



October 31, 2002

California Regional Water Quality Control Board  
San Diego Region  
9174 Sky Park Court, Suite 100  
San Diego, California 92123

ATTN: MS. KELLY DORSEY

SITE: 76 SERVICE STATION 6519  
28903 RANCHO CALIFORNIA ROAD  
TEMECULA, CALIFORNIA 92390  
RIVERSIDE COUNTY HMD CASE NO. 89382

RE: QUARTERLY STATUS REPORT  
THIRD QUARTER 2002

Dear Ms. Dorsey:

TRC Alton Geoscience, Inc. (TRC) is pleased to present this Quarterly Status Report for the Third Quarter of 2002 for 76 Service Station 6519 in Temecula, California.

## **BACKGROUND**

### **PREVIOUS SITE ASSESSMENT ACTIVITIES**

In March 1989, Harding Lawson Associates supervised the removal of one 6,000-gallon diesel and two 10,000-gallon gasoline USTs, and a 280-gallon waste oil tank from the property. New replacement USTs consisted of one 10,000-gallon diesel and two 12,000-gallon gasoline, double-walled USTs, which were placed within the enlarged, original tank cavity. Information supplied to Alton Geoscience by Unocal Refining and Marketing Division indicates that gasoline- and diesel-impacted soil was reportedly encountered following tank removal. The highest total petroleum hydrocarbon (TPH) concentrations were detected below the southern end of the center gasoline tank at 1,800 milligrams per kilogram (mg/kg). Soil samples beneath the diesel UST had total recoverable petroleum hydrocarbon concentrations of 961 mg/kg. The estimated lateral and vertical extent of gasoline- or diesel-range hydrocarbons were not assessed in the area of the gasoline storage tank cavity at that time. No impacted soil was reportedly encountered beneath the former waste oil UST (Alton Geoscience, 1992).

Alton Geoscience performed site characterization activities in March and October 1992. These activities included excavation of six slanted hand auger borings, HA-1 through HA-6, installed to approximately 9 feet below existing dispenser islands, and drilling eight onsite and two offsite hollow-stem auger borings to a maximum depth of 30 feet below grade (fbg). These eight borings

## **Quarterly Status Report, Third Quarter 2002**

76 Station 6519, 28903 Rancho California Road, Temecula, California

October 31, 2002

---

were converted to groundwater monitoring wells MW-2, MW-3, and MW-5 through MW-10 to approximately 24 fbg. One additional onsite groundwater monitoring well, MW-11, and four onsite vapor extraction wells, VEW-12 through VEW-15, were installed in September 1993.

Hydrocarbon concentrations up to 14,000 mg/kg total petroleum hydrocarbons as gasoline (TPHg) and 5,100 mg/kg total petroleum hydrocarbons as diesel (TPHd) were detected in soil samples collected in the vicinity of the tank cavity (Boring B-5 at 5 fbg), and up to 850 mg/kg TPHg in the vicinity of the center pump island (Boring HA-3 at 3.5 fbg). Soil samples from surrounding boring locations had concentrations ranging from below the laboratory detection limits to 240 mg/kg TPHg (VEW-14 at 6.5 fbg). Based on the results of these investigations, Alton Geoscience concluded that the lateral and vertical extent of adsorbed-phase hydrocarbons appeared to be adequately assessed, and the lateral extent of dissolved-phase hydrocarbons appeared adequately assessed in all directions except to the north-northwest in the downgradient direction. In this direction, it appeared that the dissolved-phase plume from the Unocal Site commingled with the dissolved-phase plume from the Chevron station. Alton Geoscience concluded that additional monitoring wells in Rancho California Road were not expected to provide any additional delineation of the dissolved-phase plumes since Chevron already had placed wells in this area (Alton Geoscience, 1992, 1993, and 1994a).

In March 1994, Alton Geoscience conducted a limited remedial excavation adjacent to and below the central dispenser island and the eastern dispenser island during station renovation activities. Soil samples collected at the limit of the excavation, representative of soil remaining at the site, had concentrations ranging from below the laboratory detection limits to 7,996 mg/kg TPHg in sample E5 at 10 fbg (Alton Geoscience, 1994b).

In April 1996, additional soil sampling was performed as part of a complete station demolition and renovation. All existing structures were removed, a limited remedial excavation was conducted beneath the waste oil tank and one of the hydraulic lifts, and the current UST system and station structures were installed at the Site. The TPHg concentrations in the soil that was removed from beneath the underground fuel storage tanks ranged up to 9,500 mg/kg (sample T1N-12.5 at 12.5 fbg). Benzene concentrations ranged up to 9.4 mg/kg. The TPHg and benzene concentrations of soil samples collected from beneath the product lines were below the laboratory detection limits. Following remedial excavation, soil sample laboratory results for total recoverable petroleum hydrocarbons (TRPH) from beneath the waste oil tank and the hydraulic lifts were below laboratory detection limits (Alton Geoscience, 1996).

A soil vapor extraction (SVE) system was installed at the Site and began operation in February 1995. On May 12, 1997, Alton Geoscience drilled five borings, B-18 through B-22, to 17 fbg to evaluate the progress of remedial activities at the Site. TPHg concentrations in soil samples ranged from below the laboratory detection limits to 3.6 mg/kg (Boring B-19-17.0 at 17 fbg). Based on the results of this investigation, Alton Geoscience concluded that remedial activities had been

## **Quarterly Status Report, Third Quarter 2002**

76 Station 6519, 28903 Rancho California Road, Temecula, California

October 31, 2002

---

successful in reducing hydrocarbon concentrations in soil and recommended closure of the unauthorized release case for this Site (Alton Geoscience, 1997a, 1997b).

In 1998, HMD stated that closure could not be granted because of increasing dissolved-phase MTBE concentrations in monitor well MW-16 and requested that the source of these increasing concentrations be investigated. Additionally, the HMD requested a 24-hour SVE test. Tosco has inspected the UST system at the Site and has not yet identified the source of the increasing MTBE concentrations. As of December 18, 2000, Tosco has started using ethanol to substitute for MTBE as a fuel additive at this station.

