WINZLER & KELLY
CONSULTING ENGINEERS

Ref: 94-131901-11058

January 13, 2006

Mr. Mark Verhey
Humboldt County Division of Environmental Health
100 H Street, Suite 100
Eureka, California 95501

Re: Quarterly Monitoring Data for the Third Quarter 2005
Mission Lath Facility, 2935 St. Louis Road, Arcata, CA, LOP #12387

Dear Mr. Verhey:

On behalf of Mr. Bob Britt and Mad River Lumber, Winzler & Kelly Consulting Engineers (Winzler & Kelly) is submitting the following quarterly monitoring data collected in September 2005 for the above-referenced site.

The purpose of this letter report is to document the activities, results, and findings of the quarterly monitoring program and summarize the data trend. All figures referred to herein are included in Appendix A. All tables are included in Appendix B, laboratory analytical reports are contained in Appendix C, Winzler & Kelly's Standard Operating Procedures (SOP) are contained in Appendix D, and Field Notes are contained in Appendix E.

SITE CONCEPTUAL MODEL

Site Location

The subject site is located at 2935 St. Louis Road in Arcata, California. The Region, Vicinity, and Site maps are included as Figures 1-3 (Appendix A). The site is currently the Mad River Lumber Mill. The site is located adjacent to the Eureka Southern Railroad tracks and approximately 150 feet from the southbound lanes of Highway 101. The site is located approximately 540 feet east of a Janes Creek tributary.

Geologic Setting

The site is located near the northeastern margin of the Arcata Bottoms, between the Mad River, roughly two miles north; and Humboldt Bay, roughly two miles south; and bedrock hills, a few hundred feet east. The hills are composed primarily of sedimentary and metamorphic rocks of the Cretaceous to Jurassic Franciscan Complex and over-lying sedimentary rocks of the Quaternary to Tertiary Wildcat Group. The location of the site on a gently sloping pediment between the nearly flat Arcata Bottoms and moderately sloping bedrock hills suggests that shallow soil stratigraphy below the site is a mixture of Mad River flood plain sediments and outwash deposits from small watercourses, draining the hills. Soil stratigraphy consists of silt from the ground surface to approximately 10 feet below ground surface (bgs) and clay from the base of the silt to the maximum explored depth of approximately 34 feet bgs. Within the silt and clay are generally thin lenses of sandy clay, sand, and gravel, which are likely to control the migration of impacted groundwater at the site.

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Groundwater gradient was calculated based on water level measurements recorded on a monthly basis between January 1997 and March 2000, and on a quarterly basis since then. Groundwater gradient within the shallow aquifer was based on depth to water measurements collected at seven of the shallow aquifer monitoring wells at the site (MW-1, MW-7, MW-9, MW-10, MW-11, MW-12, and MW-19). The average groundwater gradient within the shallow aquifer was calculated to flow in an east southeasterly direction of 102.14° Azimuth at 3.60 feet per 100 feet (Table 2, Appendix B). The calculations of average and standard deviation for groundwater gradient direction and magnitude include all data collected to date. Groundwater in the shallow aquifer at the site flows generally in an easterly direction, but fluctuates with no apparent seasonality.

Environmental Site History

Three 1,000 gallon and one 8,000 gallon petroleum USTs were formerly operated at the site to supply fuel for the operation of the lumber mill. The USTs and the piping were removed from the ground in 1991. The UST investigation has been divided into two separate areas, the North Tank Site and the South Tank Site. The North Tank Site (two 1,000-gal. tanks, one 8,000-gal. tank) has been adequately characterized and a "No Further Action" certificate was issued by the HCDEH. However, subsurface investigations have indicated that shallow perched groundwater in the vicinity of the South Tank Site (the location of one 1,000 gallon gasoline UST) has been impacted by petroleum hydrocarbons.

The Mission Lath Facility has been the subject of ongoing subsurface investigation and monitoring activities since the removal of the underground storage tanks (UST's) from the site in 1991. Previous activities include:

Removal of USTs (SHN)	November/December 1991
Over-Excavation of UST pits (SHN)	December 1991
Initial Subsurface Investigation (SHN)	February 1993
Quarterly Groundwater Monitoring (SHN)	February - December 1993
Quarterly Groundwater Monitoring (W&K)	December 1993- present
Additional Subsurface Investigation (W&K)	June 1995
Water Level Study (W&K)	February 1996
Continued Additional Subsurface Investigation (W&K)	February 1997
Stockpile Assess., Purge Water Disposal and Well Repair (W&K)	June 1997
Remedial Action Plan (W&K)	October 1997
Intrinsic Remediation Feasibility Study	September 1998
Initiation of Groundwater Pump and Treat System	September 1999
Termination of Pump and Treat System	July 2000
2002 Quarterly Monitoring Summary and Natural Attenuation Model	May 2003
Workplan for Continued Investigation and Site Conceptual Model	December 2003
Installation of MW-19 and abandonment of MW-13, -14, -16B, -17B, -18B, and RW-1	February 2004

The delineation of the extent of soil and groundwater impacts was completed and presented in the *Report of Continued Subsurface Investigation at Former Site of Underground Storage Tanks*, prepared by Winzler & Kelly, and dated February 1997. HCDEH agreed with this assessment in a letter dated April 10, 1997. The extent of impacted soil has been defined and is limited to within approximately 30 feet of the former UST. The highest recorded concentration of TPH-G in site soil is 170 parts per million (ppm) and was measured within the former UST excavation after UST removal activities. The highest recorded concentrations of the BTEX constituents in site soil are 2.9 ppm, 11 ppm, 2.9 ppm, and 10 ppm, respectively, and were recorded within, or adjacent to the former UST excavation. Soil samples collected from distances of 20 to 30 feet from the former UST have contained very low concentrations of TPH-G up to 29 ppm with BTEX concentrations mostly below laboratory detection limits, but ranging up to 3.19 ppm.

During the course of the final delineation of the hydrocarbon impacts to soil and groundwater, temporary well TW-15 was installed and sampled on November 11, 1996. Laboratory analytical results for soil and groundwater samples collected at TW-15 indicated no detectable impacts. Temporary well TW-15 was located approximately 80 feet down gradient from the former UST, in Cal Trans Highway 101 right-of-way. Currently, impacted groundwater is present only at monitoring wells MW-1, MW-9, MW-10, and MW-19. The extent of impacted groundwater is defined and is limited to less than 90 feet from the former UST in any direction. The maximum recorded concentration of TPH-G in groundwater samples collected from monitoring wells is 46,000 parts per billion (ppb) at monitoring well MW-19 during the October 2004 monitoring event (Table 4, Appendix B). The maximum recorded concentration of benzene in groundwater samples collected from monitoring wells is 12,000 ppb at monitoring well MW-19 in February 2004 (Table 4, Appendix B). MW-19 was installed in February of 2004. Prior to this installation the highest readings for both mentioned contaminants were from MW-10 during the June 1998 event. Concentrations for MW-10 have since dropped to a fraction of their June 1998 readings.

The February 1997 report concluded that the groundwater plume had been delineated, and extended to a point somewhere between MW-9 and TW-15. The HCDEH agreed with this assessment in a letter dated April 10, 1997. Given the natural attenuation of the plume that has been documented since 1997, it is reasonable to assume that the down-gradient extent of the groundwater plume is still located at a point between MW-9 and TW-15. The HCDEH agreed with this assessment in a letter dated February 1, 2005.

Changes in Distribution of Chemicals

The plume of impacted groundwater originating at the subject site appears to be fluctuating in concentration and extent over time. The presence of impacted groundwater with decreasing concentrations at the down-gradient monitoring well MW-9 suggested that the plume was naturally attenuating. However, sampling data from the May 2004 monitoring event showed an unexpected spike of TPH-G in monitoring wells MW-1, MW-9 and MW-10. The absence of contaminants in monitoring well MW-11 (approximately 60 feet down-gradient from the former UST) suggests that the rate of natural attenuation is sufficient to prevent the migration of the plume offsite to any great extent. The presence of relatively high concentrations of contamination at monitoring well MW-10 since the February 2003 monitoring event was

unexpected since this well is located upgradient of the suspected source area, although the location of the former UST is not precisely known. The trend in MW-10 had been generally decreasing through December 2002, then there was a peak in the concentration of contaminants during the February 2003 monitoring event (Figure 6, Appendix B).

Consistent non-detect petroleum hydrocarbons results at monitoring wells MW-7, MW-11, and MW-12 supports the restricted movement of the contamination plume and defines the extent of contaminants. Low levels of xylene (1.94 ppb) have been reported in MW-11 and low levels of benzene (1.1 ppb) have been reported in MW-7.

Potential Sensitive Receptors

A Sensitive Receptor Survey was completed for this site in 1998. The results of the survey were presented in the "Intrinsic Remediation Feasibility Study", Winzler & Kelly, September 1998, and are summarized here. No drinking water wells are known to be located within a 1,000-foot radius of the Mission Lath plume. The only potential sensitive receptor present near the site is a tributary to Janes Creek, located approximately 540 feet northwest of the site. Janes Creek is unlikely to have been, or to become, impacted by a migrating hydrocarbon plume originating at the site due to the slow migration rate and apparent natural attenuation of the plume. Janes Creek and its tributary are also located up gradient from the plume. The up-gradient location of the only sensitive receptor identified and the consistently limited extent of the plume strongly suggest that the plume should not impact potential sensitive receptors. No potential sensitive receptors have been identified down gradient from the subject site within the limits of the survey.

Issues Remaining to be Addressed

Issues, which remain to be addressed, include:

- Determine if recent spike in hydrocarbon levels represent a long or short-term trend. If long term, consider other remedial options.
- Locate potential soil source that is feeding groundwater plume.

QUARTERLY MONITORING ACTIVITIES

A Winzler & Kelly technician obtained water levels from monitoring wells MW-1, MW-7, MW-9, MW-10, MW-11, MW-12 and MW-19 on September 20, 2005, then purged and obtained groundwater samples from the shallow aquifer monitoring wells, MW-1, MW-9, MW-10 and MW-19. For site maps and well locations, see Figures 1, 2, and 3, Appendix A.

Groundwater Gradient

Water levels were measured during the September 2005 sampling event. Prior to water level measurements, each well was opened for at least 15 minutes to allow equalization. Water levels were then collected per Winzler & Kelly's SOP for *Groundwater Level Measurements and Free Phase Hydrocarbon Measurements* (Appendix D). The shallow groundwater elevations for all previous Winzler & Kelly sampling events are summarized in Table 1, Appendix B, and groundwater elevations for monitoring wells MW-1, MW-9, MW-10 and MW-19 are depicted in hydrographs in Figures 4-7, Appendix A.

The shallow groundwater gradient direction for September 20, 2005 was calculated using monitoring wells MW-1, MW-7, MW-9, MW-10, MW-11, MW-12, and MW-19 at 79.19° Azimuth at a slope of 3.15 feet/100 feet. These calculations are consistent with the historic shallow aquifer gradient, which indicates groundwater generally flows towards the east at a moderate rate. The shallow-well groundwater gradients for this and all previous Winzler & Kelly sampling events are summarized in Table 2, Appendix B. A groundwater gradient map for the shallow aquifer wells during September 2005 is shown on Figure 3, Appendix A.

Depth to water measurements for the September 2005 sampling event were submitted electronically to the State Water Resources Control Board Geotracker system on October 10, 2005.

Dissolved Oxygen Measurements

Dissolved oxygen (DO) measurements were not obtained during this monitoring event. Historic DO measurements for each well are summarized on Table 3, Appendix B.

Well Purging

Wells MW-1, MW-9, MW-10 and MW-19 were purged on September 21, 2005, prior to sampling using a disposable bailer and according to Winzler & Kelly's *Monitoring Well Purging and Sampling Activities* SOP (Appendix D). To ensure the collection of representative water samples from each well, a minimum of three well volumes were removed from each well prior to sampling. Temperature, pH, and conductivity parameters were monitored during purging to help determine when the well water reached equilibrium with the surrounding aquifer. During purging and sampling, petroleum odor was noted at monitoring wells MW-1, MW-9, and MW-10, and petroleum odor and sheen in MW-19.

Water Sampling

Winzler & Kelly obtained water samples for laboratory analysis from the shallow aquifer monitoring wells MW-1, MW-9, MW-10, and MW-19 during the September 2005 sampling event. The samples were collected using disposable bailers per Winzler and Kelly's *Monitoring Well Purging and Sampling Activities* SOP (Appendix D). The samples were immediately capped, labeled, stored in an iced cooler, and delivered to a State-certified analytical laboratory under proper Chain-of-Custody documentation.

The samples from the wells MW-1, MW-9, MW-10, and MW-19 were submitted for the following analysis:

- TPH-G, BTEX, and five fuel oxygenates: methyl tert-butyl ether (MTBE), Di-isopropyl Ether (DIPE), Ethyl Tertiary Butyl Ether (ETBE), Tertiary Amyl Methyl Ether (TAME) and tert-butanol (TBA) by EPA Method 8260B.

Groundwater Analytical Results

The results from the laboratory analysis for each shallow aquifer monitoring well are summarized along with previous quarterly monitoring results on Table 4, Appendix B. Copies of the laboratory reports are included in Appendix C.

Of the seven wells sampled since February 1993, four of the upper aquifer wells (MW-1, MW-9, MW-10 and MW-19) have indicated the presence of gasoline (TPH-G) or BTEX components. In a June 29, 2004 letter, Humboldt County Department of Environmental Health (HCDEH) stated that wells MW-7, MW-11, and MW-12 be monitored biannually; therefore, these wells were not sampled during this monitoring event.

For the September 2005 sampling event, MW-1 had concentrations of TPH-G at 1,300 ppb, benzene at 140 ppb, toluene at 23 ppb, ethylbenzene at 71 ppb and xylene at 141 ppb All other constituents were below laboratory detection limits (Table 4, Appendix B). The four fuel oxygenates MTBE, DIPE, ETBE, and TAME have been below laboratory detection limits since testing began in 1998. This well had shown a decreasing trend since a peak in March 1998; however it has shown an increasing trend since December 2000. Figure 4, Appendix A shows the overall trend for TPH-G in this well.

For MW-9, the September 2005 concentrations were TPH-G at 270 ppb, benzene at 12 ppb, toluene at 4.5 ppb, ethylbenzene at 9.7 ppb, and xylene at 18.2 ppb. All other constituents were below laboratory detection limits. The four fuel oxygenates MTBE, DIPE, ETBE, and TAME have been below laboratory detection limits since testing began in 1998. Occasional low levels of TBA have been reported in past monitoring events. This well had been displaying a decreasing TPH-G trend since a recent peak in June 2004. The overall trend in this well is shown in Figure 5, Appendix A.

The concentrations of contaminates in MW-10 were TPH-G at 4,400 ppb, which is an increase from the June 2005 concentration of 1,800 ppb, Benzene at 280 ppb, toluene at 160 ppb, ethylbenzene at 170 ppb, and total xylene at 370 ppb. Concentrations of the remaining tested fuel oxygenates were below laboratory detection limits. This well had been showing a decreasing trend since a peak in June 1998; however it has displayed an increasing trend since December 2002. The overall trend for this well is shown in Figure 6, Appendix A.

The concentration of TPH-G in MW-19 was 35,000 ppb, which is an increase from the June 2005 monitoring event and the highest value reported since the monitoring event of October 2004. The concentrations of the other constituents were benzene at 10,000 ppb, toluene at 880 ppb, ethylbenzene at 900 ppb, and total xylene at 1,240 ppb (Table 4, Appendix B). This well has displayed fluctuating TPH-G results since installed in February 2004. The overall trend for this well is shown in Figure 7, Appendix A.

Analytical results for the September 2005 sampling event were submitted electronically to the State Water Resources Control Board Geotracker system on October 10, 2005.

Disposition of Wastewater

Purge water for monitor wells MW-1, MW-9, MW-10 and MW-19 are contained in labeled 55-gallon drums secured on-site. Drums, which contain water from wells that have never tested positive for hydrocarbon constituents at or above the detection limits, will be discharged to the

ground surface in a manner designed to avoid ponding or runoff to surface waters. The drums for the other wells will be disposed of properly.

Quality Assurance/Quality Control (QA/QC)

Laboratory QA/QC was provided by lab analysis of a Method Blank, which is used to exclude false-positive analysis. The Method Blank for this analytical run did not report any analytes above the method detection limit. However, TPH-G, ethylbenzene, and o-xylene were detected in the method blank below the laboratory quantitation limits. The lab also used Laboratory Control Spike samples and Duplicates (LCS and LCSD) to evaluate the percentage recovery of known analyte spikes. The LCS and LCSD recovery were within acceptance recovery limits for all analytes.

The laboratory also stated:

Gasoline Components/Additives:

- The gasoline values for samples MW-1, MW-9, MW-10 and MW-19 include the reported gasoline components in addition to other peaks in the gasoline range.
- Some reporting limits were raised for samples MW-1 and MW-10 due to matrix interference.
- Sample MW-19 was reported as ND with a dilution due to matrix interference.

