field geologist examined and logged the soil core samples from the boring for each well. A photo-ionization detector (PID) was used to measure soil-hydrocarbon concentrations. PID soil samples were placed in a sealed plastic bag and after approximately 5-minutes the PID probe was inserted into the plastic bag and soil gas was allowed to pass through the PID until readings stabilized. The resulting concentration reading was recorded on the geologist's field log. Soil samples from the borehole of MW-10 were retained for laboratory analysis due to borehole's proximity to the residual source area. Select soil samples were additionally retained from other borings for laboratory analysis based on PID readings in the field.

The borings for Wells MW-5 through MW-11 predominately encountered clay with sand and sandy lean clays to a total depth of approximately 30 feet bg. Groundwater was first encountered between 24 and 28 feet bg in each boring and stabilized at approximately 22 to 28.5 feet bg.

Wells MW-5 through MW-10 were constructed of 4-inch diameter polyvinylchloride (PVC) casing and manufactured well screen. Well MW-11 was constructed of 2-inch diameter PVC casing and manufactured well screen. All wells were screened with 10 feet of 0.010-inch well screen. A 10-foot screen was used due to seasonal water level fluctuations recorded in previously installed wells. A 2/12 sand pack was installed from the bottom of hole to 2 feet above the screen in each well. Two feet of bentonite was placed above the sand pack, and a cement grout seal was then placed above the bentonite to approximately 1-foot bg. A traffic-rated vault box was then installed flush to the ground surface over each well.

SOIL ANALYSIS

Soil samples were submitted to Test America Analytical Testing Corporation in Sacramento, California for analysis of the following parameters: TPH-G, BTEX compounds, MTBE, and TBA by Method 8260B.

MTBE was detected in soil from the boring for Well MW-10 between 5 and 15 feet bg at a maximum concentration of 0.16 mg/kg. TBA was detected in soil samples MW-10@25' and MW-10@28' at concentrations of 0.2 mg/kg and 0.096 mg/kg, respectively. All other analytes were below the laboratory reporting limit.

GROUNDWATER ANALYSIS

Groundwater samples from all on- and off-site wells were collected on August 24, 2006 and submitted to Test America Analytical Testing Corporation in Sacramento, California for analysis of the following parameters: TPH-G, BTEX compounds, MTBE, and TBA by Method 8260B.

TBA continues to be the primary contaminant of concern in the shallow groundwater zone monitored by site wells. TBA was detected in Well MW-1 at 30,700 ug/l. Site Well MW-10 contained concentrations of TPH-G (626 ug/l), BTEX compounds (maximum concentration 1.22 ug/l of ethylbenzene), MTBE (12.4 ug/l), and TBA (5,740 ug/l).

TPH-G was only detected in off-site Well MW-8 at a concentration of 110 ug/l. MTBE was detected in off-site wells MW-5, MW-7, and MW-8 at concentrations ranging from 2.63 ug/l to 4.62 ug/l. TBA was detected in all off-site wells at concentrations ranging from 21 ug/l in Well MW-5 to 6,610 ug/l in Well MW-8. See Figures 2 and 3 for MTBE and TBA concentrations in groundwater. All other analytes were below the laboratory reporting limits.

Based on the results of the soil and groundwater samples from the CPT borings and monitoring wells, it was concluded that the lateral extent of TBA in shallow groundwater is not defined downgradient of well MW-8 and the vertical extent of MTBE has not been defined. Detailed results from the aforementioned work can be found in *Soil and Groundwater Investigation and Monitoring Well Installations Report*, dated September 29, 2006.

WORK PLAN

The following sections describe tasks to be performed in response to currently identified data gaps.