In September 2000, a municipal drinking water well owned and operated by the Rancho California Water District (RCWD) was taken out of service and subsequently was found to be impacted with methyl tertiary butyl ether (MTBE) at concentrations near or above State of California maximum contaminant levels (MCLs). The California Regional Water Quality Control Board, San Diego Region (CRWQCB) is beginning the process of identifying potential sources of MTBE in the vicinity of this well. In the interim, however, the CRWQCB has requested an "expedited schedule" for investigation and cleanup at several unauthorized release cases in the vicinity, including the Site.

TRC submitted a workplan for additional assessment activities on March 9, 2001, which was approved by the CRWQCB on April 12, 2001. The first stage of assessment activities, including advancement of seven cone penetrometer locations and installation of an onsite well, was performed in May. Preliminary data in the form of draft tables and figures was presented to the CRWQCB and a meeting to discuss the data was held on June 20, 2001. Based on the results of that meeting, TRC has prepared addendums to the workplan describing the agreed upon scope for the next phase of assessment, which is currently being implemented.

### **GROUNDWATER MONITORING AND SAMPLING**

Groundwater monitoring has been performed quarterly in Site wells since 1992. The depth to groundwater at the Site has historically ranged from 11 to over 25 fbg. The groundwater flow direction was initially measured for several quarters in 1992 and 1993 as flowing to the southeast at approximately 0.03 to 0.045 foot per foot. In the second quarter of 1993, however, the flow direction shifted to the northwest at approximately 0.016-foot per foot. Since then, the flow direction has consistently been to the west or northwest at gradients ranging from 0.01 foot per foot to 0.09 foot per foot (ERI, 2001a).

Historical dissolved-phase concentrations in wells adjacent to the UST cavity (MW-2, MW-3, MW-5 and MW-16) have ranged from below laboratory detection limits in well MW-3 to 3,120,000 µg/l TPHg (MW-16), 26,000 µg/l benzene (MW-5), and 717,000 µg/l MTBE (MW-16). Concentrations in the other wells at the Site have ranged from below the laboratory detection limits to 130,000 µg/l TPHg (MW-10), 6,507 µg/l benzene (MW-6), and 2,100 µg/l MTBE

## **Quarterly Status Report, Third Quarter 2002**

76 Station 6519, 28903 Rancho California Road, Temecula, California

October 31, 2002

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(MW-11). Dissolved-phase TPHg and benzene concentrations have been stable or have generally dropped by one to two orders of magnitude in all the Site wells (TRC, 2001).

Groundwater samples have only been analyzed for MTBE at the site since 1996. MTBE concentrations rose in well MW-16 to a peak of 717,000 µg/l in February 1999 and have since dropped to 27,000 µg/l in August 2001, likely as a result of ongoing SVE activities. Smaller rises in MTBE concentrations have been detected over a similar time period in wells MW-10, MW-11 and MW-17 (TRC, 2001).

### **REMEDIAL TESTING ACTIVITIES**

Two constant rate vapor injection tests were performed in October 1993. Monitoring Wells MW-2, MW-3, MW-5, and MW-15 and Vapor Extraction Wells VEW-12 through VEW-14 were used in the tests. The constant rate tests consisted of injecting air at 23.6 cubic feet per minute (cfm) and 15.5 cfm into VEW-14 (Test 1) and MW-2 (Test 2) and recording pressure responses in as many as three observation points. Based on this test, the radius of influence (ROI) at the Site was estimated to be approximately 40 to 80 feet. Based on laboratory analysis of vapor samples, VEW-14 and MW-2 had TPH concentrations of 2,790 and 670 parts per million per volume (ppmv) and benzene concentrations of 370 and 55 ppmv, respectively. Based on these successful results, SVE was selected as the remediation alternative and eventually implemented at the Site (Alton Geoscience, 1994c).

After the shutdown of the original SVE system and as a result of rising MTBE concentrations in soil, the HMD requested an additional SVE test. Alton Geoscience performed a 24-hour SVE test in September 1998. Based on the test results and data from previous SVE operations at the Site, Alton Geoscience concluded that SVE appeared to be a technically feasible approach for remediation of soil concentrations and free product at the Site. Trace levels of product were observed during the test in well MW-16 for the first time in any well at the Site. Alton Geoscience recommended resumption of SVE activities if measurable free product was observed at the Site (Alton Geoscience, 1999).

### **SOURCE REMOVAL AND REMEDIATION ACTIVITIES**

In March 1989, one 6,000-gallon diesel and two 10,000-gallon gasoline USTs, and a 280-gallon waste oil tank were removed from the property, and replaced with one 10,000-gallon diesel and two new 12,000-gallon, double-walled, gasoline USTs within the enlarged, original tank cavity. The volume of hydrocarbon impacted soil removed during these activities was not reported to Alton Geoscience (Alton Geoscience, 1992).

In March 1994 and April 1996, Alton Geoscience conducted limited remedial excavation around the dispenser islands, USTs, former clarifier, and former hydraulic lifts. The excavations removed

## **Quarterly Status Report, Third Quarter 2002**

76 Station 6519, 28903 Rancho California Road, Temecula, California

October 31, 2002

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approximately 130 cubic yards of hydrocarbon-affected soil in 1994 and 220 tons in 1996 (Alton Geoscience, 1994b; Alton Geoscience, 1996).

In addition to limited remedial excavation, an SVE remediation system has been operated at the Site. The first SVE system was started in February 1995 and shut down on June 30, 1995, under the direction of Unocal Corporation. The SVE system was disconnected on August 7, 1995 and removed from the Site on August 18, 1995. A second SVE system was installed onsite and started on February 15, 1996. The system was eventually shut off because of low benzene influent concentrations on November 21, 1996. The system was restarted on April 11, 1997, and shut off again on May 2, 1997, due to low influent concentrations. This system was subsequently removed from the Site. A total of 1,031 gallons of hydrocarbons were recovered through SVE from February 1, 1995 through 1997 (Alton Geoscience, 1999).

