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Conor Pacific



REPORT OF DOWNGRADIENT INVESTIGATION

B&C Gas Mini Mart

Livermore, California

Nov 1999

Prepared by

CONOR PACIFIC/EFW
2650 East Bayshore Road
Palo Alto, California 94303

November 1999

Project BNC102

November 5, 1999
Project No. BNC102

Ms. Eva Chu
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: Report of Downgradient Investigation, B&C Gas Mini Mart, 2008 First Street,
Livermore, California (Station ID 1689)

Dear Ms. Chu:

Conor Pacific/EFW has prepared this report presenting results of an additional downgradient site investigation performed during June and July 1999 for the B&C Gas Mini Mart at 2008 First Street, Livermore, California (Figure 1). Alameda County Environmental Health Services (ACEHS) requested that further investigation of the petroleum hydrocarbon release at 2008 First Street be conducted, because the most recent downgradient investigation performed in 1997 did not fully define the extent of the plume.¹ ACEHS also requested that monitoring wells be installed downgradient from B&C Gas Mini Mart to provide permanent monitoring locations. The basis for this investigation comes as a result of the 1997 investigation results, and was discussed and agreed upon in concept with ACEHS in a meeting on December 10, 1997.

The purpose of this investigation was to further delineate the plume with permanent wells and define the vertical distribution of the fuel oxygenate methyl tertiary-butyl ether (MTBE) and other components of gasoline in the two uppermost water-bearing zones downgradient of the site. In 1997, the extent of groundwater impact was mapped to be at least 1,400 feet downgradient (west) of the B&C site.² There are two municipal water-supply wells located to the west of the site (approximately 2,300 feet and 2,700 feet; Drawing 1). The monitoring wells installed during this investigation are intended to allow monitoring to assess the potential for the hydrocarbons to affect the water-supply wells.

Based on results of this investigation, the extent of groundwater impact at the water table does not appear to have changed significantly since 1997. The lateral and vertical extent of petroleum hydrocarbons downgradient of the B&C Gas Mini Mart site has been defined,

¹ Einarson, Fowler & Watson. *Report of Downgradient Investigation, B&C Gas Mini Mart, 2008 First Street, Livermore, California*. November 7, 1997.

² Einarson, Fowler & Watson, November 1997.

except to the north at the downgradient end of the plume. Nine new groundwater monitoring wells are now in place to provide long-term monitoring points for the plume.

The scope of work is detailed below. This is followed by a description of the site, including site history and hydrogeologic setting. The investigation findings are then presented, followed by a discussion of the results. In conclusion, recommendations for further action are provided.

PROJECT OBJECTIVES AND SCOPE

A workplan for further investigation of the area downgradient of the B&C Gas Mini Mart was prepared by Einarson, Fowler & Watson (now Conor Pacific/EFW) and submitted to ACEHS in September 1998.³ ACEHS approved the workplan,⁴ and requested that the work commence once pre-approval from the Underground Storage Tank Cleanup Fund (USTCF) staff was received.⁵

As defined in the workplan, the objective of this investigation was to delineate the plume with permanent wells and define the vertical distribution of MTBE and other petroleum hydrocarbon constituents in the two uppermost water bearing zones (if possible). This work primarily involved the installation of seven groundwater monitoring wells in the first water bearing zone and two deeper groundwater monitoring wells in the second water-bearing zone. The specific tasks completed during the investigation are listed below. The well locations and properties referenced below are shown on Drawing 1.

- Downgradient from the property, two groundwater monitoring wells were installed in the presumed core of the plume in the upper water-bearing zone (MW-7 and MW-8). While drilling these wells, groundwater samples were collected from up to five discrete depths using SimulProbe™ sampling equipment to provide vertical definition of the plume in the first water-bearing zone.
- Three perimeter groundwater monitoring wells were installed in the upper water-bearing zone to define the lateral edges of the plume in the upper water-bearing zone (MW-9, MW-10, and MW-13).

³ Einarson, Fowler & Watson. *Workplan for Additional Downgradient Investigation, B&C Gas Mini Mart, 2008 First Street, Livermore, California.* September 8, 1998.

⁴ Alameda County Environmental Health Services. Letter to B. Angle of B&C Gas Mini Mart and J. Rutherford of Desert Petroleum re: "Workplan Approval for 2008 First Street, Livermore, California." October 5, 1998.

⁵ State Water Resources Control Board. Letter from D. Hallstrom to B. Angle re: "Pre-approval of Corrective Action Costs, Claim No. 11496, Site Address: 2008 First Street, Livermore." October 27, 1998.

- Two monitoring wells (MW-11 and MW-12) were installed in the upper water-bearing zone between the presumed leading edge of the plume and the water supply wells to serve as "guard" wells.
- Two deep groundwater monitoring wells (D-1 and D-2) were installed in the lower water-bearing zone (aquifer) between the presumed downgradient edge of the plume and the water supply wells, adjacent to the two shallow "guard" wells. During installation of these wells, the aquitard between the upper unconfined water bearing zone and lower semi-confined water bearing zone was identified by soil coring.
- The SimulProbe™ groundwater samples were analyzed for total petroleum hydrocarbons as gasoline (TPH-G); benzene, toluene, ethylbenzene, and xylenes (aromatic compounds collectively referred to as BTEX); and MTBE using U.S. Environmental Protection Agency (EPA) methods 5030/8015M/8020. After the nine monitoring wells were constructed and developed, groundwater samples were collected for analysis of the same parameters.
- All new wells and existing site wells that had not previously been surveyed were surveyed to City of Livermore datum.
- Public records for the former Livermore Arcade and Miller's Outpost Shopping Center sites were reviewed to obtain the most recent groundwater monitoring data.
- Information regarding pumping rates and analytical results from the municipal water-supply wells (CWS-3 and CWS-8), located approximately one-half mile downgradient from the site, was obtained from the well owner, California Water Service Company (CWS) and Alameda County Zone 7 Water District (Zone 7).

Other tasks outlined in the workplan to be completed during this investigation included the installation of a fourth perimeter monitoring well, to be located on the western corner of the Bank of America property (Drawing 1). This well was not installed because Bank of America representatives and B&C Gas Mini Mart did not reach an agreement for access to the property. Also proposed in the workplan was the installation of a third shallow "guard" well on the east side of North P Street, just south of the railroad tracks (Drawing 1). This well was not installed, as the City of Livermore did not allow work to be conducted in the area of the P Street/railroad track grade separation, and therefore did not issue Conor Pacific/EFW an encroachment permit to install a monitoring well at that location.

SITE INFORMATION

The B&C Gas Mini Mart property is located on the northeast corner of First and South L Streets in Livermore, California, and currently operates as a gasoline station and mini market. From at least 1988 until 1994, Desert Petroleum owned and operated the site. In January 1994, Desert Petroleum sold the site to Mr. Balaji Angle.

Contact and Site Address:

Mr. Balaji Angle
B&C Gas Mini Mart
2008 First Street
Livermore, California 94550

Previous Investigations and Corrective Actions

Following is a brief chronological site history of previous investigations and remedial activities. All properties and groundwater sample locations referenced below are designated in Drawing 1, an aerial photograph of the site area.

- May 1988 - Soil contamination was noted when borings were completed in the backfill of an underground storage tank (UST) on site. A preliminary site assessment conducted in September 1998 found petroleum hydrocarbons in groundwater (site well MW-1). Subsequent groundwater monitoring continue to indicate petroleum hydrocarbons in groundwater.
- March 1994 - A 280-gallon waste oil UST and 25 cubic yards of soil were removed as part of closing the auto repair shop portion of the station. Site monitoring wells MW-2, MW-3, and MW-4 were installed and sampled for the first time in June 1994.
- August 1994 - Free product was encountered in a site monitoring well and product removal commenced twice a month. By the end of January 1995, no measurable thickness of product remained, only product sheen could be detected.
- March 1995 - Additional site assessment work was conducted. In completing one of the soil borings about 75 feet downgradient from the site, free product was found on the augers. A release from the union between a tank subpump and product line was reported to have occurred. The quantity of the release is unknown.
- March 1995 - Free product was found in monitoring well MW-1 (referred to as (MS) MW-1) at the Mill Springs Park property, 1809 Railroad Avenue, approximately 850 feet downgradient from the site (Drawing 1). In April 1995, an investigation was conducted at the Mill Springs Park property, a former bulk fuel terminal, concluding that

the free product found in (MS) MW-1 was from an off-site source.⁶ Eleven temporary borings (H-1 through H-11) were completed and groundwater samples collected. Results from the groundwater analyses indicated high concentrations of MTBE and benzene on the eastern portion of the site (H-5, H-6, H-7, and H-8), and non-detectable concentrations on the southwestern portion of the site (H-1, H-2, H-9, H-10, H-11).

- September 1995 - One gasoline UST at the B&C Gas Mini Mart site failed an integrity test. The tank was immediately taken out of commission and ACEHS was notified. Off-site well MW-5 and site well MW-6 were installed.
- July 1996 - Two gasoline USTs were removed and new double-walled fiberglass USTs and fiberglass piping with automated leak detection were installed. Other remedial activities included the removal of two hydraulic lifts and approximately 700 cubic yards of impacted soil. Also, one 1,000-gallon UST discovered during excavation activities was closed in place with approval from ACEHS and the Livermore Fire Department by grouting with a cement sand slurry
- September 1997 - First investigation of downgradient water quality was conducted. To further delineate the lateral extent of dissolved petroleum constituents in groundwater at the water table, five downgradient soil borings were completed to fifty-five feet below ground surface(bgs) and grab groundwater samples were collected. Results indicated that MTBE concentrations greater than 100 micrograms per liter ($\mu\text{g/l}$) existed at least 1,400 feet downgradient of the site.⁷ A sample of the free product in well (MS) MW-1 was collected and analyzed for fingerprint characterization. The laboratory results indicated that the product was weathered gasoline with decreased levels of BTEX compounds. No MTBE was reported to be present in the chromatographic pattern; however, MTBE was not analyzed for specifically in the fingerprinting process.
- July 1998 - Free product observed during quarterly monitoring in some site wells.⁸

Site Groundwater Chemistry Trends

Over the last five years of groundwater monitoring at B&C Gas Mini Mart, concentrations of TPH-G and other petroleum hydrocarbon constituents in groundwater have steadily decreased. In June 1994, benzene concentrations in the most heavily-impacted site wells (MW-2, MW-5, and MW-6) ranged from 18,000 $\mu\text{g/l}$ to 9,900 $\mu\text{g/l}$. As of June 1999, benzene concentrations in these wells ranged from 722 $\mu\text{g/l}$ to 259 $\mu\text{g/l}$. June 1999 results from the less-impacted site wells show that benzene concentrations range from non-detectable to 70.4 $\mu\text{g/l}$.

⁶ Earth Tech. *Final Report LNAPL Assessment and Groundwater Characterization Evaluation, Mill Springs Park Apartments, 1809 Railroad Avenue, Livermore, California.* October 9, 1995.

⁷ Einarson, Fowler & Watson, November 1997.

⁸ Einarson, Fowler & Watson. *Third Quarter 1998 Groundwater Monitoring Results, B&C Gas Mini Mart, Livermore, California.* September 10, 1998.

Analysis of site groundwater samples for MTBE began in June 1995. Since then, concentrations of MTBE have decreased significantly. In June 1995, initial analysis for MTBE in samples from site wells detected concentrations ranging from 47,000 µg/l to 4,200 µg/l. By June 1999, site wells contained significantly lower concentrations of MTBE ranging from 765 µg/l to 53 µg/l.

Historical concentrations of TPH-G have exhibited similar downward trends. The highest concentration of TPH-G detected at the site occurred in 1994 when 290,000 µg/l were detected in well MW-2. During second quarter 1999, the highest TPH-G concentration detected was 34,500 µg/l in well MW-5.

In November 1998, well (MS) MW-1 at Mill Springs Park was sampled and analyzed for TPH-G, BTEX, and MTBE. TPH-G was detected at a concentration of 10,000 µg/l. BTEX concentrations ranged from 110 to 900 µg/l. MTBE was detected at a concentration of 200 µg/l. These results are equivalent to the results obtained in August 1995, when the well was last sampled.

HYDROGEOLOGIC SETTING

The site is located in the Mocho II Sub-basin of the Livermore Valley groundwater basin.⁹ This area is drained by Arroyo Mocho, which runs from the southeast toward the northwest approximately one-half mile south of the site (Figure 1). The sediments found in the Livermore Valley are a combination of lacustrine to alluvial clay facies and alluvial gravel facies, containing cemented gravels and cobbles, and reworked terrace deposits (Figure 2).^{10,11,12} Sediments consist of oxidized yellowish-brown clay, silt, sand, and gravel deposited in alluvial fans and marsh/deltaic environments. This area of deposition contains braided channel systems and complex interfingering of sedimentary units.

In the site vicinity, subsurface investigations have found a shallow, upper unconfined water-bearing zone consisting primarily of gravels with sand and clay. Underlying the gravels, an approximately 45-foot-thick, low-permeability clay unit (aquitar) is found at depths of approximately 60 to 110 feet bgs. The top of this clay aquitar occurs at increasing depth with distance westward. Below the clayey unit, the top of the underlying semi-confined aquifer is found. Groundwater extraction for municipal water supply occurs in the semi-confined aquifer and in a deeper, confined aquifer.

No evidence of communication between the shallow water-bearing zone and the underlying aquifers in the site vicinity has been documented. However, H⁺GCL, Inc. stated that: given

⁹ California Department of Water Resources. *Livermore and Sunol Valleys, Evaluation of Ground Water Resources*. Bulletin 118-2. 1996.

¹⁰ California Department of Water Resources, 1996.

¹¹ Harrach, R. J., et al. *LLNL Environmental Report for 1997*. September 1, 1998.

¹² Helley, E.J., K.R. Lajoie, and D.B. Burke, *Late-Cenozoic Deposits in Alameda County*, U.S. Geological Survey Miscellaneous Field Studies Map, MF-429. 1972.

the complex alluvial depositional environment, and based on alluvial fan geometry, it is possible that these aquifers converge at some point (north) in the subsurface.¹³ Groundwater elevations in the shallow water-bearing zone and the semi-confined aquifer are similar and indicate that hydraulic connection at some point between these two water-bearing zones is likely.

Over the last eleven years, static water levels at the B&C site have ranged from 68.7 feet bgs (January 1992) to 17.0 feet bgs (February 1997) (Table 1). The groundwater flow direction generally is to the west-northwest. Water-level records maintained by Zone 7 for local water supply wells 8P1 and 8P2 (CWS #8 and CWS #3, Figure 1) indicate that the water level in the lower, semi-confined aquifer from 1972 to 1987 was fairly steady at 40 to 60 feet bgs (Appendix A). Seasonal fluctuations of 20 to 25 feet are common. In these two wells, the greatest depth to groundwater, 87 feet bgs, occurred in 1992, following several dry years. The groundwater levels in these wells have risen since 1992, occurring at depths of 27 to 60 feet bgs. The historical water levels are shown in cross-section on Drawing 2. When the groundwater levels are at their lowest, approaching 70 to 80 feet, the shallow water-bearing zone nearly dries out. Groundwater at these times appears to be perched on the underlying clay aquitard.

These large seasonal and long-term water-level fluctuations have a significant affect on the distribution of hydrocarbons within the upper water-bearing zone. The leak from the B&C site apparently occurred during a time of lower groundwater levels, creating a thick depth zone of residual hydrocarbon and free-phase hydrocarbon. As the water levels rise, the hydrocarbons are re-mobilized, resulting in a thick source zone of impacted groundwater.

Neighboring Groundwater Contamination Plume Hydrogeology

The following information obtained from the Regional Water Quality Control Board (RWQCB), Zone 7, and CWS regarding neighboring groundwater contamination sites is presented as background for this current investigation.

Former Livermore Arcade and Miller's Outpost Shopping Centers

The Livermore Arcade Shopping Center and Miller's Outpost Shopping Center (LASC/MOSC) site is west of P Street, between First Street and the railroad tracks (Drawing 1). During operations at dry cleaning sites at each shopping center, there were spills of tetrachloroethene (PCE) and disposal of PCE wastes to the sanitary sewer, which has lead to soil contamination and a commingled groundwater plume.

Groundwater conditions at the LASC/MOSC site has been described to occur within two distinct water-bearing zones, the upper or shallow unconfined water-bearing zone, and an

¹³ H*GCL, Inc. *Deep Groundwater Conduit Study, Livermore Arcade Shopping Center, First Street and South P Street, Livermore, California.* December 6, 1993.

underlying aquifer.¹⁴ These two water-bearing zones are separated by an approximately 40-foot thick silty-clay aquitard. Groundwater elevations in the upper shallow water-bearing zone and the deeper aquifer are similar, indicating interconnection at some point in the subsurface. The direction of groundwater flow at the LASC/MOSC site is toward the west-northwest.¹⁵

According to recent monitoring results, the LASC/MOSC site PCE plume extends between water supply wells CWS #3 and CWS #8 to approximately 1,500 feet northwest of the LASC/MOSC site.¹⁶ The impacts are reportedly limited to the shallow aquifer. The LASC/MOSC site has obtained non-attainment status for the shallow water-bearing zone.¹⁷

Beacon Gas Station

The groundwater contamination plume from the Beacon Gas Station at the corner of First and South P Street (Drawing 1) has migrated beneath the LASC site, and may extend at least as far north as well MW-24 at the corner of Railroad Avenue and South P Street.¹⁸

Municipal Well Information

The California Water Service Company owns and operates two municipal water-supply wells downgradient of the site. Well CWS #3 is located about 2,800 feet west-southwest of the site and well CWS #8 is located about 2,300 feet west of the site (Drawing 1). Well CWS #3 is completed to a depth of 415 feet, and is screened from a depth of 280 to 412 feet bgs. Well CWS #8 is completed to a depth of 273 feet, with intermittent well perforations from 122 feet to 263 feet bgs. Groundwater elevation data and groundwater pumpage volumes from each of these wells are presented as charts in Appendix A. Because well CWS #3 does not appear to be downgradient of the hydrocarbon plume, only well CWS #8 is discussed below.

The volume of groundwater pumped from well CWS #8 was obtained from Zone 7. In general, groundwater is pumped during the dry season, from about April to October. The annual volume pumped from well CWS #8 has varied from 42 to 92 million gallons over the past ten years. The equivalent pumping rate for well CWS #8, if the well ran continuously, is 400 to 450 gallons per minute (gpm). However, the use of these wells is quite variable, depending on the seasonal weather changes and status of other water supplies. Historical

¹⁴ H⁺GCL, Inc., December 1993.

¹⁵ TRW, *First 1999 Semi-Annual Groundwater Monitoring Report, Livermore Arcade Shopping Center/Millers Outpost Shopping Center, Livermore, California*. March 5, 1999.

¹⁶ TRW, March 1999.

¹⁷ Non-attainment status is defined as an area of groundwater where water quality objectives cannot reasonably be achieved, after considering what is technologically and economically feasible within a reasonable time period. Water quality objectives must continue to be met at the boundary outside of the designated non-attainment area.

¹⁸ TRW, March 1999.

water-level measurements from 1974 to 1999 indicate that groundwater elevations in well CWS #8 have ranged from approximately 27 to 87 feet bgs (379 to 439 feet MSL).

INVESTIGATION FINDINGS

Following is a summary of our investigation findings including the geologic and hydrogeologic data collected from the drilling program, and the groundwater chemistry results from the analytical program. A detailed discussion of the specific investigation methods used, including soil coring, groundwater sampling, and laboratory analysis, is presented in Appendix B.

Geologic and Hydrogeologic Conditions

For the shallow wells, borings were advanced to a depth of 25 feet using hollow-stem augers. From 25 feet bgs to the final boring depth (between 45 and 62 feet bgs), soil samples were continuously collected and logged by a Conor Pacific/EFW geologist, according to the Unified Soil Classification System (USCS). The boring for deep well D-1 was advanced to 50 feet bgs, and soils samples were continuously collected from 50 to 125 feet bgs. The boring for deep well D-2 was sampled intermittently across the aquitard, until 100 feet bgs. After the deep water-bearing zone was encountered, soil samples were continuously collected until a depth of 115 feet. Detailed hydrostratigraphic profiles (boring logs) of the borings are located in Appendix C.

Based on the geologic data collected from the borings completed in this investigation, and based on geologic data collected previously for the site and neighboring properties, two geologic cross sections have been prepared (Drawing 2). In summary, this investigation confirmed the regional hydrogeologic model. An upper unconfined water-bearing zone of alluvial gravels and sands was found to be present to a depth of approximately 60 feet. A 40- to 45-foot thick clay unit (aquitard) was found in the vicinity of the deep wells (1,800 feet downgradient of the site, Drawing 1), beneath the upper permeable zone. Beneath the clay unit, a lower semi-confined water-bearing zone was found.

Upper Water-Bearing Zone

The upper 60-foot-thick water-bearing zone contains primarily interbedded gravel and sand units (Drawing 2). The gravel units range from poorly (GP) to well-graded (GW) clean gravels to silty/sandy gravels (GM) and clayey gravels (GC). The sand units encountered in the upper 60 feet were generally poorly-graded, clean sands (SP) and clayey sands (SC). Intermittent clay units (CL) were also encountered in the upper zone, but the thickness of the clay generally was not found to exceed ten feet. Groundwater was first encountered in the upper water-bearing zone at depths between 21 and 36 feet bgs (Drawing 2).

Clay Aquitard

At a depth of 54 to 60 feet bgs, a clay unit was encountered at the bottom of some of the shallow well borings (MW-7, MW-8, and MW-11). The maximum depth that the shallow borings penetrated the clay unit was 8 feet. In the deeper borings (D-1 and D-2), this clay unit was encountered at equivalent depths and was determined to be at least 40-feet thick (Drawing 2). The clay was primarily yellowish to dark brown, mottled, firm, and had moderate plasticity. The clay was moist to wet, generally with 20% or less sand and gravel. In the area of this investigation, the top of this clay aquitard occurs at increasing depth with distance westward, mimicking topography, which also gently slopes westward (Drawing 2).

Lower Aquifer

Beneath the clay unit, the lower aquifer was encountered at a depth of about 100 to 105 feet bgs. This lower semi-confined water-bearing zone consisted primarily of clayey gravel with sand (GC), poorly graded sand (SP), and clayey sand (SC) (Drawing 2). The deep borings penetrated this lower aquifer a maximum of 15 feet. First encountered water levels in the lower, semi-confined aquifer were encountered at 100 and 112 feet bgs, just below the clay aquitard. The static water level in the deep wells was later measured to be the same elevation as the adjacent shallow wells at each deep/shallow well pair, indicating that the lower aquifer is semi-confined, and that hydraulic connection is likely at some point between these two water-bearing zones.

Groundwater Elevation Contours and Flow Velocity

Groundwater contours of the investigation area have been prepared using the groundwater elevations in the newly installed wells. The contours are shown in Drawing 1. Estimated extensions of these contours are also shown, based on data from neighboring properties. The direction of groundwater flow in the vicinity of the investigation is north of west. The gradient is calculated to be approximately 0.013. This gradient matches the regional gradient of approximately 0.01, calculated from spring 1997 regional groundwater contours.¹⁹

An estimate of groundwater velocity in the site area can be made using hydrogeologic data from neighboring sites and generalized published data regarding aquifer properties. Hydraulic testing conducted at a neighboring property (Arrow Rentals, Drawing 1) determined that the hydraulic conductivity of the upper water bearing zone was 10^{-4} centimeters per second (cm/sec). As a conservative measure and to account for more permeable zones within the aquifer, when determining the groundwater velocity, we have assumed a conductivity value of 10^{-3} cm/sec, one order of magnitude greater than the hydraulic testing results. The effective porosity for clayey and silty gravels is estimated to be

¹⁹ Alameda County Flood Control and Water Conservation District, Zone 7. Memorandum: Spring 1997 Groundwater Levels. June 10, 1997

20%,²⁰ and the local hydraulic gradient has been calculated to be 0.013. Using these values, the groundwater flow velocity in the site vicinity is calculated to be approximately 70 feet per year (ft/yr). It is possible that more permeable channels exist in the subsurface and that groundwater may flow at a higher velocity within these channels. The groundwater velocity calculated above should be considered an average for the upper water-bearing zone.

Depth-Discrete SimulProbe™ Groundwater Sampling

Monitoring wells MW-7 and MW-8 were constructed to provide permanent monitoring locations within the plume. While completing the borings for these wells, depth-discrete groundwater samples were collected using SimulProbe™ sampling equipment (Appendix B). The depth-discrete sampling was conducted to provide information regarding the vertical distribution of MTBE and other constituents in the upper water-bearing zone. Groundwater samples collected from each depth were analyzed for TPH-G, BTEX, and MTBE. Analytical results from the SimulProbe™ sampling are presented in Table 2 and in the geologic cross section, Drawing 2. Certified analytical reports are included in Appendix C.

The boring for well MW-7 was completed 600 feet downgradient of the site. In the boring for well MW-7, SimulProbe™ groundwater samples were collected at depths of 36, 41, 46, 51, and 61 feet bgs. Results from the five depth-discrete groundwater samples ranged from 1,740 to 45,400 µg/l for TPH-G; 271 to 2,160 µg/l for MTBE; and 42.3 to 524 µg/l for benzene. The sample collected from 41 feet bgs contained the highest concentration of all constituents. The lowest concentrations of constituents were detected in either the shallowest sample at 36 feet or the deepest sample at 61 feet bgs.

The boring for well MW-8 was completed 600 feet downgradient from well MW-7. In the boring for well MW-8, SimulProbe™ groundwater samples were collected at discrete depths of 41, 46, 51, and 56 feet bgs. TPH-G, benzene, and toluene were non-detectable at all four depths. Low concentrations (equal to or less than 1.2 µg/l) of ethylbenzene and xylenes were detected at some depths. MTBE was detected at all four depths, at concentrations ranging from 7.93 to 137 µg/l.

Since the depth-discrete analytical results demonstrated that the hydrocarbons were distributed throughout the upper water-bearing zone, the wells were constructed with screens that cover most of the water-bearing zone. Significant water-level fluctuations also warrant the use of long well screens. The well screens extend 20 feet below the current groundwater level, which at this time of year, is near the maximum elevation. The deep wells were constructed with 15-foot screens at the top of the lower aquifer. This length of well screen was used to assure that enough of the lower aquifer was encountered to yield representative groundwater samples. A summary of all well constructions is presented in Table 3. Well construction methods are described in Appendix B.

²⁰ U.S. Environmental Protection Agency. *Criteria for Identifying Areas of Vulnerable Hydrogeology Under RCRA*.

Monitoring Well Groundwater Sampling

In June and July 1999, the nine newly installed wells and the six existing site wells were sampled according to Conor Pacific/EFW's standard groundwater sampling methods (Appendix B) for TPH-G, BTEX, and MTBE. Well (MS)MW-1 was not sampled, due to the presence of free-phase hydrocarbons observed during pre-sample purging of the well. The results are presented in Table 2 and Drawings 1 and 2. Field measurements of electrical conductivity (EC), dissolved oxygen (DO), temperature, and pH were taken at each monitoring well and recorded on water sample field data sheets (Appendix C). All purge water was contained and properly disposed of consistent with analytical results.

Shallow Off-Site Well Results

Shallow well MW-7 contained the highest concentrations of TPH-G and most of the BTEX compounds. TPH-g was detected at a concentration of 5,090 µg/l. BTEX compounds were detected at concentrations of 31.9 µg/l, 4.8 µg/l, 60 µg/l, and 219 µg/l, respectively. MTBE was detected at a concentration of 43.6 µg/l, lower than any of the depth-discrete results obtained by SimulProbe™ sampling. This concentration difference is a result of dilution, which occurs through the mixing of varying concentrations of compounds that enter the well from distinct layers across the entire well screen. The longer the well screen, the more dilution can occur. Therefore, it should be noted that analytical results from the other monitoring wells represent an average concentration of contaminants in the monitored water-bearing zone.