Conclusions of Quarterly Monitoring

- The shallow groundwater gradient was calculated to flow to the east-northeast, which is consistent with previous measurements at the site.
- The shallow groundwater continues to be impacted by petroleum hydrocarbons at monitoring wells MW-1, MW-9, MW-10, and MW-19.
- MW-1 had been showing a general decreasing trend until December 2000. Since that time it has shown a fluctuating trend where TPH-G and the BTEX constituents decrease in the winter months and increase in the summer months.
- MW-9 had been showing a decreasing trend until December 2002. After recording a TPH-G concentration of 3,500 ppb in May 2004, levels then decreasing to 150 ppb in December 2004, increasing to 1,500 ppb in April 2005, and decreasing to 270 ppb during this monitoring event. The fluctuating pattern has not become clear, but appears to be fluctuating by season.
- MW-10 showed a decreasing trend until December 2002, and has been fluctuating widely with no apparent overall trend since that time. The fluctuations, like the other wells, maybe be related to the hydrologic cycle changes by season.
- MW-19 was installed in February 2004 and has had very high TPH-G levels with a peak of 46,000 ppb in October 2004, and a with overall fluctuating trend.
- MTBE and the other fuel oxygenates have only been detected sporadically at low levels at this site and do not seem to be constituents of concern.

Quarterly Monitoring Recommendations

- The next quarterly monitoring event should be conducted in December 2005.
- The December 2005 sampling will include wells MW-1, MW-7, MW-9, MW-10, MW-11, MW-12, and MW-19.
- In a letter dated February 1, 2005, HCDEH requested a work plan to conduct additional borings to determine the source area for the groundwater impacts observed at MW-19. This work plan was approved in a letter from HCDEH dated September 22, 2005. A cost estimate has been completed for the implementation of this workplan, and upon approval from the site owner, the workplan will be implemented.

Should you have any questions, please call Patrick Kaspari at (707) 443-8326.

Sincerely,
WINZLER & KELLY
Prepared by:

Gary S. Lester
Staff Scientist

Reviewed by:

Patrick Kaspari, PE #CO55722
Project Engineer

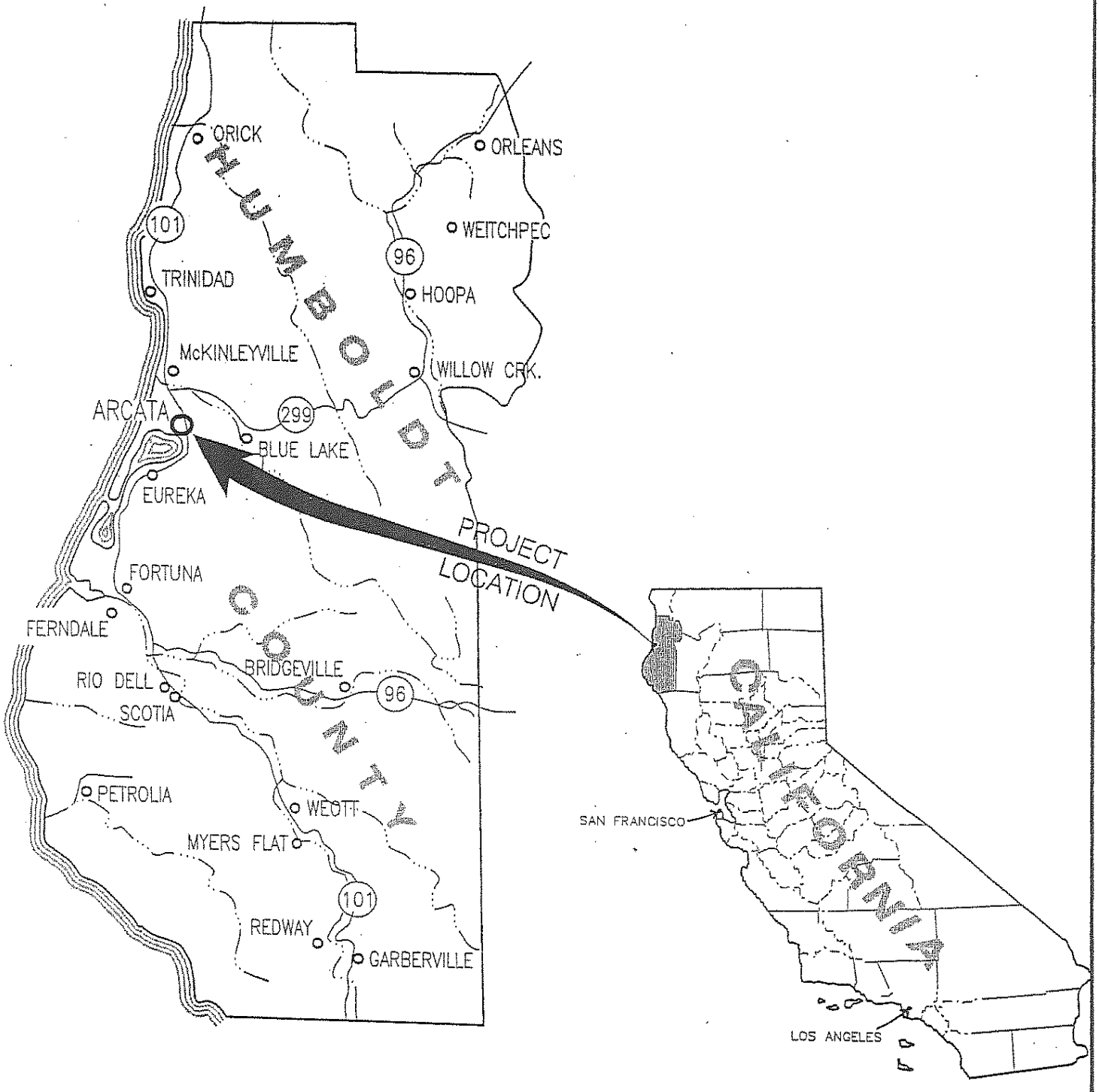
gsl

Enclosures:

	Appendix A	Figures
	Appendix B	Tables
	Appendix C	Laboratory Reports and Chain-of-Custody Forms
	Appendix D	Winzler & Kelly Standard Operating Procedures
	Appendix E	Field Notes

c: Mr. Bob Britt, Mad River Lumber, P.O. Box 1134, Arcata, CA 95518
The Estate of Mr. Abe Willis, c/o Ms. Inez Northwood, 211 S. Citrus Avenue, Covina, CA 91723

Appendix A
Figures



REGION MAP

MISSION LATH

FIGURE 1

WINZLER & KELLY

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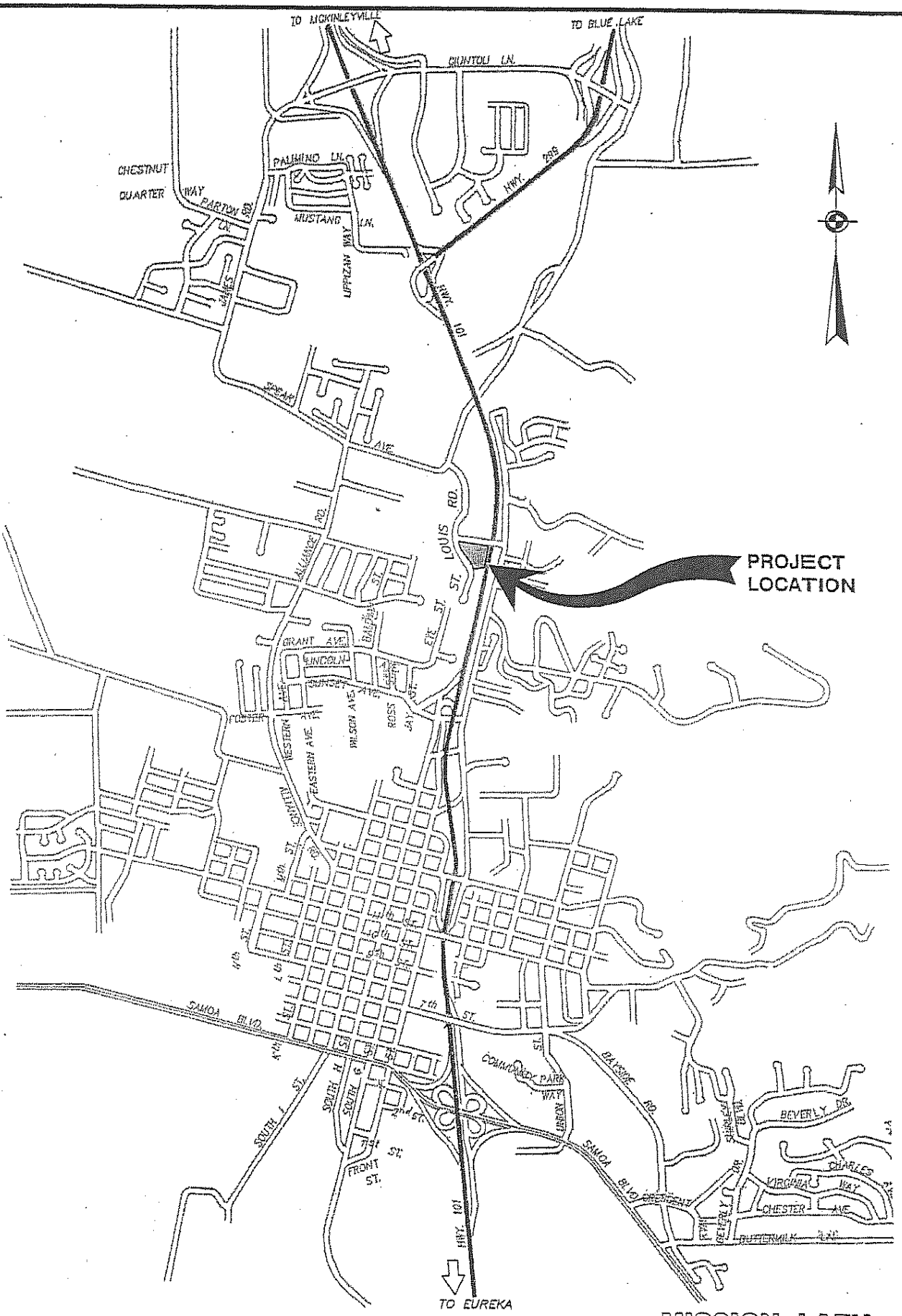

VICINITY MAP

MISSION LATH
FIGURE 2

WINZLER & KELLY

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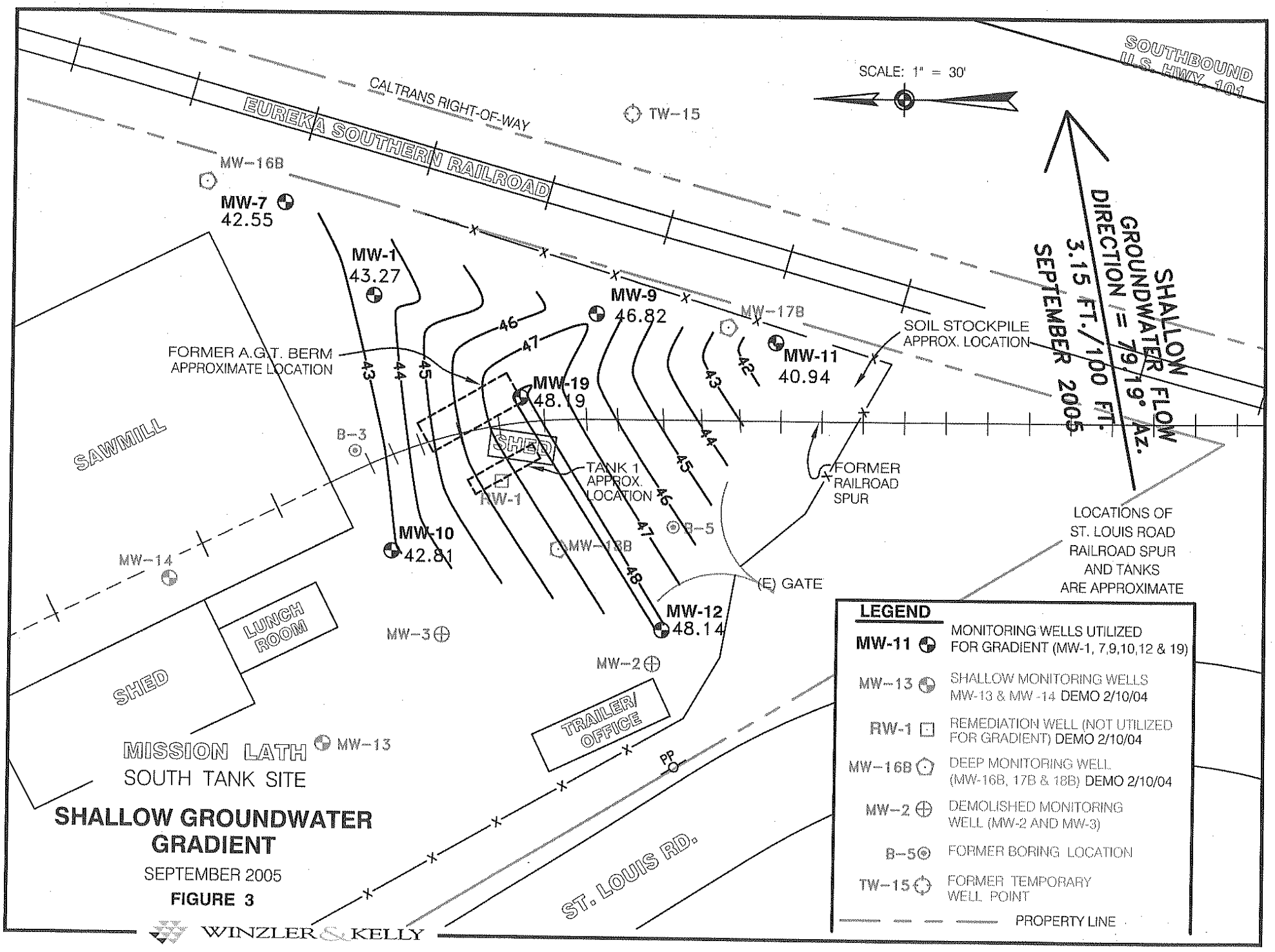
FILE: J:\CAD\JOBS\94\94131901\dwg\319a052f03b.dwg DATE: Jan 12 06 @ 12:45pm