Based on the rising dissolved-phase MTBE concentrations detected in well MW-16, the HMD requested in 1999 that remediation using SVE be resumed at the Site. TRC installed two new vapor extraction wells for this purpose in June 1999. A new SVE system at the Site and SVE operations resumed on July 31, 2000.

### **METHOD OF CLEANUP**

The site is being remediated by an SVE system. System operations were initiated on February 15, 1996. The system was shut off because of low benzene influent concentrations on November 21, 1996. The system was restarted on April 11, 1997, and shut off again on May 2, 1997. A new catalytic/thermal oxidizer, SVE system was installed at the site and started operation on July 31, 2000.

A groundwater pump and treat system was permitted and installed at the site. The system began operation on May 15, 2002. A groundwater extraction system, including seven extraction wells, was installed at the site and began operation on May 15, 2002. The system operated until it was temporarily shut down on July 22, 2002. The system was shut down because TRC received notice from the sewer authority that the permit to discharge to the sanitary sewer has been rescinded. An NPDES permit application was submitted to the CRWQCB on October 1, 2002 and upon receiving approval by the CRWQCB, the groundwater extraction system will be restarted.

### **PROGRESS THIS PERIOD**

TRC submitted a Site Conceptual Model and Site Assessment report to the CRWQCB on August 28, 2002.

## **Quarterly Status Report, Third Quarter 2002**

76 Station 6519, 28903 Rancho California Road, Temecula, California

October 31, 2002

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The third quarter 2002 groundwater monitoring and sampling event was conducted on August 27, 2002 and August 29, 2002. Data from the May 29, 2002 Chevron sampling event as reported to TRC by Chevron's consultant was incorporated into the attached Third Quarter 2002 Fluid Level Monitoring and Groundwater Sampling Report. Per the CRWQCB request, TRC has contoured wells within the aquitard and wells below the aquitard in addition to the shallow zone.

Based on a verbal conversation with Kelly Dorsey of the CRWQCB, individual groundwater monitoring wells with all laboratory result reported as not detected in both pre-purge and post-purge samples during the previous quarter, were no purge samples during this quarter. All other wells were pre- and post-pure sampled in accordance with standard regulatory protocol and TRC's general field procedures.

Per the CRWQCB email dated April 17, 2002, monthly monitoring of groundwater levels has been discontinued. Quarterly monitoring and sampling events will continue to be performed.

The SVE system operated for a total of 1,645 hours and recovered approximately 2,473 pounds of hydrocarbons this quarter. Since startup of this SVE system on July 31, 2000, the system has operated for a total of 12,114 hours and recovered approximately 10,506 pounds of hydrocarbons. The Third Quarter 2002 Vapor Extraction and Groundwater Treatment System O & M Report is attached for your review.

A groundwater extraction system, including seven extraction wells, was installed at the site and began operation on May 15, 2002. The system operated for the remainder of the second quarter. However, TRC has received notice from the sewer authority that our permit to discharge to the sanitary sewer has been rescinded. The groundwater extraction system was temporarily turned off on July 22, 2002. An NPDES permit application was submitted to the CRWQCB on October 1, 2002.

### **WASTE DISPOSAL THIS PERIOD**

A total of approximately 30,911 gallons of groundwater were pumped and treated this quarter by the groundwater remediation system. Since startup of the groundwater treatment system on May 15, 2002, the system has pumped and treated approximately 73,472 gallons of groundwater. Well purge water generated during the quarterly groundwater monitoring and sampling event was temporarily stored onsite in 55-gallon drums and shipped to Crosby and Overton facility for disposal.

## **Quarterly Status Report, Third Quarter 2002**

76 Station 6519, 28903 Rancho California Road, Temecula, California

October 31, 2002

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### **FINDINGS AND CONCLUSIONS**

The groundwater monitoring and sampling results in wells screened through the shallow water table were generally consistent with previous quarters. There appears to be a mounding of shallow groundwater around Chevron well B-13. This well has historically had higher groundwater elevations than other nearby wells since installation. The cause of this mounding is unclear but may be the result of irrigation in the nearby planter or leaks from a nearby Rancho California Water District water line. The groundwater flow direction and hydraulic gradient are variable across the site, but in general, shallow groundwater appears to flow to the east-northeast at an approximate hydraulic gradient of 0.07 foot per foot (ft/ft).

Within the aquitard, the groundwater gradient as contoured flows to the northeast at approximately 0.045 ft/ft. However, this may be deceptive. It is not clear that all of the wells screened within the aquitard are hydrologically connected. TRC excluded well R-1D from its gradient contour because it is screened entirely within silt, whereas all the other wells have reported a sand lens within the screen interval. It is not clear whether or not each sand lens is hydrologically connected to the other. The groundwater flow direction during the second quarter 2002 was to the northwest, approximately ninety degrees from the third quarter flow direction.

Below the aquitard, the groundwater gradient appears to flow to the northwest toward well 118 at an approximate hydraulic gradient of 0.009 ft/ft. This may be somewhat deceptive in that some of the wells are screened considerably deeper than others, but if real, it appears likely to be the result of the continued periodic pumping of well 118.

Pre-purge and post-purge sample results were generally consistent with minor differences, except in two wells. In MW-20B, dissolved-phase concentrations changed from 6,600 ug/l to 21,000 ug/l for TPHg, 1,100 ug/l to 2,800 ug/l for benzene, 3,300 ug/l to 8,700 ug/l for MTBE, and from 1,800 ug/l to ND (<5,000 ug/l) for TBA (Graphs 1 through 4). In MW-24B, TPHg increased from ND (<50 ug/l) to 800 ug/l. All other analytes remained as not detected for both pre- and post-purge samples for MW-24B. Based on these results, TRC believes it is reasonable to switch to non-purge sampling in all site wells, except for wells MW-24B and MW-20B.