Results from well MW-8 were similar to the SimulProbe™ results, with non-detectable concentrations of TPH-G and BTEX, and 88.5 µg/l MTBE. Well MW-13, which was installed between wells MW-7 and MW-8, contained 214 µg/l TPH-G, 42.8 µg/l benzene and 332 µg/l MTBE. The concentrations of benzene (42.8 µg/l) and MTBE in well MW-13 (332 µg/l) were the highest concentrations detected in the new shallow wells. Well MW-11, located near the intersection of Railroad Avenue and North P Street, contained TPH-G at a concentration of 91.3 µg/l. BTEX concentrations in MW-11 were low, ranging from 0.683 to 2.62 µg/l. MTBE was non-detectable at location MW-11.

Shallow perimeter wells MW-9 and MW-10 did not contain detectable concentrations of TPH-G, BTEX, or MTBE. Shallow guard well MW-12 also did not contain detectable concentrations of these constituents.

The California Department of Health Services has adopted a 5 µg/l drinking water standard for MTBE that protects consumers from unpleasant tastes and odors, and this concentration is exceeded in wells MW-7, MW-8, and MW-13. In addition, the California Office of Environmental Health Hazard Assessment has adopted a public health goal of 13 µg/l MTBE in drinking water to protect consumers against health risks over a lifetime of exposure.

When Conor Pacific/EFW sampled the monitoring wells for petroleum hydrocarbons, additional samples were provided to Zone 7 for analysis of general water quality parameters. According to Zone 7, the general groundwater chemistry in the upper water-bearing zone samples is the same as the groundwater chemistry in the lower aquifer samples.²¹ Again, this indicates that the water-bearing zones have similar sources and are likely connected at some point in the subsurface.

Deep Well Results

The deep wells D-1 and D-2 did not contain detectable concentrations of TPH-G, BTEX, or MTBE.

Site Wells

Second quarter 1999 analytical results from the site wells at B&C Gas Mini Mart continue to indicate that the concentrations of TPH-G and its constituents are decreasing, although concentrations of these constituents remain significantly higher at the site than at any downgradient location. Well MW-5, located just off the site property, has the highest concentrations. As of second quarter 1999, well MW-5 contains TPH-G at a concentration of 34,500 µg/l, benzene at 722 µg/l, and MTBE at 765 µg/l.²² Concentrations of toluene, ethylbenzene, and xylenes currently range from 1,720 µg/l to 7,170 µg/l.

DISCUSSION

The following discussion addresses the findings of the investigation.

Groundwater Flow Direction and Velocity

The findings indicate that the groundwater flow direction in the vicinity of the investigation is north of west (Drawing 1). This flow direction matches the regional flow, which in the Mocho II Sub-basin flows to the northwest.²³

The groundwater elevations collected from the two shallow/deep well pairs installed during this investigation are equivalent, indicating that there is currently not a vertical flow component between the upper water-bearing zone and the lower semi-confined aquifer. This condition may change seasonally or in the long-term, depending on the influence the CWS pumping wells have on the two water-bearing zones and changes in annual rainfall. The

²¹ M. Katen of Alameda County Zone 7. Personal communication with K. Johnson of Conor Pacific/EFW. August 1999.

²² Conor Pacific/EFW. *Second Quarter 1999 Groundwater Monitoring Results, B&C Gas Mini Mart, Livermore, California.* July 19, 1999.

²³ Alameda County Flood Control and Water Conservation District, Zone 7 Water Resources Management. Memorandum from G. Gates to D. Lunn, Chief, Water Resources Engineering Section re: "Spring 1997 Groundwater Levels." June 10, 1997.

upper water-bearing zone and lower aquifer may be connected in the subsurface at some point, because they share common groundwater elevations.

Groundwater elevation data from the B&C site and the LASC/MOSC site were used to calculate groundwater gradients during high groundwater levels, and during low groundwater levels when the CWS wells were pumping (see levels on Drawing 2). The gradients were essentially the same, indicating that the horizontal gradient may not be affected by the seasonal groundwater extraction.

Groundwater velocity in the site area was estimated to be 70 ft/yr using site-specific hydrogeologic data and generalized published data regarding aquifer properties. Groundwater assessment studies conducted in the Livermore Valley groundwater basin by Lawrence Livermore National Laboratory (LLNL) have reported that the heterogeneous alluvial sediments that underlie parts of the Livermore Valley groundwater basin yield an average estimated groundwater velocity of 20 meters/year, or 66 ft/yr.²⁴ This average velocity is similar to that calculated for the vicinity downgradient of B&C site.

Downgradient Lateral and Vertical Extent of Plume

Lateral Extent

Based on analytical data collected during June and July 1999, the current approximate lateral extent of TPH-G and its constituents in the upper water-bearing zone has been mapped in Drawing 3. The MTBE concentrations greater than 100 µg/l extend about 1,250 feet downgradient from the B&C site. This distance is based on the detection of MTBE in well MW-13 at a concentration of 332 µg/l, and in well MW-8 at a concentration of 88 µg/l. MTBE was not detected in any of the "guard" wells. Of all the hydrocarbons, the MTBE plume appears to extend the farthest distance downgradient from the site.

The other hydrocarbon constituent plumes exhibit similar shape and trend. In general, benzene and TPH-G concentrations greater than 100 µg/l extend at least 1,100 feet downgradient from the site. The 100 µg/l isoconcentrations for toluene, ethylbenzene, and xylenes are closer to the site, extending 600 to 800 feet downgradient from the site. Overall, the lateral extent of the hydrocarbons has been defined except for to the north and northwest, beyond wells MW-8 and MW-13.

Based on the isoconcentration contours and the groundwater contours derived in this investigation, the hydrocarbon plume does not appear to match the current direction of groundwater flow. This difference may result from isocontours that are based on too few data points, and therefore their geometry appears different than that of the groundwater contours. In addition, the groundwater flow direction can shift over time in a more northerly or westerly direction, depending on the groundwater recharge and discharge to and from the

²⁴ Harrach, R. J., et al. LLNL Environmental Report for 1997. September 1, 1998.

aquifer. Finally, the heterogeneity of the water-bearing zone may also contribute to the difference observed in the groundwater flow and plume migration direction.

Vertical Distribution

Collecting depth-discrete SimulProbe™ groundwater samples from the borings for wells MW-7 and MW-8 was intended to define the vertical stratification of the hydrocarbons in the upper water-bearing zone. While hydrocarbon constituent concentrations varied with depth, the hydrocarbons were found to occur throughout the upper water-bearing zone.

At location MW-7, the highest concentrations were detected at a depth of 41 feet bgs, which is 15 feet below first encountered water, and 18 feet above the aquitard. At location MW-8, the depth-discrete sample analytical results did not vary as much. However, the highest results were detected at 46 and 51 feet bgs (10 and 15 feet below first encountered water; 8 and 3 feet above the aquitard, respectively). Analytical results from location MW-8 indicate less vertical stratification of hydrocarbons than at MW-7. This probably is because MW-8 is farther from the source and fluctuating water levels have influenced the distribution of hydrocarbons. The distribution of hydrocarbons throughout the upper-water bearing zone is likely the result of large seasonal and long term water-level fluctuations in the hydrocarbon source area.

The depth-discrete groundwater sampling allowed for the collection of representative groundwater samples unaffected by dilution. A comparison of the individual depth-discrete sample analytical results collected from the boring for MW-7 to the analytical results from well MW-7, shows that the groundwater sample collected from the well generally contains lower concentrations of hydrocarbons. This is a result of dilution, which occurs through the mixing of varying concentrations of compounds that enter the well across the entire well screen. The longer the well screen, the more dilution can occur. Therefore, it should be noted that analytical results from the other monitoring wells represent an average concentration of contaminants in the monitored water-bearing zone.

At location MW-8, the SimulProbe™ sample results and monitoring well results were generally equivalent. This may indicate that with increased distance from the source, effects of dispersion and water level fluctuations increase, causing more mixing and less stratification of contaminants. This fits with the hydrogeologic setting of the site, which experiences significant water-level fluctuations seasonally and over the long term. In this case, results from a monitoring well can be indicative of contaminant concentrations.

Potential Impact to Water Supply Well CWS#8

The current configuration of the mapped hydrocarbon plume places the plume approximately 1,000 feet east of well CWS#8. However, the extent of the capture zone for well CWS#8 is not defined. Groundwater monitoring of the shallow and deep guard wells along P Street can

provide a means for early detection of the hydrocarbons, because these wells are located between the plume and well CWS#8.

RECOMMENDATIONS

Based on the results of this investigation and the discussions above, Conor Pacific/EFW recommends the following actions to monitor the plume.

- Monitor groundwater elevations in all wells quarterly to evaluate gradient and flow direction. In addition, groundwater elevations in the shallow/deep well pairs should be monitored for effects of extraction from well CWS #8 and to evaluate the extent of hydraulic connection between the upper water-bearing zone and the lower aquifer, if any.
- Continue groundwater monitoring at the B&C Gas Mini Mart. Incorporate the new downgradient monitoring wells into the quarterly monitoring program, and reduce the monitoring of existing site wells. Site wells MW-1, MW-3, MW-4 and MW-6 should be sampled annually, in the first quarter, when groundwater levels are generally the highest. Site wells MW-2 and MW-5, typically the wells with the highest concentrations, should continue to be sampled quarterly. All wells installed during this investigation should be sampled quarterly, with the exception of cross-gradient well MW-9, which should only be monitored annually. Continue to check well (MS)MW-1 for free-phase hydrocarbon quarterly and sample if free-phase hydrocarbon is not present. This monitoring program should be re-evaluated following one year, with changes proposed based on the monitoring results.
- Install monitoring well(s) in the upper water-bearing zone, north of wells MW-13, MW-8, and MW-10, to help define the downgradient lateral extent of MTBE, benzene, and TPH-G, and to monitor possible plume migration toward the north-northwest. These new wells could be conventional monitoring wells (such as those recently installed) or could be multi-level monitoring wells constructed to monitor several depths within the water-bearing zones. Because of access constraints in the area of the plume perimeter, the specific locations of the recommended monitoring wells cannot be determined at this time, and may not be feasible. Negotiations with the City of Livermore and surrounding private property owners will need to be made prior to proposing well locations.

There are additional recommendations that may be beyond the scope of the responsible parties. These recommendations involve providing a regional view of the vulnerability of the water supply wells and may include the potential impact from additional groundwater plumes in the vicinity.

- Evaluate the effects the CWS production wells have on the upper water-bearing zone and the lower aquifer to provide an assessment of the potential risk to the production wells from the hydrocarbon plume. This would involve monitoring water-level changes in the shallow and deep zones when the water supply wells are shut down for the season and

Free product removed

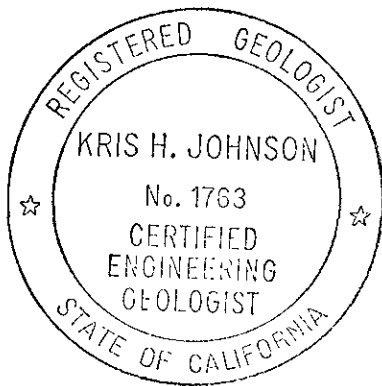
*Meet w/ Zone 7 + RP
to discuss this.*

then turned back on the following year. Performing numerical simulations of the capture zones of the water supply wells would aid in assessing the vulnerability of the wells to impact from the hydrocarbon plume. It may be important to obtain groundwater samples from the water supply wells for laboratory analyses on a more frequent schedule.

- The regional hydrogeology should be investigated in more detail to refine the hydrogeologic model for the area. This should include definition of the depositional environment and lateral continuity of the fine-grained units (aquitards) that appear to separate the water-bearing zones.

Please call if you have any questions about this report.

Sincerely,
Conor Pacific/EFW



Kris H. Johnson

Kris H. Johnson
Senior Engineering Geologist
C.E.G. 1763

Martha J. Watson

Martha J. Watson
Principal Environmental Engineer

Attachments:

Tables

- Table 1 - Summary of Groundwater Elevations
- Table 2 - Groundwater Analytical Results
- Table 3 - Monitoring Well Constructions

Figures and Drawings

- Figure 1 - Site Location
- Figure 2 - Regional Geology
- Drawing 1 - Well Locations, Groundwater Contours, and Groundwater Chemistry
- Drawing 2 - Geologic Cross Sections A-A' and B-B'
- Drawing 3 - MTBE, Benzene, Toluene, Ethylbenzene, Xylene, and TPH-G Concentrations in Groundwater

Ms. Eva Chu
November 5, 1999
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Appendices

Appendix A - Water Supply Well Data

Appendix B - Investigation Methods

Appendix C - Drilling Permits, Hydrostratigraphic Profiles, and Water Sample Data Sheets

Appendix D - Certified Analytical Reports

cc: Mr. Balaji Angle, B&C Gas Mini Mart
Mr. Matt Katen, Alameda County Zone 7
Regional Water Quality Control Board, USTCF

**OVERSIZED MAPS
NOT SCANNED**

Table 1
 Summary of Groundwater Elevations
 B & C Gas Mini Mart
 Livermore, California

Well No.	Top-of-Casing Elevation (feet, MSL)	Date Measured	Depth to Water (feet)	Groundwater Elevation (feet, MSL)	Depth to Free product (feet)	Product Thickness (feet)
MW-1	487.00	09/22/88	60.50	426.50		
		08/02/90	43.10	443.90		
		10/10/91	66.39	420.61		
		01/08/92	68.72	418.28		
		05/11/93	34.76	452.24		
	484.07	09/21/93	38.70	448.30		
		05/22/94	33.57	453.43		
		06/19/94	37.51	446.56		
		08/25/94	43.27	440.80		
		11/22/94	40.58	443.49		
		03/13/95	28.06	456.01		
		06/01/95	21.76	462.31		
		02/29/96	18.86	465.21		
		Feb-97	NM	NM		
		07/30/98	25.90	458.17		
11/05/98	33.23	450.84				
03/23/99	25.49	458.58				
06/08/99	27.78	456.29				
MW-2	483.86	06/19/94	38.15	445.71		
		08/25/94	44.13	-	43.47	0.66
		11/22/94	40.96	-	40.92	0.04
		03/09/95	29.28	-	28.47	0.81
		03/13/95	28.71	-	28.29	0.42
		06/01/95	22.61	461.25		
		02/29/96	20.05	463.81		
		Feb-97	18.30	465.56		
		07/30/98	25.75	-	25.74	0.01
		11/05/98	33.31	450.55		
		03/23/99	25.51	458.35		
06/08/99	27.54	456.32				
MW-3	484.24	06/19/94	37.15	447.09		
		08/25/94	42.31	441.93		
		11/22/94	40.07	444.17		
		03/13/95	27.94	456.30		
		06/01/95	21.31	462.93		
		02/29/96	18.78	465.46		
		Feb-97	16.97	467.27		
		07/30/98	24.88	459.36		
		11/05/98	32.09	452.15		
		03/23/99	24.49	459.75		
06/08/99	26.77	457.47				

Table 1
Summary of Groundwater Elevations
B & C Gas Mini Mart
Livermore, California

Well No.	Top-of-Casing Elevation (feet, MSL)	Date Measured	Depth to Water (feet)	Groundwater Elevation (feet, MSL)	Depth to Free product (feet)	Product Thickness (feet)
MW-4	485.04	06/19/94	37.49	447.55		
		08/25/94	42.25	442.79		
		11/22/94	40.59	444.45		
		03/13/95	28.00	457.04		
		06/01/95	21.51	463.53		
		02/29/96	18.42	466.62		
		Feb-97	17.47	467.57		
		07/30/98	25.47	459.57		
		11/05/98	32.67	452.37		
		03/23/99	25.09	459.95		
		06/08/99	27.43	457.61		
MW-5*	481.97	02/29/96	19.35	462.62		
		Feb-97	18.19	463.78		
		07/30/98	25.25	456.72	25.24	0.01
		11/05/98	32.70	449.27	32.48	0.22
		03/23/99	25.15	456.82		
		06/08/99	27.27	454.70		
MW-6	483.93	02/29/96	20.32	463.61		
		Feb-97	18.92	465.01		
		07/30/98	25.59	458.34	25.58	0.01
		11/05/98	NA	NA		
		03/23/99	25.43	458.50		
		06/08/99	27.43	456.50		
MW-7	478.14	7/12/1999	28.37	449.77		
MW-8	473.23	7/12/1999	34.29	438.94		
MW-9	477.08	7/12/1999	30.71	446.37		
MW-10	471.42	7/12/1999	34.60	436.82		
MW-11	464.93	7/12/1999	31.00	433.93		
MW-12	458.34	7/12/1999	25.50	432.84		
MW-13	474.79	7/12/1999	30.65	444.14		
D-1	464.70	7/12/1999	30.67	434.03		
D-2	457.61	7/12/1999	25.72	431.89		
MSP MW-01	477.79	07/30/98	30.37	447.42	30.35	0.02
		11/05/98	38.01	439.78	(1)	
		03/23/99	29.44	448.35	(1)	
		06/08/99	31.70	446.09	(1)	

Notes: Data prior to 1998 from RSI quarterly reports. February 1997 date unknown.
MSL = mean sea level
NM - not measured; NS - not surveyed; NA - well not accessible, blocked at 28.4 feet.
MSP - Mill Springs Park
(1) - free product visible in purge or sample water

Table 2
Groundwater Analytical Results
B&C Gas Mini Mart
Livermore, California

Well No.	Sample Date	Depth (feet)	TPH-G (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)
<i>Site Monitoring Well Samples</i>								
MW-1	6/8/1999		1,630	70.4	51.7	54.6	138	66.8
MW-2	6/8/1999		11,200	352	454	540	639	343
MW-3	6/8/1999		1,210	5	9	7	4	53
MW-4	6/8/1999		<50	<0.5	<0.5	<0.5	<0.5	<2
MW-5	6/8/1999		34,500	722	1,980	1,720	7,170	765
MW-6	6/8/1999		7,610	259	334	283	567	275
<i>Investigation Monitoring Well Samples</i>								
MW-7	7/1/1999		5,090	31.9	4.8	60	219	43.6
MW-8	6/24/1999		<50	<0.5	<0.5	<0.5	<0.5	88.5
MW-9	6/24/1999		<50	<0.5	<0.5	<0.5	<0.5	<2
MW-10	6/24/1999		<50	<0.5	<0.5	<0.5	<0.5	<2
MW-11	6/28/1999		91.3	0.683	2.02	1.07	2.62	<2
MW-12	6/28/1999		<50	<0.5	<0.5	<0.5	<0.5	<2
MW-13	7/12/1999		214	42.8	<0.5	4.48	<0.5	332
D-1	6/29/1999		<50	<0.5	<0.5	<0.5	<0.5	<2
D-2	6/29/1999		<50	<0.5	<0.5	<0.5	<0.5	<2
<i>SimulProbe Samples</i>								
MW-7-36'	6/16/1999	36	1,740	194	19	103	<2.5	593
MW-7-41'	6/16/1999	41	45,400	524	357	1,440	3,780	2,160
MW-7-46'	6/16/1999	46	10,800	112	69	506	1,250	527
MW-7-51'	6/16/1999	51	24,900	173	136	848	2,140	1,090
MW-7-61'	6/17/1999	61	25,300	42.3	31.4	588	1,390	271
MW-8-41'	6/17/1999	41	<50	<0.5	<0.5	0.979	<0.5	32.6
MW-8-46'	6/18/1999	46	<50	<0.5	<0.5	<0.5	1.20	137
MW-8-51'	6/18/1999	51	<50	<0.5	<0.5	0.514	0.611	137
MW-8-56'	6/18/1999	56	<50	<0.5	<0.5	<0.5	<0.5	7.93

µg/l = micrograms per liter

TPH-G = total petroleum hydrocarbons as gasoline

MTBE = methyl tertiary-butyl ether

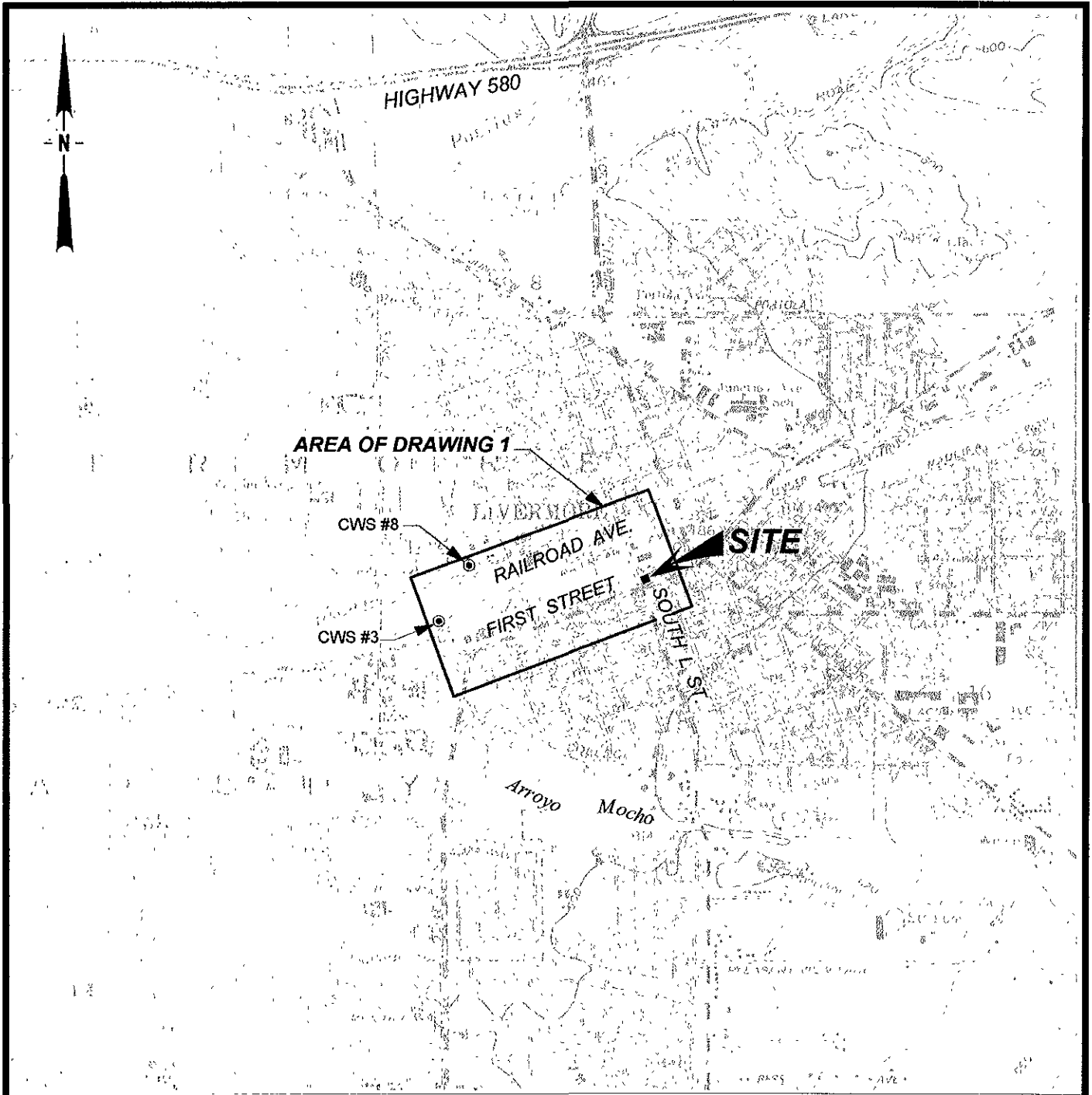
< = less than method reporting limit

Table 3
Monitoring Well Constructions
B&C Gas Mini Mart
Livermore, California

Well No.	Drilling Method	Date Installed	T.D. Boring (ft.-bgs)	T.D. Well (ft.-bgs)	Borehole Diameter (in.)	Casing Material (PVC)	Casing Diameter (in.)	Screen Size (in.)	Sand Pack Material	Screened Interval (ft.-bgs)	Sand Pack Interval (ft.-bgs)
MW-1	HSA	Sep-88	77	77	8	PVC	2	0.020	#3 sand	27 - 77	25 - 77
MW-2	HSA	Jun-94	60	60	10	PVC	4	0.020	#2/20 sand	30 - 60	27 - 60
MW-3	HSA	Jun-94	60	60	10	PVC	4	0.020	#2/20 sand	30 - 60	27 - 60
MW-4	HSA	Jun-94	60	60	10	PVC	4	0.020	#2/20 sand	30 - 60	27 - 60
MW-5	HSA	Oct-95	42	40	10	PVC	4	0.020	#2 sand	15 - 40	12 - 40
MW-6	HSA	Oct-95	42	40	10	PVC	4	0.020	#2 sand	15 - 40	12 - 40
MW-7	HSA	Jun-99	62	49	8	PVC	2	0.020	#3 sand	29-49	27-51
MW-8	HSA	Jun-99	62	54	8	PVC	2	0.020	#3 sand	34-54	32-54
MW-9	HSA	Jun-99	45	45	8	PVC	2	0.020	#3 sand	25-45	23-45
MW-10	HSA	Jun-99	55	53.5	8	PVC	2	0.020	#3 sand	33.5-53.5	23-55
MW-11	HSA	Jun-99	50	49	8	PVC	2	0.020	#3 sand	29-49	27-49
MW-12	HSA	Jun-99	45	43.5	8	PVC	2	0.020	#3 sand	23.5-43.5	21-45
MW-13	HSA	Jul-99	55	55	8	PVC	2	0.020	#3 sand	35-55	32-55
D-1	HSA	Jun-99	125	125	8	PVC	2	0.020	#3 sand	110-125	104-125
D-2	HSA	Jun-99	115	114	8	PVC	2	0.020	#3 sand	99-114	94-114

HSA Hollow-Stem Auger
T.D. Total Depth
ft.-bgs feet below ground surface

Well construction information for wells MW-2 through MW-6 collected from Remediation Service Int'l boring logs.