MISSION LATH
SOUTH TANK SITE

SHALLOW GROUNDWATER GRADIENT

SEPTEMBER 2005

FIGURE 3

WINZLER & KELLY

Figure 4
MW-1
TPH-G Concentrations
VS
Groundwater Elevation

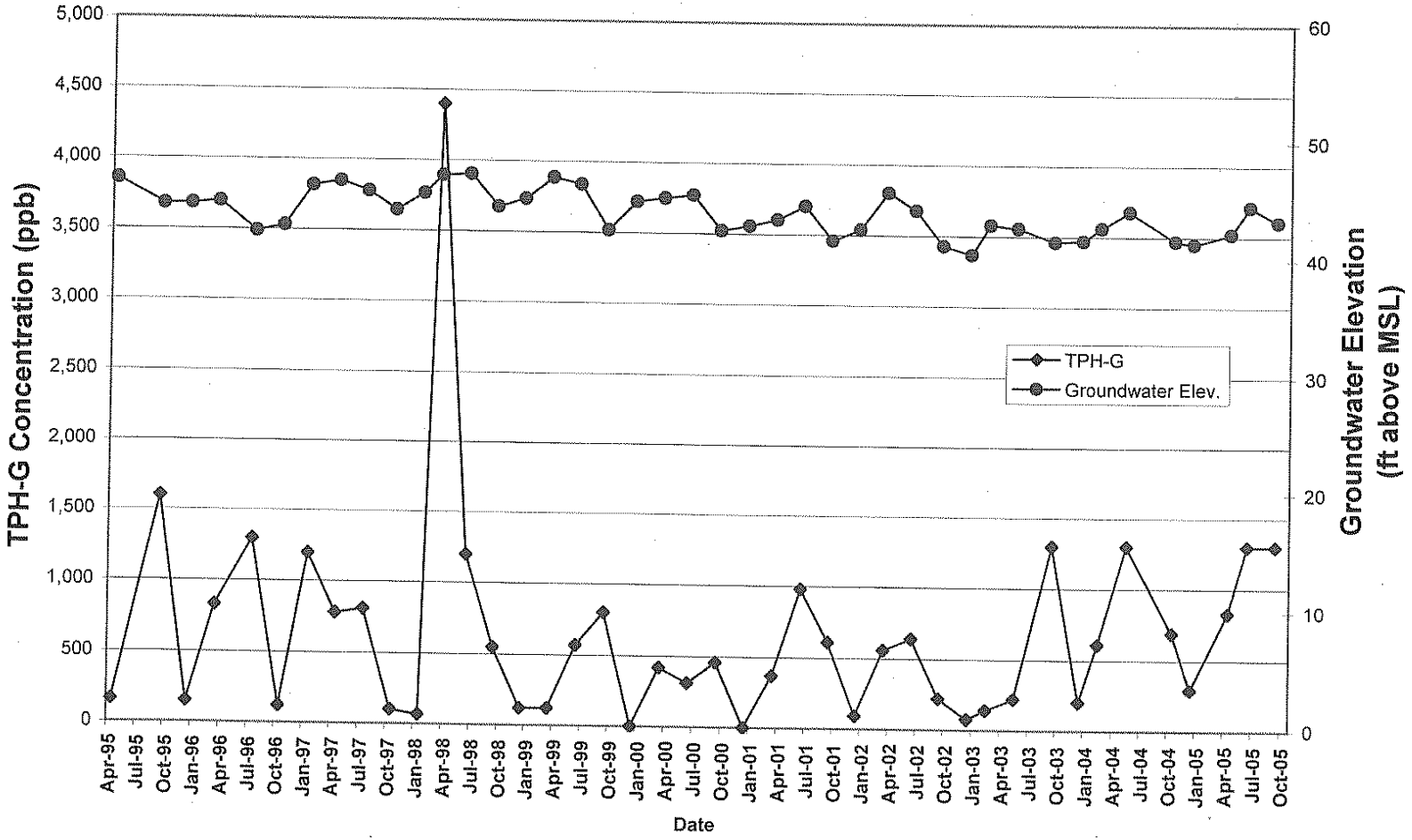


Figure 5
MW-9
TPH-G Concentrations
VS
Groundwater Elevation

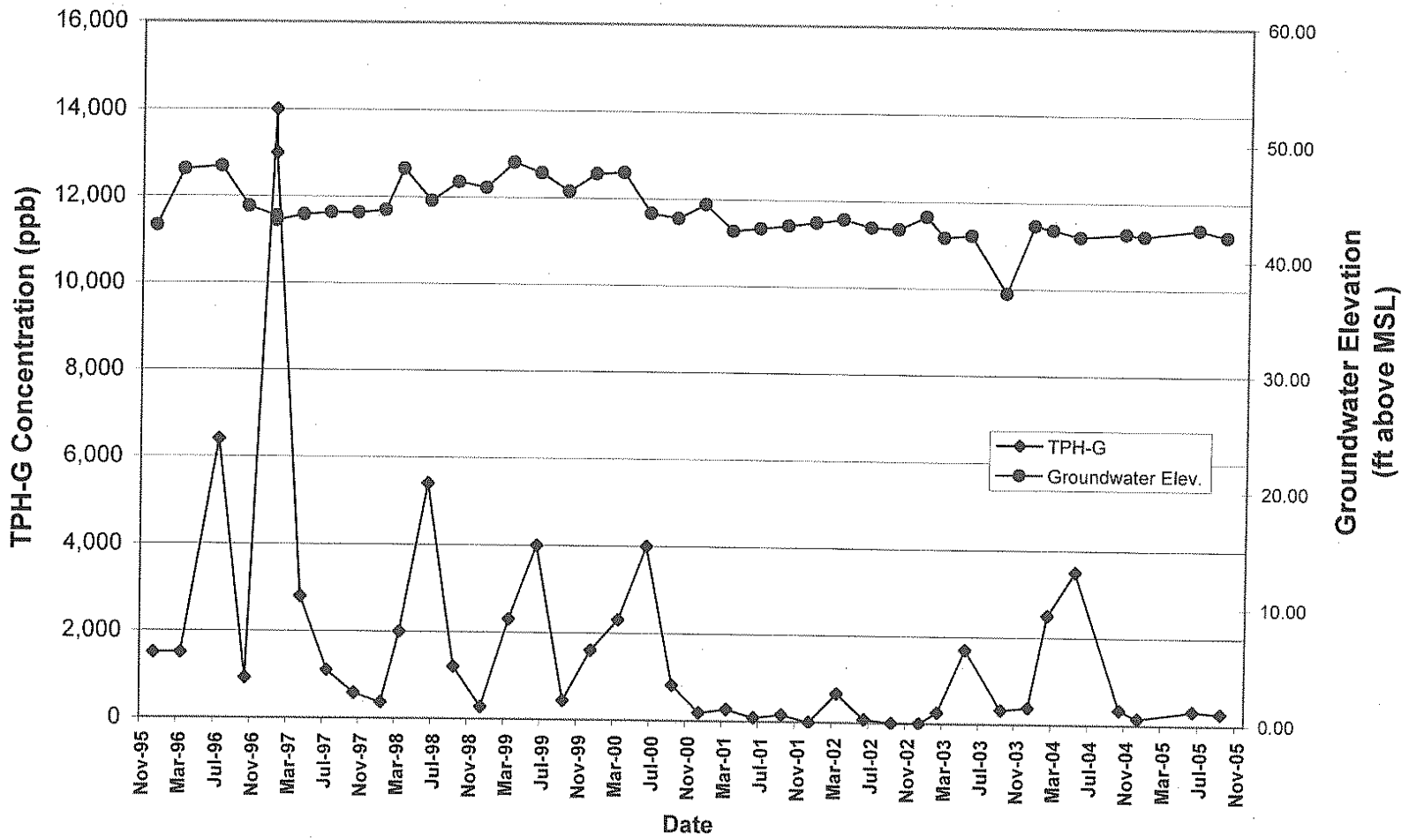


Figure 6
MW-10
TPH-G Concentrations
VS
Groundwater Elevation

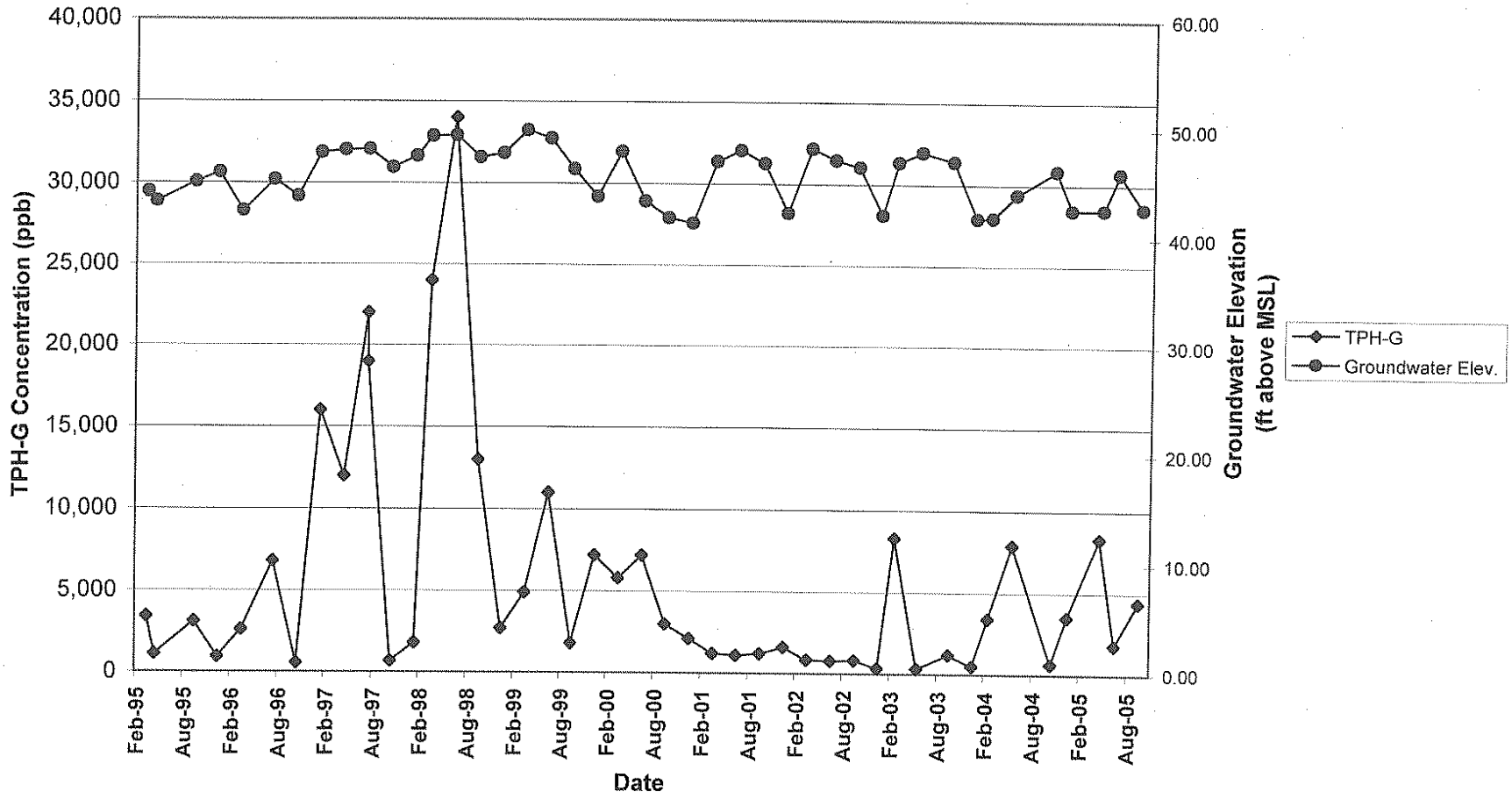
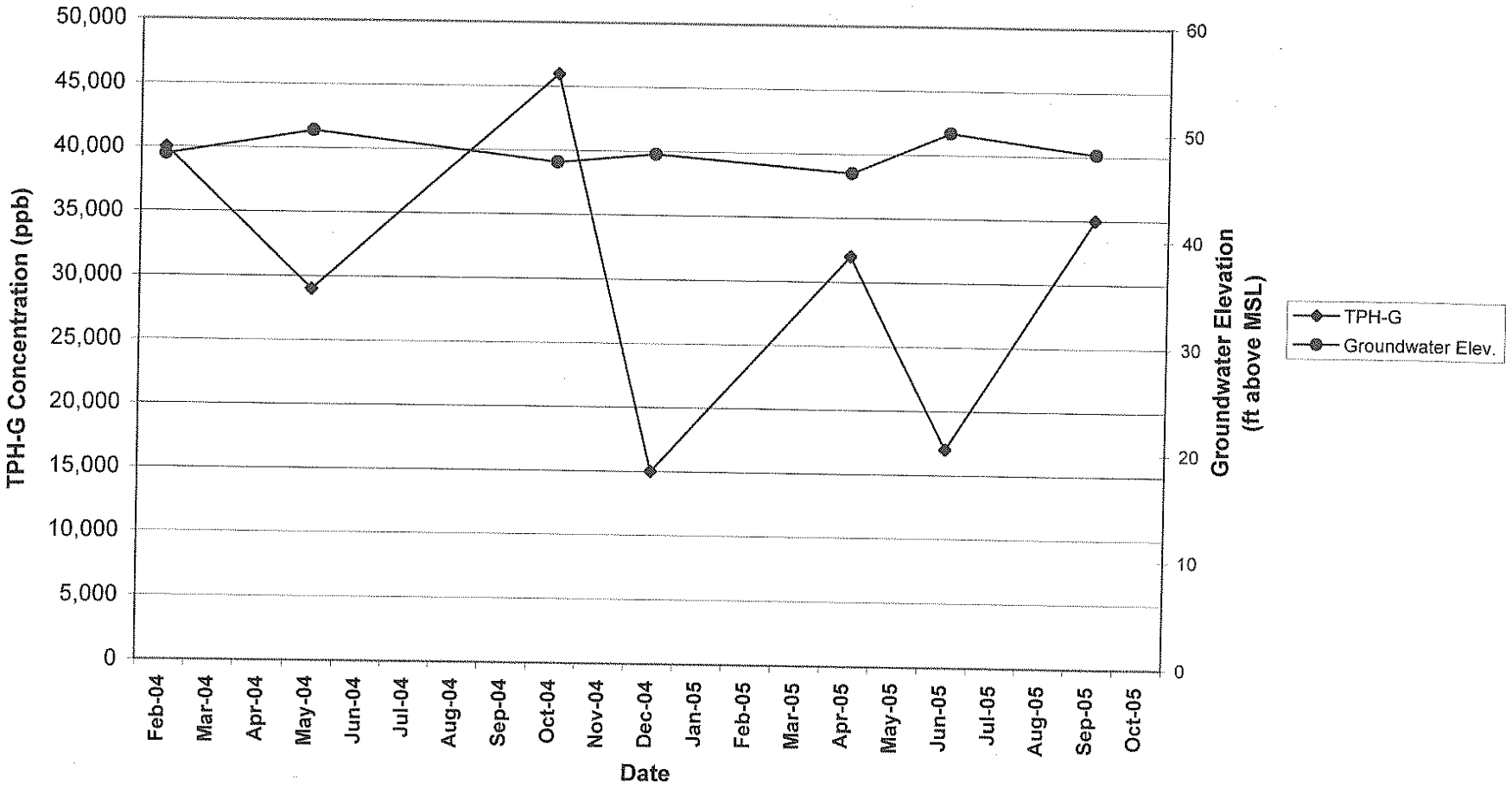


Figure 7
MW-19
TPH-G Concentrations
VS
Groundwater Elevation



Appendix B
Tables

Table 1

Shallow Groundwater Elevation Summary

(MW-1, MW-7, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14 and MW-19)

Monitoring Well ID	MW-1		MW-7		MW-9		MW-10		MW-11		MW-12		MW-13		MW-14		MW-19	
New TOC[a] (ft MSL) Dec. 13, 1996	54.72		54.24		53.26		54.73		54.12		53.80		54.10		54.71		54.36 New TOC (4/11/05) 54.10	
DATE	DTW[b] (ft bgs)	GW ELEV[c] (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)
21-Dec-94	11.61	42.56	NA		NA		NA		NA		NA		NA		NA		NA	
20-Jan-95	10.09	44.08	NA		NA		NA		NA		NA		NA		NA		NA	
24-Mar-95	8.74	45.43	11.83	42.41	10.77	42.49	10.56	43.55	NA		NA		NA		NA		NA	
19-Apr-95	8.48	45.69	11.57	42.67	5.90	47.36	11.42	42.69	NA		NA		NA		NA		NA	
16-Jun-95	13.16	41.01	10.98	43.26	11.31	41.95	8.82	45.29	NA		NA		NA		NA		NA	
07-Sep-95	10.58	43.59	9.35	44.89	5.64	47.62	9.64	44.47	NA		NA		NA		NA		NA	
17-Oct-95	12.71	41.46	13.90	40.34	10.44	42.82	10.25	43.86	NA		NA		NA		NA		NA	
21-Dec-95	10.53	43.64	12.32	41.92	9.10	44.16	8.76	45.35	NA		NA		NA		NA		NA	
11-Mar-96	10.33	43.84	11.96	42.28	9.95	43.31	12.30	41.81	NA		NA		NA		NA		NA	
15-Jul-96	12.85	41.32	13.29	40.95	10.33	42.93	9.42	44.69	NA		NA		NA		NA		NA	
03-Oct-96	12.34	41.83	11.49	42.75	9.79	43.47	10.94	43.17	NA		NA		NA		NA		NA	
21-Jan-97	8.91	45.81	12.35	41.89	9.61	43.65	6.92	47.81	5.28	48.84	8.82	44.98	11.39	42.71	8.98	45.73	NA	
14-Apr-97	8.54	46.18	7.78	46.46	9.37	43.89	6.67	48.06	5.74	48.38	3.98	49.82	11.49	42.61	8.24	46.47	NA	
06-May-97	8.47	46.25	8.37	45.87	9.65	43.61	6.34	48.39	13.53	40.59	7.91	45.89	13.99	40.11	9.41	45.30	NA	
13-Jun-97	8.81	45.91	7.29	46.95	7.92	45.34	6.54	48.19	5.98	48.14	4.05	49.75	6.29	47.81	8.26	46.45	NA	
08-Jul-97	9.37	45.35	7.51	46.73	5.78	47.48	6.62	48.11	6.12	48.00	4.25	49.55	6.57	47.53	8.47	46.24	NA	
14-Aug-97	11.15	43.57	10.69	43.55	10.42	42.84	8.14	46.59	10.47	43.65	5.48	48.32	8.11	45.99	10.50	44.21	NA	
1-Sep-97	11.50	43.22	10.42	43.82	9.71	43.55	8.47	46.26	9.57	44.55	5.18	48.62	7.53	46.57	10.40	44.31	NA	
13-Oct-97	10.97	43.75	9.77	44.47	8.55	44.71	8.29	46.44	8.07	46.05	4.83	48.97	7.63	46.47	10.37	44.34	NA	
17-Nov-97	11.06	43.66	11.74	42.50	10.58	42.68	9.22	45.51	13.03	41.09	4.87	48.93	7.31	46.79	11.42	43.29	NA	
12-Dec-97	10.09	44.63	8.83	45.41	9.34	43.92	7.87	46.86	11.25	42.87	4.62	49.18	7.34	46.76	10.27	44.44	NA	
5-Jan-98	9.53	45.19	7.08	47.16	6.91	46.35	7.23	47.50	9.85	44.27	4.56	49.24	7.18	46.92	8.99	45.72	NA	
12-Feb-98	6.31	48.41	11.87	42.37	10.28	42.98	9.06	45.67	13.27	40.85	4.02	49.78	6.11	47.99	10.43	44.28	NA	
23-Mar-98	7.97	46.75	8.18	46.06	7.39	45.87	5.39	49.34	11.21	42.91	3.31	50.49	5.85	48.25	7.37	47.34	NA	
7-Apr-98	9.26	45.46	9.82	44.42	10.43	42.83	6.28	48.45	13.41	40.71	4.54	49.26	6.30	47.80	8.37	46.34	NA	
20-May-98	8.29	46.43	6.48	47.76	7.58	45.68	5.62	49.11	11.41	42.71	3.66	50.14	6.07	48.03	7.19	47.52	NA	
10-Jun-98	7.87	46.85	5.71	48.53	5.19	48.07	5.35	49.38	9.62	44.50	3.69	50.11	5.94	48.16	6.84	47.87	NA	
17-Jul-98	9.79	44.93	7.03	47.21	4.66	48.60	7.82	46.91	12.27	41.85	4.74	49.06	6.89	47.21	8.26	46.45	NA	
14-Aug-98	10.01	44.71	8.08	46.16	5.25	48.01	7.13	47.60	11.20	42.92	5.17	48.63	7.39	46.71	8.59	46.12	NA	
8-Sep-98	10.60	44.12	8.65	45.59	6.07	47.19	7.34	47.39	10.72	43.40	5.57	48.23	8.10	46.00	9.02	45.69	NA	
26-Oct-98	11.52	43.20	9.56	44.68	10.57	42.69	8.35	46.38	11.53	42.59	5.85	47.95	7.97	46.13	10.82	43.89	NA	
24-Nov-98	10.52	44.20	8.51	45.73	9.63	43.63	7.50	47.23	10.52	43.60	5.42	48.38	6.68	47.42	9.60	45.11	NA	
7-Dec-98	9.91	44.81	7.72	46.52	7.65	45.61	6.95	47.78	8.38	45.74	5.19	48.61	6.11	47.99	8.51	46.20	NA	
8-Jan-99	10.89	43.83	11.48	42.76	10.62	42.64	7.07	47.66	12.52	41.60	5.89	47.91	6.27	47.83	10.3	44.41	NA	
12-Feb-99	8.89	45.83	7.84	46.40	9.26	44.00	5.83	48.90	11.01	43.11	4.39	49.41	5.33	48.77	7.02	47.69	NA	
9-Mar-99	8.08	46.64	5.78	48.46	6.09	47.17	4.85	49.88	5.17	48.95	3.93	49.87	4.94	49.16	6.09	48.62	NA	
4-Apr-99	8.18	46.54	4.39	49.85	9.62	43.64	5.50	49.23	6.19	47.93	4.04	49.76	4.70	49.40	6.06	48.65	NA	
21-May-99	7.83	46.89	5.60	48.64	7.11	46.15	4.84	49.89	5.90	48.22	3.77	50.03	4.99	49.11	6.28	48.43	NA	