The results of vapor extraction activities in the third quarter indicate that hydrocarbons are being recovered. Based on the drop in dissolved-phase concentrations in well MW-16 relative to pre-remediation concentrations, SVE operations appear to be effective. The results of groundwater remediation activities indicate that when in operation, impacted groundwater was being recovered and successfully treated.

## **Quarterly Status Report, Third Quarter 2002**

76 Station 6519, 28903 Rancho California Road, Temecula, California

October 31, 2002

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### **RECOMMENDATIONS**

- TRC recommends continued operation of the SVE system and groundwater remediation system.
- TRC recommends and requests CRWQCB approval to switch to non-purge sampling of all wells, except for MW-24B and MW-20B. TRC recommends continued pre-purge and post-purge sampling in MW-24B and MW-20B for at least one more event prior to making a final decision for these particular wells.

### **PLANNED PROGRESS NEXT PERIOD**

- Fourth quarter monitoring and sampling will be performed and is currently scheduled for November 20 through 22, 2002.
- The SVE system will continue to be operated.
- The groundwater extraction system will be restarted as soon as the NPDES permit is approved. The NPDES permit application was submitted to the CRWQCB on October 1, 2002.

### **REFERENCES**

- Alton Geoscience, 1992, Site Characterization Report, Unocal Station 6519, 28903 Rancho California Road, Temecula, California, June 5, 1992.
- Alton Geoscience, 1993, Report on Additional Site Characterization, Unocal Station 6519, 28903 Rancho California Road, Temecula, California, January 26, 1993.
- Alton Geoscience, 1994a, Additional Site Characterization Report, Unocal Station 6519, 28903 Rancho California Road, Temecula, California, February 11, 1994.
- Alton Geoscience, 1994b, Limited Remedial Excavation Report, Unocal Station 6519, 28903 Rancho California Road, Temecula, California, July 22, 1994.
- Alton Geoscience, 1994c, Remedial Action Plan, Unocal Station 6519, 28903 Rancho California Road, Temecula, California, September 16, 1994.
- Alton Geoscience, 1996, Tank Removal and Product Line Sampling Report, Unocal Station 6519, 28903 Rancho California Road, Temecula, California, August 23, 1996.



**Quarterly Status Report, Third Quarter 2002**

76 Station 6519, 28903 Rancho California Road, Temecula, California

October 31, 2002

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Alton Geoscience, 1997a, Progress Boring Report, 76 Station 6519, 28903 Rancho California Road, Temecula, California, May 9, 1997.

Alton Geoscience, 1997b, Progress Boring Report, 76 Station 6519, 28903 Rancho California Road, Temecula, California, August 15, 1997.

Alton Geoscience, 1999, Soil Vapor Extraction Feasibility Test, 76 Station 6519, 28903 Rancho California Road, Temecula, California, January 4, 1999.

TRC, 2001, Quarterly Monitoring Report, 76 Station 6519, 28903 Rancho California Road, Temecula, California, October 15, 2001.

If you should have any questions regarding the content of this report, please contact us at (858) 505-8881.

Sincerely,

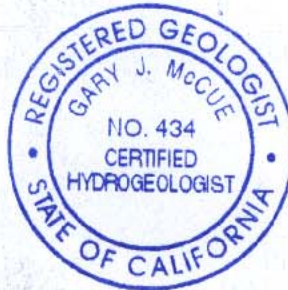
TRC



Joe Caruso  
Project Hydrogeologist



Gary J. McCue, RG 5886, CHG 434  
Principal Hydrogeologist

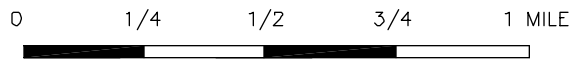
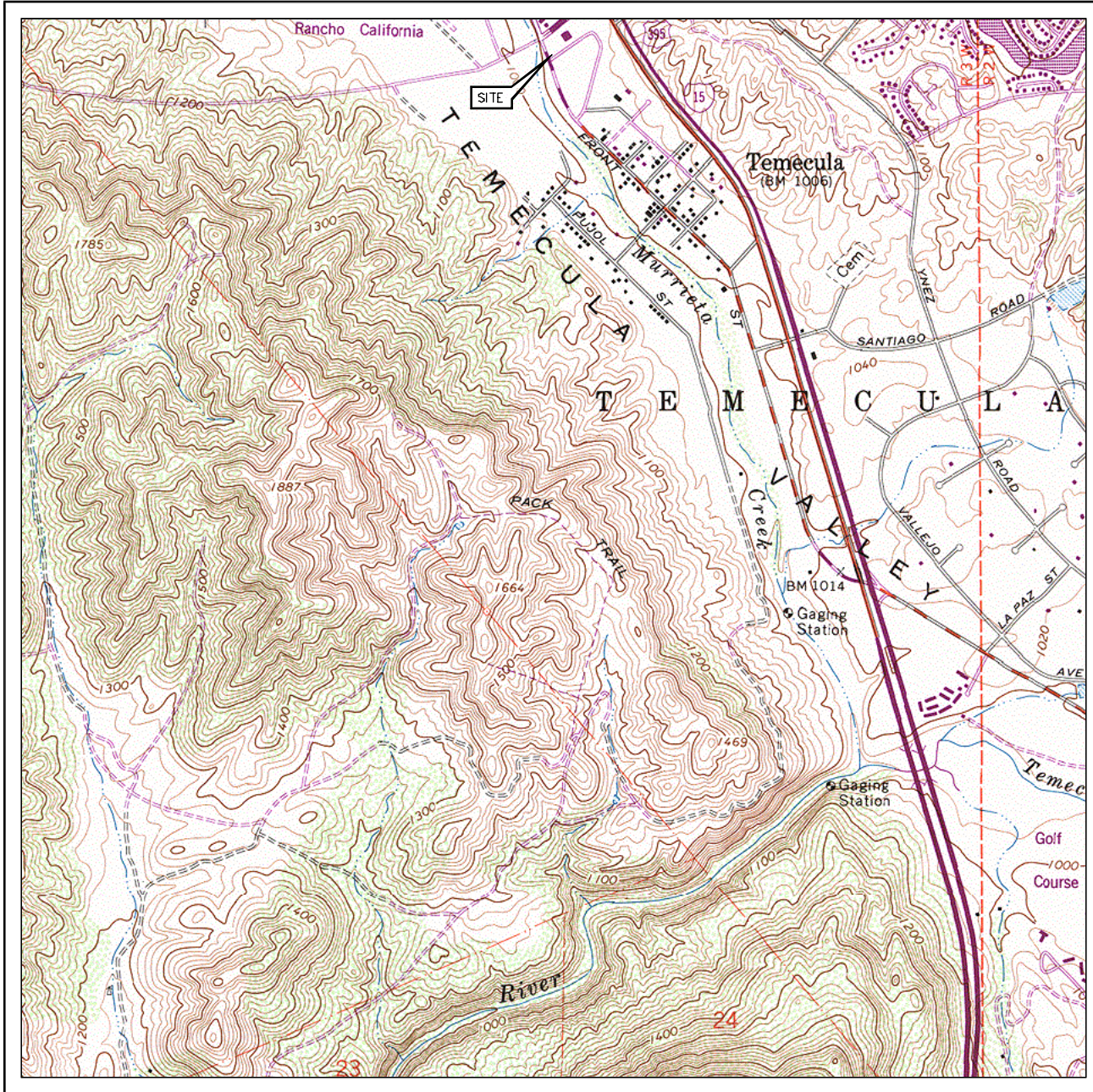