PREFIELD ACTIVITIES

Prior to drilling, Delta will mark all boring locations and contact Underground Services Alert a minimum of 48 hours beforehand. In addition, a private utility locator will be retained to perform a geophysical survey of the proposed boring locations. Each location will then be air-knifed to a depth of approximately seven feet to minimize the possibility of encountering underground utilities during drilling activities. Delta will obtain all required drilling permits from the Zone 7 Water Agency. ACHCSA will be notified a minimum of 72 hours prior to any drilling activities. Prior to conducting any field work at the site, Delta will prepare a site specific Health and Safety Plan (HASP). The Delta field geologist on-site will review the HASP with site subcontractors at the start of each work day.

1. INSTALLATION OF AN ADDITIONAL MONITORING WELL TO DEFINE DOWNGRADIENT EXTENT OF TBA IN SHALLOW GROUNDWATER

Shell proposes to install one new monitoring well (MW-12, Figure 2) to define the downgradient extent of TBA in first encountered groundwater. The well will be installed using hollow-stem auger drilling equipment provided by Gregg Drilling (License C57- 485165).

Soil samples will be collected from the boring for the well in brass liners at five foot intervals to the total depth of the boring. Soil types will be logged by a Delta field geologist. Soil will be analyzed in the field with a photo-ionization detector (PID), and readings from the soil will be recorded on the field logs. Soil samples with elevated PID readings (>10 parts per million by volume) will be retained for laboratory analysis. The retained soil samples will be capped with Teflon tape and tight fitting end caps and placed on ice for transport to Test America Sequoia Analytical in Morgan Hill, California. Additional soil samples may also be selected from site borings for laboratory analysis based on PID readings, field observations, and lithology. Any soil samples retained will be analyzed for TPH-G, BTEX compounds, MTBE, and TBA by EPA Method 8260B.

The well will be constructed of 4-inch diameter PVC casing and well screens. Well depth will be approximately 38 feet bg with well screens from 28 feet to 38 feet bg and sand pack from 27 feet to 38 feet bg. Wells will be developed by cycles of surging followed by pumping until clear water is obtained. Wells will be sampled by Blaine Tech Services (Blaine) a minimum of 24 hours after development. The location and top of casing elevation of each well will be established by a California licensed surveyor.

Groundwater samples will be analyzed for TPH-G, TPH-D, BTEX compounds, and fuel oxygenates MTBE and TBA. All analyses, with the exception of TPH-D, will be performed by EPA Method 8260B. Analysis for TPH-D will be performed by EPA Method 8015M.

2. INSTALLATION OF THREE ADDITIONAL MONITORING WELLS TO MONITOR MTBE AND TBA IN THE B-LEVEL GROUNDWATER

Shell proposes to install three new monitoring wells (MW-5B, MW-8B, and MW-11B, Figures 2 and 3) to provide monitoring of MTBE and TBA in the B-level groundwater. Wells MW-5B and MW-8B will be installed to a total depth of 68 feet bg with well screens from 58 to 68 feet bg to monitor groundwater in the deeper groundwater bearing zone. Well MW-11B will be installed to a total depth of 38 feet bg with well screen from 28 to 38 feet bg. The wells will be installed using hollow-stem auger drilling equipment provided by Gregg Drilling (License C57- 485165).

Soil samples will be collected from the borings for the new wells in brass liners at five foot intervals to the total depth of the boring. Sampling will begin at 30 feet bg for wells MW-8B and MW-11B (below the boring intervals for wells MW-8 and MW-11). No soil samples will be collected out of the boring for Well MW-5B since samples below the boring interval for MW-5 will be collected from the boring for Well MW-5C. Soil types will be logged by a Delta field geologist. Soil will be analyzed in the field with a photo-ionization detector (PID), and readings from the soil will be recorded on the field logs. Soil samples with elevated PID readings (>10 parts per million by volume) will be retained for laboratory analysis. The retained soil samples will be capped with Teflon tape and tight fitting end caps and placed on ice for transport to Test America Sequoia Analytical in Morgan Hill, California. Additional soil samples may also be selected from site borings for laboratory analysis based on PID readings, field observations, and lithology. Any soil samples retained will be analyzed for TPH-G, BTEX compounds, MTBE, and TBA by EPA Method 8260B.