Table 1 (continued)

Shallow Groundwater Elevation Summary

(MW-1, MW-7, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14, and MW-19)

Monitoring Well ID	MW-1		MW-7		MW-9		MW-10		MW-11		MW-12		MW-13		MW-14		MW-19	
New TOC[a] (ft MSL) Dec. 13, 1996	54.72		54.24		53.26		54.73		54.12		53.80		54.10		54.71		54.36 New TOC 54.10 (4/11/05)	
DATE	DTW[b] (ft bgs)	GW ELEV[c] (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)	DTW (ft bgs)	GW ELEV (ft MSL)
15-Jun-99	8.63	46.09	6.58	47.66	5.98	47.28	5.61	49.12	6.39	47.73	4.46	49.34	5.59	48.51	3.80	50.91	NA	
27-Jul-99	9.84	44.88	7.69	46.55	10.15	43.11	6.39	48.34	7.79	46.33	4.91	48.89	6.58	47.52	7.72	46.99	NA	
16-Aug-99	11.01	43.71	9.02	45.22	9.59	43.67	7.29	47.44	8.57	45.55	5.98	47.82	7.70	46.40	8.58	46.13	NA	
27-Sep-99	12.48	42.24	10.23	44.01	9.49	43.77	8.39	46.34	9.75	44.37	7.02	46.78	9.47	44.63	9.45	45.26	NA	
19-Oct-99	13.60	41.12	11.18	43.06	11.15	42.11	13.55	41.18	14.80	39.32	7.41	46.39	9.68	44.42	10.47	44.24	NA	
15-Nov-99	13.05	41.67	11.49	42.75	10.47	42.79	11.82	42.91	13.33	40.79	6.76	47.04	7.99	46.11	10.26	44.45	NA	
15-Dec-99	10.05	44.67	10.58	43.66	9.90	43.36	10.91	43.82	11.98	42.14	6.61	47.19	6.77	47.33	10.24	44.47	NA	
10-Jan-00	12.34	42.38	11.01	43.23	10.91	42.35	8.81	45.92	12.81	41.31	6.05	47.75	6.46	47.64	8.05	46.66	NA	
18-Feb-00	10.40	44.32	8.64	45.60	8.84	44.42	7.27	47.46	11.20	42.92	5.42	48.38	5.48	48.62	8.25	46.46	NA	
28-Mar-00	9.74	44.98	7.44	46.80	8.66	44.60	6.79	47.94	10.46	43.66	5.50	48.30	5.11	48.99	8.42	46.29	NA	
26-Jun-00	9.44	45.28	10.98	43.26	10.94	42.32	11.33	43.40	11.29	42.83	5.02	48.78	5.74	48.36	6.61	48.10	NA	
8-Sep-00	12.44	42.28	9.57	44.67	10.69	42.57	12.87	41.86	12.16	41.96	NA		NA		NA		NA	
8-Dec-00	12.03	42.69	13.14	41.10	10.44	42.82	13.34	41.39	14.27	39.85	NA		NA		NA		NA	
21-Mar-01	11.47	43.25	12.60	41.64	10.13	43.13	7.65	47.08	14.08	40.04	5.73	48.07	5.52	48.58	7.04	47.67	NA	
4-Jun-01	10.29	44.43	7.61	46.63	9.82	43.44	6.64	48.09	12.21	41.91	NA		NA		NA		NA	
21-Sep-01	13.21	41.51	9.85	44.39	10.50	42.76	7.80	46.93	12.89	41.23	NA		NA		NA		NA	
11-Dec-01	12.24	42.48	12.67	41.57	10.62	42.64	12.38	42.35	14.09	40.03	NA		NA		NA		NA	
20-Mar-02	9.09	45.63	12.86	41.38	9.51	43.75	6.44	48.29	14.62	39.50	NA		NA		NA		NA	
24-Jun-02	10.04	44.68	12.63	41.61	11.30	41.96	6.87	47.86	14.15	39.97	NA		NA		NA		NA	
24-Sep-02	13.57	41.15	12.54	41.70	11.11	42.15	8.14	46.59	15.45	38.67	NA		NA		NA		NA	
6-Dec-02	14.29	40.43	14.50	39.74	16.12	37.14	12.56	42.17	16.17	37.95	NA		NA		NA		NA	
26-Feb-03	11.77	42.95	13.11	41.13	10.22	43.04	7.69	47.04	14.86	39.26	5.37	48.43	5.15	48.95	7.92	46.79	NA	
5-May-03	12.02	42.70	7.58	46.66	10.57	42.69	6.75	47.98	13.24	40.88	NA		NA		NA		NA	
16-Sep-03	13.15	41.57	9.30	44.94	11.19	42.07	7.61	47.12	13.11	41.01	NA		NA		NA		NA	
2-Dec-03	13.07	41.65	13.01	41.23	10.88	42.38	12.83	41.90	13.8	40.32	NA		NA		NA		NA	
17-Feb-04	11.97	42.75	12.55	41.69	10.68	42.58	12.77	41.96	13.59	40.53	5.79	48.01	NA/DEMO 2/11/04		NA/DEMO 2/10/04		7.01	47.35
25-May-04	10.57	44.15	7.13	47.11	10.07	43.19	10.61	44.12	10.47	43.65	3.92	49.88	NA	NA	NA	NA	4.7	49.66
5-Oct-04	13.05	41.67	9.55	44.69	10.50	42.76	8.41	46.32	12.72	43.65	6.41	47.39	NA	NA	NA	NA	7.44	46.92
8-Dec-04	13.32	41.40	9.78	44.46	11.11	42.15	12.03	42.70	11.85	42.27	5.21	48.59	NA	NA	NA	NA	6.60	47.76
4/4-5/2005	12.46	42.26	11.00	43.24	11.35	41.91	12.01	42.72	11.27	42.85	5.26	48.54	NA	NA	NA	NA	8.15	46.21
7-Jun-05	10.14	44.58	10.24	44.00	10.60	42.66	8.67	46.06	10.32	43.80	4.33	49.47	NA	NA	NA	NA	4.02	50.08
20-Sep-05	11.45	43.27	11.69	42.55	6.44	46.82	11.92	42.81	13.18	40.94	5.66	48.14	NA	NA	NA	NA	5.91	48.19

Notes:

[a]TOC indicates top of casing elevation in feet above mean sea level as surveyed on dates indicated

[b]DTW indicates depth to water below top of casing (point of survey)

[c]GW ELEV indicates groundwater elevation calculated from TOC-DTW

MW-13, MW-14 and RW-1 were destroyed 2/10-11/04.

NA Denotes not applicable for wells that were not yet installed, or wells were destroyed.

- Denotes well not measured on this date.

MW-19 installed 2/11/04, TOC 54.36 ft MSL relative elevation

Table 2
Shallow Groundwater Gradient Summary
(MW-1, MW-7, MW-9, MW-10, MW-11, MW-12, MW-19)

Date	Calculated Gradient			
	Direction	Dir. (Azimuth)	Magnitude	
21-Jan-97	N 13.4 E	13.40	2.07 ft/100 ft	
14-Apr-97	N 0.35 E	0.35	1.87 ft/100 ft	
06-May-97	S 31.78 W	211.78	2.41 ft/100 ft	
13-Jun-97	N 53.75 E	53.75	2.30 ft/100 ft	
08-Jul-97	N 38.44 E	38.44	2.37 ft/100 ft	
14-Aug-97	N 74.48 E	74.48	3.37 ft/100 ft	
1-Sep-97	N 66.86 E	66.86	3.58 ft/100 ft	
13-Oct-97	N 50.60 E	50.60	3.30 ft/100 ft	
17-Nov-97	N 82.28 E	82.28	4.32 ft/100 ft	
12-Dec-97	N 86.06 E	86.06	2.69 ft/100 ft	
5-Jan-98	N 84.78 E	84.78	1.46 ft/100 ft	
12-Feb-98	S 85.62 E	94.38	3.97 ft/100 ft	
23-Mar-98	S 75.75 E	104.25	3.33 ft/100 ft	
7-Apr-98	S 69.66 E	110.34	4.61 ft/100 ft	
20-May-98	S 57.50 E	122.50	2.86 ft/100 ft	
10-Jun-98	S 60.27 E	119.73	1.61 ft/100 ft	
17-Jul-98	S 60.32 E	119.68	1.64 ft/100 ft	
14-Aug-98	S 85.27 E	94.73	1.64 ft/100 ft	
8-Sep-98	N 80.39 E	80.39	1.66 ft/100 ft	
26-Oct-98	N 87.37 E	87.37	2.87 ft/100 ft	
24-Nov-98	S 86.25 E	93.75	2.81 ft/100 ft	
7-Dec-98	N 80.59 E	80.59	2.22 ft/100 ft	
8-Jan-99	S 86.58 E	93.42	4.65 ft/100 ft	
12-Feb-99	S 66.40 E	113.60	3.87 ft/100 ft	
9-Mar-99	N 72.73 E	72.73	1.76 ft/100 ft	
4-Apr-99	S 63.43 E	116.57	2.12 ft/100 ft	
21-May-99	N 87.69 E	87.69	1.83 ft/100 ft	
15-Jun-99	S 74.87 E	105.13	2.14 ft/100 ft	
27-Jul-99	S 89.95 E	90.05	2.66 ft/100 ft	
16-Aug-99	N 80.51 E	80.51	2.51 ft/100 ft	
27-Sep-99	N 72.53 E	72.53	2.26 ft/100 ft	
19-Oct-99	S 73.51 E	106.49	2.84 ft/100 ft	
15-Nov-99	S 87.36 E	92.64	3.63 ft/100 ft	
15-Dec-99	S 83.73 E	96.27	2.85 ft/100 ft	
10-Jan-00	S 76.99 E	103.01	4.99 ft/100 ft	
18-Feb-00	S 75.02 E	104.98	3.61 ft/100 ft	
28-Mar-00	S 69.52 E	110.48	3.02 ft/100 ft	
26-Jun-00	S 77.16 E	102.84	4.48 ft/100 ft	
8-Sep-00	S 64.75 W	244.75	2.72 ft/100 ft	(See Note 1)
8-Dec-00	S 12.29 W	192.29	0.98 ft/100 ft	(See Note 1)
21-Mar-01	S 75.33 E	104.67	6.34 ft/100 ft	(See Note 2)
4-Jun-01	S 40.44 E	139.56	5.84 ft/100 ft	(See Note 1)
21-Sep-01	S 59.00 E	121.00	5.69 ft/100 ft	
11-Dec-01	S 30.53 E	149.47	1.57 ft/100 ft	
20-Mar-02	S 64.2 E	115.80	9.07 ft/100 ft	(See Note 3)
24-Jun-02	S 63.21 E	116.79	8.84 ft/100 ft	(See Note 3)
24-Sep-02	S 41.74 E	138.26	7.69 ft/100 ft	(See Note 3)
6-Dec-02	S 53.18 E	126.82	5.04 ft/100 ft	(See Note 3)
26-Feb-03	S 66.42 E	113.58	8.08 ft/100 ft	
5-May-03	S 41.00 E	139.00	6.57 ft/100 ft	(See Note 3)
16-Sep-03	S 53.48 E	121.12	6.09 ft/100 ft	(See Note 3)
2-Dec-03	S 44.70 E	135.30	0.95 ft/100 ft	(See Note 3)
17-Feb-04	S 0.37 E	90.37	4.51 ft/100 ft	(See Note 4)
25-May-04	S 74.07 E	105.93	3.38 ft/100 ft	(See Note 4)
5-Oct-04	S 78.39 E	101.61	4.38 ft/100 ft	(See Note 4)
8-Dec-04	S 0.76 E	90.76	3.37 ft/100 ft	(See Note 4)
4-5-Apr-05	N 82.21 E	82.21	4.00 ft/100 ft	(See Note 4)
7-Jun-05	S 8.11 E	98.11	5.65 ft/100 ft	(See Note 4)
20-Sep-05	N 79.19 E	79.19	3.15 ft/100 ft	(See Note 4)
19-Dec-05	S 10.03 E	100.03	5.11 ft/100 ft	(See Note 4)
Average		102.10	3.62 ft/100 ft	
Std. Dev.		38.38	1.89 ft/100 ft	

(Note 1: Gradient calculated using wells MW-1, -7, -9, -10, -11)
(Note 2: Gradient calculated using wells MW-1, -7, -9, -10, -11, -12, -13, -14)
(Note 3: Gradient calculated using wells MW-1, -7, -9, -10, and -11)
(Note 4: Gradient calculated using wells MW-1, -7, -9, -10, -11, -12 and -19.)