Base map. USGS 7.5' topography, Livermore, California (1961; photorevised 1980)

SCALE: 0 2,000 4,000 FEET



1/BNC/102/FIGURES/SITELOC DSF 8/19/99

Conor Pacific



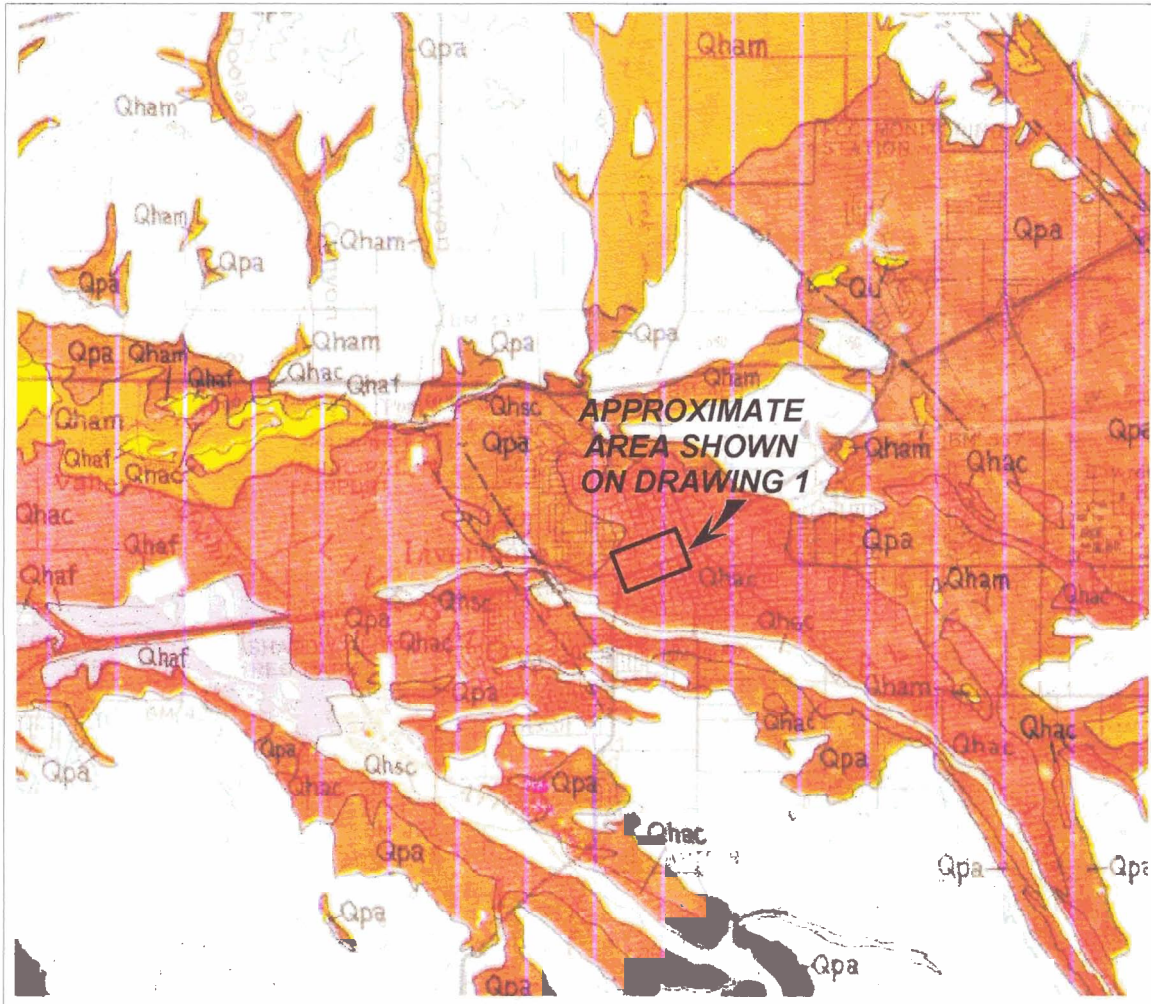
WATER QUALITY EVALUATION
B & C GAS MINI MART
LIVERMORE, CALIFORNIA

SITE LOCATION MAP

FIGURE

1

PROJECT NO
BNC102



EXPLANATION

- Qhsc Stream channel deposits, Holocene
- YOUNGER ALLUVIAL FAN AND FLUVIAL DEPOSITS**
- Qhac Coarse-grained alluvium, Holocene
- Qham Medium-grained alluvium, Holocene
- OLDER ALLUVIAL FAN DEPOSITS:**
- Qpa Late Pleistocene alluvium, Livermore Formation



BASE MAP FROM USGS PROFESSIONAL PAPER 943:
 "FLATLAND DEPOSITS - THEIR GEOLOGY AND ENGINEERING PROPERTIES
 AND THEIR IMPORTANCE TO COMPREHENSIVE PLANNING", 1979



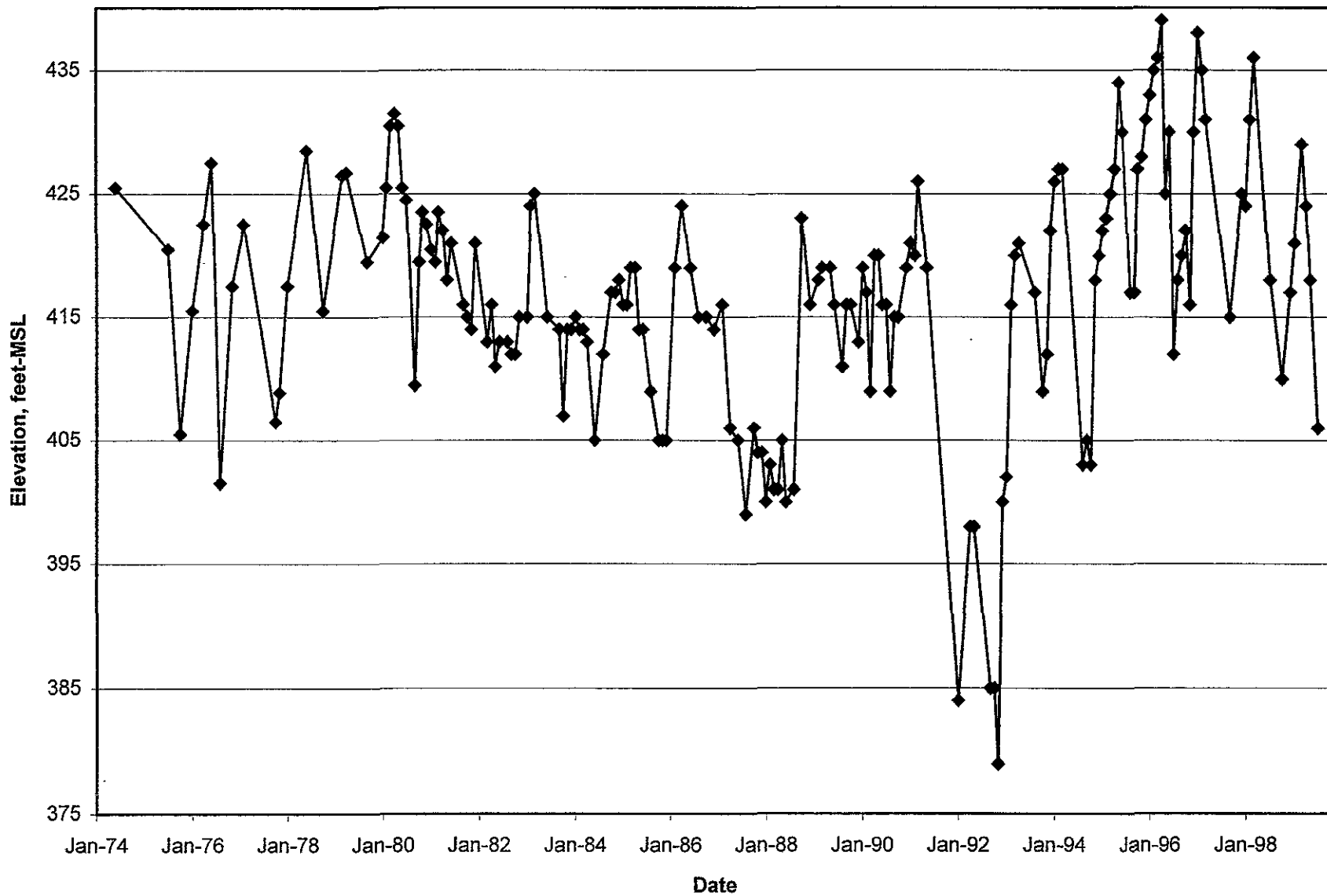
B & C GAS MINI MART
 LIVERMORE, CALIFORNIA
 REGIONAL GEOLOGY

FIGURE
2
 PROJECT NO.
 BNC102

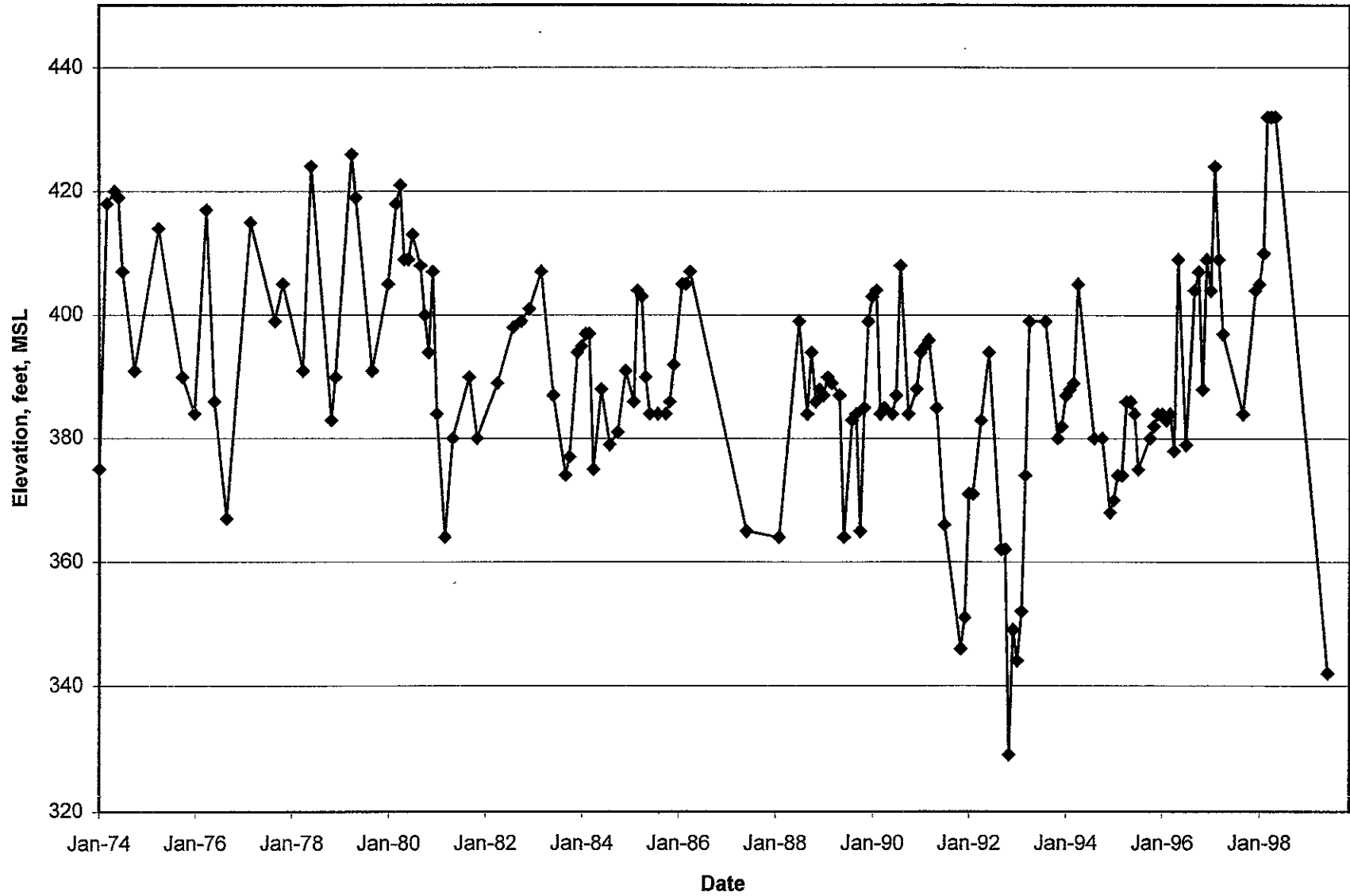
APPENDIX A

WATER SUPPLY WELL DATA

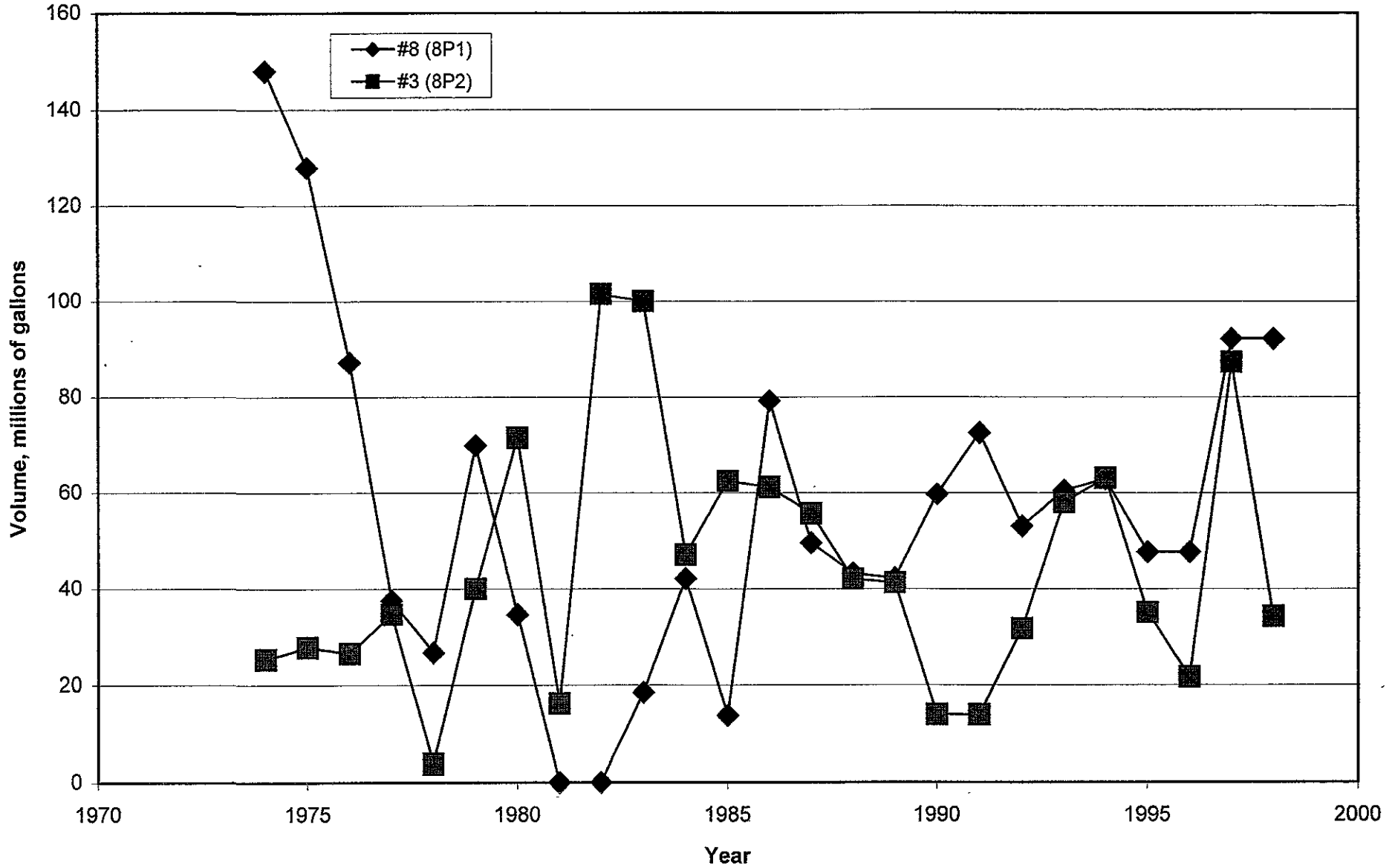
Groundwater Elevation, CWS Well #8



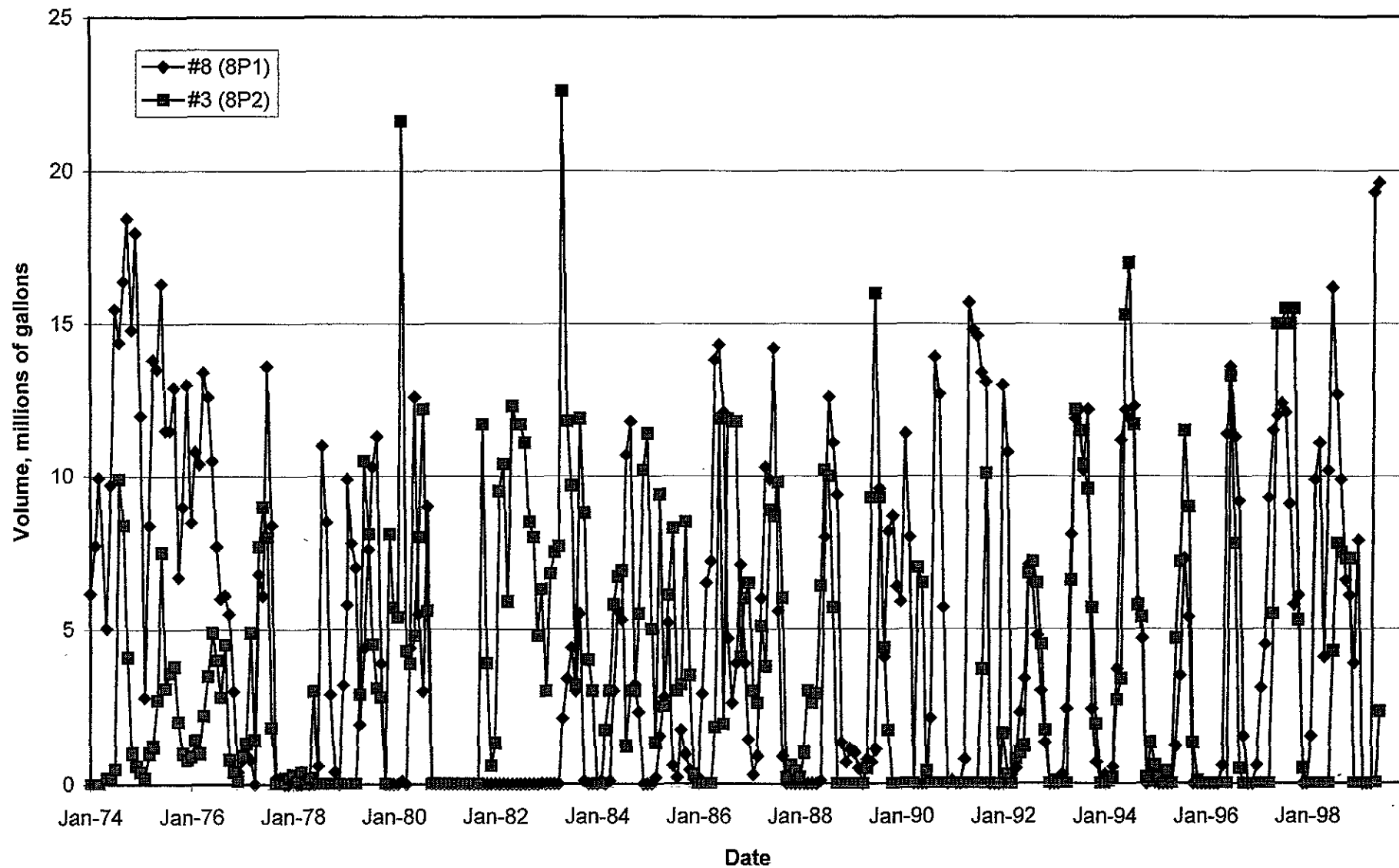
Goundwater Elevation, CWS Well #3



Annual Groundwater Pumpage



Monthly Groundwater Pumpage



ZONE 7 WATER AGENCY
WATER RESOURCES MANAGEMENT
REPORTED GROUNDWATER PUMPAGE
CALIFORNIA WATER SERVICE WELL #8 (3S/2E 8P 1)
IN MILLIONS OF GALLONS

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL_CY
1974	6.160	7.727	9.942	5.044	9.709	15.470	14.378	16.390	18.445	14.791	17.979	11.985	
1975	2.797	8.443	13.814	13.455	16.311	11.513	11.539	12.942	6.689	9.027	12.969	8.541	
1976	10.803	10.385	13.426	12.622	10.485	7.744	5.981	6.119	5.200	3.035	0.388	0.835	
1977	1.301	0.796	0.011	6.757	6.077	13.609	8.360	0.230	0.190	0.000	0.005	0.067	
1978	0.032	0.000	0.086	0.032	0.022	0.592	10.982	8.485	2.894	0.395	0.000	3.209	
1979	5.811	9.941	7.783	7.013	1.874	4.358	7.581	10.280	11.279	3.904	0.000	0.000	
1980	0.000	0.000	0.052	0.000	4.378	12.631	5.550	3.038	9.000	0.000	0.000	0.000	
1981	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1982	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.038	
1983	0.000	0.000	0.036	0.035	2.054	3.425	4.438	3.009	5.506	0.134	0.000	0.005	
1984	0.000	0.090	0.000	0.064	3.009	5.624	5.332	10.719	11.818	3.268	2.293	0.000	
1985	0.000	0.038	0.208	1.498	2.829	5.177	0.616	0.227	1.711	0.949	0.446	0.138	
1985	0.207	2.867	6.541	7.202	13.756	14.356	12.179	4.688	2.579	3.932	7.097	3.919	
1987	1.376	0.357	0.896	6.030	10.333	9.874	14.299	5.622	0.893	0.000	0.000	0.000	
1988	0.000	0.000	0.000	0.000	0.000	0.993	8.003	12.598	11.061	9.407	1.343	0.698	
1989	1.147	0.967	0.536	0.000	0.844	0.657	1.076	9.648	4.131	8.230	8.680	6.350	
1990	5.900	11.410	7.970	0.000	0.000	0.000	0.000	2.163	13.846	12.659	5.732	0.000	
1991	0.099	0.003	0.000	0.759	15.665	14.827	14.623	13.402	13.065	0.000	0.000	0.000	
1992	13.039	10.841	0.344	0.545	2.354	3.351	7.075	6.504	4.808	2.950	1.369	0.000	
1993	0.000	0.000	0.267	2.397	8.082	11.911	12.213	10.226	12.226	2.452	0.970	0.086	
1994	0.279	0.072	0.538	3.718	11.153	12.188	11.900	12.291	5.926	4.724	0.004	0.061	
1995	0.030	0.000	0.000	0.000	0.000	1.200	3.482	7.263	5.387	0.000	0.000	0.000	
1995	0.000	0.000	0.000	0.000	0.623	11.360	13.599	11.343	9.237	1.528	0.000	0.000	
1997	0.610	3.162	4.518	9.335	11.485	12.000	12.400	12.050	9.115	5.751	6.150	0.000	
1998	0.000	1.516	9.953	11.168	4.098	10.244	16.232	12.714	9.861	6.622	6.050	3.853	
1999	7.921	0.000	0.000	0.000	39.322	49.596							

ZONE 7 WATER AGENCY
WATER RESOURCES MANAGEMENT
REPORTED GROUNDWATER PUMPAGE
CALIFORNIA WATER SERVICE WELL #3 (3S/2E 8P 2)
IN MILLIONS OF GALLONS

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL_CY
1974	0.000	0.000	0.000	0.211	0.253	0.533	9.956	8.379	4.152	0.995	0.615	0.416	25.51
1975	0.151	1.021	1.191	2.659	7.502	3.113	3.604	3.821	2.000	1.011	0.778	0.873	27.724
1976	1.422	0.946	2.181	3.468	4.901	4.044	2.780	4.523	0.806	0.373	0.128	0.890	26.462
1977	1.285	4.885	1.384	7.687	8.972	8.035	1.838	0.000	0.027	0.000	0.225	0.260	34.598
1978	0.067	0.449	0.021	0.205	2.957	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.699
1979	0.000	0.000	0.000	0.000	2.885	10.532	8.093	4.508	3.069	2.807	0.000	8.070	39.964
1980	5.737	5.345	21.617	4.292	3.931	4.811	8.035	12.150	5.609	0.000	0.000	0.000	71.527
1981	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.730	3.910	0.652	16.292
1982	1.303	9.449	10.427	5.865	12.382	11.730	11.730	11.079	8.472	8.000	4.833	6.278	101.548
1983	3.017	6.804	7.508	7.746	22.556	11.784	9.726	3.170	11.848	8.828	4.005	0.262	97.254
1984	0.000	0.004	1.655	3.007	5.772	5.685	6.933	1.239	3.032	2.994	5.543	10.242	46.106
1985	11.401	5.008	1.269	9.419	2.514	6.125	8.314	2.986	3.190	8.479	3.453	0.311	62.469
1986	0.024	0.002	0.000	0.000	1.806	11.874	11.909	11.919	11.823	10.792	4.132	0.614	64.895
1987	6.489	2.997	2.597	5.128	3.767	8.899	8.722	9.840	6.004	0.232	0.621	0.418	55.714
1988	0.191	0.997	2.982	2.602	2.937	6.369	10.205	10.076	5.689	0.000	0.000	0.000	42.048
1989	0.000	0.000	0.000	0.000	0.478	9.384	16.033	9.291	4.435	1.710	0.000	2.020	43.351
1990	0.000	0.000	0.000	0.000	7.549	6.592	0.448	0.000	0.000	0.000	0.000	0.000	14.589
1991	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.715	10.116	0.000	0.000	0.000	13.831
1992	1.587	0.315	0.003	0.847	1.039	1.237	6.838	7.253	6.511	4.545	1.682	0.000	31.857
1993	0.088	0.000	0.000	0.000	6.626	12.224	11.529	10.359	9.624	5.684	1.933	0.000	58.067
1994	0.030	0.081	0.155	2.655	3.412	15.280	16.892	11.692	5.835	5.405	0.152	1.328	63.017
1995	0.636	0.190	0.000	0.403	0.000	4.704	7.151	11.461	8.955	1.255	0.136	0.000	34.891
1996	0.000	0.000	0.000	0.000	0.000	0.000	13.250	7.750	0.501	0.000	0.000	0.000	21.501
1997	0.000	0.000	0.000	0.000	5.524	15.000	15.024	15.500	15.000	15.500	5.250	0.500	87.298
1998	0.000	0.000	0.000	0.000	0.000	0.000	4.250	7.750	7.500	7.274	7.250	0.000	34.024
1999	0.000	0.000	0.000	0.000	0.000	2.256							

ZONE 7
WATER RESOURCES ENGINEERING
HISTORIC MONTHLY WATER ELEVATION (Non pumping)
3S/2E 8P 1 #8
(ft above MSL)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1974					425.5							415.5
1975						420.5			405.5			
1976			422.5		427.5		401.5			417.5		
1977	422.5								406.5	408.9		417.5
1978					428.5				415.5			
1979			426.5	426.7					419.5			
1980	421.5	425.5	430.5	431.5	430.5	425.5	424.5		409.5	419.5	423.5	422.5
1981	420.5	419.5	423.5	422.5	418.5	421.5			416.5	415.5	414.5	421.5
1982			413.5	416.5	411.5	413.5		413.5	412.5	412.5	415.5	
1983	415.5	424.5	425.5			415.5			414.5	407.5	414.5	414.5
1984	415.5	414.5	414.5	413.5		405.5		412.5		417.5	417.5	418.5
1985	416.5	416.0	419.5	419.5	414.5	414.5		409.5		405.5	405.5	405.5
1986		419.5		424.5		419.5		415.5		415.5		414.5
1987		416.5		406.5		405.5		399.5		406.5	404.5	404.5
1988	400.5	403.5	401.5	401.5	405.5	400.5		401.5		423.5		416.5
1989		418.5	419.5		419.5	416.5		411.5	416.5	416.5		413.5
1990	419.5	417.5	409.5	420.5	420.5	416.5	416.5	409.5	415.5	415.5		419.5
1991	421.5	420.5	426.5		419.5							
1992	384.5			398.5	398.5				385.5	385.5	379.5	400.5
1993	402.5	416.5	420.5	421.5				417.5		409.5	412.5	422.5
1994	426.5	427.5	427.5					403.5	405.5	403.5	418.5	420.5
1995	422.5	423.5	425.5	427.5	434.5	430.5		417.5	417.5	427.5	428.5	431.5
1996	433.5	435.5	436.5	439.5	425.5	430.5	412.5	418.5	420.5	422.5	416.5	430.5
1997	438.5	435.5	431.5						415.5			425.5
1998	424.5	431.5	436.5				418.5			410.5		417.5
1999	421.5		429.5	424.5	418.5		406.5		414.5			

04-Aug-99

ZONE 7
WATER RESOURCES ENGINEERING
HISTORIC MONTHLY WATER ELEVATION *(Non-pumping)*
3S/2E 8P 2
(ft above MSL)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1974	375.0		418.0	420.0	419.1	407.0			391.0			
1975			414.0						390.0			384.0
1976			417.0		386.0			367.0				
1977		415.0						399.0		404.6		
1978			391.0		424.0					382.9	390.0	
1979				425.8	419.0				391.0			
1980	405.0		418.0	421.1	409.0	409.0	413.0		408.0	400.1	394.0	407.0
1981	384.0		364.0		380.0				390.0		380.0	
1982				389.0				398.0		399.0		401.0
1983			407.0			387.0			374.0	377.0		394.0
1984	395.0	397.0	397.0	375.0		388.0		379.0		381.0		391.0
1985		386.0	404.0	403.0	390.0	384.0		384.0		384.0	386.0	392.0
1986		405.0	405.0	407.0								
1987						365.0						
1988		364.0					399.0		384.0	394.0	386.0	388.0
1989	387.0	390.0	389.0		387.0	364.0		383.0	384.0	366.0	385.0	399.0
1990	403.0	404.0	384.0	385.0		384.0	387.0	408.0		384.0		388.0
1991	394.0	395.0	396.0		385.0		366.0				346.0	351.0
1992	371.0	371.0		383.0		394.0			362.0	362.0	329.0	349.0
1993	344.0	352.0	374.0	399.0				399.0			380.0	382.0
1994	387.0	388.0	389.0	405.0				380.0		380.0		368.0
1995	370.0	374.0	374.0	386.0	386.0	384.0	375.0			380.0	382.0	384.0
1996	384.0	383.0	384.0	378.0	409.0		379.0		404.0	407.0	388.0	409.0
1997	404.0	424.0	409.0	397.0					384.0			404.0
1998	405.0	410.0	432.0	432.0	432.0							
1999						342.0		384.0	380.0			

FROM : ZONE 7 WATER AGENCY

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APPENDIX B
INVESTIGATION METHODS

APPENDIX B

INVESTIGATION METHODS

APPENDIX B

INVESTIGATION METHODS

Soil Borings, Soil Sampling and Well Installation

Shallow Wells

Conor Pacific/EFW subcontracted Spectrum Drilling of Stockton, California, to drill and install the groundwater monitoring wells. The borings were drilled with 8-inch diameter hollow-stem auger. Continuous soil samples were collected while drilling below a depth of 25 feet. Soils were logged by a CP/EFW geologist according to the Unified Soil Classification System (USCS) under the supervision of a California Certified Engineering Geologist. Hydrostratigraphic profiles (boring logs) are included in Appendix ----. Periodic soil samples were screened in the field using an organic vapor analyzer (OVA) to evaluate the presence of hydrocarbons in the soil.

