2004 ANNUAL REPORT

PENTA WOOD PRODUCTS SITE

Town of Daniels, Wisconsin

Long-Term Response Action

WA No. 201-RALR-05WE/Contract No. 68-W6-0025

September 2005

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Acronyms

µg/L	micrograms per liter
ASC	Analytical Service Center
BTEX	benzene, toluene, ethylbenzene, and xylene
CAMU	Corrective Action Management Unit
ES	Enforcement Standard
EW	extraction well
g/cm^3	grams per cubic centimeter
gal	gallon
gpm	gallons per minute
GW	groundwater
lb	pound
lbs	pounds
LNAPL	light non-aqueous phase liquid
mg/L	milligrams per liter
MW	monitoring well
ORP	oxidation-reduction potential
PAL	Preventive Action Limit
PCP	pentachlorophenol
PVC	polyvinyl chloride
QC	quality control
RA	remedial action
USEPA	United States Environmental Protection Agency
WA	Work Assignment
WAM	Work Assignment Manager
WDNR	Wisconsin Department of Natural Resources

Introduction

This Annual Report documents the groundwater sampling, hazardous waste generation and disposal, and site inspection and maintenance activities conducted at the Penta Wood Products Site as performed by CH2M HILL for the U.S. Environmental Protection Agency (USEPA) under Work Assignment (WA) No. 201-RALR-05WE.

The format of the report has been modified from previous annual groundwater sampling result technical memorandums to a comprehensive sitewide annual report as recommended in the first 5-year review report prepared by the Wisconsin Department of Natural Resources (WDNR) and agreed upon by USEPA.

2004 Groundwater Sampling Results

Introduction

Semiannual groundwater sampling was conducted at the Penta Wood Products Site in May 2004 at five monitoring wells, four residential wells, and one onsite potable well, along with static water level measurements collected at all monitoring wells, and product level measurements in wells with product. The fourth annual post-remedial action (RA) groundwater sampling event was conducted in September 2004 and consisted of sampling 20 monitoring wells, five residential wells, and one onsite potable well, and measuring static water levels in all monitoring wells and product levels in wells with product. This memorandum presents the results of the two groundwater sampling events and includes tables and figures presenting historical groundwater data. It is an update of the previous year's memorandum, retaining and updating evaluations based on the new data.

The treatment system was operated for about 1 year prior to September 2001 when it was shut down to allow for pilot testing and plant modifications intended to help meet effluent criteria. On February 27, 2004, the treatment system was restarted and has been running continuously since that time. The September 2004 monitoring well results reflect approximately 6 months of system operation since the 2001 shutdown.

Purpose and Scope

The purpose of the groundwater sampling events is to monitor groundwater contaminant levels, remaining product thickness, and natural attenuation parameters to assess the effectiveness of the groundwater and product extraction, treatment, and natural attenuation. Parameters that are analyzed include pentachlorophenol (PCP); naphthalene; benzene, toluene, ethylbenzene, and xylene (BTEX); total and dissolved metals; and natural attenuation parameters (see the analytical results in Appendices A and B). Water level measurements were also collected during each sampling event to assess groundwater flow direction.

Water Level Measurements

Water levels in all monitoring wells were measured in May and September 2004. An oil/water interface probe was used to measure the distance from the top of the inner well casing to the water surface and, where applicable, to the product surface. The extraction wells were returned to operation in March 2004; therefore, the effects of water table/potentiometric surface drawdown are reflected in the measured water levels for May and September 2004.

Unconfined Aquifer Groundwater

Groundwater in the unconfined aquifer displays a varied local flow pattern across the site (Figures 1 and 2). A groundwater divide exists beneath the site, running from the southwest

to the northeast. Monitoring wells MW-09 and MW-16 exhibit the local groundwater highs within this divide, possibly indicating varying rates of infiltration within the unconfined aquifer. To the west of the divide, site groundwater in the unconfined aquifer flowed north and northwest towards the infiltration basin and monitoring well MW-26. To the east of the divide, groundwater north of MW-09 flowed to the northeast, and groundwater south of MW-09 flowed towards the extraction wells, as indicated by the low water levels in the Corrective Action Management Unit (CAMU) monitoring wells.