ATTACHMENTS:      Third Quarter 2002 Vapor Extraction System O&M Report  
                            Third Quarter 2002 Quarterly Monitoring Report

cc:                      Mr. Dan Fischman, Tosco Marketing, 2 copies  
                            Mr. Kelly Winters, Riverside County HMD  
                            Mr. Barry Pulver, CRWQCB San Diego Region

600121; 6519q11.doc





SCALE 1:24,000

**SOURCE:**

United States Geological Survey  
7.5 Minute Topographic Map:  
Temecula Quadrangles



QUADRANGLE  
LOCATION

**INDEX MAP**

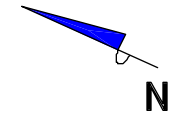
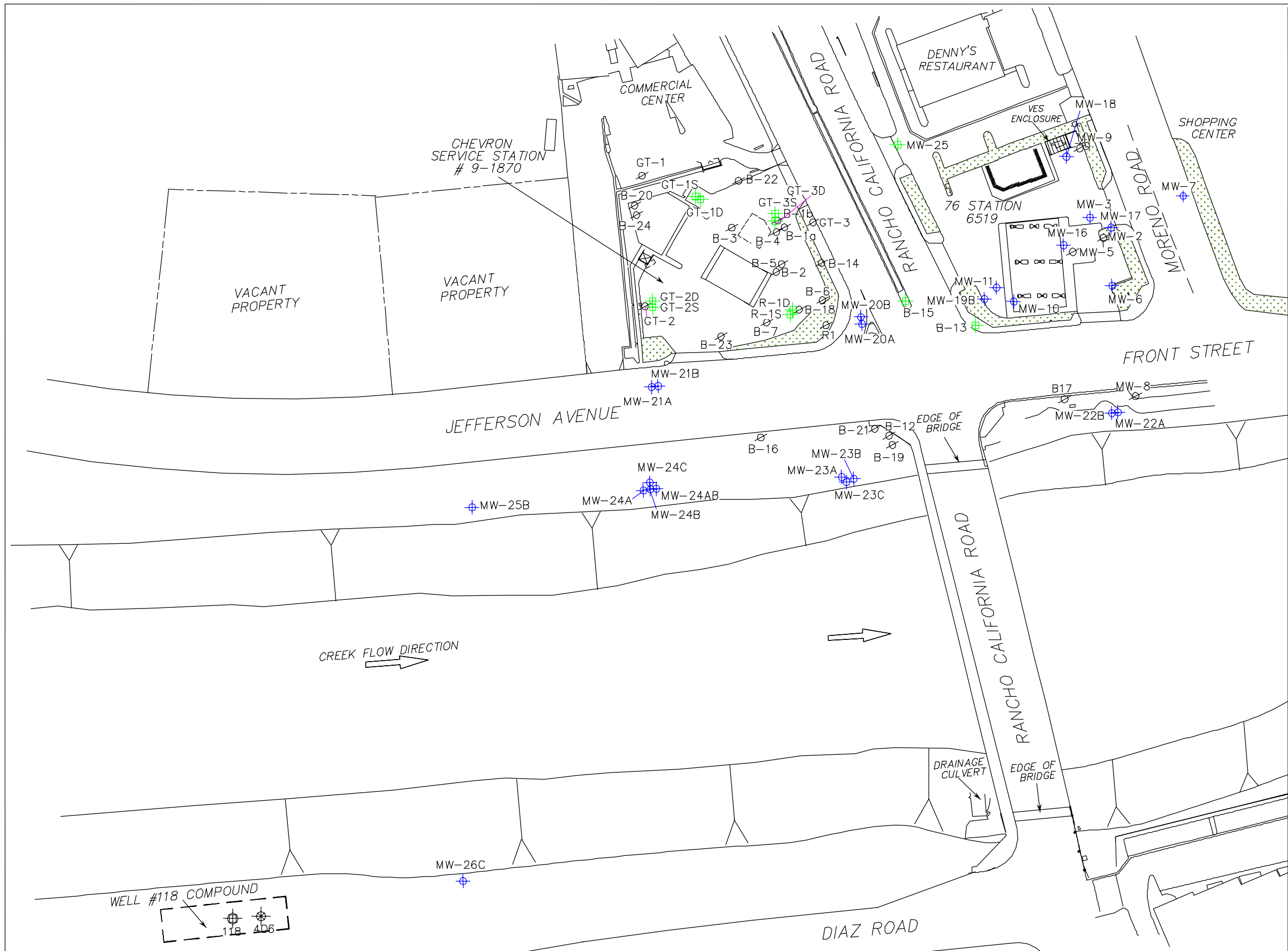
76 Station 6519  
28903 Rancho California Road  
Temecula, California