The wells were constructed within the 8-inch hollow-stem augers using 2-inch-diameter, Schedule 40, flush-threaded polyvinyl chloride (PVC) casing. For the shallow wells, twenty-foot well screens were placed so that the water table will remain intersected, considering the historical variability of groundwater elevations. For the two borings drilled to the top of the aquitard, MW-7 and MW-8, the lower portion of the boring was backfilled with bentonite prior to well construction. A #3-size sand pack was placed from the bottom of each boring to approximately 2 feet above the top of the screened interval. A bentonite seal of at least 2 feet was placed above the sand pack. A sanitary seal of neat cement was placed to within one foot of ground surface. A traffic-rated well vault box was installed at the surface and the well heads were capped with watertight locking expansion caps and locks.

The wells were developed prior to groundwater sampling. The wells were developed by bailing and surging the groundwater in the wells until the water was relatively free of sediment, and the temperature, pH, and specific conductance of the water had stabilized. The purge water generated during development was contained and subsequently disposed of properly.

Following well installation, the top of casing of each new well and existing unsurveyed site wells were surveyed to Livermore City Datum (mean sea level) using local benchmarks.

Deep Wells

The borings for the deep wells were also drilled using 8-inch-diameter hollow-stem augers. Because these wells were located adjacent to guard wells in the upper aquifer (MW-11 and MW-12), the deep borings were sampled only below the depth of the adjacent shallow boring. The borings extended through the aquitard, and 15 feet into the underlying lower aquifer.

The wells were constructed within the 8-inch hollow-stem augers in the same manner as described above for the shallow wells. Well screens were placed across the uppermost 15 feet of the lower aquifer. A bentonite seal of at least 2 feet was placed above the sand pack. The

sanitary seal of neat cement was placed across the depth of the aquitard and extended to within one foot of ground surface. The surface completion was as described for the shallow wells.

Groundwater Sampling and Analysis

To define possible stratification of the plume, the soil borings for wells MW-7 and MW-8 were drilled to the top of the aquitard and depth-discrete grab groundwater samples were obtained at approximate 5-foot intervals within the upper aquifer. The grab groundwater samples were obtained using SimulProbe™ technology to ensure the integrity of the samples. The samples were analyzed for petroleum hydrocarbons (TPH-gasoline [TPH-G], MTBE, benzene, toluene, ethylbenzene, and xylenes [BTEX]) using U.S. Environmental Protection Agency (EPA) methods 5030/8015M/8020.

SimulProbe™ is an in-situ sampling device, which allows the collection of a groundwater sample and soil core from the same sampling depth in a borehole. The SimulProbe™ is basically a split-spoon sampler with a 2-liter stainless steel water canister attached to the upper end. The probe is placed in the borehole, inside the hollow-stem augers and the water canister is pressurized with nitrogen gas. The probe is then hammered into the subsurface to collect the soil core. To collect a groundwater sample, the probe is pulled back 4 inches to retract the sliding drive shoe and expose the intake screen. A valve is opened to allow pressure to bleed off and allow water to enter the tool under ambient hydrostatic pressure. The water canister fill rate can be observed by placing the open end of the pressure tube into a bucket of water and observe the displaced nitrogen bubbling out of the tube. After sufficient water sample has been collected, the canister is re-pressurized and the probe is pulled out of the augers. A groundwater sample is obtained by inserting a Teflon tube through a valve in the canister. Occasionally, the intake screen on the probe can be clogged by fine sediment and groundwater cannot enter the canister. In these cases, if groundwater was in the core barrel of the split-spoon sampler, a water sample was obtained by pouring this water into the sample bottles.

Following well installation, groundwater samples were obtained from each of the groundwater monitoring wells installed in this investigation according to CP/EFW's standard sampling methods. Field measurements of electrical conductivity (EC), dissolved oxygen (DO), temperature, and pH were taken at each monitoring well and recorded on water sample field data sheets. All purge water was contained and properly disposed of consistent with analytical results.

APPENDIX C

**DRILLING PERMITS, BORING LOGS, AND
WATER SAMPLE FIELD DATA SHEETS**

	Hydrostratigraphic Profile	Boring No. <u>MW-7</u>	Site: <u>LIVERMORE</u>	Ground Elev. <u>478.6</u>
		Well No. <u>MW-7</u>	Client: <u>B&C Gas Min. Maint</u>	T.O.C. Elev. <u>478.14</u>
		Sheet <u>1</u> of <u>3</u>	Project No. <u>BK102</u>	Coordinates: N E: _____
Drilling Summary: <u>Hollow stem auger, drill to 25' continuous sampler below 25', alternate 5' core barrel w/ 2' sampler; water sample @ 5' intervals, TDE clay @ 62', backfill w/ bent chips to 49', set well @ 49' w/ 20' screen, 0.020 slots #3 sand, flush box</u>			Date(s) Drilled: <u>6/16/99, 6/17/99</u>	Drilling Method: <u>Hollow Stem Auger</u>
			Date(s) Well Installed: <u>6/17/99</u>	Borehole Total Depth (FT): <u>62'</u>
			Drilling Co./Driller: <u>Spectrum</u>	Final Borehole Dia. (in): <u>8-inch</u>

Well Depth (feet)	Sample Desig.	Odor				Sample Type	Fine Blows/Run	Recovery	Sample	Water Level	Depth (feet)	Graphics		Name & Unit	USCS	Color (Munsell)	Fines (%)				Fines Plasticity					Sand					Grvl.					Sorting					Hardness - Clays (Density - Sands)					Moisture			Remarks
		N	F	M	S							Sand & Grvl.					L	M	H	F	M	C	F	C	v.well	well	mod.	poor	v.poor	v. soft (psi)	soft (psi)	firm (psi)	stiff (psi)	very stiff (psi)	hard (psi)	D	M	W											
												20	40																										60	80	80	60	40	20					
1							1020				1	xxxx	Asphalt Pavement																																				
2											2																																						
3											3																																						
4											4																																						
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Cement Grout

6/17/0740

 Logged by N. Bryson Checked by ky

Hydrostratigraphic Profile

Boring No. MW-7
Well No. MW-7
Sheet 3 of 3

Site: LIVERMORE
Client: SEC. 265 N N - W 4 E
Project No. BNC '02
Date(s) Drilled: 6/16, 6/17/99
Date(s) Well Installed: 6/17/99
Drilling Co./Driller: SPECTRUM/DAVE

Ground Elev. _____
T.O.C. Elev. _____
Coordinates; N E: _____
Drilling Method: HSA
Borehole Total Depth (FT): 62'
Final Borehole Dia. (FI): 8"

Drilling Summary: (SEE PAGE 1)

Bentonite chips

Well Depth (feet)	Sample Desig.	FID	Odor				Sample Type	Time Blows/ Run	Recovery	Sample	Water Level	Depth (feet)	Graphics		Name & Unit	USCS	Color (Munsell)	Fines (%)			Fines Plasticity					Sand					Grvl.					Sorting					Hardness - Clays (Density - Sands)				Moisture			Remarks
			N	F	M	S							20	40				60	L	M	H	F	M	C	F	C	F	C	v.well	well	mod.	poor	v.poor	v.well (1-3)	well (4)	mod (5)	poor (6-8)	v.poor (9-12)	D	M	W							
			80	60	40	20							80	60				40	20																													
57							0700				57					2.5Y 4/2	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Clayey gravel grading from to clayey sand. Then clay; mottled olive.							
58					CC						58				4.5Y 3	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
59											59						X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
60											60						X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
61	61'				SP/CC		0800				61						X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	61' sand + fine gravel with clay matrix trace								
62							SB 1/2				62						X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	cause gravel									
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TD @ 62'

BORING DESIGNATION: MW-7

INSTALLATION
DATE: 6/17/99 BY: K. Johnson

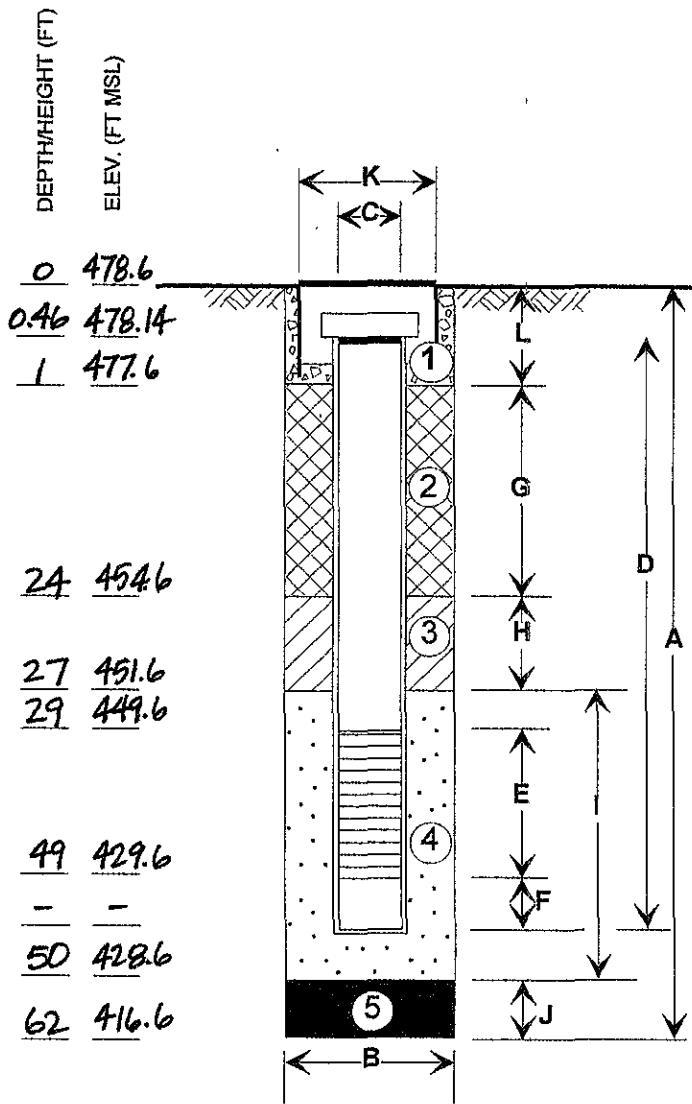
DIMENSIONS

A Total Depth of Boring (ft.)	<u>62</u>
B Borehole Diameter (in.)	<u>8</u>
C Well Casing Diameter (in.)	<u>2</u>
D Well Casing Length (ft.)	<u>49</u>
E Well Casing Slotted Interval (ft.)	<u>29-49</u>
F Well Casing End Cap or Sump (ft.)	<u>-</u>
G Annular Seal Interval (ft.)	<u>0-24</u>
H Annular Seal Interval (ft.)	<u>24-27</u>
I Sand Pack Interval (ft.)	<u>27-50</u>
J Bottom Material Interval (ft.)	<u>50-62</u>
K Protective Cover Diameter (in.)	<u>12</u>
L Monument Footing Interval (ft.)	<u>0-1</u>
Well Centralizer Depth(s) (ft.)	<u>-</u>

MATERIALS DATA

Monument Footing	①	<u>Concrete</u>
Annular Seal	②	<u>Cement</u>
Annular Seal	③	<u>Bentonite</u>
Sand Pack	④	<u>#3 Sand</u>
Bottom Material	⑤	<u>Bentonite</u>
Slotted Casing		<u>0.020" PVC</u>
Well Casing		<u>Sch. 40 PVC</u>
Well Centralizers		<u>-</u>
Protective Cover		<u>Flush</u>

WELL DESIGNATION
MW-7



SECTION VIEW (not to scale)

NOTES:

SITE: B+C Gas Mini Mart
 PROJ. NO: BNC 102
 N. E.
 WELL PERMIT NO: 99089

Hydrostratigraphic Profile

Boring No. MW-8
Well No. MW-8
Sheet 2 of 3

Site: LIVERMORE
Client: RFC GAS MINI-MART
Project No. BNC102
Date(s) Drilled: 6/17, 6/18
Date(s) Well Installed: 6/18/99
Drilling Co./Driller: SPECTRUM/DAVE

Ground Elev. _____
T.O.C. Elev. _____
Coordinates: N E: _____
Drilling Method: H.S.A*
Borehole Total Depth (ft): 62'
Final Borehole Dia. (ft): 8"

Drilling Summary: (SEE PAGE 1.)

Well Depth (feet)	Sample Desig.	FID	Odor				Sample Type	Time Blows/Run	Recovery	Sample	Water Level	Depth (feet)	Graphics		Name & Unit	USCS	Color (Munsell)	Fines (%)			Fines Plasticity					Sand				Grvl.			Sorting				Hardness - Clays (Density - Sands)				Moisture			Remarks
			N	F	M	S							20	40				80	80	60	40	20	L	M	H	F	M	C	F	C	v. well	mod.	poor	v. poor	v. soft (p-ty)	stiff (u)	firm (mch)	stiff (dne)	very stiff (v-dne)	D	M	W		
													Sand & Grvl.																															
29		3	X								30	Mottled	Sandy Clay (cont.)	CL	dk y/b brown			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	trace fine gr.					
31			X								32							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
33			X			CC					34							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
35		3	X				1430				36							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
37		3	X			CC					38							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
39			X				1448				40							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
41	4'		X			SP	1600				42							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
43		3	X			CC	0820				44	mottled	fine clayey sand					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
45			X								46							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
47	46'	3	X			CC	0930				48	mottled	fine clayey sand					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
49			X								50							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
51	51'	3	X			SP	1000				52							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
53			X			CC	1030				54							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
55			X				1138				56							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
57	56'	3	X			SP					58	mottled	fine clayey sand					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								

0.020' SLOT

FID BACKGROUND: 3

Logged by KJ/NB

Checked by [Signature]

Boring No. MW-4
Well No. MW-8
Sheet 3 of 3

Site: LIVERMORE
Client: B&C GAS MINI-MART
Project No. BNC12
Date(s) Drilled: 6/17, 6/18/99
Date(s) Well installed: 6/18/99
Drilling Co./Driller: SPECTRUM/DAVE

Ground Elev. _____
T.O.C. Elev. _____
Coordinates; N E: _____
Drilling Method: H.S.A.
Borehole Total Depth (Ft): 62'
Final Borehole Dia. (Ft): 8"

Drilling Summary: (SEE PAGE 1)

Dipstick to 61 feet

Well Depth (feet)	Sample Desig.	FID	Odor				Sample Type	Time Blows/Run	Recovery	Sample	Water Level	Depth (feet)	Graphics		Name & Unit	USCS	Color (Munsell)	Fines (%)				Fines Plasticity					Sand				Grvl.			Sorting				Hardness - Clays (Density - Sands)					Moisture			Remarks
			N	F	M	S							Lithology	Structure				Sand & Grvl.		Plasticity					Sand				Grvl.			Hardness - Clays (Density - Sands)				Moisture										
																		20	40	60	80	L	M	H	F	M	C	F	C	v.well	well	mod.	poor	v.poor	v.well (psi)	well (psi)	mod. (psi)	poor (psi)	D	M	W					
58											58	diagonal lines	mottled	Gravelly Clay	CL	7.5R	X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	mottled clay							
59											59			Clay w/ gravel	CL	5YR	X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	increasing depth gravel up to 1							
60	3						1243				60						X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										
61											61						X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
62											62						X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
63											63						X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
64											64						X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
65											65						X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									

Logged by NB Checked by KJ

BORING DESIGNATION: MW-8

INSTALLATION

DATE: 6/18/99 BY: N. Bryson

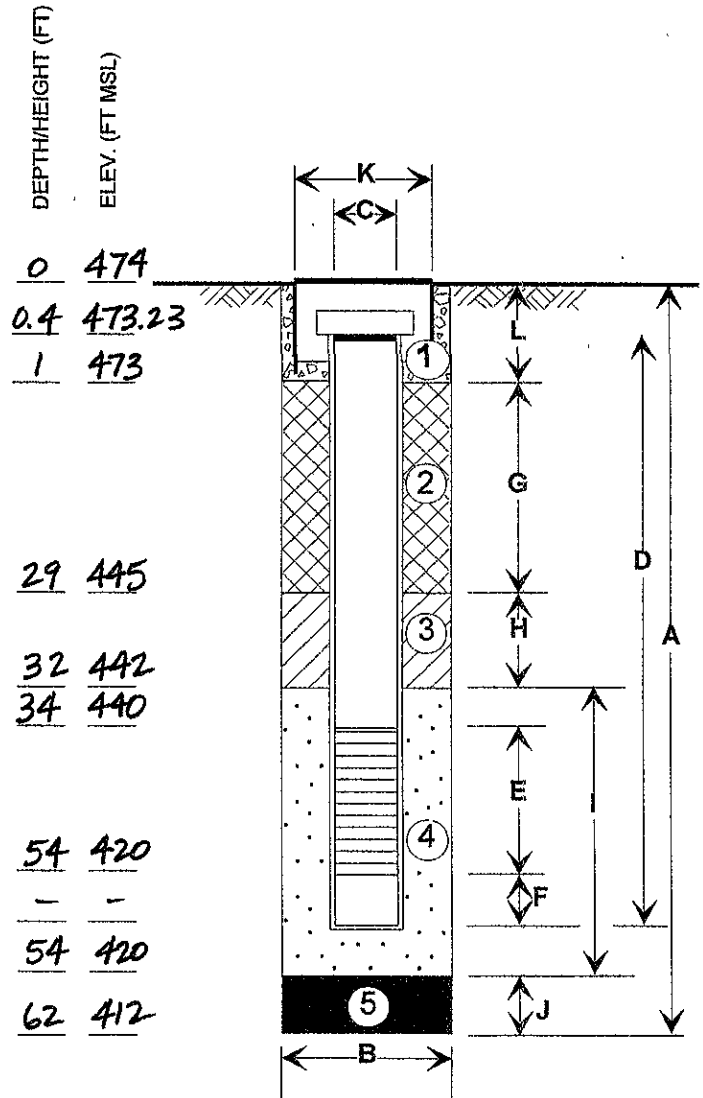
DIMENSIONS

A Total Depth of Boring (ft.)	<u>62</u>
B Borehole Diameter (in.)	<u>8</u>
C Well Casing Diameter (in.)	<u>2</u>
D Well Casing Length (ft.)	<u>54</u>
E Well Casing Slotted Interval (ft.)	<u>34-54</u>
F Well Casing End Cap or Sump (ft.)	<u>-</u>
G Annular Seal Interval (ft.)	<u>1-29</u>
H Annular Seal Interval (ft.)	<u>29-32</u>
I Sand Pack Interval (ft.)	<u>32-54</u>
J Bottom Material Interval (ft.)	<u>54-62</u>
K Protective Cover Diameter (in.)	<u>12</u>
L Monument Footing Interval (ft.)	<u>0-1</u>
Well Centralizer Depth(s) (ft.)	<u>-</u>

MATERIALS DATA

Monument Footing	①	<u>Concrete</u>
Annular Seal	②	<u>Cement</u>
Annular Seal	③	<u>Bentonite</u>
Sand Pack	④	<u>#3 Sand</u>
Bottom Material	⑤	<u>Bentonite</u>
Slotted Casing		<u>0.020" PVC</u>
Well Casing		<u>Sch. 40 PVC</u>
Well Centralizers		<u>-</u>
Protective Cover		<u>Flush</u>

WELL DESIGNATION
MW-8



SECTION VIEW (not to scale)

NOTES:

SITE: B+C Gas Mini Mart
 PROJ. NO: BNC102
 N. E.
 WELL PERMIT NO: 99089



Hydrostratigraphic Profile

Boring No. NW-9
 Well No. NW-9
 Sheet 1 of 2

Site: LIVERMORE
 Client: B&C GAS H.W.I. - MART
 Project No. BNC102
 Date(s) Drilled: 6/21/90
 Date(s) Well Installed: _____
 Drilling Co./Driller: _____

Ground Elev. 477.6
 T.O.C. Elev. 477.08
 Coordinates; N E: _____
 Drilling Method: Hollow Stem Auger
 Borehole Total Depth (FT): 45'
 Final Borehole Dia. (FI): 8"

Drilling Summary: 8" Hollow-stem augers, drill to 25', continuous sample below 25',
5' core barrels, TD @ 45', set well @ 45' w/ 20' screen, 0.020"
slots #3 sand. Linch box (SEE WELL CONSTRUCTION DIAGRAM)

Depth (feet)	Sample Desig.	FID	Odor				Sample Type	Blows/Run	Recovery	Sample	Water Level	Depth (feet)	Graphics		Name & Unit	USCS	Color (Munsell)	Fines (%)				Fines Plasticity					Sand					Grvl.					Sorting					Hardness - Clays (Density - Sands)					Moisture			Remarks	
			N	F	M	S							20	40				60	80	L	M	H	F	M	C	F	C	V	V	V	V	V	V	V	v	v	v	v	v	v	v	v	v	v	D	M	W				
0																																																			
0.020 slot H.5 Sand																																																			

FID BAKED

Logged by J. RISONI Checked by [Signature]

BORING DESIGNATION: MW-9

INSTALLATION

DATE: 6/21/99 BY: N. Bryson

DIMENSIONS

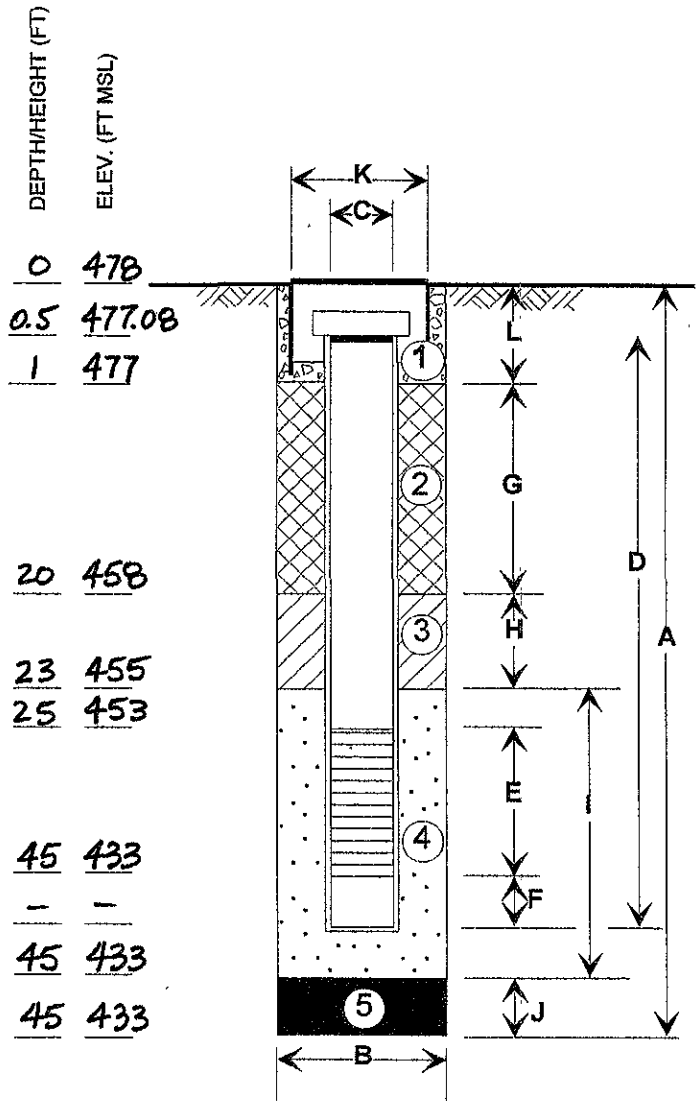
A Total Depth of Boring (ft.)	<u>45</u>
B Borehole Diameter (in.)	<u>8</u>
C Well Casing Diameter (in.)	<u>2</u>
D Well Casing Length (ft.)	<u>45</u>
E Well Casing Slotted Interval (ft.)	<u>25-45</u>
F Well Casing End Cap or Sump (ft.)	<u>-</u>
G Annular Seal Interval (ft.)	<u>1-20</u>
H Annular Seal Interval (ft.)	<u>20-23</u>
I Sand Pack Interval (ft.)	<u>23-45</u>
J Bottom Material Interval (ft.)	<u>-</u>
K Protective Cover Diameter (in.)	<u>12</u>
L Monument Footing Interval (ft.)	<u>0-1</u>
Well Centralizer Depth(s) (ft.)	<u>-</u>

MATERIALS DATA

Monument Footing	①	<u>Concrete</u>
Annular Seal	②	<u>Cement</u>
Annular Seal	③	<u>Bentonite</u>
Sand Pack	④	<u>#3 Sand</u>
Bottom Material	⑤	<u>-</u>
Slotted Casing		<u>0.020" PVC</u>
Well Casing		<u>Sch. 40 PVC</u>
Well Centralizers		<u>-</u>
Protective Cover		<u>Flush</u>

WELL DESIGNATION

MW-9



SECTION VIEW (not to scale)

NOTES:

SITE: B+C Gas Mini Mart
 PROJ. NO: BNC102
 N. E.
 WELL PERMIT NO: 99089

BORING DESIGNATION: MW-10

INSTALLATION
DATE: 6/22/99 BY: N. Bryson

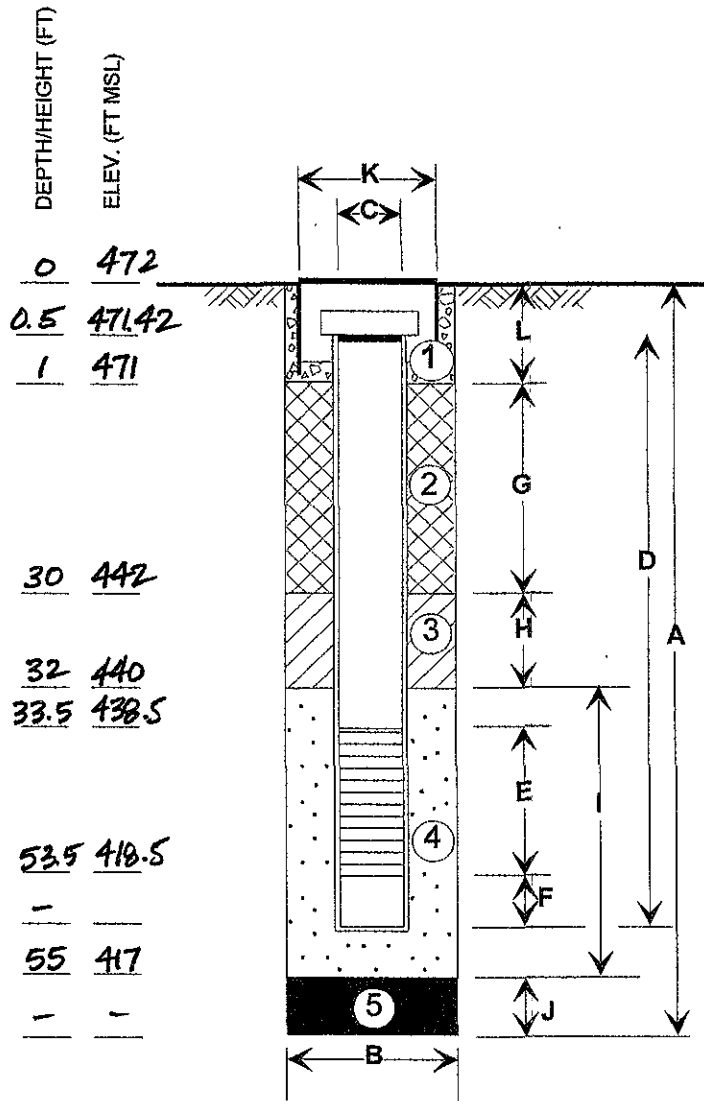
DIMENSIONS

A Total Depth of Boring (ft.)	<u>55</u>
B Borehole Diameter (in.)	<u>8</u>
C Well Casing Diameter (in.)	<u>2</u>
D Well Casing Length (ft.)	<u>53.5</u>
E Well Casing Slotted Interval (ft.)	<u>33.5-53.5</u>
F Well Casing End Cap or Sump (ft.)	<u>-</u>
G Annular Seal Interval (ft.)	<u>1-30</u>
H Annular Seal Interval (ft.)	<u>30-32</u>
I Sand Pack Interval (ft.)	<u>32-55</u>
J Bottom Material Interval (ft.)	<u>-</u>
K Protective Cover Diameter (in.)	<u>12</u>
L Monument Footing Interval (ft.)	<u>0-1</u>
Well Centralizer Depth(s) (ft.)	<u>-</u>

MATERIALS DATA

Monument Footing	①	<u>Concrete</u>
Annular Seal	②	<u>Cement</u>
Annular Seal	③	<u>Bentonite</u>
Sand Pack	④	<u>#3 Sand</u>
Bottom Material	⑤	<u>-</u>
Slotted Casing		<u>0.020" PVC</u>
Well Casing		<u>Sch. 40 PVC</u>
Well Centralizers		<u>-</u>
Protective Cover		<u>Flush</u>

WELL DESIGNATION
MW-10



SECTION VIEW (not to scale)

NOTES:

SITE: B+C Gas Mini Mart
 PROJ. NO: BNC102
 N. E.
 WELL PERMIT NO: 99089

	Hydrostratigraphic Profile	Boring No. <u>MW-11</u>	Site: <u>LIVEDMORE</u>	Ground Elev. <u>465.4</u>
		Well No. <u>MW-11</u>	Client: <u>B&C GAS MINI-NACE</u>	T.O.C. Elev. <u>464.93</u>
		Sheet <u>1</u> of <u>1</u>	Project No. <u>BNC10Z</u>	Coordinates; N E: _____
Drilling Summary: <u>8' Hollow stem augers, drill to 25', continuous sample below 25', 5' core barrel, ID @ 50' set well @ 49' w/ 20' of screen, 0.020" static.</u> <u>2 sand flushbox (SEE WELL CONSTRUCTION DIAGRAM)</u>			Date(s) Drilled: <u>6/22/99</u>	Drilling Method: <u>H.S.A.</u>
			Date(s) Well Installed: <u>6/22/99</u>	Borehole Total Depth (FT): <u>50'</u>
			Drilling Co./Driller: <u>SPECTRUM/DAVE</u>	Final Borehole Dia. (FT): <u>8"</u>

Well Depth (feet)	Sample Desig.	Odor				TIME Blower Run	Recovery	Sample	Water Level	Depth (feet)	Graphics		Name & Unit	USCS	Color (Munsell)	Fines (%)		Fines Plasticity					Sand					Grv.					Sorting					Hardness - Clays (Density - Sands)					Moisture			Remarks
		N	F	M	S						Lithology	Structure				Sand & Grvl.		L	M	H	F	M	C	F	C	v. well	well	mod.	poor	v. poor	v. soft	soft	firm	stiff	very stiff	indiv.	D	M	W							
																20-80	80-20																							20	40	60	80	20	40	
0						1140				0		FILL																																		
25	3					1245				25		CLAY CORE BARREL w/SAND	GC	10YR 5/3 brown																																
26										26																																				
27										27																																				
28										28																																				
29										29																																				
30	3									30																																				
31										31																																				
32										32																																				
33										33																																				
34										34																																				
35	3									35																																				
36										36																																				
37										37																																				
38										38		mottled	GRAVELLY CLAY w/SAND	CL	10YR 5/3 brown																															
39										39																																				
40	3									40																																				
41										41																																				
42										42																																				
43										43																																				
44										44																																				
45	3									45		mottled	GRAVELLY CLAY w/SAND	CL	5Y 4/3 olive																															
46										46																																				
47										47																																				
48										48																																				
49	3									49																																				
50										50																																				

0.020" slot #3 sand

FID BACKGROUND = 3
 TD @ 48.5' 1.5' cutoff

Logged by N. BRAYSON Checked by [Signature]

BORING DESIGNATION: MW-11

INSTALLATION

DATE: 6/22/99 BY: N. Bryson

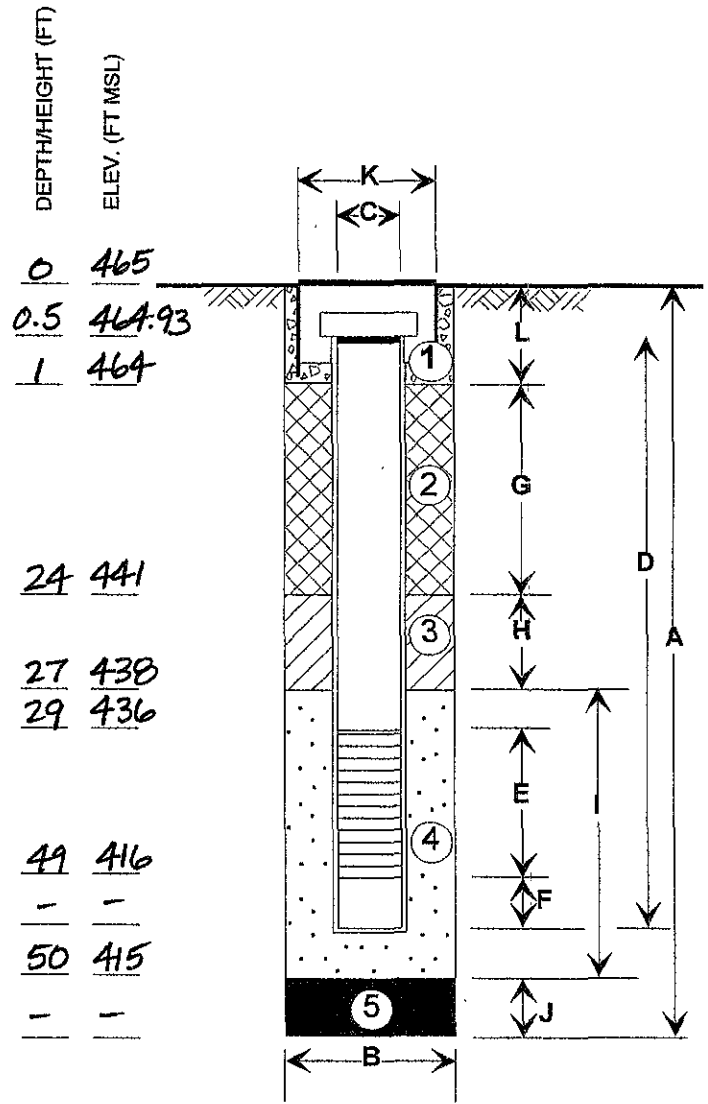
DIMENSIONS

A Total Depth of Boring (ft.)	<u>50</u>
B Borehole Diameter (in.)	<u>8</u>
C Well Casing Diameter (in.)	<u>2</u>
D Well Casing Length (ft.)	<u>49</u>
E Well Casing Slotted Interval (ft.)	<u>29-49</u>
F Well Casing End Cap or Sump (ft.)	<u>-</u>
G Annular Seal Interval (ft.)	<u>1-24</u>
H Annular Seal Interval (ft.)	<u>24-27</u>
I Sand Pack Interval (ft.)	<u>27-50</u>
J Bottom Material Interval (ft.)	<u>-</u>
K Protective Cover Diameter (in.)	<u>12</u>
L Monument Footing Interval (ft.)	<u>0-1</u>
Well Centralizer Depth(s) (ft.)	<u>-</u>

MATERIALS DATA

Monument Footing	①	<u>Concrete</u>
Annular Seal	②	<u>Cement</u>
Annular Seal	③	<u>Bentonite</u>
Sand Pack	④	<u>#3 Sand</u>
Bottom Material	⑤	<u>-</u>
Slotted Casing		<u>0.020" PVC</u>
Well Casing		<u>Sch.40 PVC</u>
Well Centralizers		<u>-</u>
Protective Cover		<u>Flush</u>

WELL DESIGNATION
MW-11



SECTION VIEW (not to scale)

NOTES:

SITE: B+C Gas Mini Mart
 PROJ. NO: BNC102
 N. E.
 WELL PERMIT NO: 99089

BORING DESIGNATION: MW-12

INSTALLATION

DATE: 6/23/99 BY: N. Bryson

DIMENSIONS

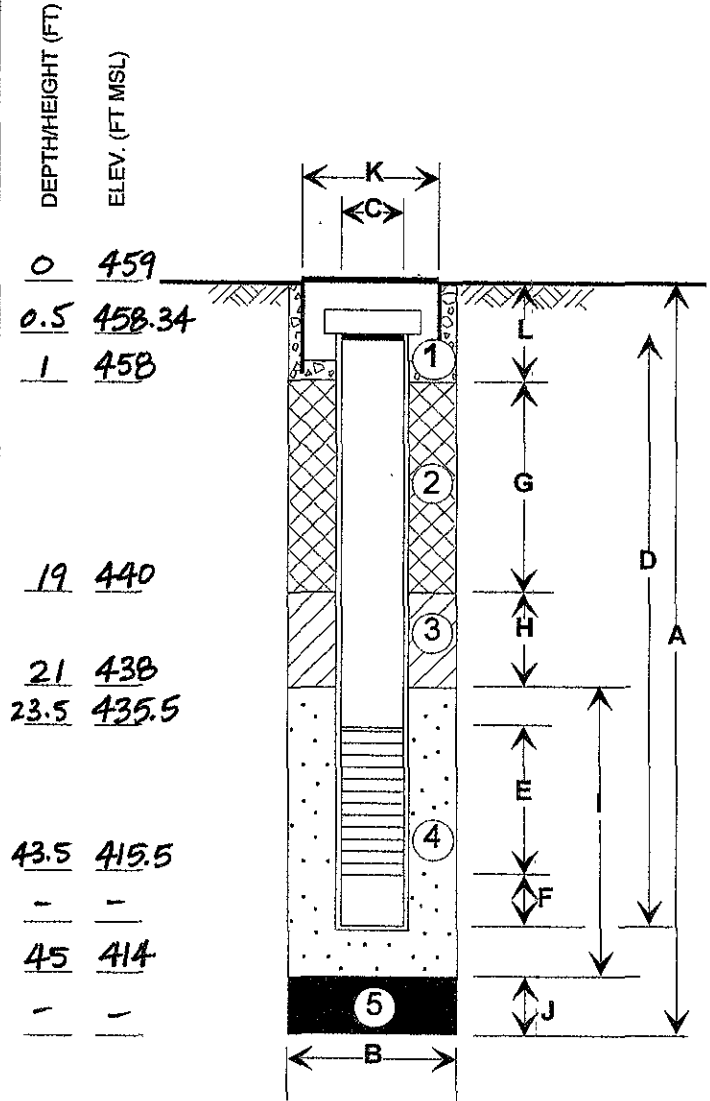
A Total Depth of Boring (ft.)	<u>45</u>
B Borehole Diameter (in.)	<u>8</u>
C Well Casing Diameter (in.)	<u>2</u>
D Well Casing Length (ft.)	<u>43.5</u>
E Well Casing Slotted Interval (ft.)	<u>23.5-43.5</u>
F Well Casing End Cap or Sump (ft.)	<u>-</u>
G Annular Seal Interval (ft.)	<u>1-19</u>
H Annular Seal Interval (ft.)	<u>19-21</u>
I Sand Pack Interval (ft.)	<u>21-45</u>
J Bottom Material Interval (ft.)	<u>-</u>
K Protective Cover Diameter (in.)	<u>12</u>
L Monument Footing Interval (ft.)	<u>0-1</u>
Well Centralizer Depth(s) (ft.)	<u>-</u>

MATERIALS DATA

Monument Footing	①	<u>Concrete</u>
Annular Seal	②	<u>Cement</u>
Annular Seal	③	<u>Bentonite</u>
Sand Pack	④	<u>#3 Sand</u>
Bottom Material	⑤	<u>-</u>
Slotted Casing		<u>0.020" PVC</u>
Well Casing		<u>Sch. 40 PVC</u>
Well Centralizers		<u>-</u>
Protective Cover		<u>Flush</u>

WELL DESIGNATION

MW-12



SECTION VIEW (not to scale)

NOTES:

SITE: B+C Gas Mini Mart
 PROJ. NO: BNC102
 N. E.
 WELL PERMIT NO: 99089



Hydrostratigraphic Profile

Boring No. MW-13
Well No. MW-13
Sheet 1 of 1

Site: Livermore
Client: BTC
Project No. BNC102
Date(s) Drilled: 7/2/99
Date(s) Well Installed: 7/2/99
Drilling Co./Driller: SPECTRUM

Ground Elev. 475.2
T.O.C. Elev. 474.79
Coordinates; N E:
Drilling Method: HSA
Borehole Total Depth (FT): 55'
Final Borehole Dia. (FI): 8"

Drilling Summary: _____

Well Depth (feet)	Sample Desig.	FID				Odor			Sample Type	Time Blows/Run	Recovery	Sample	Water Level	Depth (feet)	Graphics		Name & Unit	USCS	Color (Munsell)	Fines (%)			Fines Plasticity				Sand				Grvl.				Sorting				Hardness - Clays (Density - Sands)				Moisture			Remarks								
		N	F	M	S	N	F	M							S	20				40	60	80	L	M	H	F	M	C	F	C	very well	well	med.	poor	very poor	vat (v.b)	10 (h)	10 (m)	10 (s)	10 (c)	10 (d)	10 (w)	D	M	W									
		Sand & Grvl.	90	80	40	20	U	S							U	L				U	S	U	L	U	S	U	L	U	S	U	L	U	S	U	L	U	S	U	L	U	S	U	L	U	S		U	L	U					
0									0800				0																																									
30	3								CC 0845	↓																																				Gravel upto 2"								
35	3								CC 0900	↓																																												
38																																																						
40	3								CC 0915	↓																																												
45	3								CC 0925	↓																																												
50	3								CC 0935	↓																																												

0.010" SEAL #3 SAND

Background = 3

449. 11
S. 2-11

Logged by N. Bryson Checked by [Signature]

BORING DESIGNATION: MW-13

INSTALLATION

DATE: 7/2/99 BY: N. Bryson

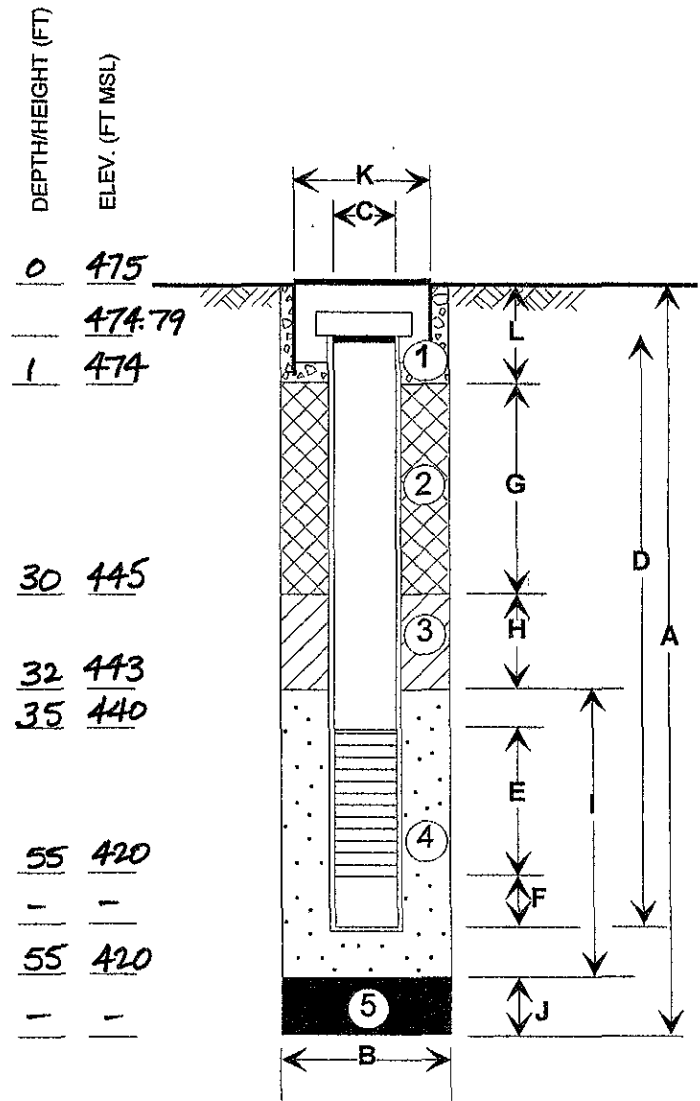
DIMENSIONS

A Total Depth of Boring (ft.)	<u>55</u>
B Borehole Diameter (in.)	<u>8</u>
C Well Casing Diameter (in.)	<u>2</u>
D Well Casing Length (ft.)	<u>55</u>
E Well Casing Slotted Interval (ft.)	<u>35-55</u>
F Well Casing End Cap or Sump (ft.)	<u>-</u>
G Annular Seal Interval (ft.)	<u>1-30</u>
H Annular Seal Interval (ft.)	<u>30-32</u>
I Sand Pack Interval (ft.)	<u>32-55</u>
J Bottom Material Interval (ft.)	<u>-</u>
K Protective Cover Diameter (in.)	<u>12</u>
L Monument Footing Interval (ft.)	<u>0-1</u>
Well Centralizer Depth(s) (ft.)	<u>-</u>

MATERIALS DATA

Monument Footing	①	<u>Concrete</u>
Annular Seal	②	<u>Cement</u>
Annular Seal	③	<u>Bentonite</u>
Sand Pack	④	<u>#3 Sand</u>
Bottom Material	⑤	<u>-</u>
Slotted Casing		<u>0.020" PVC</u>
Well Casing		<u>Sch. 40 PVC</u>
Well Centralizers		<u>-</u>
Protective Cover		<u>Flush</u>

WELL DESIGNATION
MW-13



SECTION VIEW (not to scale)

NOTES:

SITE: B+C Gas Mini Mart
 PROJ. NO: BNC 102
 N. E.
 WELL PERMIT NO: 99089

BORING DESIGNATION: D-1

INSTALLATION
DATE: 6/25/99 BY: N. Bryson

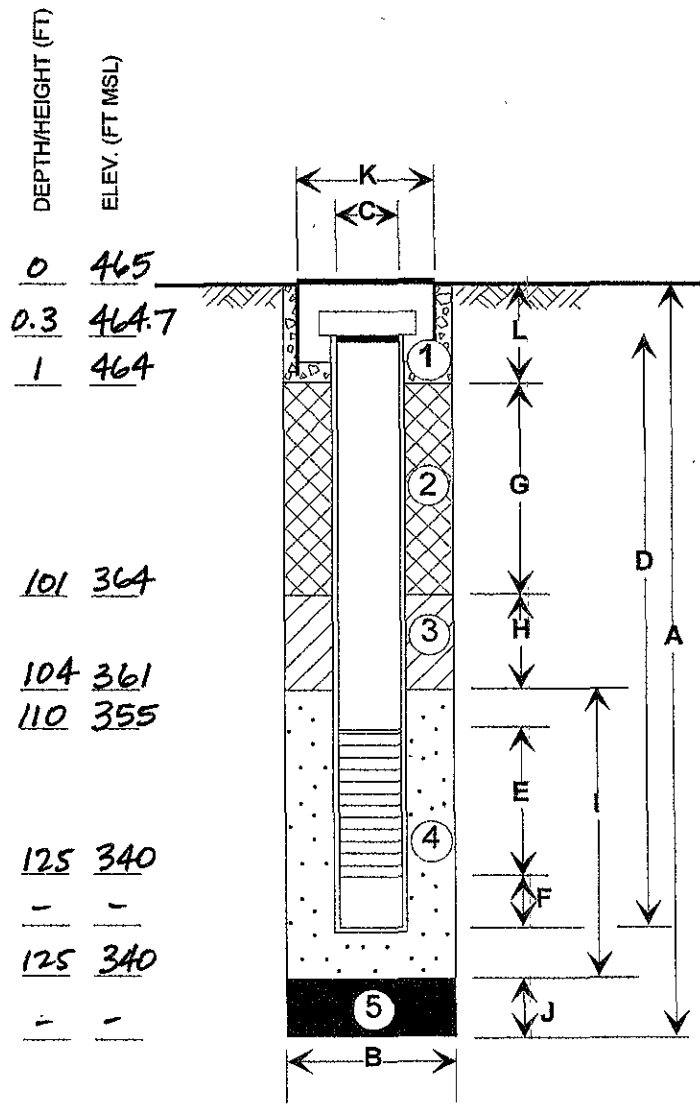
DIMENSIONS

A Total Depth of Boring (ft.)	<u>125</u>
B Borehole Diameter (in.)	<u>8</u>
C Well Casing Diameter (in.)	<u>2</u>
D Well Casing Length (ft.)	<u>125</u>
E Well Casing Slotted Interval (ft.)	<u>110-125</u>
F Well Casing End Cap or Sump (ft.)	<u>-</u>
G Annular Seal Interval (ft.)	<u>1-101</u>
H Annular Seal Interval (ft.)	<u>101-104</u>
I Sand Pack Interval (ft.)	<u>104-125</u>
J Bottom Material Interval (ft.)	<u>-</u>
K Protective Cover Diameter (in.)	<u>12</u>
L Monument Footing Interval (ft.)	<u>0-1</u>
Well Centralizer Depth(s) (ft.)	<u>-</u>

MATERIALS DATA

Monument Footing	①	<u>Concrete</u>
Annular Seal	②	<u>Cement</u>
Annular Seal	③	<u>Bentonite</u>
Sand Pack	④	<u>#3 Sand</u>
Bottom Material	⑤	<u>-</u>
Slotted Casing		<u>0.020" PVC</u>
Well Casing		<u>Sch. 40 PVC</u>
Well Centralizers		<u>-</u>
Protective Cover		<u>Flush</u>

WELL DESIGNATION
D-1



SECTION VIEW (not to scale)

NOTES:

SITE: B+C Gas Mini Mart
 PROJ. NO: BNC102
 N. E.
 WELL PERMIT NO: 99089

BORING DESIGNATION: D-2

INSTALLATION

DATE: 6/28/99 BY: N. Bryson

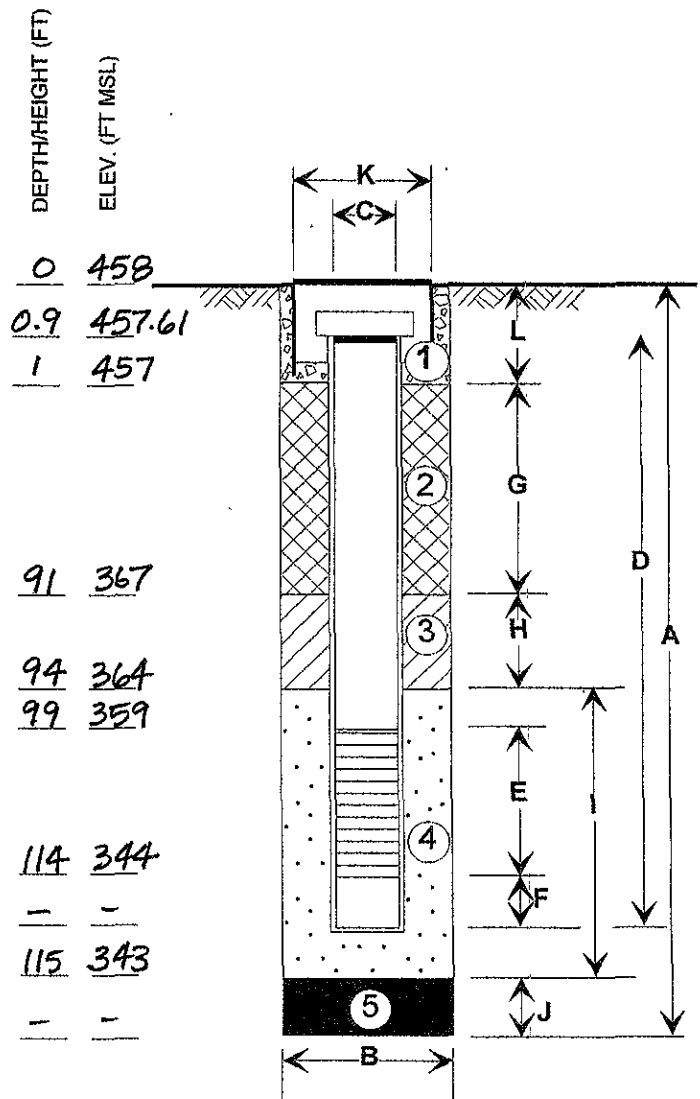
DIMENSIONS

A Total Depth of Boring (ft.)	<u>115</u>
B Borehole Diameter (in.)	<u>8</u>
C Well Casing Diameter (in.)	<u>2</u>
D Well Casing Length (ft.)	<u>114</u>
E Well Casing Slotted Interval (ft.)	<u>99-114</u>
F Well Casing End Cap or Sump (ft.)	<u>-</u>
G Annular Seal Interval (ft.)	<u>1-91</u>
H Annular Seal interval (ft.)	<u>91-94</u>
I Sand Pack Interval (ft.)	<u>94-115</u>
J Bottom Material Interval (ft.)	<u>-</u>
K Protective Cover Diameter (in.)	<u>12</u>
L Monument Footing Interval (ft.)	<u>0-1</u>
Well Centralizer Depth(s) (ft.)	<u>-</u>

MATERIALS DATA

Monument Footing	①	<u>Concrete</u>
Annular Seal	②	<u>Cement</u>
Annular Seal	③	<u>Bentonite</u>
Sand Pack	④	<u>#3 Sand</u>
Bottom Material	⑤	<u>-</u>
Slotted Casing		<u>0.020" PVC</u>
Well Casing		<u>Sch. 40 PVC</u>
Well Centralizers		<u>-</u>
Protective Cover		<u>Flush</u>

WELL DESIGNATION
D-2



SECTION VIEW (not to scale)

NOTES:

SITE: B+C Gas Mini Mart
 PROJ. NO: BNC102
 N. E.
 WELL PERMIT NO: 99089

LOCATION: BAND BIC GAS Minimart
PROJECT NO: BNC102
CLIENT: BIG GAMMI MART
SAMPLE TYPE: Groundwater l Surface Water _____
CASING DIAMETER (OD-inches): 3/4 1 2 4 4.5 6 8
GALLONS PER LINEAR FOOT: (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

SAMPLE ID: MW-7
SAMPLED BY: RPAWK
REGULATORY AGENCY: _____
Leachate _____ Treatment Effluent _____ Other _____

Well Total Depth (ft): 49.4 Volume in Casing (gal): 3.7
Depth to Water (ft): 20.05 Calculated Purge (volumes / gal.): 10.9
Height of Water Column (ft): 21.35 Actual Pre-Sampling Purge (gal): 11.0

PURGE:
Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump (39')
S.S. Bailer _____ Teflon Bailer _____ PVC Bailer _____ Disposable Bailer _____ Other _____
Purge Water Containment: drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB- _____ FB- _____ Other _____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Specific Conductance		pH (std. units)	Color (visual)	Turbidity (visual)	Observation
			Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1240</u>	<u>4.0</u>	<u>20.5</u>	<u>1000</u>	/	<u>7.10</u>	<u>Whitish</u>	<u>high</u>	
<u>1243</u>	<u>7.5</u>	<u>20.42</u>	<u>1000</u>	/	<u>7.10</u>	<u>↓</u>	<u>↓</u>	
<u>1245</u>	<u>11.0</u>	<u>20.1</u>	<u>1070</u>	/	<u>7.19</u>	<u>↓</u>	<u>↓</u>	

Purge Date: 7/1/99

SAMPLE:
Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump _____
Teflon Bailer _____ PVC Bailer _____ Disposable Bailer l Other _____

Time (2400 Hr)	Temp. (°C)	Specific Conductance		pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)
		Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1255</u>	<u>20.7</u>	<u>1000</u>	/	<u>7.10</u>	<u>3.79</u>	<u>Whitish</u>	<u>>999</u>

Sheen: none Odor: moderate Sample Date: 7/1/99

Field Measurement Devices: Horiba l Omega _____ QuickCheck _____ D.O. Test Kit _____

REMARKS: _____

Calibrated meter 1140, 7/1/99: pH: 7.01, 4.01; EC: 0.206; turb: 0; DO: auto; T: 20.7°C

SIGNATURE: [Signature] DATE: 7/1/99

WELL DEVELOPMENT FORM

Conor Pacific/EFW

Project No.: BNC102	Date: 7/1/99
Site Location: BIC Gas Mini Mart	Well: MW-7
Name: EFW	Diameter: 2"
Development Method: milk hand pump	Initial DTW: 20.05'
Total Water Removed: 20.0 gal	Final DTW: 20.6'
Water Contained? drummed	Initial TD: 49.4'
Important! Estimate of specific capacity or recharge to well:	Final TD: 49.4'

Time	Volume (gal.)	Sand/Silt (ml/1000ml)	Temp (°C)	EC (µS/cm)	pH	DTW (feet)	Turbidity (NTU/vis)	Appearance/Comments
1152	20.0		21.7	1050	7.11		Very high	moderate odor
1159	30.0	250 silt	20.9	1070	7.17		↓	↓
1200	45.0		20.5	1070	7.17		↓	
1214	60.0		20.7	1070	7.16			
1220	75.0	~100 silt	20.3	1070	7.17		high	↓

- bailed from bottom of well to surge and remove sand/silt: 10 gal.
- hand pumped from bottom of well to remove sand: 20 gal
- hand pumped from ~44': 30 gal
- hand pumped from ~39': 20 gal - includes purge prior to sampling.