The well will be constructed of 4-inch diameter PVC casing and well screens. Well depths for Wells MW-5B and MW-8B will be 68 feet bg with well screens from 58 feet to 68 feet bg and sand pack from 57 feet to 68 feet bg. Wells will be developed by cycles of surging followed by pumping until clear water is obtained. Wells will be sampled by Blaine Tech Services (Blaine) a minimum of 24 hours after development. The location and top of casing elevation of each well will be established by a California licensed surveyor.

Groundwater samples will be analyzed for TPH-G, TPH-D, BTEX compounds, and fuel oxygenates MTBE and TBA. All analyses, with the exception of TPH-D, will be performed by EPA Method 8260B. Analysis for TPH-D will be performed by EPA Method 8015M.

3. INSTALLATION OF ONE DEEP MONITORING WELL ADJACENT TO WELL MW-5 TO AN APPROXIMATE DEPTH OF 100 FEET BGS TO DEFINE THE VERTICAL EXTENT OF MTBE IN GROUNDWATER

Shell proposes to install one new monitoring well (MW-5C, Figures 2 and 3) to define the vertical extent of MTBE in groundwater. The well will be installed using hollow-stem auger drilling equipment provided by Gregg Drilling (License C57- 485165).

Soil samples will be collected from the boring for the new well in brass liners at five foot intervals to the total depth of the boring. Sampling will begin at 30 feet bg for well MW-5C (below the boring interval for well MW-5). Soil types will be logged by a Delta field geologist. Soil will be analyzed in the field with a photo-ionization detector (PID), and readings from the soil will be recorded on the field logs. Soil samples with elevated PID readings (>10 parts per million by volume) will be retained for laboratory analysis. The retained soil samples will be capped with Teflon tape and tight fitting end caps and placed on ice for transport to Test America Sequoia Analytical in Morgan Hill, California. Additional soil samples may also be selected from site borings for laboratory analysis based on PID readings, field observations, and lithology. Any soil samples retained will be analyzed for TPH-G, BTEX compounds, MTBE, and TBA by EPA Method 8260B.

The well will be constructed of 4-inch diameter PVC casing and well screens. Well depth will be approximately 100 feet bg with well screens from 90 feet to 100 feet bg and sand pack from 89 feet to 100 feet bg. Wells will be developed by cycles of surging followed by pumping until clear water is obtained.

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December 13, 2006
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Wells will be sampled by Blaine Tech Services (Blaine) a minimum of 24 hours after development. The location and top of casing elevation of each well will be established by a California licensed surveyor.

Groundwater samples will be analyzed for TPH-G, TPH-D, BTEX compounds, and fuel oxygenates MTBE and TBA. All analyses, with the exception of TPH-D, will be performed by EPA Method 8260B. Analysis for TPH-D will be performed by EPA Method 8015M.

4. GROUNDWATER MONITORING

Groundwater monitoring will be performed on a quarterly basis. All groundwater monitoring wells will be gauged, purged, and sampled by Blaine. Groundwater samples will be analyzed for TPH-G, TPH-D, BTEX compounds, MTBE, and TBA. A fourth quarter 2006 groundwater monitoring report will be submitted to the ACHCSA within 60 days of the end of the fourth quarter.


SUMMARY

Shell proposes the following site assessment activities:

- Install an additional shallow groundwater monitoring well (MW-12, Figure 2) to define the lateral downgradient of extent of TBA.
- Delta proposes to install three additional wells (Wells MW-5B, MW-8B, and MW-11B) to provide monitoring of MTBE and TBA in the B-level groundwater. The proposed locations of the wells are presented on Figure 2. Wells MW-5B and MW-8B will be installed to a total depth of approximately 68 feet bg with well screens from 58 to 68 feet bg to monitor groundwater in the deeper groundwater bearing zone. Well MW-11B will be installed to a total depth of 38 feet bg with a well screen from 28 to 38 feet bg.
- Install an additional deep groundwater monitoring well (Well MW-5C) adjacent to Well MW-5 and MW-5B to an approximate depth of 100 feet bg in order to define vertical extent of MTBE (see Figure 2).