**TRC**

**FIGURE 1**

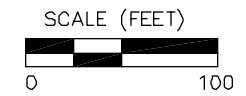
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**LEGEND**

- MW-18 76 Monitoring Well
- B-15 Chevron Monitoring Well
- MW-9 Abandoned Well
- 118 Rancho California Water District Production Well
- 406 Rancho California Water District Monitoring Well

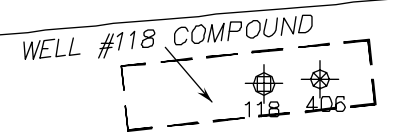


**NOTES:**  
 USTs = underground storage tanks. VES = vapor extraction system. All dimensions and locations are estimated.

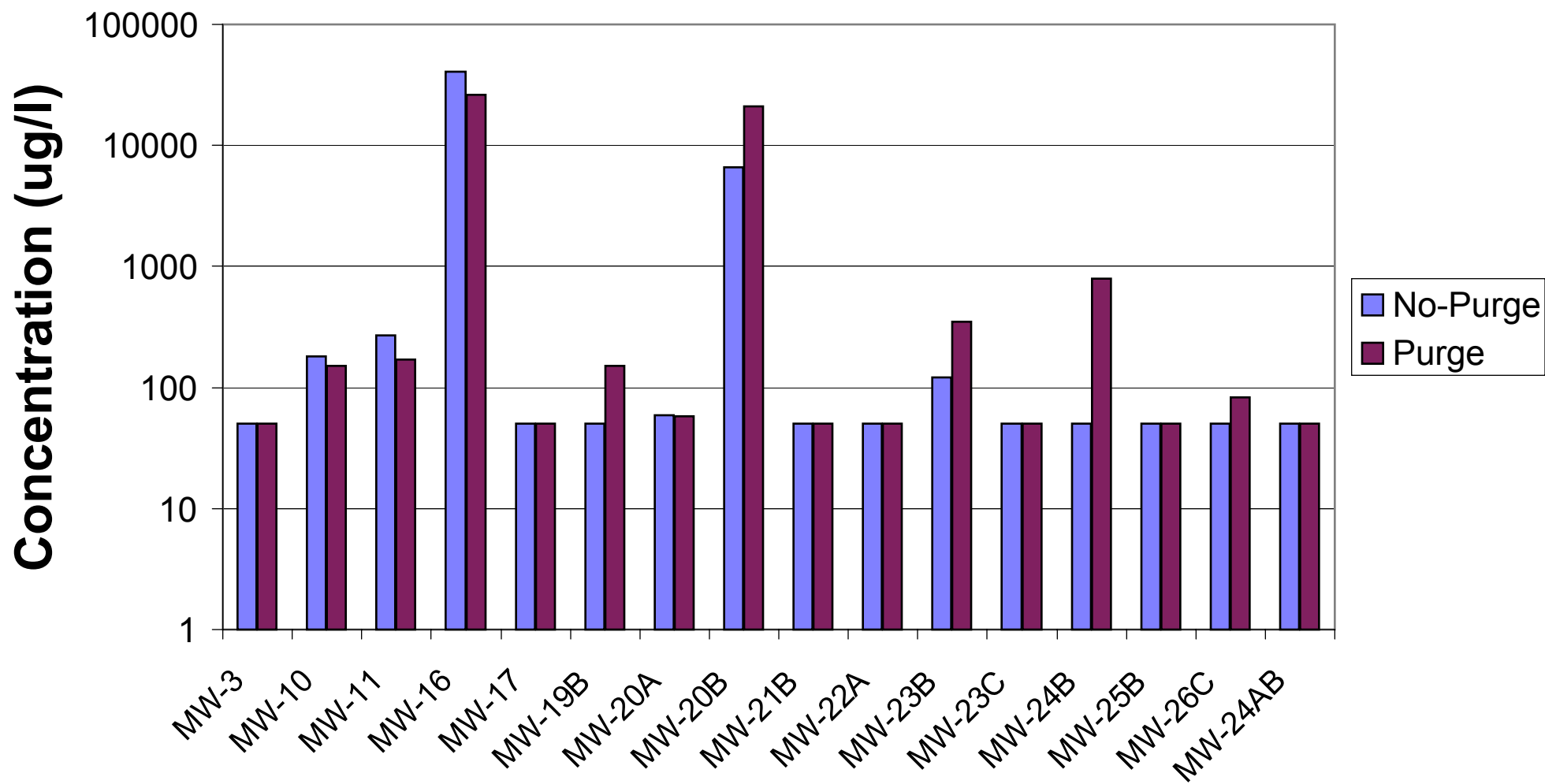
**SOURCE:**  
 Figures redrawn from blueprints by Harding Lawson and Associates. Chevron Ground and Grade Plan, blueprints by Holmes and Narver, aerial survey provided by Project Design Consultant, and survey provided by O.K.O. Engineering Inc. Chevron monitoring wells installed by Groundwater Technology, and Harding Lawson and Associates. 76 monitoring wells installed by TRC.