LOCATION: B&C Gas Mini Mart SAMPLE ID: MW-8
 PROJECT NO: BNC102 SAMPLED BY: R Paine
 CLIENT: B&C Gas Mini Mart REGULATORY AGENCY: _____
 SAMPLE TYPE: Groundwater Surface Water _____ Leachate _____ Treatment Effluent _____ Other _____
 CASING DIAMETER (OD-inches): 3/4 _____ 1 _____ 2" _____ 4 _____ 4.5 _____ 6 _____ 8 _____
 GALLONS PER LINEAR FOOT: (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 54.0 Volume in Casing (gal): 3.7
 Depth to Water (ft): 32.70 Calculated Purge (volumes / gal.): 10.9
 Height of Water Column (ft): 21.22 Actual Pre-Sampling Purge (gal): 12.0

PURGE:
 Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump (44')
 S.S. Bailer _____ Teflon Bailer _____ PVC Bailer _____ Disposable Bailer _____ Other _____
 Purge Water Containment: drummed
 Field QC Samples Collected at this Well (Equipment or Field Blank): EB- _____ FB- _____ Other _____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Specific Conductance		pH (std. units)	Color (visual)	Turbidity (visual)	Observation
			Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1212</u>	<u>4.0</u>	<u>20.4</u>	<u>1020</u>	/	<u>7.02</u>	<u>lt. brown</u>	<u>high</u>	
<u>1215</u>	<u>8.0</u>	<u>20.3</u>	<u>1030</u>	/	<u>7.01</u>	↓	↓	
<u>1210</u>	<u>12.0</u>	<u>20.2</u>	<u>1030</u>	/	<u>7.00</u>	↓	↓	
Purge Date: <u>6/24/99</u>								

SAMPLE:
 Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump _____
 Teflon Bailer _____ PVC Bailer _____ Disposable Bailer Other _____

Time (2400 Hr)	Temp. (°C)	Specific Conductance		pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)
		Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1220</u>	<u>20.0</u>	<u>1040</u>	/	<u>7.05</u>	<u>2.14</u>	<u>lt. brown</u>	<u>>999</u>
Sheen: <u>none</u> Odor: <u>none</u> Sample Date: <u>6/24/99</u>							

Field Measurement Devices: Horiba Omega _____ QuickCheck _____ D.O. Test Kit _____
 REMARKS: Well developed 6/24/99.

Calibrated meter 1100, 6/24/99: pH 7.00, 4.00; EC: 0.200; turb: 0; DO: auto; T: 24.5°C

SIGNATURE: [Signature] DATE: 6/24/99

WELL DEVELOPMENT FORM
 EINARSON, FOWLER & WATSON

Project No. BNC102 Date: 11/24/99
 Site Location: LVMORE Well: VW-10
 Name: Frank Well Diameter: 2"
 Development Method: bailed hand pump Initial DTW: 32.70
 Total Water Removed: 102 gal Final DTW: 33.55'
 Water Contained? drummed Initial TD: 30.7'
 Important! Estimate of specific capacity or recharge to well: Final TD: 5A.0
twb

Time	Com. Vol. Removed	Sand/Silt (ml/1,000ml)	Temp	EC	pH	DTW (FOC)	Appearance/Comments
1106	30.0	~500	21.1	1070	6.95	7999	brown
1121	45.0		20.6	1030	7.05		
1131	60.0	~50	20.2	1030	7.00		ll. brown
1150	75.0		20.2	1030	6.99		
1201	90.0	< 10	20.2	1030	7.00		

- bailed from bottom to remove silt/sand : 15 gal
- hand pumped from bottom to remove all sand, hard bottom feet : 5 gal
- hand pumped from ~ 49' : ~ 40 gal.
- hand pumped from ~ 44' : 30 gal.
- hand pumped purge : 12 gal

LOCATION: BIG GAS mini mart
 PROJECT NO: BNC103
 CLIENT: BIG GAS mini mart
 SAMPLE TYPE: Groundwater l Surface Water _____
 CASING DIAMETER (OD-inches): 3/4 _____ 1 _____ 2 _____ 4 _____ 4.5 _____ 6 _____ 8 _____
 GALLONS PER LINEAR FOOT: (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

SAMPLE ID: MW-9
 SAMPLED BY: R.P.W.
 REGULATORY AGENCY: _____
 Leachate _____ Treatment Effluent _____ Other _____

Well Total Depth (ft): 44.1 Volume in Casing (gal): 2.4
 Depth to Water (ft): 30.24 Calculated Purge (volumes / gal.): 7.1
 Height of Water Column (ft): 13.86 Actual Pre-Sampling Purge (gal): 9.0

PURGE:
 Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump (37')
 S.S. Bailer _____ Teflon Bailer _____ PVC Bailer _____ Disposable Bailer _____ Other _____
 Purge Water Containment: drummed
 Field QC Samples Collected at this Well (Equipment or Field Blank): EB- _____ FB- _____ Other _____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Specific Conductance		pH (std. units)	Color (visual)	Turbidity (visual)	Observation
			Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1031</u>	<u>2.0</u>	<u>19.4</u>	<u>1050</u>	/	<u>7.22</u>	<u>h. brown</u>	<u>high</u>	
<u>1033</u>	<u>0.0</u>	<u>19.7</u>	<u>1050</u>	/	<u>7.19</u>	↓		
<u>1036</u>	<u>0.0</u>	<u>19.6</u>	<u>1050</u>	/	<u>7.21</u>	↓		

Purge Date: 4/24/99

SAMPLE:
 Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump _____
 Teflon Bailer _____ PVC Bailer _____ Disposable Bailer l Other _____

Time (2400 Hr)	Temp. (°C)	Specific Conductance		pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)
		Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1046</u>	<u>19.4</u>	<u>1040</u>	/	<u>7.19</u>	<u>3.98</u>	<u>h. brown</u>	<u>7999</u>

Sheen: none Odor: none Sample Date: 4/24/99

Field Measurement Devices: Horiba l Omega _____ QuickCheck _____ D.O. Test Kit _____

REMARKS: Developed 4/24/99.

SIGNATURE: R.P.W. DATE: 4/24/99

WELL DEVELOPMENT FORM
EINARSON, FOWLER & WATSON

Project No. BNC 107	Date: 4/24
Site Location: BNC Gas Mini Mart	Well: MW-4
Name: Ryan	Depth/Diameter: 2
Development Method: water hand pump	Initial DTW: 30.24
Total Water Removed: 74.0 gal	Final DTW: 33.22
Water Contained? drummed	Hydco #: Initial TD: 41.7
Important! Estimate of specific capacity or recharge to well:	Final TD: 44.1

Time	Cum. Vol. Removed	Sand/Silt (ml/1,000ml)	Temp	EC	pH	DTW (TOC)	Appearance/Comments
7:45	15.0	~50 sand / 150 silt	21.6	1120	7.27		4.6 grams
10:00	30.0		20.3	1080	7.30		
10:13	45.0		19.9	1080	7.21		
10:24	65.0						
10:24	74.0	~150	19.5	1050	7.21		

- bailed from bottom of well to remove sand/silt, surge well: 10 gal.
- hand pumped from bottom of well, removed remainder sand: 25 gal
- hand pumped from ~37' : 30 gal.
- hand pumped purge: 9 gal

LOCATION: B&C Gas Mini Mart SAMPLE ID: MW-10
 PROJECT NO: BN102 SAMPLED BY: EVAN
 CLIENT: B&C Gas Mini Mart REGULATORY AGENCY: _____
 SAMPLE TYPE: Groundwater ✓ Surface Water _____ Leachate _____ Treatment Effluent _____ Other _____
 CASING DIAMETER (OD-inches): 3/4 _____ 1 _____ 2 ✓ 4 _____ 4.5 _____ 6 _____ 8 _____
 GALLONS PER LINEAR FOOT: (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 54.1 Volume in Casing (gal): 35
 Depth to Water (ft): 33.74 Calculated Purge (volumes / gal.): 10.4
 Height of Water Column (ft): 20.36 Actual Pre-Sampling Purge (gal): 12.0

PURGE:
 Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump (44')
 S.S. Bailer _____ Teflon Bailer _____ PVC Bailer _____ Disposable Bailer _____ Other _____
 Purge Water Containment: drummed
 Field QC Samples Collected at this Well (Equipment or Field Blank): EB- _____ FB- _____ Other _____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Specific Conductance		pH (std. units)	Color (visual)	Turbidity (visual)	Observation	
			Horiba (µmhos/cm)	QuickCheck (µS)					
1535	4.0	19.8	1000	/	6.92	lt. brown	moderate		
1538	8.0	19.8	1010	/	6.92	↓	↓		
1540	12.0	19.7	1010	/	6.93	↓	↓		
						Purge Date:	<u>6/24/99</u>		

SAMPLE:
 Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump _____
 Teflon Bailer _____ PVC Bailer _____ Disposable Bailer ✓ Other _____

Time (2400 Hr)	Temp. (°C)	Specific Conductance		pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)
		Horiba (µmhos/cm)	QuickCheck (µS)				
1550	20.2	1050	/	6.94	2.92	lt. brown	7909
Sheen: <u>none</u> Odor: <u>none</u> Sample Date: <u>6/24/99</u>							

Field Measurement Devices: Horiba ✓ Omega _____ QuickCheck _____ D.O. Test Kit _____

REMARKS: Developed 6/24/99.

SIGNATURE: [Signature] DATE: 6/24/99

Project No. <u>BNC107</u>	Date: <u>4/22/99</u>
Site Location: <u>Big Gas Mini Mart</u>	Well: <u>MW-10</u>
Name: <u>PLANK</u>	Depth/Diameter: <u>7</u>
Development Method: <u>bailed, hand pump</u>	Initial DTW: <u>33.74</u>
Total Water Removed: <u>100 92.0 gal</u>	Final DTW: <u>33.95</u>
Water Contained? <u>skipped</u>	Hydac #: <u>Initial TD: 52.0</u>
Important! Estimate of specific capacity or recharge to well:	<u>Final TD: 54.1</u>

Time	Cum. Vol. Removed	Sand/Silt (ml/l; 100ml)	Temp	EC	pH	DTW (TOC)	Appearance/Comments
1400	15.0		21.9	1050	6.90		lt. brown
1444	30.0	<u>50 sand, 400 silt</u>	21.0	1020	6.80		removed sand from bottom
1454	45.0		20.4	1020	6.91		almost all sand gone from bottom
1504	60.0	<u>~100</u>	20.0	1020	6.93		
1520	60.0	<u>~250</u>	20.5	1.01	6.95		

- bailed from bottom of well. to remove sand/silt and surge: 10 gal
- hand pumped from ~ bottom to remove more remainder of sand: ~~10~~ 35 gal
- hand pumped from ~ 49' : 20 gal.
- hand pumped from ~ 44' : 15 gal.
- hand pumped purge: 12 gal

LOCATION: B&C Gas minimart
 PROJECT NO: BN1002
 CLIENT: B&C Gas minimart

SAMPLE ID: MW-11
 SAMPLED BY: TPM
 REGULATORY AGENCY: _____

SAMPLE TYPE: Groundwater ✓ Surface Water _____ Leachate _____ Treatment Effluent _____ Other _____
 CASING DIAMETER (OD-inches): 3/4 _____ 1 _____ 2 ✓ 4 _____ 4.5 _____ 6 _____ 8 _____
 GALLONS PER LINEAR FOOT: (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 49.2 Volume in Casing (gal): 3.2
 Depth to Water (ft): 30.55 Calculated Purge (volumes / gal.): 9.6
 Height of Water Column (ft): 10.5 Actual Pre-Sampling Purge (gal): 10.5

PURGE:
 Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump (39')
 S.S. Bailer _____ Teflon Bailer _____ PVC Bailer _____ Disposable Bailer _____ Other _____
 Purge Water Containment: covered
 Field QC Samples Collected at this Well (Equipment or Field Blank): EB- _____ FB- _____ Other _____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Specific Conductance		pH (std. units)	Color (visual)	Turbidity (visual)	Observation
			Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1342</u>	<u>3.5</u>	<u>21.3</u>	<u>1000</u>	/	<u>7.00</u>	<u>High turb</u>	<u>high</u>	
<u>1345</u>	<u>7.0</u>	<u>21.2</u>	<u>1000</u>	/	<u>7.04</u>	<u>↓</u>	<u>↓</u>	
<u>1347</u>	<u>10.5</u>	<u>20.8</u>	<u>1000</u>	/	<u>7.05</u>	<u>↓</u>	<u>↓</u>	

Purge Date: 6/20/99

SAMPLE:
 Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump _____
 Teflon Bailer _____ PVC Bailer _____ Disposable Bailer ✓ Other _____

Time (2400 Hr)	Temp. (°C)	Specific Conductance		pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)
		Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1430</u>	<u>22.9</u>	<u>1000</u>	/	<u>7.05</u>	<u>3.37</u>	<u>High turb</u>	<u>7999</u>

Sheen: none Odor: none Sample Date: 6/20/99

Field Measurement Devices: Horiba ✓ Omega _____ QuickCheck _____ D.O. Test Kit _____

REMARKS: Well developed 6/20/99.

Calibrated meter 1435, 6/20/99: pH: 7.00, 4.00; EC: 0.200; turb: 0; DO: auto; T: 24.50

SIGNATURE: [Signature] DATE: 6/20/99

WELL DEVELOPMENT FORM

Conor Pacific/EFW

Project No.: BNC102	Date: 0/20/99
Site Location: B9CGas MiniMant	Well: MW-11
Name: RANK	Diameter: 2
Development Method: hand pump	Initial DTW: 30.55
Total Water Removed: Normal, 25 gal, 25.5 gal	Final DTW: 30.7
Water Contained? drummed	Initial TD: 47.1
Important! Estimate of specific capacity or recharge to well:	Final TD: 49.2

Time	Volume (gal.)	Sand/Silt (ml/100ml)	Temp (°C)	EC (µS/cm)	pH	DTW (feet)	Turbidity (NTU/vis.)	Appearance/Comments
1245	15.0	0 sand, 50 silt	24.3	1040	7.00		very high	lt. brown
1257	30.0		21.5	1020	7.05		↓	
1307	45.0		20.9	1020	7.07		↓	
1321	60.0	~100 silt	21.1	1010	7.03		high	
1334	75.0		20.9	1000	7.03		↓	

- hand bailed from bottom of well to surge and remove sand/silt: 10 gal.
- hand pumped from ~ bottom of well to remove sand: 35 gal.
- hand pumped from ~ 44' : 15 gal
- hand pumped from ~ 39' : 15 gal
- additional 10.5 gal hand pumped purge from ~ 39' : 10.5 gal.

LOCATION: B+C Gas Mini Mart
 PROJECT NO: BNC 102
 CLIENT: B+C Gas Mini Mart
 SAMPLE TYPE: Groundwater Surface Water
 CASING DIAMETER (OD-inches): 3/4 1 2 1/4 4 4.5 6 8
 GALLONS PER LINEAR FOOT: (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

SAMPLE ID: MW-12
 SAMPLED BY: P. Paine
 REGULATORY AGENCY: _____
 Leachate Treatment Effluent Other

Well Total Depth (ft): 43.4 Volume in Casing (gal): 3.2
 Depth to Water (ft): 24.00 Calculated Purge (volumes / gal.): 9.5
 Height of Water Column (ft): 10.52 Actual Pre-Sampling Purge (gal): 11.0

PURGE:
 Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump (34')
 S.S. Bailer _____ Teflon Bailer _____ PVC Bailer _____ Disposable Bailer _____ Other _____
 Purge Water Containment: drummed
 Field QC Samples Collected at this Well (Equipment or Field Blank): EB- _____ FB- _____ Other _____

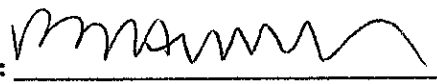
Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Specific Conductance		pH (std. units)	Color (visual)	Turbidity (visual)	Observation
			Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1657</u>	<u>4.0</u>	<u>20.2</u>	<u>1010</u>	/	<u>6.84</u>	<u>H. brown</u>	<u>high</u>	
<u>1700</u>	<u>7.5</u>	<u>20.2</u>	<u>1010</u>	/	<u>6.86</u>	↓	↓	
<u>1702</u>	<u>11.0</u>	<u>20.2</u>	<u>1010</u>	/	<u>6.89</u>	↓	↓	
Purge Date: <u>6/20/99</u>								

SAMPLE:
 Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump _____
 Teflon Bailer _____ PVC Bailer _____ Disposable Bailer Other _____

Time (2400 Hr)	Temp. (°C)	Specific Conductance		pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)
		Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1715</u>	<u>20.7</u>	<u>1020</u>	/	<u>6.91</u>	<u>4.96</u>	<u>H. brown</u>	<u>7999</u>
Sheen: <u>None</u> Odor: <u>None</u> Sample Date: <u>6/20/99</u>							

Field Measurement Devices: Horiba Omega QuickCheck D.O. Test Kit

REMARKS: Well developed 6/20/99.

SIGNATURE:  DATE: 6/20/99

WELL DEVELOPMENT FORM
 Conor Pacific/EFW

Project No.: BNC102	Date: 6/28/99
Site Location: B&C Gas mini mart	Well: MW-12
Name: Zank	Diameter: 2'
Development Method: bail, hand pump	Initial DTW: 24.00
Total Water Removed: 81.0 gal	Final DTW: 25.0
Water Contained? drummed	Initial TD: 42.7
Important! Estimate of specific capacity or recharge to well:	Final TD: 43.4

Time	Volume (gal.)	Sand/Silt (ml/1000ml)	Temp (°C)	EC (µS/cm)	pH	DTW (feet)	Turbidity (NTU/vis)	Appearance/Comments
11:10	15.0	~700 silt, 50 sm	22.9	990	6.43	NM	very high	1.6 dam
11:15	30.0		21.0	1020	6.42	↓	↓	
11:33	45.0		20.4	1020	6.43	↓		
11:42	60.0		20.6	1020	6.44	↓	high	
11:50	76.0	~150 silt	20.4	1020	6.44	↓	↓	

- bailed from bottom of well to remove sand/silt and to surge: 10 gal.
- hand pumped from ~bottom of well to remove sand/silt: 30 gal
- hand pumped from ~39': 20 gal
- hand pumped from ~34': 10 gal
- hand pumped from ~34' to purge: 11 gal

LOCATION: B&C Gas Mini Mart SAMPLE ID: MW-13
PROJECT NO: BN0102 SAMPLED BY: R PANK
CLIENT: B&C Gas Mini Mart REGULATORY AGENCY: _____
SAMPLE TYPE: Groundwater Surface Water _____ Leachate _____ Treatment Effluent _____ Other _____
CASING DIAMETER (OD-inches): 3/4 1 2 4 4.5 6 8
GALLONS PER LINEAR FOOT: (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 54.5 Volume in Casing (gal): 4.1
Depth to Water (ft): 30.71 Calculated Purge (volumes / gal.): 12.2
Height of Water Column (ft): 23.79 Actual Pre-Sampling Purge (gal): 15.0

PURGE:

Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump (45')
S.S. Bailer _____ Teflon Bailer _____ PVC Bailer _____ Disposable Bailer _____ Other _____
Purge Water Containment: drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB- _____ FB- _____ Other _____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Specific Conductance		pH (std. units)	Color (visual)	Turbidity (visual)	Observation
			Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1329</u>	<u>5.0</u>	<u>21.2</u>	<u>1080</u>	/	<u>7.13</u>	<u>lt. brown</u>	<u>high</u>	
<u>1332</u>	<u>10.0</u>	<u>20.3</u>	<u>1080</u>	/	<u>7.11</u>	<u>↓</u>	<u>↓</u>	
<u>1334</u>	<u>15.0</u>	<u>20.2</u>	<u>1080</u>	/	<u>7.11</u>	<u>↓</u>	<u>↓</u>	

Purge Date: 7/12/99

SAMPLE:

Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump _____
Teflon Bailer _____ PVC Bailer _____ Disposable Bailer Other _____

Time (2400 Hr)	Temp. (°C)	Specific Conductance		pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)	Odor
		Horiba (µmhos/cm)	QuickCheck (µS)					
<u>1344</u>	<u>20.9</u>	<u>1080</u>	/	<u>7.13</u>	<u>1.02</u>	<u>lt. brown</u>	<u>> 999</u>	<u>slight</u>

Sheen: none Odor: slight Sample Date: 7/12/99

Field Measurement Devices: Horiba Omega _____ QuickCheck _____ D.O. Test Kit _____

REMARKS: Developed 7/12/99.

SIGNATURE: [Signature] DATE: 7/12/99

WELL DEVELOPMENT FORM

Conor Pacific/EFW

Project No.: <u>BN102</u>	Date: <u>7/12/99</u>
Site Location: <u>B&C Gas Mini Mart</u>	Well: <u>WW-13</u>
Name: <u>TZ PAUL</u>	Diameter: <u>2"</u>
Development Method: <u>bailed hand pump</u>	Initial DTW: <u>30.71</u>
Total Water Removed: <u>80 gal</u>	Final DTW: <u>30.74</u>
Water Contained? <u>drummed</u>	Initial TD: <u>54.7</u>
Important! Estimate of specific capacity or recharge to well:	Final TD: <u>54.5'</u>

Time	Volume (gal.)	Sand/Silt (ml/1000ml)	Temp. (°C)	EC (µS/cm)	pH	DTW (feet)	Turbidity (NTU/vis)	Appearance/Comments
1237	15.0		22.5	1040	7.10		very high	lt. brown, lt. odor
1240	30.0	~400 silt	21.3	1040	7.14		↓	
1250	45.0		20.0	1080	7.14		↓	
1309	55.0		21.0	1070	7.14		high	
1310	65.0	~50 silt	21.1	1080	7.15		↓	

- bailed 7 gal from bottom of well to remove sand and surge well: 7 gal
- hand pumped from bottom of well to remove sand : 0 gal
- hand pumped from ~ 53' : 10 gal
- hand pumped from ~ 50' : 20 gal
- hand pumped from ~ 45' : 20 gal
- hand pumped purge from 45' : 15 gal.

LOCATION: BIG GAS Mini Mart
 PROJECT NO: BNC002
 CLIENT: BIG GAS Mini Mart
 SAMPLE TYPE: Groundwater Surface Water _____ Leachate _____ Treatment Effluent _____ Other _____
 CASING DIAMETER (OD-inches): 3/4 _____ 1 _____ 2 l 4 _____ 4.5 _____ 6 _____ 8 _____
 GALLONS PER LINEAR FOOT: (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

SAMPLE ID: D1
 SAMPLED BY: BRANK
 REGULATORY AGENCY: _____

Well Total Depth (ft): 124.3 Volume in Casing (gal): 15.2
 Depth to Water (ft): 35.29 Calculated Purge (volumes / gal.): 45.4
 Height of Water Column (ft): 89.01 Actual Pre-Sampling Purge (gal): 45.0

PURGE:
 Device (Depth of Intake from TOC): Submersible Pump 2" (40') Peristaltic Pump _____ PVC Hand Pump _____
 S.S. Bailer _____ Teflon Bailer _____ PVC Bailer _____ Disposable Bailer _____ Other _____
 Purge Water Containment: drummed
 Field QC Samples Collected at this Well (Equipment or Field Blank): EB- _____ FB- _____ Other _____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Specific Conductance		pH (std. units)	Color (visual)	Turbidity (visual)	Observation
			Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1128</u>	<u>15.0</u>	<u>20.8</u>	<u>910</u>	/	<u>7.14</u>	<u>lt. brown</u>	<u>high</u>	
<u>1137</u>	<u>30.0</u>	<u>21.2</u>	<u>910</u>	/	<u>7.15</u>	<u>↓</u>	<u>↓</u>	
<u>1145</u>	<u>45.0</u>	<u>21.0</u>	<u>910</u>	/	<u>7.22</u>	<u>↓</u>	<u>↓</u>	

Purge Date: 6/29/99

SAMPLE:
 Device (Depth of Intake from TOC): Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump _____
 Teflon Bailer _____ PVC Bailer _____ Disposable Bailer Other _____

Time (2400 Hr)	Temp. (°C)	Specific Conductance		pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)
		Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1159</u>	<u>20.7</u>	<u>920</u>	/	<u>7.31</u>	<u>0.17</u>	<u>lt. brown</u>	<u>>999</u>

Sheen: none Odor: none Sample Date: 6/29/99

Field Measurement Devices: Horiba Omega _____ QuickCheck _____ D.O. Test Kit _____
 REMARKS: Well developed 6/29/99. Pumped US gal prior to purge.