The water levels recorded in May 2004 reflect the operational groundwater collection system's initial effects upon the water table. Water levels recorded at MW-02 indicate this area has a localized groundwater depression, due to extraction well pumping, with groundwater flow on the eastern half of the divide directed radially towards the area near MW-02. By September 2004, the effect of the operational groundwater collection system on the water table had likely reached steady-state conditions. Groundwater elevation data to be collected in 2005 should confirm whether water table conditions have stabilized under the effect of continuous pumping. The effect of the discharge of the treated groundwater at the infiltration basin was not clearly seen in the unconfined aquifer. This may be due to the lack of sufficient water level data in this more remote area of the site.

The variability of the water table surface observed in the unconfined aquifer in 2004 is likely a function of both the influence of the treatment system's pumping wells and varying surface infiltration rates across the site, caused by heterogeneity in the hydraulic properties of the aquifer material, and/or downward flow rates into the semiconfined aquifer. It is likely that the vertical movement of groundwater from the unconfined to the underlying semiconfined aquifer is greater at the area of the local groundwater depression.

Semiconfined Aquifer Groundwater

Groundwater in the semiconfined aquifer exhibited more significant variation in its flow patterns between May and September 2004 (Figures 3 and 4). During May 2004, a groundwater divide ran north-south beneath the site. To the west of the divide, groundwater flowed to the northwest, while to the east of the divide, groundwater flowed to the east. A local groundwater high was observed to the south of the site, near monitoring wells MW-03 and MW-15, where groundwater flows were downgradient from the local high and either to the east or west. The water levels recorded in May 2004 indicate the operational groundwater collection system's initial effects upon the semiconfined aquifer's potentiometric surface.

In September 2004, the groundwater divide had moved to the west, closer to the infiltration basin. West of this divide, groundwater flow was to the northwest. Water levels recorded at MW-12 indicate that this area has a localized groundwater depression, due to extraction well pumping with groundwater flow on the eastern half of the divide directed radially toward the area near MW-12. By September 2004, the effect of the operational collection system on the semiconfined aquifer had likely reached steady-state conditions. The effect of the recharge from the infiltration basin was apparent in the elevated potentiometric surface in this area. Groundwater elevation data to be collected in 2005 should confirm whether semiconfined aquifer conditions have stabilized under the effect of continuous pumping.

The potentiometric surface observed in the semiconfined aquifer is likely a function of extraction well pumping, recharge from the infiltration basin, heterogeneity in the hydraulic properties of the aquifer material and the varying downward flow rates into the semiconfined aquifer. The depression seen on Figure 4 may be enhanced due to varying rates of vertical infiltration from the above unconfined aquifer.

In May 2004, light non-aqueous phase liquid (LNAPL) was observed in MW-18 (0.45 foot), MW-19 (0.36 foot), and MW-20 (0.35 foot). During September 2004, LNAPL was observed in MW-10 (trace product <0.01 foot), MW-10S (0.21 foot), MW-18 (0.54 foot), MW-19 (0.67 foot), and MW-20 (0.52 foot). This is consistent with observations made in the past several years, with the exception that LNAPL was observed in MW-10. Groundwater elevations, oil/water interface measurement data, and other observations are included in Appendix C.

Monitoring Well Sampling and Analysis

For the semiannual sampling round conducted in May 2004, five monitoring wells and four residential wells were sampled. The monitoring wells chosen for this event were MW-01, MW-12, MW-19, MW-21, and MW-26. MW-19 was chosen to represent the unconfined groundwater in the LNAPL area; MW-01, MW-12, and MW-21 were chosen to assess the impacts of the plant shutdown to the perimeter of the plume, particularly in the direction of residential wells; and, MW-26 was chosen to monitor groundwater quality near the treated water infiltration basin. These wells were sampled on May 4 and 5, 2004, by Gina Bayer, Bill Andrae, Heather Hodach, Steve Paukner, Dave Shekoski, and Mary Wicklund of CH2M HILL. All monitoring wells were purged of at least 3 well volumes before sampling. MW-12 was purged and sampled with the dedicated Timco bladder pump installed in 1997, and the remaining monitoring wells were purged and sampled using disposable polyvinyl chlorine (PVC) bailers.