Table 3
Dissolved Oxygen Concentration
(mg/L)

Date	MW-1	MW-7	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	MW-16B	MW-17B	MW-18B	MW-19	RW-1
21-Dec-94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20-Jan-95	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24-Mar-95	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19-Apr-95	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16-Jun-95	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
07-Sep-95	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17-Oct-95	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21-Dec-95	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11-Mar-96	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15-Jul-96	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
03-Oct-96	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
21-Jan-97	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14-Apr-97	1.0	8.0	1.6	2.0	9.0	7.0	9.0	7.0	2.2	1.4	2.4	NA	NA
6-May-97	1.6	8.0	1.2	4.0	10.0	8.0	9.0	5.0	3.0	1.2	8.0	NA	NA
13-Jun-97	0.6	8.0	1.2	1.0	9.0	8.0	5.0	6.0	1.0	0.6	1.2	NA	NA
8-Jul-97	0.8	8.0	1.0	1.0	9.0	7.0	8.0	6.0	1.0	0.8	1.2	NA	NA
14-Aug-97	0.6	7.0	1.8	1.4	10.0	8.0	6.0	7.0	4.0	1.6	2.6	NA	NA
1-Sep-97	0.6	8.0	6.0	1.4	10.0	7.0	7.0	8.0	2.6	2.0	1.8	NA	NA
13-Oct-97	1.0	7.0	0.8	1.8	9.0	5.0	5.0	7.0	2.0	2.0	0.8	NA	NA
17-Nov-97	1.4	8.0	1.4	2.4	10.0	8.0	8.0	6.0	4.0	4.0	4.0	NA	NA
12-Dec-97	2.2	7.0	1.4	3.0	9.0	8.0	8.0	6.0	2.4	4.0	2.2	NA	NA
5-Jan-98	2.0	9.0	0.6	3.2	9.0	8.0	8.0	6.0	2.0	3.0	2.6	NA	NA
23-Mar-98	0.6	9.0	0.4	2.4	10.0	NA	9.0	NA	NA	NA	NA	NA	NA
7-Apr-98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20-May-98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10-Jun-98	0.6	9.0	2.4	1.0	10.0	9.0	8.0	6.0	1.0	0.6	1.4	NA	NA
17-Jul-98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14-Aug-98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8-Sep-98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26-Oct-98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24-Nov-98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8-Dec-98	0.8	9.0	0.6	1.8	8.0	7.0	7.0	6.0	1.0	0.6	1.4	NA	NA
8-Jan-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12-Feb-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9-Mar-99	0.8	9.0	1.4	0.4	9.0	9.0	9.0	8.0	2.0	5.0	1.0	NA	NA
4-Apr-99	0.6	5.0	1.0	0.4	9.0	9.0	8.0	9.0	1.4	3.0	1.0	NA	NA
21-May-99	0.8	10.0	1.2	0.8	11.0	10.0	10.0	8.0	1.6	0.8	2.6	NA	NA
15-Jun-99	0.4	8.0	0.8	0.2	9.0	3.0	4.0	8.0	1.2	3.0	1.6	NA	NA
19-Jul-99	0.4	8.0	1.0	0.6	9.0	8.0	7.0	7.0	3.0	0.4	3.0	NA	NA
16-Aug-99	0.2	4.7	0.2	0.2	5.7	4.8	5.3	4.3	0.5	0.2	0.6	NA	NA
27-Sep-99	1.2	6.0	0.4	1.0	9.0	0.6	0.4	7.0	1.6	0.6	3.0	NA	NA
19-Oct-99	1.6	8.0	1.2	0.6	9.0	8.0	8.0	7.0	5.0	3.0	6.0	NA	NA
15-Nov-99	1.2	6.0	0.8	0.2	9.0	7.0	6.0	6.0	3.0	3.0	5.0	NA	NA
14-Dec-99	3.0	9.0	1.8	1.4	9.0	8.0	9.0	9.0	7.0	9.0	8.0	NA	NA
10-Jan-00	0.6	6.0	1.6	2.0	9.0	8.0	8.0	7.0	7.0	7.0	8.0	NA	NA
18-Feb-00	1.6	8.0	1.6	0.4	9.0	7.0	9.0	9.0	7.0	6.0	6.0	NA	NA
28-Mar-00	1.0	8.0	2.0	1.8	9.0	7.0	8.0	7.0	1.4	1.2	6.0	NA	NA
26-Jun-00	0.6	5.0	1.0	0.4	6.0	8.0	9.0	7.0	1.6	1.0	3.0	NA	NA
8-Sep-00	0.06	8.95	0.04	0.03	13.96	NA	NA	NA	NA	NA	NA	NA	0.05
8-Dec-00	0.14	4.64	0.03	0.03	7.17	NA	NA	NA	NA	NA	NA	NA	0.04
19-Mar-01	0.04	14.10	0.03	0.06	8.92	5.24	5.31	4.16	0.28	0.04	0.32	NA	0.03
4-Jun-01	0.05	5.84	0.05	0.02	9.24	NA	NA	NA	NA	NA	NA	NA	0.03
21-Sep-01	0.07	5.00	0.13	0.06	7.71	NA	NA	NA	NA	NA	NA	NA	0.05
11-Dec-01	3.00	2.44	0.18	0.17	3.15	NA	NA	NA	NA	NA	NA	NA	0.49
20-Mar-02	0.38	5.27	0.20	0.70	7.80	NA	NA	NA	NA	NA	NA	NA	0.40
24-Jun-02	0.24	4.99	0.32	0.45	9.93	NA	NA	NA	NA	NA	NA	NA	0.37
24-Sep-02	0.18	1.71	0.27	0.39	3.59	NA	NA	NA	NA	NA	NA	NA	0.71
6-Dec-02	5.03	9.33	3.75	3.03	4.64	NA	NA	NA	NA	NA	NA	NA	3.43
26-Feb-03	0.31	7.04	0.35	0.51	9.86	2.86	0.16	1.83	0.67	1.08	0.50	NA	0.60
5-May-03	0.13	6.79	1.12	0.14	9.07	NA	NA	NA	NA	NA	NA	NA	0.11
16-Sep-03	1.90	5.00	2.70	2.80	5.20	NA	NA	NA	NA	NA	NA	NA	2.10
2-Dec-03	1.40	2.80	1.40	1.00	2.90	NA	NA	NA	NA	NA	NA	NA	2.10
17-Feb-04	4.9	8.1	3.1	1.9	6.9	8.8	NA	NA	NA	NA	NA	3.0	NA
25-May-04	1.1	3.6	1.4	0.9	6.4	4.8	NA	NA	NA	NA	NA	1.0	NA
5-Oct-04	1.3	5.5	1.8	2.1	4.9	5.7	NA	NA	NA	NA	NA	1.7	NA
5-Oct-04 *	1.2	7.0	4.3 **	1.0	7.0	6.0	NA	NA	NA	NA	NA	1.4	NA
8-Dec-04	0.8	1.2	1.1 ***	0.8	2.0	2.1	NA	NA	NA	NA	NA	0.8 ***	NA
5-Apr-05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7-Jun-05	1.6	3.00	1.00	1.40	6.50	4.80	NA	NA	NA	NA	NA	1.3	NA
20-Sep-05	No dissolved oxygen sampling was conducted during this sampling event.												
Average	1.1	6.8	1.3	1.2	8.1	6.7	7.0	6.6	2.5	2.4	3.0	1.5	0.8
Std. Dev.	1.1	2.4	1.2	1.0	2.3	2.2	2.4	1.6	1.9	2.2	2.4	0.8	1.0

Notes:
Dissolved oxygen concentrations were measured using a field test kit (HACH Dissolved Oxygen Test Kit Model OX2P).
Samples were collected prior to purging.
Laboratory confirmation samples were collected after purging and are included in Winzler & Kelly's Intrinsic Remediation Feasibility Study.
NA indicates not analyzed
Well MW-19 was installed & wells MW-13, MW-14, MW-16B, MW-17B, MW-18B & RW-1 were destroyed 2/10-11/04.

* Humboldt County requested dissolved oxygen levels be monitored using a probe as usual and an alternative method, Hach electronic meter and Hach chemical test kit prior to purging
** Measurment was taken after purging
*** Measurment taken 12/9/04

Table 4
MW-1
Sampling Results Summary

MW-1
Well Installed: February 1993

Original TOC (ft MSL) 22-Mar-95 54.17
New TOC (ft MSL) 13-Dec-96 54.72

Date	Sample ID	DTW[a] (ft bgs)	GW Elev[b] (ft MSL)	TPH-G (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenz. (ug/L)	Xylene (Total) (ug/L)	Xylene (m,p) (ug/L)	Xylene (o) (ug/L)	MTBE (ug/L)	DIPE (ug/L)	ETBE (ug/L)	TAME (ug/L)	Tert-butanol (ug/L)	Methanol (ug/L)	Ethanol (ug/L)
24-Feb-93	NA	NA	NA	<50	<50	<50	<50	<50	NT	NT	NT	NT	NT	NT	NT	NT	NT
14-Apr-93	NA	NA	NA	<50	<50	<50	<50	1.4	0.74	0.66	NT	NT	NT	NT	NT	NT	NT
21-Jul-93	NA	NA	NA	<50	<50	<50	<50	<50	NT	NT	NT	NT	NT	NT	NT	NT	NT
20-Oct-93	NA	NA	NA	<50	<50	<50	<50	<50	NT	NT	NT	NT	NT	NT	NT	NT	NT
26-Jan-95	WK/1319-107	10.09	44.63	4,600	1.5	16	21	150	NT	NT	NT	NT	NT	NT	NT	NT	NT
23-Mar-95	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
19-Apr-95	WK/1319-13	8.48	46.24	160	1.1	7.5	1.2	38	NT	NT	NT	NT	NT	NT	NT	NT	NT
7-Sep-95	WK/1319-19	10.58	44.14	1,600	280	28	250	200	NT	NT	NT	NT	NT	NT	NT	NT	NT
21-Dec-95	WK/1319-28	10.53	44.19	150	1.6	4.1	3.1	18	NT	NT	NT	NT	NT	NT	NT	NT	NT
11-Mar-96	WK/1319-34	10.33	44.39	830	1.8	14	16	100	NT	NT	NT	NT	NT	NT	NT	NT	NT
18-Jul-96	WK/1319-43	12.85	41.87	1,300	28	12	9.9	200	NT	NT	<1	NT	NT	NT	NT	NT	NT
3-Oct-96	WK/1319-50	12.34	42.38	120	0.76	0.52	0.52	4.9	NT	NT	<1	NT	NT	NT	NT	NT	NT
23-Jan-97	WK/319-54	8.91	45.81	1,200	6.9	36	18	85	NT	NT	<1	NT	NT	NT	NT	NT	NT
16-Apr-97	WK/319-66	8.54	46.18	780	14	16	14	99	NT	NT	<1	NT	NT	NT	NT	NT	NT
10-Jul-97	WK/319-81	9.37	45.35	810	14	4.9	12	86	NT	NT	<1	NT	NT	NT	NT	NT	NT
15-Oct-97	WK/319-93	10.97	43.75	100	5.7	0.88	2.3	6.7	NT	NT	<1	NT	NT	NT	NT	NT	NT
7-Jan-98	WK/319-105	9.53	45.19	67	3.2	0.8	3.3	6.7	NT	NT	<1	NT	NT	NT	NT	NT	NT
25-Mar-98	WK/319-110	7.97	46.75	4,400	62	88	150	650	NT	NT	<50	NT	NT	NT	NT	NT	NT
12-Jun-98	WK/319-126	7.87	46.85	1,200	33	14	35	170	NT	NT	NA	NT	NT	NT	NT	NT	NT
11-Sep-98	M-1	10.6	44.12	550	21	5.7	21	67	40	27	<5	NT	NT	NT	NT	NT	NT
10-Dec-98	M-1	9.91	44.81	120	8.6	<0.3	7.5	4.4	NT	NT	<1	NT	NT	NT	NT	NT	NT
11-Mar-99	MW-1[c]	8.08	46.64	120	9.6	1.8	3.1	62	NT	NT	<0.5	<0.5	<0.5	<0.5	<5.0	<50	<5.0
17-Jun-99	MW-1[c]	8.63	46.09	570	39	7.8	46	140	NT	NT	<0.5	<0.5	<0.5	<0.5	<5.0	<50	<5.0
28-Sep-99	MW-1c	12.48	42.24	800	48	7	49	93	NT	NT	<0.5	<0.5	<0.5	<0.5	<5.0	<50	6.4
15-Dec-99	MW-1/1299	10.05	44.67	<50	3.3	<0.50	0.59	<0.50	NT	NT	<0.5	<0.5	<0.5	<0.5	<5.0	<50	<5.0
29-Mar-00	MW-1/0300	9.74	44.98	420	32	0.90	9.4	27	NT	NT	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0
26-Jun-00	MW-1/0600	9.44	45.28	310	13	1.50	11	30	NT	NT	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0
11-Sep-00	MW-1	12.44	42.28	460	37	2.00	13	27	NT	NT	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0
11-Dec-00	MW-1	12.03	42.69	<50	5.1	<0.50	<0.50	<0.50	NT	NT	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0
21-Mar-01	MW-1	11.47	43.25	370	7.3	<0.50	<0.50	23	NT	NT	<0.50	<0.50	<0.50	<0.50	6.2	<50	<5.0
5-Jun-01	MW-1	10.29	44.43	980	100	3.70	46	66	NT	NT	<0.50	<0.50	<0.50	<0.50	8.7	<50	<5.0
21-Sep-01	MW-1	13.21	41.51	610	55	4.80	35	48	NT	NT	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0
11-Dec-01	MW-1	12.24	42.48	92	13	<0.50	2.7	0.66	0.66	<0.50	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0
20-Mar-02	MW-1	9.09	45.63	560	88	1.40	19	43	31	12	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0
24-Jun-02	MW-1	10.04	44.13	640	100	1.5	56	16.0	8.0	8.0	<0.50	<1.0	<1.0	<1.0	<10	<50	<5.0
24-Sep-02	MW-1	13.57	41.15	220	36	0.7	9.7	7.0	4.3	2.7	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0
6-Dec-02	MW-1	14.29	40.43	77	12	<0.50	0.9	1.1	-	-	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<13
28-Feb-03	MW-1	11.77	42.95	140	20	<0.50	4.0	2.8	1.4	1.4	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0
5-May-03	MW-1	12.02	42.70	220	13	0.63	<0.50	45	28	17	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0
17-Sep-03	MW-1	13.15	41.57	1,300	150	54	86	202	140	62	<1.0	<2.0	<2.0	<2.0	<20.0	<50	<5.0
2-Dec-03	MW-1	13.07	41.65	200	41	0.61	22	2.85	1.90	0.95	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0
19-Feb-04	MW-1	11.97	42.75	610	87	8.7	21	62	35	27	<1.0	<1.0	<1.0	<1.0	<20	NT	NT
25-May-04	MW-1	10.57	44.15	1,300	150	14	67	153	110	43	<1.0	<1.0	<1.0	<1.0	<25	NT	NT
5-Oct-04	MW-1	13.05	41.67	690	110	1.4	18	37	27	10	<1.0	<1.0	<1.0	<1.0	<10	NT	NT
8-Dec-04	MW-1	13.32	41.40	290	81	<0.50	2.3	<1.00	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	NT	NT
5-Apr-05	MW-1	12.46	42.26	830	110	4.4	34	56	40	16	<1.0	<1.0	<1.0	<1.0	<10	NT	NT
7-Jun-05	MW-1	10.14	44.58	1,300	140	6.1	82	86	58	28	<1.0	<1.0	<1.0	<1.0	<20	NT	NT
21-Sep-05	MW-1	11.45	43.27	1,300	140	23	71	141	100	41	<1.0	<1.0	<1.0	<1.0	<50	NT	NT

NOTES:
[a] DTW indicates Depth to Groundwater
[b] GW Elev indicates Groundwater Elevation
[c] Analyzed by Method 8260B
NA indicates Not Applicable
NT indicates not tested
ug/L = micrograms per liter = parts per billion (ppb)
<X = not detected at, or above, laboratory detection limit X.
This table summarizes all the sampling results, including results from another consulting firm prior to 1995. Winzler & Kelly does not assume any responsibility for the accuracy or validity of data collected by other consultants.