**SITE PLAN**

76 Station 6519  
 28903 Rancho California Road  
 Temecula, California

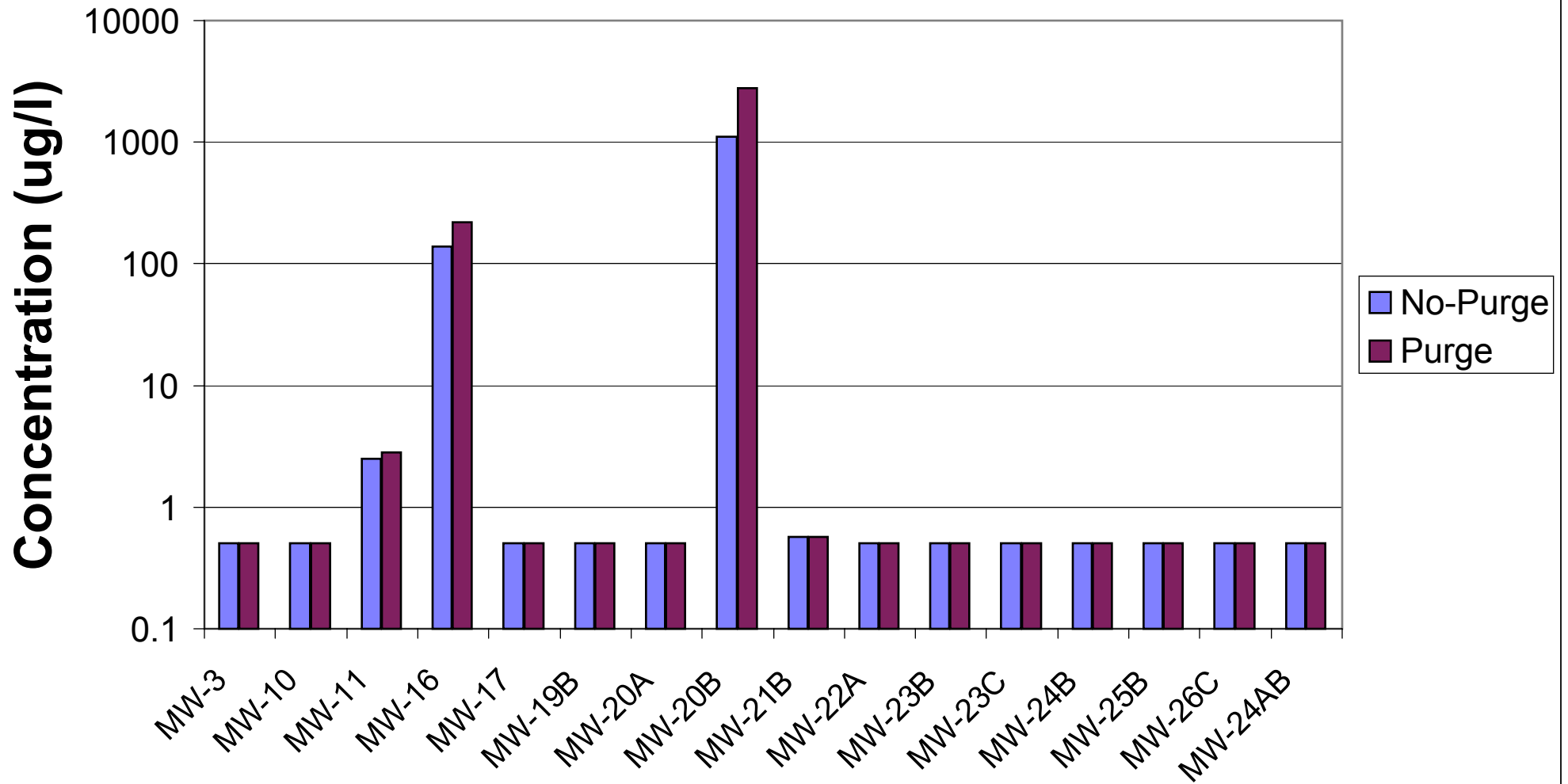


# Graph 1: TPHg Comparison



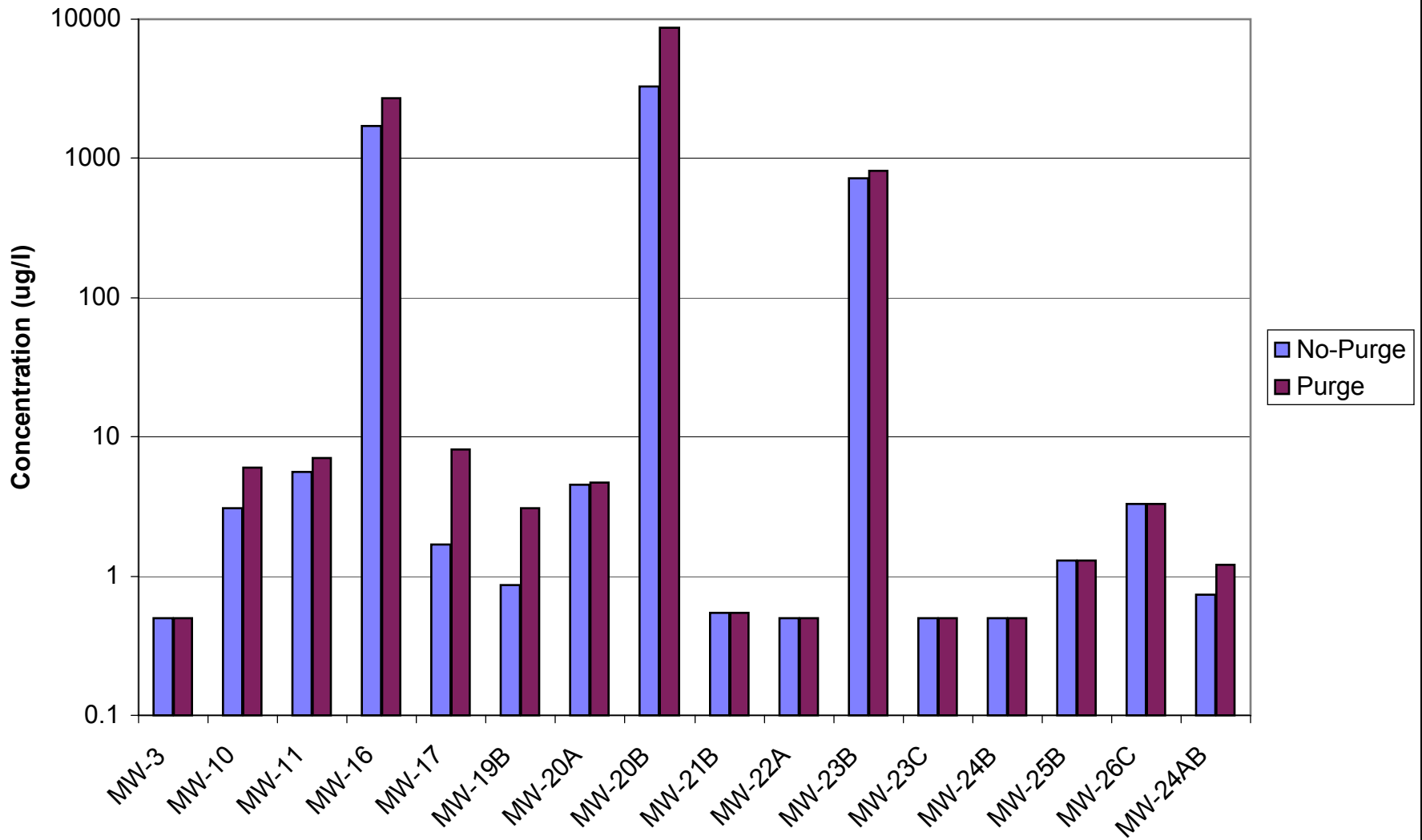
Note: NDs are plotted at the detection limit