SIGNATURE: [Signature] DATE: 6/29/99

WELL DEVELOPMENT FORM

Conor Pacific/EFW

Project No.: <u>BNC102</u>	Date: <u>6/29/99</u>
Site Location: <u>B&C Gas Mini Mart</u>	Well: <u>D-1</u>
Name: <u>EPW</u>	Diameter: <u>2"</u>
Development Method: <u>Surge block, bailer, sub. pump.</u>	Initial DTW: <u>35.29</u>
Total Water Removed: <u>110 gal</u>	Final DTW: <u>32.5</u>
Water Contained? <u>drummed</u>	Initial TD: <u>112.2</u>
Important! Estimate of specific capacity or recharge to well:	Final TD: <u>124.3</u>

Time	Volume (gal.)	Sand/Silt (ml/1000ml)	Temp (°C)	EC (µS/cm)	pH	DTW (feet)	Turbidity (NTU/VIS)	Appearance/Comments
11004	30.0		23.0	950	7.51	30.4	Very high	lt. brown
11013	45.0		21.3	920	7.13		↓	
11022	60.0	~100 silt, 20 sand	21.0	920	7.17		↓	most sand removed
11029	75.0		20.8	910	7.14		high	
11037	95.0		21.2	910	7.15	34.1	↓	
11045	110.0	~80 silt	21.0	910	7.21		↓	

- Surged using steel surge block, baiting well: 15 min.
- bailed from bottom of well to remove sand, silt: 6 gal.
- pumped from various depths, surging with pump in screens: 59 gal
- began purge, continue development pumping from ~110' for: 15 gal
- continue purge pumping from ~40' : 30 gal

LOCATION: BIG Gas Mini Mart
 PROJECT NO: BNC102
 CLIENT: BIG Gas Mini Mart

SAMPLE ID: D-2
 SAMPLED BY: RPMK
 REGULATORY AGENCY: _____

SAMPLE TYPE: Groundwater Surface Water _____ Leachate _____ Treatment Effluent _____ Other _____
 CASING DIAMETER (OD-inches): 3/4 _____ 1 _____ 2 1/2 4 _____ 4.5 _____ 6 _____ 8 _____
 GALLONS PER LINEAR FOOT: (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 112.9 Volume in Casing (gal): 14.3
 Depth to Water (ft): 20.91 Calculated Purge (volumes / gal.): 42.9
 Height of Water Column (ft): 03.99 Actual Pre-Sampling Purge (gal): 15.0

PURGE:
 Device (Depth of Intake from TOC): 2" Submersible Pump (105') Peristaltic Pump _____ PVC Hand Pump _____
 S.S. Bailer _____ Teflon Bailer _____ PVC Bailer _____ Disposable Bailer _____ Other _____
 Purge Water Containment: drummed
 Field QC Samples Collected at this Well (Equipment or Field Blank): EB- _____ FB- _____ Other _____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Specific Conductance		pH (std. units)	Color (visual)	Turbidity (visual)	Observation
			Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1310</u>	<u>15.0</u>	<u>21.0</u>	<u>910</u>	/	<u>7.42</u>	<u>light brown</u>	<u>high</u>	
<u>1322</u>	<u>30.0</u>	<u>21.0</u>	<u>910</u>	/	<u>7.39</u>	↓	↓	
<u>1329</u>	<u>45.0</u>	<u>21.0</u>	<u>910</u>	/	<u>7.39</u>	↓	↓	

Purge Date: 6/20/99

SAMPLE:
 Device (Depth of Intake from TOC): _____ Submersible Pump _____ Peristaltic Pump _____ PVC Hand Pump _____
 Teflon Bailer _____ PVC Bailer _____ Disposable Bailer Other _____

Time (2400 Hr)	Temp. (°C)	Specific Conductance		pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)
		Horiba (µmhos/cm)	QuickCheck (µS)				
<u>1340</u>	<u>21.0</u>	<u>930</u>	/	<u>7.47</u>	<u>5.00</u>	<u>light brown</u>	<u>7999</u>

Sheen: none Odor: none Sample Date: 6/29/99

Field Measurement Devices: Horiba Omega _____ QuickCheck _____ D.O. Test Kit _____

REMARKS: well developed 6/29/99.

SIGNATURE: [Signature] DATE: 6/29/99

WELL DEVELOPMENT FORM

Conor Pacific/EFW

Project No.: <u>BNC002</u>	Date: <u>12/29/99</u>
Site Location: <u>B&C Gas Mini Mart</u>	Well: <u>D-2</u>
Name: <u>EVINK</u>	Diameter: <u>2"</u>
Development Method:	Initial DTW: <u>28.9</u>
Total Water Removed:	Final DTW: <u>29.0</u>
Water Contained? <u>drummed</u>	Initial TD: <u>100.9</u>
Important! Estimate of specific capacity or recharge to well:	Final TD: <u>112.9</u>

Time	Volume (gal.)	Sand/Silt (gal/1000ml)	Temp (°C)	EC (µS/cm)	pH	DTW (feet)	Turbidity (NTU/vis.)	Appearance/Comments
1247	30.0		22.3	947	7.34	28.9	very high	H. brown
1254	45.0	50 silt/40 sand	22.1	930	7.46	29.0	↓	
1309	65.0		21.1	910	7.45		↓	
1310	80.0		21.0	910	7.42	29.0	high	most sand removed
1322	95.0		21.0	910	7.39	↓	↓	
1329	110.0		21.0	910	7.39			

- surged using steel surge block and bailing reel: 15 minutes
- bailed from bottom to remove sand/silt: 0 gal.
- pumped from various depths within screens, surging with pump: 57.0 gal
- begin surge/continue development: pumping from ~105': 45 gal.



ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA, 94588-5127 PHONE (925) 484-2600 FAX (925) 462 3914

May 18, 1999

Mr. Kris Johnson
Conor Pacific
2650 E. Bayshore Road
Palo Alto, CA 94303

Dear Mr. Johnson:

Enclosed is drilling permit 99089 for a monitoring well construction project at North "P" Street and Railroad Avenue in Livermore for B & C Gas Mini Mart. Also enclosed are memoranda regarding drilling restrictions for projects in the vicinity of Livermore.

Please note that permit condition A-2 requires that well construction report be submitted after completion of the work. The report should include drilling and completion logs, location sketch, and permit number. Please submit the original of your completion report. We will forward your submittal to the California Department of Water Resources.

If you have any questions, please contact me at extension 235 or Matt Katen at extension 234.

Very truly yours,

Wyman Hong
Water Resources Technician II

WH:arr

Enc.



ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE, PLEASANTON, CALIFORNIA 94588-6127 PHONE (510) 484+2600 X235
FAX (510) 482-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT North 'P' street between Railroad Ave. and trucks, North of Railroad Ave. between North 'P' and North 'L' streets, Area bounded by South 'P' St, 1st St., North 'L' St., and Railroad Ave. (LIVERMORE)
California Coordinates Source _____ ft. Accuracy ± _____ ft. MAP
CCN _____ ft. CCE _____ ft.
APN _____

PERMIT NUMBER 99089
WELL NUMBER _____
APN _____

PERMIT CONDITIONS

Circled Permit Requirements Apply

CLIENT
Name B.S. Angle B+C Gas Mini Mart
Address 2008 First Street Phone 510-654-3461
City LIVERMORE Zip 94550

APPLICANT
Name Conor Pacific / EFW
Address 2650 E. BAYSHORE RD. Phone 660-843-3815
City Alto Zip 94303

TYPE OF PROJECT
Well Construction Geotechnical Investigation
Cathodic Protection General
Water Supply Contamination
Monitoring Well Destruction

PROPOSED WATER SUPPLY WELL USE
New Domestic Replacement Domestic
Municipal Irrigation
Industrial Other _____

DRILLING METHOD:
Mud Rotary Air Rotary Auger
Cable Other

DRILLER'S LICENSE NO. _____

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum Depth 135 ft.
Casing Diameter 2 in. Number 9
Surface Seal Depth 40-120' ft.

GEOTECHNICAL PROJECTS
Number of Borings _____ in. Maximum Depth _____ ft.
Hole Diameter _____ in.

ESTIMATED STARTING DATE 6/7/99
ESTIMATED COMPLETION DATE 6/18/99

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Keis Johnson Date 5/10/99

- (A) GENERAL
 1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
 2. Submit to Zone 7 within 60 days after completion of permitter work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
 3. Permit is void if project not begun within 90 days of approval date.
- B. WATER SUPPLY WELLS
 1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
 2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless lesser depth is specially approved.
- (C) GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
 1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
 2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.
- D. GEOTECHNICAL. Backfill bore hole with compacted cuttings & heavy bentonite and upper two feet with compacted material. areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.
- E. CATHODIC. Fill hole above anode zone with concrete placed & tremie.
- F. WELL DESTRUCTION. See attached.
- (G) SPECIAL CONDITIONS
See item 2 in December 18, 1996 Containment Zone memo.

Approved Wyman Hong Date 14 May 99
Wyman Hong

APPENDIX D

CERTIFIED ANALYTICAL REPORTS



Sequoia Analytical

1455 McDowell Blvd. North, Ste. D
Petaluma, CA 94954
(707) 792-1865
FAX (707) 792-0342

July 1, 1999

Kris Johnson
Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

RE: B&C Gas Mini Mart/P906684

Dear Kris Johnson

Enclosed are the results of analyses for sample(s) received by the laboratory on June 25, 1999. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Michelle M. Portis
Project Manager

CA ELAP Certificate Number I-2374





Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

Project: B&C Gas Mini Mart
Project Number: BNC102
Project Manager: Kris Johnson

Sampled: 6/24/99
Received: 6/25/99
Reported: 7/1/99

ANALYTICAL REPORT FOR P906684

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-8	P906684-01	Water	6/24/99
MW-9	P906684-02	Water	6/24/99
MW-10	P906684-03	Water	6/24/99





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/24/99 Received: 6/25/99 Reported: 7/1/99
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**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M
 Sequoia Analytical - Petaluma**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-8				P906684-01		Water		
Gasoline	9060784	6/28/99	6/28/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.00	88.5	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		103	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		93.7	"	
MW-9				P906684-02		Water		
Gasoline	9060784	6/28/99	6/28/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.00	ND	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		97.7	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		96.0	"	
MW-10				P906684-03		Water		
Gasoline	9060784	6/28/99	6/28/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.00	ND	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		97.7	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		97.3	"	





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/24/99 Received: 6/25/99 Reported: 7/1/99
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**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M/Quality Control
Sequoia Analytical - Petaluma**

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes
Batch: 9060784		Date Prepared: 6/28/99			Extraction Method: EPA 5030 waters					
Blank										
9060784-BLK1										
Gasoline	6/28/99			ND	ug/l	50.0				
Benzene	"			ND	"	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	0.500				
Methyl tert-butyl ether	"			ND	"	2.00				
Surrogate: a,a,a-Trifluorotoluene	"	300		283	"	65.0-135	94.3			
Surrogate: 4-Bromofluorobenzene	"	300		303	"	65.0-135	101			
LCS										
9060784-BS1										
Gasoline	6/28/99	1000		980	ug/l	65.0-135	98.0			
Surrogate: 4-Bromofluorobenzene	"	300		309	"	65.0-135	103			
Matrix Spike										
9060784-MS1 P906667-02										
Gasoline	6/28/99	1000	ND	989	ug/l	65.0-135	98.9			
Surrogate: 4-Bromofluorobenzene	"	300		307	"	65.0-135	102			
Matrix Spike Dup										
9060784-MSD1 P906667-02										
Gasoline	6/28/99	1000	ND	983	ug/l	65.0-135	98.3	20.0	0.609	
Surrogate: 4-Bromofluorobenzene	"	300		303	"	65.0-135	101			





Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

Project: B&C Gas Mini Mart
Project Number: BNC102
Project Manager: Kris Johnson

Sampled: 6/24/99
Received: 6/25/99
Reported: 7/1/99

Notes and Definitions

#	Note
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DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

Recov. Recovery

RPD Relative Percent Difference



CHAIN OF CUSTODY

CONTRACT LABORATORY: Sequoia-Petaluma

TURN-AROUND TIME: Standard

PO # _____

Project No. <u>BNC 102</u>		Site Name <u>B&C Gas MiniMart</u>				Analyses				Remarks			
Sampler(s): (printed) <u>R. Vance</u>		(signature) <u>[Signature]</u>				TPH, GCS, BTEX, MTBE							
Sample I.D.	Lab I.D.	Collection		Matrix	Depth					Container Information			
		Date	Time			Type	Volume	Qty	Filt	Prsv			
<u>mw-9</u>		<u>6/24/99</u>		<u>water</u>	/								
<u>mw-9</u>								<u>3</u>	<u>2</u>			<u>3</u>	<u>P906684-01</u>
<u>mw-10</u>								<u>3</u>				<u>3</u>	<u>-02</u>
								<u>3</u>				<u>3</u>	<u>-03</u>

COOLER CUSTODY SEALS INTACT NOT INTACT
COOLER TEMPERATURE _____ °F

Relinquished by: (signature)
[Signature]
Relinquished by: (signature)
[Signature] 6/25/99
Relinquished by: (signature)

Received by: (signature)
[Signature]
Received by: (signature)
[Signature]
Received by: (signature)

Date/Time:
6/25/99 0950
Date/Time:
6-25-99 1602
Date/Time:

Send Results To:
Attn: Kris Johnson
EINARSON, FOWLER & WATSON
2650 East Bayshore Road
Palo Alto, CA 94303
Phone (650) 843-3828
Fax (650) 843-3815



Sequoia Analytical

1455 McDowell Blvd. North, Ste. D
Petaluma, CA 94954
(707) 792-1865
FAX (707) 792-0342

July 8, 1999

Kris Johnson
Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

RE: B&C Gas Mini Mart/P907085

Dear Kris Johnson:

Enclosed are the results of analyses for sample(s) received by the laboratory on July 6, 1999. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Michelle M. Portis
Project Manager

CA ELAP Certificate Number I-2374





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 7/2/99 Received: 7/6/99 Reported: 7/8/99
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ANALYTICAL REPORT FOR P907085

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
Soil Bin	P907085-01	Soil	7/2/99





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 7/2/99 Received: 7/6/99 Reported: 7/8/99
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Sample Description:
Laboratory Sample Number:

Soil Bin
P907085-01

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method/ Surrogate Limits	Reporting Limit	Result	Units	Notes*
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Sequoia Analytical - Petaluma

Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M

Gasoline	9070133	7/8/99	7/8/99		400	ND	ug/kg	
Benzene	"	"	"		2.00	ND	"	
Toluene	"	"	"		2.00	ND	"	
Ethylbenzene	"	"	"		2.00	ND	"	
Xylenes (total)	"	"	"		4.00	ND	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		106	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		81.7	"	

Total Metals by EPA 6000/7000 Series Methods

Lead	9070041	7/8/99	7/8/99	EPA 6010B	7.50	ND	mg/kg	
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Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 7/2/99 Received: 7/6/99 Reported: 7/8/99
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Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M/Quality Control
Sequoia Analytical - Petaluma

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes
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Batch: 9070133	Date Prepared: 7/8/99	Extraction Method: EPA 5030 soils								
Blank	9070133-BLK1									
Gasoline	7/8/99			ND	ug/kg	400				
Benzene	"			ND	"	2.00				
Toluene	"			ND	"	2.00				
Ethylbenzene	"			ND	"	2.00				
Xylenes (total)	"			ND	"	4.00				

Surrogate: a,a,a-Trifluorotoluene	"	300		322	"	65.0-135	107			
Surrogate: 4-Bromofluorobenzene	"	300		259	"	65.0-135	86.3			

LCS	9070133-BS1									
Benzene	7/8/99	200		178	ug/kg	65.0-135	89.0			
Toluene	"	200		181	"	65.0-135	90.5			
Ethylbenzene	"	200		182	"	65.0-135	91.0			
Xylenes (total)	"	600		553	"	65.0-135	92.2			
Surrogate: a,a,a-Trifluorotoluene	"	300		312	"	65.0-135	104			

Matrix Spike	9070133-MS1	P907085-01								
Benzene	7/8/99	200	ND	178	ug/kg	65.0-135	89.0			
Toluene	"	200	ND	182	"	65.0-135	91.0			
Ethylbenzene	"	200	ND	181	"	65.0-135	90.5			
Xylenes (total)	"	600	ND	553	"	65.0-135	92.2			
Surrogate: a,a,a-Trifluorotoluene	"	300		301	"	65.0-135	100			

Matrix Spike Dup	9070133-MSD1	P907085-01								
Benzene	7/8/99	200	ND	175	ug/kg	65.0-135	87.5	20.0	1.70	
Toluene	"	200	ND	178	"	65.0-135	89.0	20.0	2.22	
Ethylbenzene	"	200	ND	178	"	65.0-135	89.0	20.0	1.67	
Xylenes (total)	"	600	ND	540	"	65.0-135	90.0	20.0	2.41	
Surrogate: a,a,a-Trifluorotoluene	"	300		317	"	65.0-135	106			





Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

Project: B&C Gas Mini Mart
Project Number: BNC102
Project Manager: Kris Johnson

Sampled: 7/2/99
Received: 7/6/99
Reported: 7/8/99

**Total Metals by EPA 6000/7000 Series Methods/Quality Control
Sequoia Analytical - Petaluma**

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 9070041			Date Prepared: 7/8/99			Extraction Method: EPA 3050B				
Blank			9070041-BLK1							
Lead	7/8/99			ND	mg/kg	7.50				
LCS			9070041-BS1							
Lead	7/8/99	50.0		44.0	mg/kg	80.0-120	88.0			
Matrix Spike			9070041-MS1 P906739-21							
Lead	7/8/99	46.3	ND	42.1	mg/kg	75.0-125	90.9			
Matrix Spike Dup			9070041-MSD1 P906739-21							
Lead	7/8/99	45.5	ND	40.9	mg/kg	75.0-125	89.9	20.0	1.11	





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 7/2/99 Received: 7/6/99 Reported: 7/8/99
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Notes and Definitions

#	Note
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference



CONTRACT LABORATORY: SEQ

TURN-AROUND TIME: 48 hr

Project No.		Site Name				Analyses								Remarks
BNC 102		Livermore, CA				<div style="border: 1px solid black; padding: 5px; transform: rotate(-90deg); display: inline-block;"> TPH (SOILS M) BTEX (SOILS) Lead (TILL) </div>								
Sampler(s): (printed)		(signature)												
Sample I.D.	Lab I.D.	Collection		Matrix	Depth	Container Information								
		Date	Time			Type/Volume	Qty	Fill	Prsrv.					
Soil Bin		7/2/99	10:30	Soil	-	SS sleeve	1	N	N					
COOLER CUSTODY SEALS INTACT <input type="checkbox"/> NOT INTACT <input type="checkbox"/> COOLER TEMPERATURE <u>2</u> °C														

Relinquished by: (signature)
[Signature]

Relinquished by: (signature)
[Signature]

Relinquished by: (signature)

Received by: (signature)
[Signature]

Received by: (signature)
[Signature]

Received by: (signature)
[Signature]

Date/Time: 7-6-99 3:55

Date/Time:

Date/Time: 7/1/99 15:20

Send Results To: *Kris Johnson*

Attn:

EINARSON, FOWLER & WATSON
2650 East Bayshore Road
Palo Alto, CA 94303
Phone (415) 843-3828
Fax (415) 843-3815



Sequoia Analytical

1455 McDowell Blvd. North, Ste. D
 Petaluma, CA 94954
 (707) 792-1865
 FAX (707) 792-0342

INVOICE

Invoice To:
 Kris Johnson
 Conor Pacific / EFW
 2650 East Bayshore Rd.
 Palo Alto, CA 94303

Invoice Number
 P907085-1727

Remit To:
 Accounts Receivable
 Sequoia Analytical
 885 Jarvis Drive
 Morgan Hill, CA 95037

PO Number

Received
 07/06/99

Project
 B&C Gas Mini Mart

Client
 Kris Johnson
 Conor Pacific / EFW

Terms
 NET 30

Project Number
 BNC102

Project Manager
 Michelle M. Portis

<u>Quantity</u>	<u>Analysis/Description</u>	<u>Matrix</u>	<u>Unit Cost</u>	<u>Extended Cost</u>
Sequoia Analytical - Petaluma				
1	Gas/btex by EPA 8015M/8020M	Soil	\$67.50	\$67.50
1	Individual total metal by ICP	Soil	\$12.00	\$12.00

Invoice Total: \$79.50





Sequoia Analytical

1455 McDowell Blvd. North, Ste. D
Petaluma, CA 94954
(707) 792-1865
FAX (707) 792-0342

July 9, 1999

Kris Johnson
Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

RE: B&C Gas Mini Mart/P907015

Dear Kris Johnson:

Enclosed are the results of analyses for sample(s) received by the laboratory on June 30, 1999. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Michelle M. Portis
Project Manager

CA ELAP Certificate Number I-2374





Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

Project: B&C Gas Mini Mart
Project Number: BNC102
Project Manager: Kris Johnson

Sampled: 6/28/99 to 6/29/99
Received: 6/30/99
Reported: 7/9/99

ANALYTICAL REPORT FOR P907015

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-11	P907015-01	Water	6/28/99
MW-12	P907015-02	Water	6/28/99
D-1	P907015-03	Water	6/29/99
D-2	P907015-04	Water	6/29/99





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/28/99 to 6/29/99 Received: 6/30/99 Reported: 7/9/99
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Sample Description: MW-11
Laboratory Sample Number: P907015-01

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method/ Surrogate Limits	Reporting Limit	Result	Units	Notes*
<u>Sequoia Analytical - Petaluma</u>								
<u>Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M</u>								
Gasoline	9070106	7/7/99	7/7/99		50.0	91.3	ug/l	
Benzene	"	"	"		0.500	0.683	"	
Toluene	"	"	"		0.500	2.02	"	
Ethylbenzene	"	"	"		0.500	1.07	"	
Xylenes (total)	"	"	"		0.500	2.62	"	
Methyl tert-butyl ether	"	"	"		2.00	ND	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		97.0	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		99.3	"	





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/28/99 to 6/29/99 Received: 6/30/99 Reported: 7/9/99
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Sample Description: MW-12
Laboratory Sample Number: P907015-02

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method/ Surrogate Limits	Reporting Limit	Result	Units	Notes*
Sequoia Analytical - Petaluma								
Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M								
Gasoline	9070106	7/7/99	7/7/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.00	ND	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		96.3	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		98.7	"	





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/28/99 to 6/29/99 Received: 6/30/99 Reported: 7/9/99
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Sample Description: D-1
Laboratory Sample Number: P907015-03

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method/ Surrogate Limits	Reporting Limit	Result	Units	Notes*
<u>Sequoia Analytical - Petaluma</u>								
<u>Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M</u>								
Gasoline	9070106	7/7/99	7/7/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.00	ND	"	
Surrogate: <i>a,a,a</i> -Trifluorotoluene	"	"	"	65.0-135		96.7	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		100	"	





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/28/99 to 6/29/99 Received: 6/30/99 Reported: 7/9/99
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Sample Description: D-2
Laboratory Sample Number: P907015-04

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method/ Surrogate Limits	Reporting Limit	Result	Units	Notes*
<u>Sequoia Analytical - Petaluma</u>								
<u>Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M</u>								
Gasoline	9070106	7/7/99	7/7/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.00	ND	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		95.7	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		98.0	"	





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/28/99 to 6/29/99 Received: 6/30/99 Reported: 7/9/99
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Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M/Quality Control
Sequoia Analytical - Petaluma

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 9070106			Date Prepared: 7/7/99			Extraction Method: EPA 5030 waters				
Blank			9070106-BLK1							
Gasoline	7/7/99			ND	ug/l	50.0				
Benzene	"			ND	"	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	0.500				
Methyl tert-butyl ether	"			ND	"	2.00				
Surrogate: a,a,a-Trifluorotoluene	"	300		291	"	65.0-135	97.0			
Surrogate: 4-Bromofluorobenzene	"	300		301	"	65.0-135	100			
Blank			9070106-BLK2							
Gasoline	7/8/99			ND	ug/l	50.0				
Benzene	"			ND	"	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	0.500				
Methyl tert-butyl ether	"			ND	"	2.00				
Surrogate: a,a,a-Trifluorotoluene	"	300		304	"	65.0-135	101			
Surrogate: 4-Bromofluorobenzene	"	300		288	"	65.0-135	96.0			
LCS			9070106-BS1							
Benzene	7/7/99	100		101	ug/l	65.0-135	101			
Toluene	"	100		101	"	65.0-135	101			
Ethylbenzene	"	100		95.3	"	65.0-135	95.3			
Xylenes (total)	"	300		294	"	65.0-135	98.0			
Surrogate: a,a,a-Trifluorotoluene	"	300		283	"	65.0-135	94.3			
LCS			9070106-BS2							
Gasoline	7/8/99	1000		928	ug/l	65.0-135	92.8			
Surrogate: 4-Bromofluorobenzene	"	300		292	"	65.0-135	97.3			
Matrix Spike			9070106-MS1		P907015-01					
Benzene	7/7/99	100	0.683	104	ug/l	65.0-135	103			
Toluene	"	100	2.02	104	"	65.0-135	102			
Ethylbenzene	"	100	1.07	96.9	"	65.0-135	95.8			
Xylenes (total)	"	300	2.62	303	"	65.0-135	100			
Surrogate: a,a,a-Trifluorotoluene	"	300		293	"	65.0-135	97.7			
Matrix Spike Dup			9070106-MSD1		P907015-01					
Benzene	7/7/99	100	0.683	103	ug/l	65.0-135	102	20.0	0.976	
Toluene	"	100	2.02	104	"	65.0-135	102	20.0	0	





Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

Project: B&C Gas Mini Mart
Project Number: BNC102
Project Manager: Kris Johnson

Sampled: 6/28/99 to 6/29/99
Received: 6/30/99
Reported: 7/9/99

**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M/Quality Control
Sequoia Analytical - Petaluma**

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes
Matrix Spike Dup (continued)	9070106-MSD1	P907015-01								
Ethylbenzene	7/7/99	100	1.07	97.8	ug/l	65.0-135	96.7	20.0	0.935	
Xylenes (total)	"	300	2.62	304	"	65.0-135	100	20.0	0	
Surrogate: a,a,a-Trifluorotoluene	"	300		291	"	65.0-135	97.0			





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/28/99 to 6/29/99 Received: 6/30/99 Reported: 7/9/99
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Notes and Definitions

#	Note
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference





Project No.		Site Name				Analyses				Remarks
BNC102		B & C Gas Mini Mart				<div style="writing-mode: vertical-rl; transform: rotate(180deg);">TPH, GMS, BTEX, MTBE</div>				
Sampler(s): (printed)		(signature)								
Klavac		[Signature]								
Sample I.D.	Lab I.D.	Collection		Matrix	Depth	Container Information				
		Date	Time			Type/Volume	Qty	Filt		Prsry
MW-11		6/28/99	1430	Water		3	N	3	P907015-01	
MW-12		↓	1715	↓		3	↓	3	↓ -02	
D-1		6/29/99	1659	↓		3	↓	3	↓ -03	
D-2		↓	1340	↓		3	↓	3	↓ -04	
COOLER CUSTODY SEALS INTACT <input type="checkbox"/> NOT INTACT <input type="checkbox"/> COOLER TEMPERATURE <u>5</u> °C										

Relinquished by: (signature) [Signature]

Received by: (signature) [Signature]