Table 4 - Continued
MW-9
Sampling Results Summary

MW-9

Well Installed: March 1995

Original TOC (ft MSL) 22-Mar-95 53.26
New TOC (ft MSL) 53.26

Date	Sample ID	DTW[a] (ft bgs)	GW Elev[b] (ft MSL)	TPH-G (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenz. (ug/L)	Xylene (Total) (ug/L)	Xylene (m,p) (ug/L)	Xylene (o) (ug/L)	MTBE (ug/L)	DIPE (ug/L)	ETBE (ug/L)	TAME (ug/L)	Tert-butanol (ug/L)	Methanol (ug/L)	Ethanol (ug/L)
24-Feb-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14-Apr-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NT	NT	NT	NT	NT	NT
21-Jul-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NT	NT	NT	NT	NT	NT
20-Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NT	NT	NT	NT	NT	NT
26-Jan-95	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NT	NT	NT	NT	NT	NT
23-Mar-95	WK/1319-110	10.77	42.49	11,000	180	250	22	680	NT	NT	NT	NT	NT	NT	NT	NT	NT
19-Apr-95	WK/1319-15	5.90	47.36	6,700	350	980	48	840	NT	NT	NT	NT	NT	NT	NT	NT	NT
7-Sep-95	WK/1319-21	5.64	47.62	1,200	190	30	66	84	NT	NT	NT	NT	NT	NT	NT	NT	NT
21-Dec-95	WK/1319-27	9.10	44.16	1,500	59	15	46	47	NT	NT	NT	NT	NT	NT	NT	NT	NT
11-Mar-96	WK/1319-32	9.95	43.31	1,500	150	48	76	140	NT	NT	NT	NT	NT	NT	NT	NT	NT
17-Jul-96	WK/1319-40	10.33	42.93	6,400	340	280	60	970	NT	NT	<1	NT	NT	NT	NT	NT	NT
3-Oct-96	WK/1319-48	9.79	43.47	920	86	15	38	80	NT	NT	<1	NT	NT	NT	NT	NT	NT
23-Jan-97	WK/319-55	9.61	43.65	14,000	520	800	200	2,000	NT	NT	<75	NT	NT	NT	NT	NT	NT
23-Jan-97	WK/319-56	9.61	43.65	13,000	520	800	200	2,000	NT	NT	<75	NT	NT	NT	NT	NT	NT
16-Apr-97	WK/319-67	9.37	43.89	2,600	150	56	72	180	NT	NT	<65	NT	NT	NT	NT	NT	NT
10-Jul-97	WK/319-80	5.78	47.48	1,100	100	30	43	100	NT	NT	<1	NT	NT	NT	NT	NT	NT
15-Oct-97	WK/319-92	8.55	44.71	580	70	22	38	55	NT	NT	<1	NT	NT	NT	NT	NT	NT
7-Jan-98	WK/319-103	6.91	46.35	370	34	13	16	36	NT	NT	<1	NT	NT	NT	NT	NT	NT
24-Mar-98	WK/319-109	7.39	45.87	2,000	98	89	76	222	NT	NT	<250	NT	NT	NT	NT	NT	NT
12-Jun-98	WK/319-123	5.19	48.07	5,400	250	350	100	720	NT	NT	NT	NT	NT	NT	NT	NT	NT
11-Sep-98	M-9	6.07	47.19	1,200	110	19	120	147	100	47	<5.0	NT	NT	NT	NT	NT	NT
10-Dec-98	M-9	7.65	45.61	280	21	2.5	14	12	NT	NT	<1	NT	NT	NT	NT	NT	NT
11-Mar-99	MW-9[c]	6.09	47.17	2,300	220	580	140	920	NT	NT	<0.5	<0.5	<0.5	<0.5	5.6	110	<5.0
17-Jun-99	MW-9[c]	5.96	47.28	4,000	210	570	150	950	NT	NT	<0.5	<0.5	<0.5	<0.5	7.1	220	7.2
28-Sep-99	MW9/092899	9.49	43.77	440	29	3.6	28	19	NT	NT	<0.5	<0.5	<0.5	<0.5	<5.0	<50	<5.0
15-Dec-99	MW-9\1299	9.90	43.36	1,600	62	13	48	84	NT	NT	<0.5	<0.5	<0.5	<0.5	5.9	<50	<5.0
29-Mar-00	MW-9\0300	8.66	44.60	2,300	82	78	130	250	NT	NT	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0
27-Jun-00	MW-9/0600	10.94	42.32	4,000	160	130	220	400	NT	NT	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<10
11-Sep-00	MW-9	10.69	42.57	810	32	9.8	37	43	NT	NT	<0.50	<0.50	<0.50	<0.50	7.6	<50	<5.0
8-Dec-00	MW-9	10.44	42.82	190	7.4	1.2	8.6	4.2	NT	NT	<0.50	<0.50	<0.50	<0.50	5.7	<50	<5.0
21-Mar-01	MW-9	10.13	43.13	270	9.5	4	11	20	NT	NT	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<10
5-Jun-01	MW-9	9.82	43.44	93	7.4	0.92	6	4.3	NT	NT	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0
21-Sep-01	MW-9	10.50	42.76	160	13	0.53	9.5	2.6	NT	NT	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0
11-Dec-01	MW-9	10.62	42.64	<50	2.0	<0.50	1.6	0.63	0.63	<0.50	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0
20-Mar-02	MW-9	9.51	43.75	660	30.0	15	40	55	41	14	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0
24-Jun-02	MW-9	11.30	41.96	75	3.6	1.0	5.1	5.78	4.8	0.98	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0
24-Sep-02	MW-9	11.11	42.15	<50	3.6	<0.50	2.5	1.1	1.1	<0.50	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0
6-Dec-02	MW-9	16.12	37.14	<50	<0.5	<0.5	<0.5	<1.0	-	-	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<13
27-Feb-03	MW-9	10.22	43.04	250	16	3.6	12	13.4	9.9	3.5	<0.50	<1.0	<1.0	<1.0	5.0	<50	<5.0
5-May-03	MW-9	10.57	42.69	1,700	87	170	85	208	150	58	<1.0	<2.0	<2.0	<2.0	<20	<50	<5.0
17-Sep-03	MW-9	11.19	42.07	320	19	2.3	20	17.2	14	3.2	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0
2-Dec-03	MW-9	10.88	42.38	380	27	0.9	23	7.5	6.1	1.4	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0
19-Feb-04	MW-9	10.68	42.18	2,500	71	100	70	254	180	74	<1.0	<1.0	<1.0	<1.0	<10	NT	NT
24-May-04	MW-9	10.07	43.19	3,500	73	95	130	369	270	99	<1.0	<1.0	<1.0	<1.0	<10	NT	NT
5-Oct-04	MW-9	10.50	42.76	340	33	1.2	14	8.1	6.1	2.0	<1.0	<1.0	<1.0	<1.0	<10	NT	NT
9-Dec-04	MW-9	11.11	42.15	150	7.0	<0.50	4.9	0.87	0.87	<0.50	<1.0	<1.0	<1.0	<1.0	<10	NT	NT
5-Apr-05	MW-9	11.35	41.91	1,500	38	47	55	173	120	53	<1.0	<1.0	<1.0	<1.0	<10	NT	NT
7-Jun-05	MW-9	10.60	42.66	320	71	15	16	22.6	16	6.6	<1.0	<1.0	<1.0	<1.0	<10	NT	NT
21-Sep-05	MW-9	10.14	43.12	270	12	4.5	9.7	18.2	13	5.2	<1.0	<1.0	<1.0	<1.0	<10	NT	NT

NOTES:
[a] DTW indicates Depth to Groundwater
[b] GW Elev indicates Groundwater Elevation
[c] Analyzed by Method 8260B
NA Indicates Not Applicable
NT indicates not tested
ug/L = micrograms per liter = parts per billion (ppb)
<X = not detected at, or above, laboratory detection limit X.
This table summarizes all the sampling results, including results from another consulting firm prior to 1995. Winzler & Kelly does not assume any responsibility for the accuracy or validity of data collected by other consultants.

Table 4 - Continued
MW-10
Sampling Results Summary

MW-10

Well Installed: March 1995

Original TOC (ft MSL) 22-Mar-95 54.11
13-Dec-96 54.73

Date	Sample ID	DTW[a] (ft bgs)	GW Elev[b] (ft MSL)	TPH-G (ug/L)	Benzene (B) (ug/L)	Toluene (T) (ug/L)	Ethylbenz. (E) (ug/L)	Xylene (Total) (ug/L)	Xylene (m,p) (X) (ug/L)	Xylene (o) (ug/L)	MTBE (ug/L)	DIPE (ug/L)	ETBE (ug/L)	TAME (ug/L)	Tert-butanol (ug/L)	Methanol (ug/L)	Ethanol (ug/L)
											(fuel oxygenates)					(alcohols)	
24-Feb-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14-Apr-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NT	NT	NT	NT	NT	NT
21-Jul-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NT	NT	NT	NT	NT	NT
20-Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NT	NT	NT	NT	NT	NT
26-Jan-95	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NT	NT	NT	NT	NT	NT
23-Mar-95	WK/1319-108	10.56	44.17	3,400	81	250	62	500	NT	NT	NT	NT	NT	NT	NT	NT	NT
19-Apr-95	WK/1319-16	11.42	43.31	1,100	15	69	19	500	NT	NT	NT	NT	NT	NT	NT	NT	NT
7-Sep-95	WK/1319-22	9.64	45.09	3,100	280	28	250	200	NT	NT	NT	NT	NT	NT	NT	NT	NT
21-Dec-95	WK/1319-26	8.76	45.97	930	58	9	35	24	NT	NT	NT	NT	NT	NT	NT	NT	NT
11-Mar-96	WK/1319-33	12.30	42.43	2,600	110	300	73	220	NT	NT	NT	NT	NT	NT	NT	NT	NT
17-Jul-96	WK/1319-39	9.42	45.31	6,800	550	790	180	630	NT	NT	<1	NT	NT	NT	NT	NT	NT
3-Oct-96	WK/1319-47	10.94	43.79	540	40	0.9	6.8	2.5	NT	NT	<1	NT	NT	NT	NT	NT	NT
23-Jan-97	WK/319-52	6.92	47.81	16,000	1000	2200	360	2100	NT	NT	<75	NT	NT	NT	NT	NT	NT
17-Apr-97	WK/319-68	6.67	48.06	12,000	990	1700	180	1400	NT	NT	<8.5	NT	NT	NT	NT	NT	NT
10-Jul-97	WK/319-82	6.62	48.11	22,000	1700	2900	650	2400	NT	NT	<85	NT	NT	NT	NT	NT	NT
10-Jul-97	WK/319-83	6.62	48.11	19,000	1400	2400	530	2000	NT	NT	<85	NT	NT	NT	NT	NT	NT
15-Oct-97	WK/319-94	8.29	46.44	670	71	42	31	51	NT	NT	<1	NT	NT	NT	NT	NT	NT
7-Jan-98	WK/319-104	7.23	47.50	1,800	150	260	55	170	NT	NT	<1	NT	NT	NT	NT	NT	NT
25-Mar-98	WK/319-111	5.39	49.34	24,000	1700	3300	470	2250	NT	NT	<250	NT	NT	NT	NT	NT	NT
12-Jun-98	WK/319-127	5.35	49.38	34,000	2300	4000	760	3300	NT	NT	NA	NT	NT	NT	NT	NT	NT
11-Sep-98	M-10	7.34	47.39	13,000	1,100	1,100	440	1,380	890	490	29	NT	NT	NT	NT	NT	NT
10-Dec-98	M-10[c]	6.95	47.78	2,700	570	33	290	63	NT	NT	<0.50	NT	NT	NT	NT	NT	NT
11-Mar-99	MW-10[c]	4.85	49.88	4,900	230	660	140	910	NT	NT	0.74	<0.5	<0.5	<0.5	63	<50	<5.0
17-Jun-99	MW-10[c]	5.61	49.12	11,000	1,500	2,000	740	2,600	NT	NT	1.5	<0.5	<0.5	<0.5	92	<50	5.2
28-Sep-99	MW10/92899	8.39	46.34	1,800	220	15	67	43	NT	NT	0.78	<0.50	<0.50	<0.50	61	<50	6
15-Dec-99	MW10/1299	10.91	43.82	7,200	580	310	410	460	NT	NT	0.53	<0.50	<0.50	<0.50	56	<50	<5.0
29-Mar-00	MW-10\0300	6.79	47.94	5,800	680	820	440	1,200	NT	NT	0.9	<0.50	<0.50	<0.50	53	<50	8.4
27-Jun-00	MW-10/0600	11.33	43.40	7,200	510	540	330	720	NT	NT	0.56	<0.50	<0.50	<0.50	50	<50	<5.0
11-Sep-00	MW-10	12.87	41.86	3,000	160	110	110	160	NT	NT	0.63	<0.50	<0.50	<0.50	52	<400	<5.0
11-Dec-00	MW-10	13.34	41.39	2,100	110	74	64	120	NT	NT	1.5	<0.50	<0.50	<0.50	30	<50	<5.0
21-Mar-01	MW-10	7.65	47.08	1,200	60	45	17	41	NT	NT	<0.50	<0.50	<0.50	<0.50	39	<50	<5.0
5-Jun-01	MW-10	6.64	48.09	1,100	46	13	8.1	24	NT	NT	0.61	<0.50	<0.50	<0.50	46	<50	<5.0
21-Sep-01	MW-10	7.80	46.93	1,200	43	6.3	13	12	NT	NT	0.55	<0.50	<0.50	<0.50	36	<50	<5.0
11-Dec-01	MW-10	12.38	42.35	1,600	38	30	22	48	31	17	0.60	<1.0	<1.0	<1.0	47	<50	<5.0
20-Mar-02	MW-10	6.44	48.29	840	45	43	29	69	46	23	0.50	<1.0	<1.0	<1.0	30	<50	6.7
24-Jun-02	MW-10	6.87	47.24	790	30	17	20	39	26	13	0.61	<1.0	<1.0	<1.0	37	<50	<5.0
24-Sep-02	MW-10	8.14	46.59	820	24	7	20	20.4	13	7.4	0.62	<1.0	<1.0	<1.0	25	<50	<5.0
6-Dec-02	MW-10	12.56	42.17	350	8.8	2.7	4.6	2.7	-	-	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<13
28-Feb-03	MW-10	7.69	47.04	8,300	540	620	400	1,100	740	360	<5.0	<10	<10	<10	<100	<50	<5.0
5-May-03	MW-10	6.75	47.98	320	34	19	8.6	24.2	15	9.2	0.57	<1.0	<1.0	<1.0	<5.0	<50	<5.0
17-Sep-03	MW-10	7.61	47.12	1,200	160	75	71	144	91	53	<2.0	<2.0	<2.0	<2.0	<20.0	<50	<5.0
2-Dec-03	MW-10	12.83	41.90	500	28	13	23	34	24	10	0.66	<1.0	<1.0	<1.0	22	<50	<5.0
19-Feb-04	MW-10	12.77	41.96	3,400	230	200	110	320	210	110	<1.0	<1.0	<1.0	<1.0	<80	NT	NT
25-May-04	MW-10	10.61	44.12	7,900	650	660	410	1,290	880	410	<3.5	<1.0	<1.0	<1.0	54	NT	NT
5-Oct-04	MW-10	8.41	46.32	630	47	33	19	47	31	16	1.0	<1.0	<1.0	<1.0	<60	NT	NT
9-Dec-04	MW-10	12.03	42.70	3,500	220	160	140	380	260	120	<1.0	<1.0	<1.0	<1.0	<60	NT	NT
5-Apr-05	MW-10	12.01	42.72	8,300	460	400	400	1,120	790	330	<3.0	<1.0	<1.0	<1.0	27	NT	NT
7-Jun-05	MW-10	8.67	46.06	1,800	81	43	79	122	86	36	<2.0	<1.0	<1.0	<1.0	<70	NT	NT
21-Sep-05	MW-10	11.92	42.81	4,400	280	160	170	370	260	110	<3.0	<1.0	<1.0	<1.0	<100	NT	NT

NOTES:
[a] DTW indicates Depth to Groundwater
[b] GW Elev indicates Groundwater Elevation
[c] Analyzed by Method 8260B
NA indicates Not Applicable
NT indicates not tested
ug/L = micrograms per liter = parts per billion (ppb)
<X = not detected at, or above, laboratory detection limit X.
This table summarizes all the sampling results, including results from another consulting firm prior to 1996. Winzler & Kelly does not assume any responsibility for the accuracy or validity of data collected by other consultants.

Table 4 -Continued
MW-19
Sampling Results Summary

MW-19

Well Installed: February 12, 2004

Original TOC (ft MSL) 12-Feb-04 54.36
New TOC (ft MSL) 4/11/2005* 54.10

Date	Sample ID	DTW[a] (ft bgs)	GW Elev[b] (ft MSL)	TPH-G (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenz. (ug/L)	Xylene (Total) (ug/L)	Xylene (m,p) (ug/L)	Xylene (o) (ug/L)	MTBE (ug/L)	DIPE (ug/L)	ETBE (ug/L)	TAME (ug/L)	Tert-butanol (ug/L)	Methanol (ug/L)	Ethanol (ug/L)
19-Feb-04	MW-19	7.01	47.35	40,000	12,000	2,200	610	2,490	1,700	790	<140	<1.0	<1.0	<2.0	<260	NT	NT
25-May-04	MW-19	4.70	49.66	29,000	7,600	1,900	960	2,260	1,700	560	<70	<10	<10	<10	<100	NT	NT
5-Oct-04	MW-19	7.44	46.92	46,000	11,000	3,600	1,400	3,260	2,400	860	<70	<1.0	<1.0	1.3	<150	NT	NT
9-Dec-04	MW-19	6.60	47.76	15,000	2,100	1,800	130	1,760	1,200	560	<100	<100	<100	<100	<1,000	NT	NT
5-Apr-05	MW-19	8.15	46.21	32,000	9,100	910	1,100	1,350	1,000	350	<100	<100	<100	<100	<1,000	NT	NT
7-Jun-05	MW-19	4.02	50.08	17,000	5,200	1,000	720	1,490	1,000	490	<60	<1.0	<1.0	<1.0	87	NT	NT
21-Sep-05	MW-19	5.91	48.19	35,000	10,000	880	900	1,240	890	350	<100	<100	<100	<100	<1000	NT	NT

NOTES:
[a] DTW indicates Depth to Groundwater
[b] GW Elev indicates Groundwater Elevation
NA indicates Not Applicable
NT indicates not tested
ug/L = micrograms per liter = parts per billion (ppb)
<X = not detected at, or above, laboratory detection limit X.
* Original TOC lowered 0.26' to protect well head on 4/11/05

Appendix C
Laboratory Reports and Chain-of-Custody Forms

NORTH COAST LABORATORIES LTD.

October 04, 2005

Winzler and Kelly
633 Third Street
Eureka, CA 95501

Attn: Pat Kaspari

RE: 94131901.058, Mission Lath

Order No.: 0509426
Invoice No.: 53294
PO No.:

ELAP No. 1247-Expires July 2006

SAMPLE IDENTIFICATION

Fraction	Client Sample Description
01A	MW-1
02A	MW-9
03A	MW-10
04A	MW-19

ND = Not Detected at the Reporting Limit

Limit = Reporting Limit

All solid results are expressed on a wet-weight basis unless otherwise noted.

REPORT CERTIFIED BY

Laboratory Supervisor(s) | QA Unit | Jesse G. Chaney, Jr. Laboratory Director

5680 West End Road • Arcata California 95521-9202 • 707-822-4649 • FAX 707-822-6831

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CLIENT: Winzler and Kelly
Project: 94131901.058, Mission Lath
Lab Order: 0509426

CASE NARRATIVE

Gasoline Components/Additives:
The gasoline values for samples MW-1, MW-9, MW-10 and MW-19 include the reported gasoline components in addition to other peaks in the gasoline range.