## Graph 2: Benzene Comparison

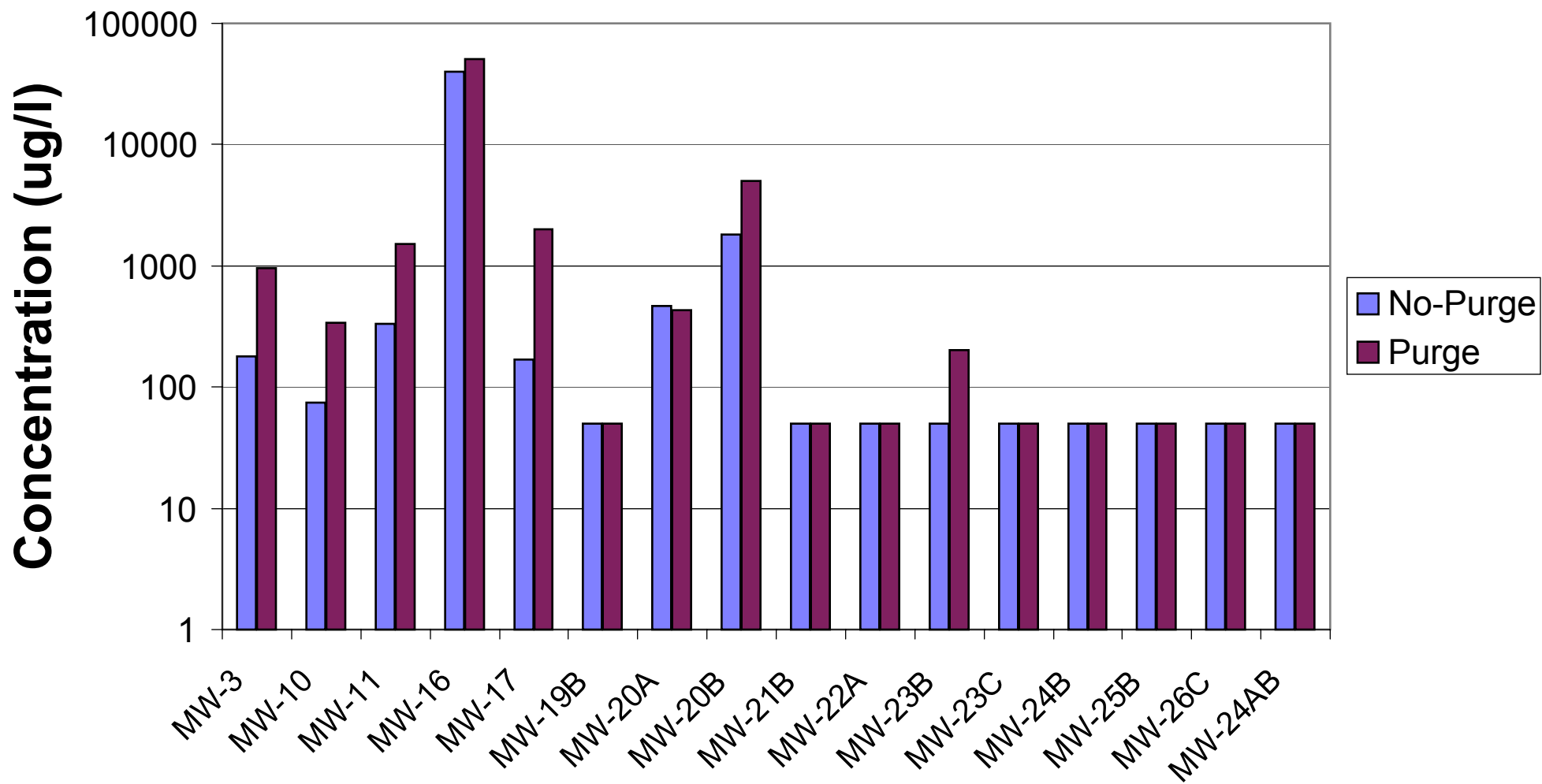


Note: NDs are plotted at the detection limit

### Graph 3: MTBE Comparison



# Graph 4: TBA Comparison



Note: NDs are plotted at the detection limit