Date/Time: 6/30/99 13:20

Send Results To:
 Attn: Kris Johnson
 EINARSON, FOWLER & WATSON
 2650 East Bayshore Road
 Palo Alto, CA 94303
 Phone (650) 843-3828
 Fax (650) 843-3815

Relinquished by: (signature) [Signature]

Received by: (signature) [Signature]

Date/Time: 6:30 13:00

Relinquished by: (signature) [Signature]

Received by: (signature) [Signature]

Date/Time: 15:15



Sequoia Analytical

1455 McDowell Blvd. North, Ste. D
Petaluma, CA 94954
(707) 792-1865
FAX (707) 792-0342

July 14, 1999

Kris Johnson
Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

RE: B&C Gas Mini Mart/P907111

Dear Kris Johnson:

Enclosed are the results of analyses for sample(s) received by the laboratory on July 2, 1999. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Michelle M. Portis
Project Manager

CA ELAP Certificate Number I-2374





Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

Project: B&C Gas Mini Mart
Project Number: BNC102
Project Manager: Kris Johnson

Sampled: 7/1/99
Received: 7/2/99
Reported: 7/14/99

ANALYTICAL REPORT FOR P907111

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-7	P907111-01	Water	7/1/99





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 7/1/99 Received: 7/2/99 Reported: 7/14/99
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Sample Description: MW-7
Laboratory Sample Number: P907111-01

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method/ Surrogate Limits	Reporting Limit	Result	Units	Notes*
Sequoia Analytical - Petaluma								
<u>Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M</u>								
Gasoline	9070187	7/12/99	7/12/99		250	5090	ug/l	
Benzene	"	"	"		2.50	31.9	"	
Toluene	"	"	"		2.50	4.81	"	
Ethylbenzene	"	"	"		2.50	60.0	"	
Xylenes (total)	"	"	"		2.50	219	"	
Methyl tert-butyl ether	"	"	"		10.0	43.6	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		105	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		87.7	"	





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 7/1/99 Received: 7/2/99 Reported: 7/14/99
--	---	--

Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M/Quality Control
 Sequoia Analytical - Petaluma

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes
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Batch: 9070187

Date Prepared: 7/12/99

Extraction Method: EPA 5030 waters

Blank

9070187-BLK1

Gasoline	7/12/99			ND	ug/l	50.0				
Benzene	"			ND	"	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	0.500				
Methyl tert-butyl ether	"			ND	"	2.00				
Surrogate: a,a,a-Trifluorotoluene	"	300		323	"	65.0-135	108			
Surrogate: 4-Bromofluorobenzene	"	300		264	"	65.0-135	88.0			

LCS

9070187-BS1

Benzene	7/12/99	100		95.1	ug/l	65.0-135	95.1			
Toluene	"	100		95.8	"	65.0-135	95.8			
Ethylbenzene	"	100		94.5	"	65.0-135	94.5			
Xylenes (total)	"	300		287	"	65.0-135	95.7			
Surrogate: a,a,a-Trifluorotoluene	"	300		297	"	65.0-135	99.0			

Matrix Spike

9070187-MS1

P907097-06

Benzene	7/12/99	100	ND	100	ug/l	65.0-135	100			
Toluene	"	100	ND	101	"	65.0-135	101			
Ethylbenzene	"	100	ND	100	"	65.0-135	100			
Xylenes (total)	"	300	ND	303	"	65.0-135	101			
Surrogate: a,a,a-Trifluorotoluene	"	300		305	"	65.0-135	102			

Matrix Spike Dup

9070187-MSD1

P907097-06

Benzene	7/12/99	100	ND	98.7	ug/l	65.0-135	98.7	20.0	1.31	
Toluene	"	100	ND	99.6	"	65.0-135	99.6	20.0	1.40	
Ethylbenzene	"	100	ND	98.2	"	65.0-135	98.2	20.0	1.82	
Xylenes (total)	"	300	ND	298	"	65.0-135	99.3	20.0	1.70	
Surrogate: a,a,a-Trifluorotoluene	"	300		306	"	65.0-135	102			





Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

Project: B&C Gas Mini Mart
Project Number: BNC102
Project Manager: Kris Johnson

Sampled: 7/1/99
Received: 7/2/99
Reported: 7/14/99

Notes and Definitions

#	Note
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference



PRO 7111

CHAIN OF CUSTODY

CONTRACT LABORATORY: Agudio - Petaluma

TURN-AROUND TIME: Standard

PO # _____

Project No.		Site Name				Analyses				Remarks
BNC102		BCCGADMINIWAY				<div style="writing-mode: vertical-rl; transform: rotate(180deg);"> TTHQ5/BTEX/WTRC </div>				
Sampler(s): (printed)		(signature)								
FRANK		[Signature]								
Sample I.D.	Lab I.D.	Collection		Matrix	Depth	Container Information				
		Date	Time			Type/Volume	Qty	Filt		Prsrv.
mw-7		7/1/99	1255	water		3	N			
										PT07111-01

COOLER CUSTODY SEALS INTACT NOT INTACT
 COOLER TEMPERATURE 5 °C

Relinquished by: (signature) [Signature]	Received by: (signature) [Signature]	Date/Time: 7-2-99 1405	Send Results To: Attn: <u>Kris Johnson</u> EINARSON, FOWLER & WATSON 2650 East Bayshore Road Palo Alto, CA 94303 Phone (650) 843-3828 Fax (650) 843-3815
Relinquished by: (signature) [Signature]	Received by: (signature) [Signature]	Date/Time: 7-6 1200	
Relinquished by: (signature) [Signature]	Received by: (signature) [Signature]	Date/Time: 7-6 1430	



Sequoia Analytical

1455 McDowell Blvd, North, Ste. D
Petaluma, CA 94954
(707) 792-1865
FAX (707) 792-0342

July 15, 1999

Kris Johnson
Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

RE: B&C Gas Mini Mart/P907241

Dear Kris Johnson:

Enclosed are the results of analyses for sample(s) received by the laboratory on July 13, 1999. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Michelle M. Portis
Project Manager

CA ELAP Certificate Number I-2374





Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

Project: B&C Gas Mini Mart
Project Number: BNC102
Project Manager: Kris Johnson

Sampled: 7/12/99
Received: 7/13/99
Reported: 7/15/99

ANALYTICAL REPORT FOR P907241

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-13	P907241-01	Water	7/12/99





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 7/12/99 Received: 7/13/99 Reported: 7/15/99
--	---	--

Sample Description: MW-13
Laboratory Sample Number: P907241-01

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method/ Surrogate Limits	Reporting Limit	Result	Units	Notes*
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Sequoia Analytical - Petaluma

Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M

Gasoline	9070250	7/14/99	7/14/99		50.0	214	ug/l	
Benzene	"	"	"		0.500	42.8	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	4.48	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.00	332	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		99.7	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		79.0	"	





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 7/12/99 Received: 7/13/99 Reported: 7/15/99
--	---	--

Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M/Quality Control
 Sequoia Analytical - Petaluma

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 9070250		Date Prepared: 7/14/99			Extraction Method: EPA 5030 waters					
Blank		9070250-BLK1								
Gasoline	7/14/99			ND	ug/l	50.0				
Benzene	"			ND	"	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	0.500				
Methyl tert-butyl ether	"			ND	"	2.00				
Surrogate: a,a,a-Trifluorotoluene	"	300		317	"	65.0-135	106			
Surrogate: 4-Bromofluorobenzene	"	300		264	"	65.0-135	88.0			
LCS		9070250-BS1								
Benzene	7/14/99	100		93.2	ug/l	65.0-135	93.2			
Toluene	"	100		94.2	"	65.0-135	94.2			
Ethylbenzene	"	100		93.8	"	65.0-135	93.8			
Xylenes (total)	"	300		284	"	65.0-135	94.7			
Surrogate: a,a,a-Trifluorotoluene	"	300		306	"	65.0-135	102			
Matrix Spike		9070250-MS1		P907215-01						
Benzene	7/14/99	100	ND	91.1	ug/l	65.0-135	91.1			
Toluene	"	100	ND	92.2	"	65.0-135	92.2			
Ethylbenzene	"	100	ND	91.8	"	65.0-135	91.8			
Xylenes (total)	"	300	ND	277	"	65.0-135	92.3			
Surrogate: a,a,a-Trifluorotoluene	"	300		316	"	65.0-135	105			
Matrix Spike Dup		9070250-MSD1		P907215-01						
Gasoline	7/14/99		ND	ND	ug/l	65.0-135		20.0		
Benzene	"	100	ND	90.8	"	65.0-135	90.8	20.0	0.330	
Toluene	"	100	ND	92.0	"	65.0-135	92.0	20.0	0.217	
Ethylbenzene	"	100	ND	91.7	"	65.0-135	91.7	20.0	0.109	
Xylenes (total)	"	300	ND	276	"	65.0-135	92.0	20.0	0.326	
Surrogate: a,a,a-Trifluorotoluene	"	300		314	"	65.0-135	105			





Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

Project: B&C Gas Mini Mart
Project Number: BNC102
Project Manager: Kris Johnson

Sampled: 7/12/99
Received: 7/13/99
Reported: 7/15/99

Notes and Definitions

#	Note
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference



CONTRACT LABORATORY: Sequoia-Petaluma

TURN-AROUND TIME: Rush 40 hours

PO # _____

Project No.		Site Name				Analyses			
BNC102		B&C Gap Mini Mart				<div style="border: 1px solid black; padding: 5px;"> Results by: <u>Friday 7/16/99</u> Remarks </div>			
Sampler(s): (printed)		(signature)							
K Evans		[Signature]				TP HgAs, BTEX, MTBE P907241			
Sample I.D.	Lab I.D.	Collection		Matrix	Depth				
		Date	Time			Type/Volume	Qty	Filt	Prsrv
MW-13	P907241-01	7/12/99	1344	water			3	N	3

COOLER CUSTODY SEALS INTACT NOT INITIATED
 COOLER TEMPERATURE 9 °C

Relinquished by: (signature) [Signature]	Received by: (signature) [Signature]	Date/Time: 7/13/99 0955	Send Results To: Attn: <u>Kris Johnson</u> EINARSON, FOWLER & WATSON 2650 East Bayshore Road Palo Alto, CA 94303 Phone (650) 843-3828 Fax (650) 843-3815
Relinquished by: (signature)	Received by: (signature) [Signature]	Date/Time: 7-13 12:00	
Relinquished by: (signature)	Received by: (signature) [Signature]	Date/Time: 7-13 1430	



Sequoia Analytical

1455 McDowell Blvd. North, Ste. D
Petaluma, CA 94954
(707) 792-1865
FAX (707) 792-0342

June 21, 1999

Kris Johnson
Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

RE: B&C Gas Mini Mart/P906479

Dear Kris Johnson

Enclosed are the results of analyses for sample(s) received by the laboratory on June 17, 1999. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Michelle M. Portis
Project Manager

CA ELAP Certificate Number 2245





Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

Project: B&C Gas Mini Mart
Project Number: BNC102
Project Manager: Kris Johnson

Sampled: 6/16/99
Received: 6/17/99
Reported: 6/21/99

ANALYTICAL REPORT FOR P906479

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-7-36	P906479-01	Water	6/16/99
MW-7-41	P906479-02	Water	6/16/99
MW-7-46	P906479-03	Water	6/16/99
MW-7-51	P906479-04	Water	6/16/99





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/16/99 Received: 6/17/99 Reported: 6/21/99
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**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M
Sequoia Analytical - Petaluma**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-7-36				<u>P906479-01</u>			<u>Water</u>	
Gasoline	9060549	6/18/99	6/18/99		250	1740	ug/l	
Benzene	"	"	"		2.50	194	"	
Toluene	"	"	"		2.50	18.6	"	
Ethylbenzene	"	"	"		2.50	103	"	
Xylenes (total)	"	"	"		2.50	ND	"	
Methyl tert-butyl ether	"	"	"		10.0	593	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		112	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		95.3	"	
MW-7-41				<u>P906479-02</u>			<u>Water</u>	<u>1</u>
Gasoline	9060549	6/18/99	6/18/99		1000	45400	ug/l	
Benzene	"	"	"		10.0	524	"	
Toluene	"	"	"		10.0	357	"	
Ethylbenzene	"	"	"		10.0	1440	"	
Xylenes (total)	"	"	"		10.0	3780	"	
Methyl tert-butyl ether	"	"	"		40.0	2160	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		103	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		93.7	"	
MW-7-46				<u>P906479-03</u>			<u>Water</u>	
Gasoline	9060549	6/18/99	6/18/99		500	10800	ug/l	
Benzene	"	"	"		5.00	112	"	
Toluene	"	"	"		5.00	69.2	"	
Ethylbenzene	"	"	"		5.00	506	"	
Xylenes (total)	"	"	"		5.00	1250	"	
Methyl tert-butyl ether	"	"	"		20.0	527	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		102	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		91.7	"	
MW-7-51				<u>P906479-04</u>			<u>Water</u>	<u>1</u>
Gasoline	9060549	6/18/99	6/18/99		1000	24900	ug/l	
Benzene	"	"	"		10.0	173	"	
Toluene	"	"	"		10.0	136	"	
Ethylbenzene	"	"	"		10.0	848	"	
Xylenes (total)	"	"	"		10.0	2140	"	
Methyl tert-butyl ether	"	"	"		40.0	1090	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		105	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		94.7	"	





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/16/99 Received: 6/17/99 Reported: 6/21/99
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**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M/Quality Control
Sequoia Analytical - Petaluma**

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 9060549		Date Prepared: 6/18/99			Extraction Method: EPA 5030 waters					
Blank		9060549-BLK1								
Gasoline	6/18/99			ND	ug/l	50.0				
Benzene	"			ND	"	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	0.500				
Methyl tert-butyl ether	"			ND	"	2.00				
Surrogate: a,a,a-Trifluorotoluene	"	300		325	"	65.0-135	108			
Surrogate: 4-Bromofluorobenzene	"	300		290	"	65.0-135	96.7			
LCS		9060549-BS1								
Benzene	6/18/99	100		99.4	ug/l	65.0-135	99.4			
Toluene	"	100		99.4	"	65.0-135	99.4			
Ethylbenzene	"	100		97.4	"	65.0-135	97.4			
Xylenes (total)	"	300		322	"	65.0-135	107			
Surrogate: a,a,a-Trifluorotoluene	"	300		323	"	65.0-135	108			
Matrix Spike		9060549-MS1	P906454-01							
Benzene	6/18/99	100	ND	98.0	ug/l	65.0-135	98.0			
Toluene	"	100	ND	98.1	"	65.0-135	98.1			
Ethylbenzene	"	100	ND	96.0	"	65.0-135	96.0			
Xylenes (total)	"	300	ND	316	"	65.0-135	105			
Surrogate: a,a,a-Trifluorotoluene	"	300		314	"	65.0-135	105			
Matrix Spike Dup		9060549-MSD1	P906454-01							
Benzene	6/18/99	100	ND	95.1	ug/l	65.0-135	95.1	20.0	3.00	
Toluene	"	100	ND	95.0	"	65.0-135	95.0	20.0	3.21	
Ethylbenzene	"	100	ND	93.1	"	65.0-135	93.1	20.0	3.07	
Xylenes (total)	"	300	ND	307	"	65.0-135	102	20.0	2.90	
Surrogate: a,a,a-Trifluorotoluene	"	300		292	"	65.0-135	97.3			





Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

Project: B&C Gas Mini Mart
Project Number: BNC102
Project Manager: Kris Johnson

Sampled: 6/16/99
Received: 6/17/99
Reported: 6/21/99

Notes and Definitions

#	Note
1	Sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference





E. INARSON
FOWLER & WATSON

CONOR PACIFIC/EFW

CHAIN OF CUSTODY

Page 1 of 1

PO # _____

CONTRACT LABORATORY: VERUOIA PETALUMA TURN-AROUND TIME: 48 hrs.

Project No.		Site Name				Analyses						Remarks			
BNC102		B&C GAS MINI MART				TPH-GAS BTEX, MDE by BODZ TPH-GAS									
Sampler(s): (printed)		(signature)													
K. JOHNSON		Kris Johnson													
Sample I.D.	Lab I.D.	Collection		Matrix	Depth	Container Information									
		Date	Time			Type/Volume	Qty	Filt	Prsv.						
MW-7-36		6-16-99	1215	H2O	36	VOA/40 mL	2	N	HCl	X	X				9906479-01
MW-7-41		6-16-99	1515		41	"	3			X	X				-02
MW-7-46		6-16-99	1440		46	"	3			X	X				-03
MW-7-51		6-16-99	1545	↓	51	"	3	↓	↓	X	X				-04

COOLER CUSTODY SEALS INTACT NOT INTACT
 COOLER TEMPERATURE 12 °C

Relinquished by: (signature) <i>K. Johnson</i>	Received by: (signature) <i>Steve Kay #271</i>	Date/Time: 6-17-99 11:31
Relinquished by: (signature) <i>Steve Kay #271</i>	Received by: (signature)	Date/Time: 6-17 1300
Relinquished by: (signature) <i>[Signature]</i>	Received by: (signature) <i>[Signature]</i>	Date/Time: 6-17-1999

Send Results To:
 Attn: KRIS JOHNSON
 EINARSON, FOWLER & WATSON
 2650 East Bayshore Road
 Palo Alto, CA 94303
 Phone (415) 843-3828
 Fax (415) 843-3815



Sequoia Analytical

1455 McDowell Blvd. North, Ste. D
Petaluma, CA 94954
(707) 792-1865
FAX (707) 792-0342

June 22, 1999

Kris Johnson
Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

RE: B&C Gas Mini Mart/P906523

Dear Kris Johnson

Enclosed are the results of analyses for sample(s) received by the laboratory on June 18, 1999. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Michelle M. Portis
Project Manager

CA ELAP Certificate Number 2245





Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

Project: B&C Gas Mini Mart
Project Number: BNC102
Project Manager: Kris Johnson

Sampled: 6/17/99
Received: 6/18/99
Reported: 6/22/99

ANALYTICAL REPORT FOR P906523

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-8-41'	P906523-01	Water	6/17/99
MW-7-61'	P906523-02	Water	6/17/99





Conor Pacific / BFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/17/99 Received: 6/18/99 Reported: 6/22/99
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**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M
Sequoia Analytical - Petaluma**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-8-41'				<u>P906523-01</u>			<u>Water</u>	
Gasoline	9060618	6/21/99	6/21/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	0.979	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.00	32.6	"	
Surrogate: <i>a,a,a</i> -Trifluorotoluene	"	"	"	65.0-135		94.7	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		98.7	"	
MW-7-61'				<u>P906523-02</u>			<u>Water</u>	
Gasoline	9060618	6/21/99	6/21/99		500	25300	ug/l	
Benzene	"	"	"		5.00	42.3	"	
Toluene	"	"	"		5.00	31.4	"	
Ethylbenzene	"	"	"		5.00	588	"	
Xylenes (total)	"	"	"		5.00	1390	"	
Methyl tert-butyl ether	"	"	"		20.0	271	"	
Surrogate: <i>a,a,a</i> -Trifluorotoluene	"	"	"	65.0-135		107	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		103	"	





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/17/99 Received: 6/18/99 Reported: 6/22/99
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**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M/Quality Control
Sequoia Analytical - Petaluma**

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes
Batch: 9060618			Date Prepared: 6/21/99			Extraction Method: EPA 5030 waters				
Blank			9060618-BLK1							
Gasoline	6/21/99			ND	ug/l	50.0				
Benzene	"			ND	"	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	0.500				
Methyl tert-butyl ether	"			ND	"	2.00				
Surrogate: a,a,a-Trifluorotoluene	"	300		295	"	65.0-135	98.3			
Surrogate: 4-Bromofluorobenzene	"	300		312	"	65.0-135	104			
LCS			9060618-BS1							
Benzene	6/21/99	100		113	ug/l	65.0-135	113			
Toluene	"	100		110	"	65.0-135	110			
Ethylbenzene	"	100		102	"	65.0-135	102			
Xylenes (total)	"	300		317	"	65.0-135	106			
Surrogate: a,a,a-Trifluorotoluene	"	300		294	"	65.0-135	98.0			
Matrix Spike			9060618-MS1		P906459-05					
Benzene	6/21/99	100	ND	104	ug/l	65.0-135	104			
Toluene	"	100	ND	103	"	65.0-135	103			
Ethylbenzene	"	100	ND	95.8	"	65.0-135	95.8			
Xylenes (total)	"	300	ND	297	"	65.0-135	99.0			
Surrogate: a,a,a-Trifluorotoluene	"	300		285	"	65.0-135	95.0			
Matrix Spike Dup			9060618-MSD1		P906459-05					
Benzene	6/21/99	100	ND	107	ug/l	65.0-135	107	20.0	2.84	
Toluene	"	100	ND	106	"	65.0-135	106	20.0	2.87	
Ethylbenzene	"	100	ND	98.5	"	65.0-135	98.5	20.0	2.78	
Xylenes (total)	"	300	ND	305	"	65.0-135	102	20.0	2.99	
Surrogate: a,a,a-Trifluorotoluene	"	300		288	"	65.0-135	96.0			





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/17/99 Received: 6/18/99 Reported: 6/22/99
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Notes and Definitions

#	Note
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference





P906523

CHAIN OF CUSTODY

CONTRACT LABORATORY: *Signature Petaluma* TURN-AROUND TIME: 48 HR PO # _____

Project No.		Site Name				Analyses						Remarks
BNC 102		BIG GAS Mini Mart				<div style="border: 1px solid black; padding: 5px; transform: rotate(-90deg); display: inline-block;"> TRH GAS BLENDE (2/16/2002) </div>						
Sampler(s): (printed)		Collection		Matrix	Depth							Container Information
K. Johnson						Type/Volume	Qty	Filt	Prsv.			
Sample I.D.	Lab I.D.	Date	Time									
MW-8-41		6/17/99	1552	H ₂ O		VOA/40ml	4	N	HCl	X	P906523-01 ↓ -02	
MW-7-61		6/17/99	0900	H ₂ O		" "	3	N	HCl	X		

COOLER CUSTODY SEALS INTACT NOT INTACT
COOLER TEMPERATURE 13 °C

Relinquished by: (signature) <i>K Johnson</i>	Received by: (signature) <i>[Signature]</i>	Date/Time: 6/18/99 9:54	Send Results To: Attn: <i>Kristi Johnson</i> EINARSON, FOWLER & WATSON 2650 East Bayshore Road Palo Alto, CA 94303 Phone (415) 843-3828 Fax (415) 843-3815
Relinquished by: (signature) <i>[Signature]</i>	Received by: (signature) <i>[Signature]</i>	Date/Time: 6/18/99	
Relinquished by: (signature) <i>[Signature]</i> 6/18/99	Received by: (signature) <i>[Signature]</i>	Date/Time: 6/18/99 11:45	



Sequoia Analytical

1455 McDowell Blvd. North, Ste. D
Petaluma, CA 94954
(707) 792-1865
FAX (707) 792-0342

June 23, 1999

Kris Johnson
Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

RE: B&C Gas Mini Mart/P906576

Dear Kris Johnson

Enclosed are the results of analyses for sample(s) received by the laboratory on June 21, 1999. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Michelle M. Portis
Project Manager

CA ELAP Certificate Number 2245





Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

Project: B&C Gas Mini Mart
Project Number: BNC102
Project Manager: Kris Johnson

Sampled: 6/18/99
Received: 6/21/99
Reported: 6/23/99

ANALYTICAL REPORT FOR P906576

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-8-46	P906576-01	Water	6/18/99
MW-8-51	P906576-02	Water	6/18/99
MW-8-56	P906576-03	Water	6/18/99





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/18/99 Received: 6/21/99 Reported: 6/23/99
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**BTEX by 8020M
Sequoia Analytical - Petaluma**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-8-46				<u>P906576-01</u>			<u>Water</u>	
Benzene	9060681	6/23/99	6/23/99		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	1.20	"	
Methyl tert-butyl ether	"	"	"		2.00	137	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		103	%	
MW-8-51				<u>P906576-02</u>			<u>Water</u>	
Benzene	9060681	6/23/99	6/23/99		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	0.514	"	
Xylenes (total)	"	"	"		0.500	0.611	"	
Methyl tert-butyl ether	"	"	"		2.00	137	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		104	%	
MW-8-56				<u>P906576-03</u>			<u>Water</u>	
Benzene	9060681	6/23/99	6/23/99		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.00	7.93	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		105	%	





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC102 Project Manager: Kris Johnson	Sampled: 6/18/99 Received: 6/21/99 Reported: 6/23/99
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BLKX by 8020M/Quality Control
Sequoia Analytical - Petaluma

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 9060681			Date Prepared: 6/23/99			Extraction Method: EPA 5030 waters				
Blank			9060681-BLK1							
Benzene	6/23/99			ND	ug/l	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	0.500				
Methyl tert-butyl ether	"			ND	"	2.00				
Surrogate: a,a,a-Trifluorotoluene	"	300		332	"	65.0-135	111			
LCS			9060681-BS1							
Benzene	6/23/99	100		102	ug/l	65.0-135	102			
Toluene	"	100		100	"	65.0-135	100			
Ethylbenzene	"	100		96.8	"	65.0-135	96.8			
Xylenes (total)	"	300		320	"	65.0-135	107			
Surrogate: a,a,a-Trifluorotoluene	"	300		302	"	65.0-135	101			
Matrix Spike			9060681-MS1		P906576-01					
Benzene	6/23/99	100	ND	99.6	ug/l	65.0-135	99.6			
Toluene	"	100	ND	98.0	"	65.0-135	98.0			
Ethylbenzene	"	100	ND	95.3	"	65.0-135	95.3			
Xylenes (total)	"	300	1.20	314	"	65.0-135	104			
Surrogate: a,a,a-Trifluorotoluene	"	300		303	"	65.0-135	101			
Matrix Spike Dup			9060681-MSD1		P906576-01					
Benzene	6/23/99	100	ND	99.9	ug/l	65.0-135	99.9	20.0	0.301	
Toluene	"	100	ND	98.6	"	65.0-135	98.6	20.0	0.610	
Ethylbenzene	"	100	ND	95.2	"	65.0-135	95.2	20.0	0.105	
Xylenes (total)	"	300	1.20	313	"	65.0-135	104	20.0	0	
Surrogate: a,a,a-Trifluorotoluene	"	300		314	"	65.0-135	105			





Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

Project: B&C Gas Mini Mart
Project Number: BNC102
Project Manager: Kris Johnson

Sampled: 6/18/99
Received: 6/21/99
Reported: 6/23/99

Notes and Definitions

#	Note
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference





CONTRACT LABORATORY: SEQUOIA

TURN-AROUND TIME: 48 HRS.

Project No. BNC102		Site Name BTC GAS MINI-MART				Analyses					Remarks
Sampler(s): (printed) NICK BRYSON		(signature) 				STEX/MTBE					
Sample I.D.	Lab I.D.	Collection		Matrix	Depth						Container Information
		Date	Time			Type/Volume	Qty	Filt	Prsrv.		
MW-8-46	P906576-01	6/18/99	0930	H ₂ O	45-47	VOA/40ml	3	N	HLI	XXX	SEND VOA to SEQUOIA PER ALUM FOR ANALYSES
MW-8-51	02	↓	1030	↓	50-52	↓	3	↓	↓		
MW-8-56	03	↓	1200	↓	55-57	↓	3	↓	↓		

COOLER CUSTODY SEALS INTACT NOT INTACT
COOLER TEMPERATURE 9 °C

Relinquished by: (signature)

Received by: (signature)

Date/Time:
06/18/99 10:40

Send Results To:
Attn: KRIS JOHNSON
EINARSON, FOWLER & WATSON
2650 East Bayshore Road
Palo Alto, CA 94303
Phone (415) 843-3828
Fax (415) 843-3815

Relinquished by: (signature)

Received by: (signature)

Date/Time:
6-25 14:00

Relinquished by: (signature)

Received by: (signature)

Date/Time:
6-25 12:03