If you have any questions, please call Lee Dooley at (408) 826-1880.

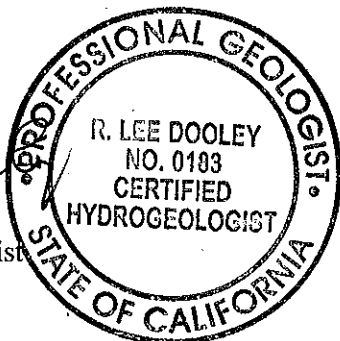
Sincerely,
Delta Consultants

 JUSTIN LINK FOR

Andy Persio
Staff Geologist



R. Lee Dooley
Senior Hydrogeologist
CHG 183



Mr. Jerry Wickham
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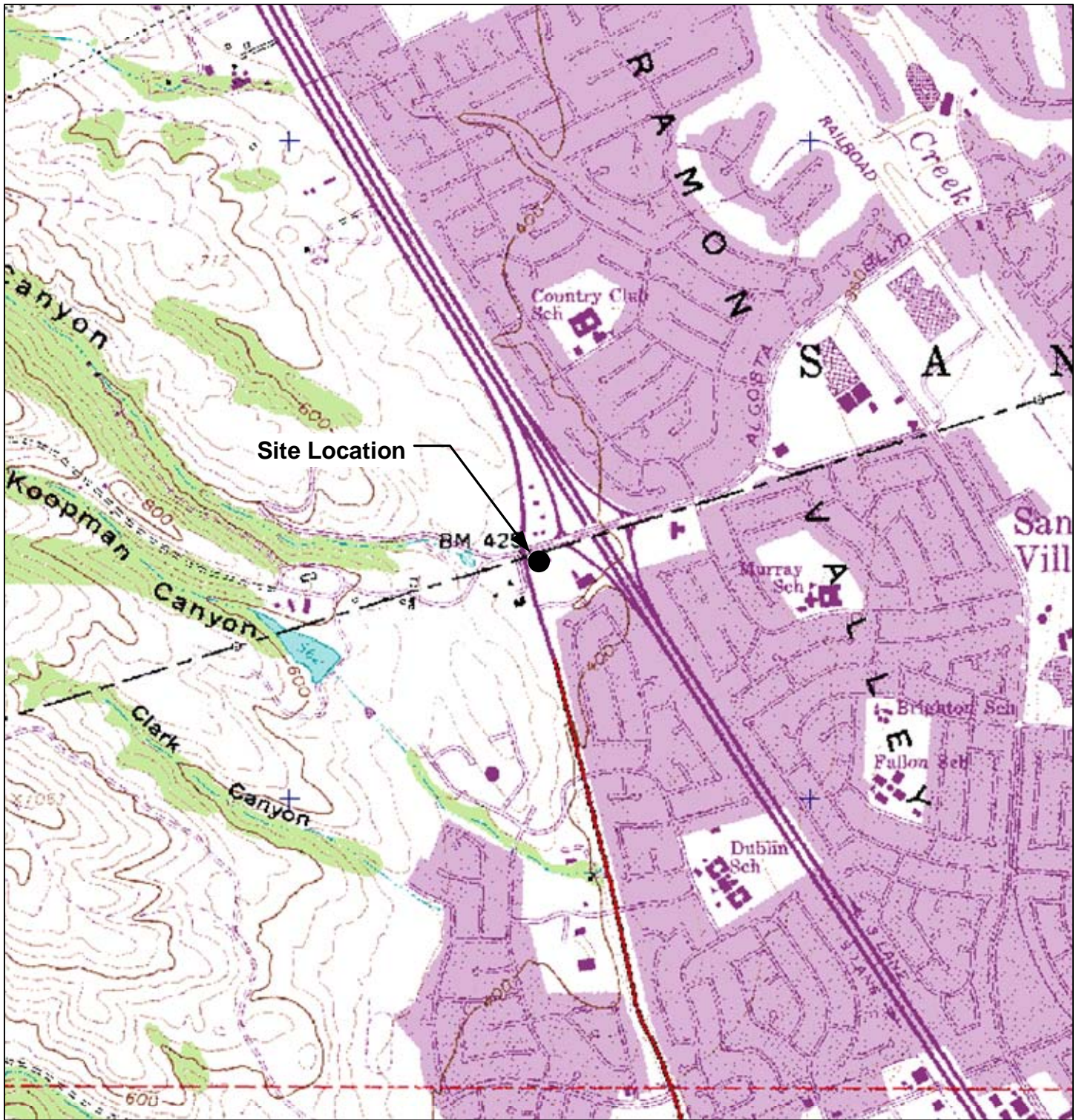
Attachments:

Figure 1 – Site Location Map

Figure 2 – Extended Site Map With MTBE/TBA Groundwater Concentrations, Shallow Zone

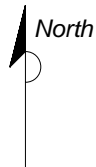
Figure 3 – Geologic Cross Section A-A'-A''

cc. Denis Brown, Shell Oil Products US
Betty Graham, RWQCB – San Francisco Bay Region
Danielle Stefani, Livermore-Pleasanton Fire Department
Matthew Katen, Zone 7 Water Agency
Susan Smallwood, Shell Oil Products, Houston

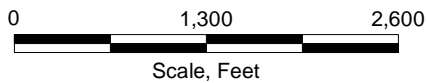


GENERAL NOTES:

Base Map from: 3-D TopoQuads DeLorme
 Yarmouth, ME 04096 Source Data: USGS



QUADRANGLE LOCATION



Scale, Feet

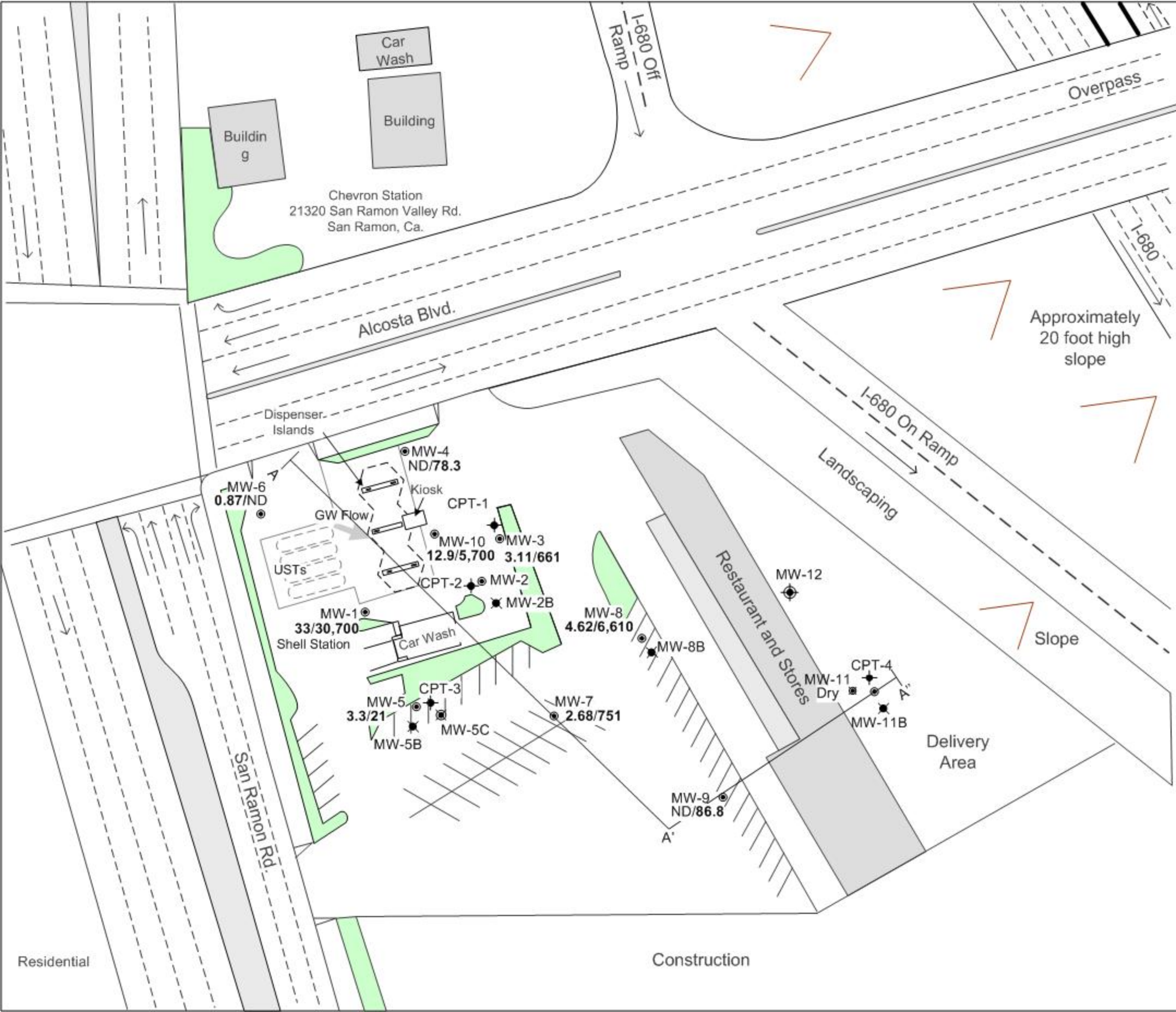
FIGURE 1
SITE LOCATION MAP

SHELL-BRANDED SERVICE STATION
 8999 San Ramon Road
 Dublin, California

PROJECT NO. SJ89-99S-1.2005	DRAWN BY V. F. 12/9/04
FILE NO. SJ89-99S-1.2004	PREPARED BY VF
REVISION NO.	REVIEWED BY



Delta
 Environmental
 Consultants, Inc.



LEGEND

- **GROUNDWATER MONITORING WELL**
- ⊕ **CPT SAMPLING LOCATION**
- ⊙ **PROPOSED "A" WELL**
- ⊗ **PROPOSED "B" WELL**
- ⊘ **PROPOSED "C" WELL**
- 3.11/611 **MTBE/TBA UG/L 2006**
- A — A' **GEOLOGIC CROSS SECTION**