Some reporting limits were raised for samples MW-1 and MW-10 due to matrix interference.

Sample MW-19 was reported as ND with a dilution due to matrix interference.

Date: 04-Oct-05
WorkOrder: 0509426

ANALYTICAL REPORT

Client Sample ID: MW-1 **Received:** 9/21/05 **Collected:** 9/21/05 14:10
Lab ID: 0509426-01A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1.0		10/3/05
Tert-butyl alcohol (TBA)	ND	50	µg/L	1.0		10/3/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		10/3/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		10/3/05
Benzene	140	5.0	µg/L	10		10/3/05
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		10/3/05
Toluene	23	0.50	µg/L	1.0		10/3/05
Ethylbenzene	71	0.50	µg/L	1.0		10/3/05
m,p-Xylene	100	0.50	µg/L	1.0		10/3/05
o-Xylene	41	0.50	µg/L	1.0		10/3/05
Surrogate: 1,4-Dichlorobenzene-d4	105	80.8-139	% Rec	1.0		10/3/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	1,300	500	µg/L	10		10/3/05

Client Sample ID: MW-9 **Received:** 9/21/05 **Collected:** 9/21/05 14:20
Lab ID: 0509426-02A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1.0		9/30/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		9/30/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		9/30/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		9/30/05
Benzene	12	0.50	µg/L	1.0		9/30/05
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		9/30/05
Toluene	4.5	0.50	µg/L	1.0		9/30/05
Ethylbenzene	9.7	0.50	µg/L	1.0		9/30/05
m,p-Xylene	13	0.50	µg/L	1.0		9/30/05
o-Xylene	5.2	0.50	µg/L	1.0		9/30/05
Surrogate: 1,4-Dichlorobenzene-d4	105	80.8-139	% Rec	1.0		9/30/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	270	50	µg/L	1.0		9/30/05

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Date: 04-Oct-05
WorkOrder: 0509426

ANALYTICAL REPORT

Client Sample ID: MW-10 **Received:** 9/21/05 **Collected:** 9/21/05 14:30
Lab ID: 0509426-03A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	3.0	µg/L	1.0		9/30/05
Tert-butyl alcohol (TBA)	ND	100	µg/L	1.0		9/30/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		9/30/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		9/30/05
Benzene	280	25	µg/L	50		9/30/05
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		9/30/05
Toluene	160	25	µg/L	50		9/30/05
Ethylbenzene	170	25	µg/L	50		9/30/05
m,p-Xylene	260	25	µg/L	50		9/30/05
o-Xylene	110	25	µg/L	50		9/30/05
Surrogate: 1,4-Dichlorobenzene-d4	107	80.8-139	% Rec	1.0		9/30/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	4,400	50	µg/L	1.0		9/30/05

Client Sample ID: MW-19 **Received:** 9/21/05 **Collected:** 9/21/05 14:40
Lab ID: 0509426-04A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	100	µg/L	100		9/30/05
Tert-butyl alcohol (TBA)	ND	1,000	µg/L	100		9/30/05
Di-isopropyl ether (DIPE)	ND	100	µg/L	100		9/30/05
Ethyl tert-butyl ether (ETBE)	ND	100	µg/L	100		9/30/05
Benzene	10,000	500	µg/L	1,000		9/30/05
Tert-amyl methyl ether (TAME)	ND	100	µg/L	100		9/30/05
Toluene	880	50	µg/L	100		9/30/05
Ethylbenzene	900	50	µg/L	100		9/30/05
m,p-Xylene	890	50	µg/L	100		9/30/05
o-Xylene	350	50	µg/L	100		9/30/05
Surrogate: 1,4-Dichlorobenzene-d4	99.0	80.8-139	% Rec	100		9/30/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	35,000	5,000	µg/L	100		9/30/05

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North Coast Laboratories, Ltd.

Date: 04-Oct-05

CLIENT: Winzler and Kelly
Work Order: 0509426
Project: 94131901.058, Mission Lath

QC SUMMARY REPORT

Method Blank

Sample ID: **MB 093005** Batch ID: **R37217** Test Code: **8260OXYW** Units: **µg/L** Analysis Date: **9/30/05 3:52:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS2_050930B** SeqNo: **535703**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	1.0									
Tert-butyl alcohol (TBA)	ND	10									
Di-isopropyl ether (DIPE)	ND	1.0									
Ethyl tert-butyl ether (ETBE)	ND	1.0									
Benzene	ND	0.50									
Tert-amyl methyl ether (TAME)	ND	1.0									
Toluene	ND	0.50									
Ethylbenzene	0.08283	0.50									J
m,p-Xylene	ND	0.50									
o-Xylene	0.1018	0.50									J
1,4-Dichlorobenzene-d4	0.949	0.10	1.00	0	94.9%	81	139	0			

Sample ID: **MB 093005** Batch ID: **R37210** Test Code: **GASW-MS** Units: **µg/L** Analysis Date: **9/30/05 3:52:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS2_050930A** SeqNo: **535609**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	ND	50									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

North Coast Laboratories, Ltd.

Date: 04-Oct-05

CLIENT: Winzler and Kelly
Work Order: 0509426
Project: 94131901.058, Mission Lath

QC SUMMARY REPORT

Laboratory Control Spike

Sample ID: **LCS-05625** Batch ID: **R37217** Test Code: **8260OXYW** Units: **µg/L** Analysis Date: **9/30/05 11:45:00 AM** Prep Date:

Client ID: Run ID: **ORGCMS2_050930B** SeqNo: **535700**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	18.88	1.0	20.0	0	94.4%	80	120	0			
Tert-butyl alcohol (TBA)	459.8	10	400	0	115%	25	162	0			
Di-isopropyl ether (DIPE)	19.41	1.0	20.0	0	97.0%	80	120	0			
Ethyl tert-butyl ether (ETBE)	19.26	1.0	20.0	0	96.3%	77	120	0			
Benzene	20.74	0.50	20.0	0	104%	78	117	0			
Tert-amyl methyl ether (TAME)	17.73	1.0	20.0	0	88.6%	64	136	0			
Toluene	19.88	0.50	20.0	0	99.4%	80	120	0			
Ethylbenzene	20.78	0.50	20.0	0	104%	80	120	0			
m,p-Xylene	41.34	0.50	40.0	0	103%	80	120	0			
o-Xylene	19.95	0.50	20.0	0	99.8%	80	120	0			
1,4-Dichlorobenzene-d4	1.10	0.10	1.00	0	110%	81	139	0			

Sample ID: **LCSD-05625** Batch ID: **R37217** Test Code: **8260OXYW** Units: **µg/L** Analysis Date: **9/30/05 12:16:00 PM** Prep Date:

Client ID: Run ID: **ORGCMS2_050930B** SeqNo: **535701**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	18.68	1.0	20.0	0	93.4%	80	120	18.9	1.07%	20	
Tert-butyl alcohol (TBA)	442.7	10	400	0	111%	25	162	460	3.78%	20	
Di-isopropyl ether (DIPE)	19.13	1.0	20.0	0	95.7%	80	120	19.4	1.42%	20	
Ethyl tert-butyl ether (ETBE)	19.62	1.0	20.0	0	98.1%	77	120	19.3	1.87%	20	
Benzene	19.71	0.50	20.0	0	98.5%	78	117	20.7	5.11%	20	
Tert-amyl methyl ether (TAME)	17.71	1.0	20.0	0	88.5%	64	136	17.7	0.101%	20	
Toluene	19.21	0.50	20.0	0	96.0%	80	120	19.9	3.42%	20	
Ethylbenzene	19.98	0.50	20.0	0	99.9%	80	120	20.8	3.94%	20	
m,p-Xylene	40.36	0.50	40.0	0	101%	80	120	41.3	2.40%	20	
o-Xylene	19.34	0.50	20.0	0	96.7%	80	120	20.0	3.13%	20	
1,4-Dichlorobenzene-d4	1.09	0.10	1.00	0	109%	81	139	1.10	1.39%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Winzler and Kelly
Work Order: 0509426
Project: 94131901.058, Mission Lath

QC SUMMARY REPORT

Laboratory Control Spike

Sample ID: **LCS-05626** Batch ID: **R37210** Test Code: **GASW-MS** Units: **µg/L** Analysis Date: **9/30/05 1:48:00 AM** Prep Date:

Client ID: Run ID: **ORGCMS2_050930A** SeqNo: **535606**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	1,144	50	1,000	0	114%	80	120	0			

Sample ID: **LCSD-05626** Batch ID: **R37210** Test Code: **GASW-MS** Units: **µg/L** Analysis Date: **9/30/05 2:19:00 AM** Prep Date:

Client ID: Run ID: **ORGCMS2_050930A** SeqNo: **535607**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	1,109	50	1,000	0	111%	80	120	1,140	3.13%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

NORTH COAST LABORATORIES LTD.
5680 West End Road • Arcata • CA 95521-9202
707-822-4649 Fax 707-822-6831

Chain of Custody

LABORATORY NUMBER: 0509426

Attention: Pat Kaspari
Results & Invoice to: Winzler & Kelly
Address: 633 Third St
Eureka, CA 95501
Phone: 443-8326
Copies of Report to:
Sampler (Sign & Print): Gary S. Lester Gary Lester

TAT: ☐ 24 Hr ☐ 48 Hr ☐ 5 Day ☐ 5–7 Day
☒ STD (2–3 Wk) ☐ Other:
PRIOR AUTHORIZATION IS REQUIRED FOR RUSHES

REPORTING REQUIREMENTS: State Forms ☐
Preliminary: FAX ☐ Verbal ☐ By: __/__/__
Final Report: FAX ☐ Verbal ☐ By: __/__/__

CONTAINER CODES: 1—½ gal. pl; 2—250 ml pl; 3—500 ml pl; 4—1 L Nalgene; 5—250 ml BG; 6—500 ml BG; 7—1 L BG; 8—1 L cg; 9—40 ml VOA; 10—125 ml VOA; 11—4 oz glass jar; 12—8 oz glass jar; 13—brass tube; 14—other

PRESERVATIVE CODES: a—HNO_3; b—HCl; c—H_2SO_4; d—$Na_2S_2O_3$; e—NaOH; f—$C_2H_3O_2Cl$; g—other

PROJECT INFORMATION

Project Number: 94131901.058
Project Name: Mission Latin
Purchase Order Number:

LAB ID	SAMPLE ID	DATE	TIME	MATRIX*	CONTAINER	PRESERVATIVE	ANALYSIS
	MW-1	9/21/05	1410	GW	7	HCl	8260
	MW-9	"	1420	↓			
	MW-10	"	1430				
	MW-19	"	1440				
	QCTB						

SAMPLE CONDITION/SPECIAL INSTRUCTIONS

* TPH-G, BTEX + 5 fuel oxygenates by 8260

QCTB = Do not analyze if any project sample is ND for all analytes

Please provide in Geotracker format Global ID = T0602300292

RELINQUISHED BY (Sign & Print)	DATE/TIME	RECEIVED BY (Sign)	DATE/TIME
Gary S. Lester Gary Lester	9/21/05 1420	K. Thompson	9/21/05 1530

SAMPLE DISPOSAL
☐ NCL Disposal of Non-Contaminated
☐ Return ☐ Pickup

CHAIN OF CUSTODY SEALS Y/N/NA
SHIPPED VIA: UPS Air-Ex Fed-Ex Bus Hand

*MATRIX: DW=Drinking Water; Eff=Effluent; Inf=Influent; SW=Surface Water; GW=Ground Water; S=Soil; O=Other.

Cooler temp - 5.2°C

ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT

Appendix D

W&K Standard Operating Procedures (SOPs)

WINZLER & KELLY CONSULTING ENGINEERS

STANDARD OPERATING PROCEDURES
GROUNDWATER LEVEL MEASUREMENTS AND
FREE PHASE HYDROCARBON MEASUREMENTS

1. Objective

To establish accepted procedures for detecting free-phase hydrocarbons and measuring groundwater levels in monitoring wells.

2. Background

Any time water levels are required to determine the groundwater flow gradient or flow direction, water levels are collected. Wells are tested for free-phase hydrocarbons prior to insertion of electronic water level probes or purge pumps the first time a well is sampled and in any well that has a history of free-phase hydrocarbons.

3. Personnel Required and Responsibilities

Project Manager: The Project Manager (PM) is responsible for ensuring that field personnel have been trained in these procedures and for verifying that water levels have been collected in compliance with this SOP.

Field Technician: The Field Technician is responsible for complying with this SOP, including determining if there are free phase hydrocarbons in the well, the thickness (if it exists) and the stabilized water level in the well.

4. Equipment Required

- Water level/free phase hydrocarbon indicator probe or pastes
- Tape measure
- Water Level Data Form/pencil
- Watch
- Disposable gloves
- Distilled water
- Alconox soap
- Containers to hold rinsate water
- Site Safety Plan and Hospital Map
- Keys to wells
- Tools to open wells

5. Procedure

After reviewing the Site Safety Plan and determining the type and concentrations of contaminants that may be present on site, the field personnel will don the proper level of personal protection prior to opening any wells.

Open all monitoring wells to be measured and remove expandable caps. Allow wells to equilibrate 5 to 15 minutes. Record time and visual observations regarding well access, condition, security, etc on water level data sheet.

5a. Alternative procedure for electronic water-level/free-phase hydrocarbon indicator

- Decontaminate probe with potable water and alconox mix. Rinse with distilled water.
- Lower probe into the well and determine the presence of any free-phase hydrocarbons. The probe will emit a continuous sound if free product is present. If no product is present, the probe will make an oscillating (beeping) sound when it encounters water. Record the depth of free-phase hydrocarbons on the water level data sheet. If no free-phase hydrocarbons are present, record the water depth. DO NOT SUBMERGE THE PROBE THROUGH THE FLOATING PRODUCT LAYER.
- Gradient calculations shall then be performed by calculation of the groundwater elevation by:
- GW ELEV = (TOC) - (depth to water).
- TOC indicates top of casing elevation as surveyed.
- If free-phase hydrocarbons are indicated, determine the depth to water using a steel measuring tape and water indicator paste, by the procedure below.

5b. Alternative procedure for product and water indicator pastes

- Decontaminate tape measure.
- Place **product** indicator paste on bottom two feet of tape measure.
- Lower tape measure into well. Note depth to which the end of the tape is lowered relative to the point of survey mark on the top of the well casing.
- Withdraw the tape. If paste has changed color, free-phase hydrocarbons are present. Calculate depth to the floating layer by:
  - Depth to Product = (depth to which tape lowered into well) - (length of product indicator paste discoloration).
- Remove product indicator paste with paper towel and decontaminate tape measure.
- Apply **water** indicator paste on bottom two feet of tape measure.
- Lower tape into well. Note depth to which end of tape is lowered.
- Withdraw the tape. Calculate the depth to water by:
  - Depth to Water = (depth to which tape lowered into well) - (length of water indicator paste discoloration).
- Obtain the depth to groundwater level readings from the point of survey mark, or from the North side of the top of the casing, if no point of survey mark is present. Readings will be measured to the nearest 0.01 foot. Note time and readings on water level data sheet.
- Use the same measuring device to measure water levels in all wells to be used in the gradient calculation.

- Obtain depth to casing bottom for each well by submerging a tape measure until it reaches the bottom of the well. Readings will be measured to the nearest 0.01 foot. Note readings on data sheet. If sampling is not going to be completed at the site, close and lock all wells.
- Gradient calculations shall then be conducted by making water depth corrections for the presence of free product. First calculate the product thickness:
  - Product Thickness = (Depth to Water) - (Depth to Product).
  - Water elevations when free product is present shall then be calculated by:
  - GW ELEV = (TOC) - (Depth to Water) - $SG_{product}$ (Product Thickness).
  - On any site where monitoring will occur more than once, a free product sample will be collected and measured for specific gravity ($SG_{product}$). In the absence of the site specific free product specific gravity $SG_{product}$ shall be assumed to be 0.78.

WINZLER & KELLY CONSULTING ENGINEERS

STANDARD OPERATING PROCEDURES
for
MONITOR WELL PURGING AND SAMPLING ACTIVITIES

1.0 Objective

To establish accepted procedures for the purging and sampling groundwater from monitoring wells, to ensure that representative samples of formation water are collected by accepted methods.

1.1 Background

To obtain a representative groundwater sample from monitor wells, it is necessary to remove (purge) stagnant water from within and near the well prior to sampling. In general, three to seven casing volumes must be removed from the well prior to sampling, to provide a representative sample. Wells may be sampled after purging less than the minimum three volumes if well recharge rates are beyond reasonable time constraints. The specific method of well purging will be decided on a case by case basis, or as required by project specifications.

1.2 Personnel Required and Responsibilities

Project Manager: The Project Manager (PM) is responsible for ensuring that field personnel have been trained in the use of these procedures and for verifying that monitoring well purging and sampling activities are performed in compliance with these SOP's.

Field Technician: The Field Technician is responsible for complying with these SOP's, including the purging and sampling of monitor wells, the safe containerization of extracted waters, the documentation of field procedures, and the handling of samples.