North

0 100

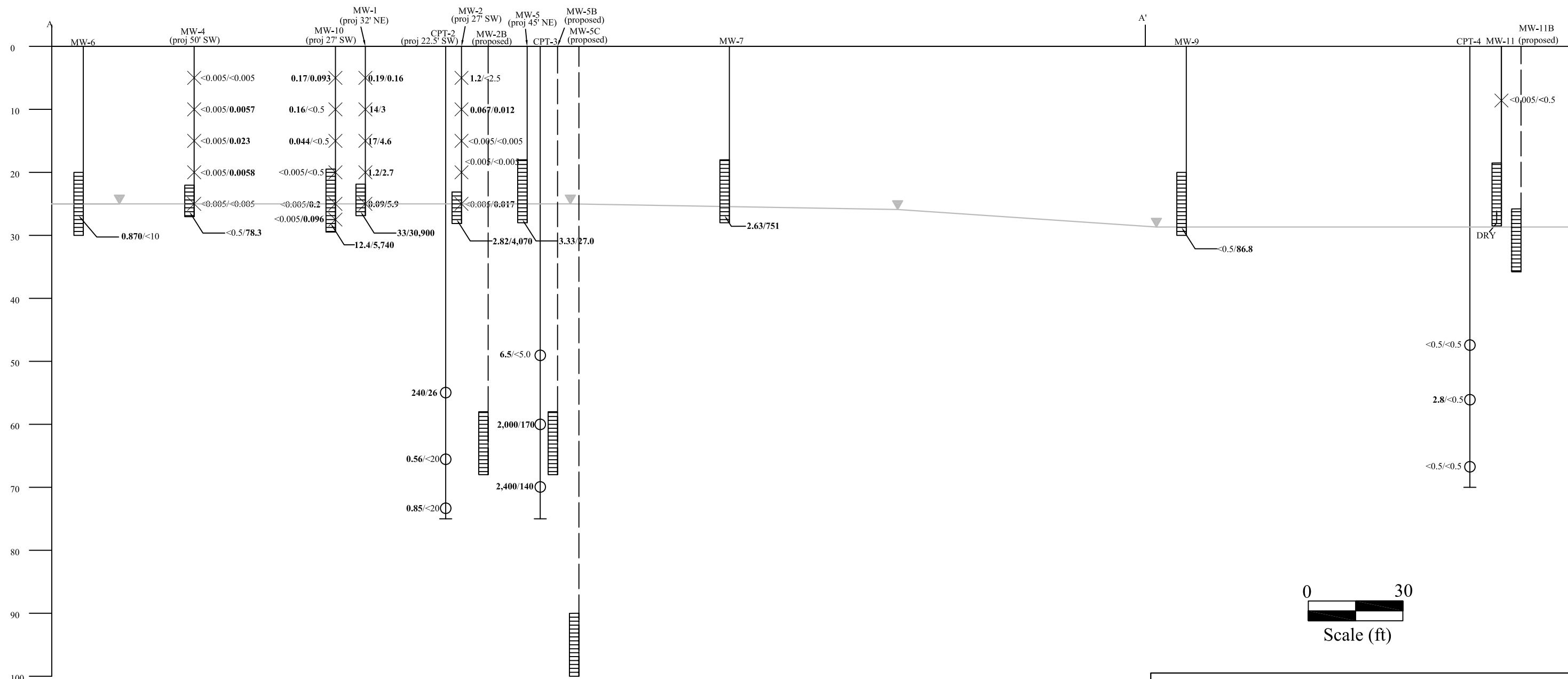
APPROX. SCALE (IN FEET)

FIGURE 2
 EXTENDED SITE MAP WITH MTBE/TBA
 GROUNDWATER CONCENTRATIONS, SHALLOW ZONE
 SHELL-BRANDED SERVICE STATION
 8999 San Ramon Road
 Dublin, California

PROJECT NO. SJ89-99S-1.2005	DRAWN BY BH 9/27/06
FILE NO. SJ89-99S-1.2005	PREPARED BY JL
REVISION NO. 2	REVIEWED BY



Residential Construction



MW-1 WELL/BORING IDENTIFICATION

SCREENED INTERVAL

(0.870/40) MTBE/TBA CONCENTRATIONS GROUNDWATER (µg/L), 8/24/06

- LEGEND**
- 6.5/<5.0 MTBE/TBA CONCENTRATIONS IN GROUNDWATER (µg/L)
 - × 1.2/<2.5 MTBE/TBA CONCENTRATIONS IN SOIL (mg/kg)
 - ▼ GROUNDWATER ELEVATION (8/24/06)
 - PROPOSED WELL

FIGURE 3
GEOLOGIC CROSS SECTION A-A'-A''

SHELL SERVICE STATION
8999 San Ramon Rd.
Dublin, CA

PROJECT NO.	DRAWN BY BH 09/15/06
FILE NO.	PREPARED BY
REVISION NO. 2	REVIEWED BY