2.0 WELL PURGING ACTIVITIES

2.1 Equipment Required

- Bottom-filling bailer, suction air pump, air-lift pump, gas operated (bladder) pump, submersible pump, or other pumping device

- pH meter
- Conductivity/Temperature Meter
- Water Level Indicator
- Well Sampling Data Sheet
- Indelible marker
- Disposable gloves
- Containers to hold extracted water (as required)

2.2. Purging Procedure

Prior to groundwater sampling, each monitoring well will be purged as described below. Prior to insertion into each well, all equipment will be either decontaminated (following W&K Decontamination procedures) or will be deemed clean or previously unused by the manufacturer.

- Open all monitoring wells to be purged and allow to equilibrate 5 to 15 minutes. Record time and visual observations regarding well access, condition, security, etc. in log book.
- Obtain depth to groundwater level readings according to Winzler & Kelly Standard Operating Procedures for Groundwater Level measurements and Free Phase Hydrocarbon Measurements. Record time and readings on the Well Level Measurement Data Sheet.
- Calculate the volume of standing water in each monitoring well. Record the volume calculated for each well on the Well Sampling Data Sheet.
- Begin purging the well by removing water from the well and collecting in a calibrated container (i.e., 5-gallon bucket marked in 1-gallon increments). The depth, or interval, from which the water is being purged should be noted on the data sheet.
- Obtain readings of field parameters (pH, conductivity, temperature, and turbidity) and make visual observations of color/odor/turbidity at selected intervals (i.e., every gallon, every five gallons, etc.) throughout the purging process. Depending on the calculated volume and the expected number of gallons to be purged, a minimum of five readings should be collected. Record the time, readings, and visual comments on the Purge Data Sheet.
- Continue purging until at least three (minimum) to four well volumes have been removed and the field parameters stabilize to within:

pH	≈0.1
conductivity	≈10%
turbidity	≈10%
temperature	≈1°

  Do not exceed seven well volumes.
- Obtain a final depth to groundwater level measurement prior to collection of the groundwater sample and note the reading and time on the Well Level Measurement Data Sheet. Be sure that the measurement probe has been thoroughly decontaminated prior to insertion into each well. Note any qualitative comments regarding recharge rate of each well, and calculate the percent of the original water column that has recovered at the time of the final depth measurement. It is ideal to attain a minimum

of 80% water level recovery prior to sampling, if time constraints allow. Very slow recharge rates may not allow purging the minimum three volumes or 80% recovery; lesser volumes may be used for sampling, as needed and documented.

- Collect a groundwater sample following the directions below under Section 3.0.
- Containerize all purge water and decontamination water in 55-gallon drums. Use yellow indelible markers (storeroom supply) to label all drums on the side with date, contents, origin and other pertinent information. Avoid marking the tops of drums with black marker, such marks are temporary and will soon fade/rust. Note the number, condition and location of drums on site in the field notes.

3.0 WELL SAMPLING ACTIVITIES

3.1 Equipment Required

- Disposable bailer (previously unused) *
- Bottom emptying device (sampling port)
- Monofilament nylon line (min 40-lb test)
- Monitor Well Purge & Sample Data Sheets
- Sample containers (preserved, as required) - provided by the laboratory
- Sample labels
- Indelible marker
- Disposal gloves
- Decontamination soap (Alconox)
- Distilled water for equipment decontamination.

* A variety of sampling techniques are available for the collection of groundwater samples. Except where otherwise required, W&K only utilizes disposable polyethylene bailers to collect groundwater samples.

3.2. Sampling Procedure

Prior to collecting a groundwater sample from a monitoring well, each well must be properly purged in accordance with W&K's SOP for Monitoring Well Purging Activities (See Section 2.0 above), including the measurement of the final water level and documentation of recharge.

- Water from the desired screen interval will be collected by lowering the previously unused disposable, polyethylene, bottom-filling bailer into the well.
- When bailer is completely full, carefully retract the bailer from the well casing.
- Using a previously unused, new, bottom-emptying device, to minimize agitation of the water, transfer the water from the bailer to the sample containers.
- When sampling for volatile constituents (VOA's), the water samples will be collected in 40-ml glass vials (preserved as required by the analyses requested). Precautions will be taken to prevent capturing air bubbles in the vials.

- Upon filling, each vial will be immediately capped with a Teflon septum and plastic screw cap. The vial will be checked for air bubbles by inverting and gently tapping the vial. If any bubbles are visible, the vial will be refilled and confirmed to be free of any air bubbles.
- At a minimum, all samples will be labeled with the following information:

Sample ID	Date and Time Sample Collected
Location	Sampler's Initials
Project Number	Analyses Requested

- Sample information will be documented on the Chain-of-Custody form.
- All samples will be placed in an ice chest, chilled to a temperature of 4°C. The ice chest will remain in the custody of the sampler until it is transferred to the courier service for delivery at the analytical laboratory for analyses. Any and all transfer of sample custody must be documented on the Chain-of-Custody form with the name, signature, affiliation, date and time of the persons releasing and receiving custody of the samples.
- Upon completion of the sampling activities, each well shall be closed and secured by replacing the well cap and securing the lock.
- Dispose of gloves, bailers, bottom-emptying devices, and bailing line after each use.

Appendix E
Field Data Sheets

CONSULTING ENGINEERS

WATER LEVEL MEASUREMENT DATA SHEET

PROJECT NAME: Mission Lester

PROJECT NUMBER: 94131901.

TODAY'S DATE: 9/20/05

FIELD PERSONNEL: Lester

WELL NUMBER	OPEN WELL	INITIAL WATER LEVEL		FINAL WATER LEVEL		COMMENTS
	Time	Time	Depth to Water (ft. bgs)	Time	Depth to Water (ft. bgs)	
MW-7	01405	1435	11.69			
MW-11	1410	1440	13.18			
MW-12	1413	1442	5.66			
MW-1	1416	1447	11.45		12.88	24.51' TD
MW-9	1420	1450	6.44		7.11	18.57' TD
MW-10	1425	1453	~~12.00~~	11.92	13.07	20.25' TD
MW-19	1430	1450	5.91		6.97	19.96' TD

Weather Conditions Today: clear, cool

FORMS\H2OLVL

WINZLER & KELLY
CONSULTING ENGINEERS

WELL SAMPLING DATA SHEET

PROJECT NAME: Mission Carton
PROJECT NUMBER: 941319.01
WELL DESIGNATION: MW-10

PROJECT DATE: 9/20/05
SAMPLER: Lesta
SAMPLE NUMBER: MW-10

CONDITION OF WELL HEAD/VAULT/CAP & LOCK:
A. TOP OF CASING ELEVATION:
B. DEPTH TO GROUNDWATER (initial): 11.92
C. DEPTH OF WELL: MEASURED 20.25
D. HEIGHT OF WATER COLUMN (C-B): 8.33
E. GROUNDWATER ELEVATION (A-B):

CASING DIAMETER: 2" ✓ 3" ____ 4" ____ OTHER ____

CALCULATED WELL VOLUME: D X V = 8.33 · .163 = 1.4.3 gals
Volume (V) of 2" well - 0.163 gal/ft
Volume (V) of 4" well - 0.653 gal/ft

ODOR ✓ SHEEN No FLOATING PRODUCT THICKNESS ____

PUMP TYPE: POLY BAILER ____ STAINLESS BAILER ____
ELECTRIC ____ OTHER ____

PUMP DEPTH:

TIME	GALLONS PURGED	NO. OF WELL VOLUMES	pH	TEMPERATURE (°F OR °C)	CONDUCTIVITY (mmhos/cm or µmhos/cm	TURBIDITY (NTU or visual)
1040	initial	—	6.55	17.5	195 µs/cm	clear
1050	2.0	1.6	5.47	17.0	198 µs/cm	clear
1058	3.0	2.5	5.64	16.7	169 µs/cm	clear
1104	3.5	2.8	5.58	16.9	168 µs/cm	clear
1110	4.25	3.2	5.58	16.7	171 µs/cm	clear

RECHARGE RATE (qualitative): Good

SAMPLER TYPE: TEFLON BAILER ____ ACRYLIC BAILER ____ DISPOSABLE BAILER ✓

SAMPLES COLLECTED:
PRESERVED VOA'S ____ UNPRESERVED VOA'S ____
PRESERVED LITERS ____ UNPRESERVED LITERS ____
500 ml PLASTIC BOTTLE WITH PRESERVATIVE FOR METALS:
FILTERED ____ UNFILTERED ____
OTHER ____

COMMENTS:

T.D. = 13.07

Sampled 1430

FORMSWELLSMPL

WINZLER & KELLY
CONSULTING ENGINEERS

WELL SAMPLING DATA SHEET

PROJECT NAME: Missionlata
PROJECT NUMBER: 94131901.
WELL DESIGNATION: MW-9

PROJECT DATE: 9/20/05
SAMPLER: Lester
SAMPLE NUMBER: MW-9

CONDITION OF WELL HEAD/VAULT/CAP & LOCK:
A. TOP OF CASING ELEVATION:
B. DEPTH TO GROUNDWATER (initial): 6.44
C. DEPTH OF WELL: MEASURED 18.57
D. HEIGHT OF WATER COLUMN (C-B): 12.13
E. GROUNDWATER ELEVATION (A-B):

CASING DIAMETER: 2" ✓ 3" ____ 4" ____ OTHER ____

CALCULATED WELL VOLUME: D X V = 12.13 · .163 = 2.0 · 3 = 6g...
Volume (V) of 2" well - 0.163 gal/ft
Volume (V) of 4" well - 0.653 gal/ft

ODOR Yes SHEEN No FLOATING PRODUCT THICKNESS ____

PUMP TYPE: POLY BAILER ____ STAINLESS BAILER ____
ELECTRIC ____ OTHER ____

PUMP DEPTH:

TIME	GALLONS PURGED	NO. OF WELL VOLUMES	pH	TEMPERATURE (°F OR °C)	CONDUCTIVITY (mmhos/cm or µmhos/cm	TURBIDITY (NTU or visual)
0945	initial	—	5.95	17.4	241 µs/cm	clear
0953	2.0	1.0	5.21	17.5	234	clear
1000	4.0	2.0	5.10	16.9	251	cloudy
1007	5.0	2.5	5.13	16.7	210	cloudy
1013	5.5	2.75	5.13	16.4	209	cloudy
1017	6.0	3.0	5.16	16.6	207	cloudy

RECHARGE RATE (qualitative): Good

SAMPLER TYPE: TEFLON BAILER ____ ACRYLIC BAILER ____ DISPOSABLE BAILER ✓

SAMPLES COLLECTED:
PRESERVED VOA'S 3 UNPRESERVED VOA'S ____
PRESERVED LITERS ____ UNPRESERVED LITERS ____
500 ml PLASTIC BOTTLE WITH PRESERVATIVE FOR METALS:
FILTERED ____ UNFILTERED ____
OTHER ____

COMMENTS:

T.D. = 7.11'

½ bailer @ 5.5 - 6.0g

Sample @ 1420

FORMSTWELLSMPL

WINZLER & KELLY
CONSULTING ENGINEERS

WELL SAMPLING DATA SHEET

PROJECT NAME: Mission Lada
PROJECT NUMBER: 941319
WELL DESIGNATION: MW-19

PROJECT DATE: 9/20/05
SAMPLER: Lester
SAMPLE NUMBER: MW19

CONDITION OF WELL HEAD/VAULT/CAP & LOCK:
A. TOP OF CASING ELEVATION:
B. DEPTH TO GROUNDWATER (initial): 5.91
C. DEPTH OF WELL: MEASURED 19.96
D. HEIGHT OF WATER COLUMN (C-B): 14.05
E. GROUNDWATER ELEVATION (A-B):

CASING DIAMETER: 2" ✓ 3" ____ 4" ____ OTHER ____

CALCULATED WELL VOLUME: D X V = 14.05 · .163 = 2.3, = 6.9 5
Volume (V) of 2" well - 0.163 gal/ft
Volume (V) of 4" well - 0.653 gal/ft

ODOR ✓ SHEEN Yes FLOATING PRODUCT THICKNESS ____

PUMP TYPE: POLY BAILER ____ STAINLESS BAILER ____
ELECTRIC ____ OTHER ____

PUMP DEPTH:

TIME	GALLONS PURGED	NO. OF WELL VOLUMES	pH	TEMPERATURE (°F OR °C)	CONDUCTIVITY (mmhos/cm or µmhos/cm	TURBIDITY (NTU or visual)
1130	initial	—	5.26	15.6	279 µs/cm	clear
1140	2.0	.80	5.03	20.1	268 µs/cm	cloudy
1146	4.0	1.60	5.01	19.8	291 µs/cm	cloudy
1155	6.0	2.78	4.97	19.2	364 µs/cm	turbid
1159	6.5	2.89	4.98	19.0	371 µs/cm	turbid
1205	7.0	3.10	5.00	18.8	380 µs/cm	"

RECHARGE RATE (qualitative):

SAMPLER TYPE: TEFLON BAILER ____ ACRYLIC BAILER ____ DISPOSABLE BAILER ✓

SAMPLES COLLECTED: PRESERVED VOA'S 3 UNPRESERVED VOA'S ____
PRESERVED LITERS ____ UNPRESERVED LITERS ____
500 ml PLASTIC BOTTLE WITH PRESERVATIVE FOR METALS:
FILTERED ____ UNFILTERED ____
OTHER ____

COMMENTS:

T.D. = 6.97'

Sample @ 1440

FORMSWELLSMPL

WINZLER & KELLY
CONSULTING ENGINEERS

WELL SAMPLING DATA SHEET

PROJECT NAME: Mission Cafe
PROJECT NUMBER: 94131901.
WELL DESIGNATION: MW-1

PROJECT DATE: 9/20/05
SAMPLER: Lester
SAMPLE NUMBER: MW-1

CONDITION OF WELL HEAD/VAULT/CAP & LOCK:
A. TOP OF CASING ELEVATION:
B. DEPTH TO GROUNDWATER (initial): 11.45
C. DEPTH OF WELL: MEASURED 24.51
D. HEIGHT OF WATER COLUMN (C-B): 13.06
E. GROUNDWATER ELEVATION (A-B):

CASING DIAMETER: 2" ✓ 3" ____ 4" ____ OTHER ____

CALCULATED WELL VOLUME: D X V = 13.06 · .163 = 2.13 = 6.4 g
Volume (V) of 2" well - 0.163 gal/ft
Volume (V) of 4" well - 0.653 gal/ft

ODOR Yes SHEEN NO FLOATING PRODUCT THICKNESS ____

PUMP TYPE: POLY BAILER ____ STAINLESS BAILER ____
ELECTRIC ____ OTHER ____

PUMP DEPTH:

TIME	GALLONS PURGED	NO. OF WELL VOLUMES	pH	TEMPERATURE (°F OR °C)	CONDUCTIVITY (mmhos/cm or µmhos/cm	TURBIDITY (NTU or visual)
1218	initial	—	5.25	18.8	147 µs/cm	clear
1226	2.0	1.9	4.69	17.2	115 µs/cm	clear
1236	4.0	2.8	4.67	16.9	118 µs/cm	clear
1245	5.5	3	4.63	16.8	121 µs/cm	turbid
1250	6.0	2.9	4.61	16.6	129 µs/cm.	"
1255	6.5	3.1	4.55	17.0	130 µs/cm	"

RECHARGE RATE (qualitative):

SAMPLER TYPE: TEFLON BAILER ____ ACRYLIC BAILER ____ DISPOSABLE BAILER ✓

SAMPLES COLLECTED: PRESERVED VOA'S 3 UNPRESERVED VOA'S ____
PRESERVED LITERS ____ UNPRESERVED LITERS ____
500 ml PLASTIC BOTTLE WITH PRESERVATIVE FOR METALS:
FILTERED ____ UNFILTERED ____
OTHER ____

COMMENTS:

T.D. = 12.88

Sample @ 1410

FORMS\WELLSMPL

WINZLER & KELLY
CONSULTING ENGINEERS
633 Third Street, Eureka, CA 95501-0417
(707) 443-8326 / FAX (707) 444-8330

By GSC Date 9/20/05 Client Missimlatch Sheet No. ____ of ____

Subject 3 QM (MW-1, MW-9, MW-10, MW-19) Job No. 93131901.058

Arrive at site 1300

Open Dispose Drums

Drum Inventory:

2 full (purge H_2O)

1 full (decon H_2O)

1/2 full (purge H_2O)

1 full soil

3 empty (one rim crushed)

1405 - 1430 open wells

1435 - 1458 water levels

Secure wells

430 Return to office

9/21/05 Arrive at site

0920 open wells for sampling

WINZLER & KELLY
CONSULTING ENGINEERS
633 Third Street, Eureka, CA 95501-0417
(707) 443-8326 / FAX (707) 444-8330

By GSC Date 9/21/05 Client Bob Britt Sheet No. ____ of ____

Subject Mission Cater Job No. 94131901.058

0945 - 1300 purge wells

Bring purge water to dispose drums

start sampling @ 1400

sample complete

to 1445.

MW-1 1410
MW-9 1420
MW-10 1430
MW-19 1440

1520 secure well heads

1530 Deliver samples to lab

1545 Secure Dispose drums

1630 Return to office