Analytical Service Center (ASC) of Lancaster, New York, analyzed the samples. Quality control (QC) samples consisting of field blanks, duplicate samples, and matrix spike/matrix spike duplicate samples were collected at the frequency specified in the Sampling and Analysis Plan (CH2M HILL 2000; revised April 2001).

For the annual sampling event conducted during September 2004, 20 monitoring wells, five residential wells, and one potable water well were sampled. The monitoring wells selected for sampling were MW-01, MW-02, MW-03, MW-05, MW-07, MW-08, MW-09, MW-10, MW-10S, MW-11, MW-12, MW-13, MW-15, MW-16, MW-17, MW-19, MW-20, MW-21, MW-22, and MW-26. Bill Andrae, Craig LaCosse, Steve Paukner, Dave Shekoski, and Heather Ziegelbauer of CH2M HILL sampled the wells during the week of September 20, 2004. Well MW-06S was not sampled as it was found to be dry during this sampling event. Monitoring wells MW-03, MW-05, MW-07, MW-08, MW-10, and MW-12 were purged and sampled with either dedicated Timco bladder pumps that had been installed in 1997, or with a dedicated Grundfos Redi-flo 2 MP1 pump. The remaining wells were purged and sampled using disposable PVC bailers.

The samples were analyzed by ASC of Lancaster, New York. QC samples consisting of field blanks, duplicate samples, and matrix spike/matrix spike duplicate samples were collected at the frequency specified in the Sampling and Analysis Plan (CH2M HILL 2000; revised April 2001).

All monitoring well and residential well sample result packages were submitted to the director of USEPA Region 5 Central Regional Laboratory for data validation.

Residential Well Analytical Results

The residential well sample information (names, addresses, telephone numbers) and the analytical results were submitted under separate cover to Tony Rutter/USEPA Work Assignment Manager (WAM) on September 13, 2004 and March 4, 2005 (Appendix D).

Semiannual sampling (May 2004) results received from ASC showed that PCP was not present above the limit of detection in any groundwater samples collected from residential wells. No other contaminants (BTEX or naphthalene) were detected in the semiannual residential well groundwater samples.

Annual sampling (September 2004) results received from ASC showed that PCP was present at low concentrations at all five residential wells. PCP concentrations ranged from 0.201 micrograms per liter (µg/L) to 2.18 µg/L. Since the presence of PCP in these wells is not likely, it was suspected that there may have been instrument carryover from other site monitoring well samples with high PCP concentrations. The residential wells and potable well were resampled on November 1, 2004, and the subsequent results showed no PCP detections. No other contaminants were detected in the annual residential well groundwater samples.

Variance for PCP Criteria

CH2M HILL submitted the *PCP WPDES Permit Effluent Criteria Technical Memorandum* to USEPA and WDNR on August 1, 2002, which provided statistical evidence that PCP analytical methods are not reliable around the 0.1 µg/L level at this site. Instead, a criterion of 1.0 µg/L was proposed. At this time, the 0.1 µg/L criterion is being met so revision of the criteria is not being proposed.

Evaluation of Groundwater Contaminant Trends

Trend analysis of historical groundwater data is being presented to evaluate the performance of the RA at the site. The analysis has the following objectives:

- Evaluate the influent data from the groundwater extraction system to determine the amount of PCP removed between September 2000, when the treatment system was started, and September 2001, when it was shut down for evaluation and pilot testing.
- Evaluate the current monitoring data to determine whether the plume is declining in size since the February 2004 restart of the treatment system.
- Evaluate the infiltration basin area to determine the effect of reinfiltration on groundwater quality.
- Identify changes needed to groundwater monitoring strategy.

For completeness, however, the results of the previous analyses and new data from 2004 are presented below.

Groundwater Extraction System PCP Removal Estimates

The groundwater extraction system was operated between September 27, 2000, and September 27, 2001, for a total of 280 days, with flow rates ranging from 35 gallons per minute (gpm) to 120 gpm during operation. A total volume of 30 million gallons of groundwater, or roughly 2 pore volumes of the extraction zone, was removed. PCP influent concentrations typically were in the 5,000 to 14,000 µg/L range. Based on this information, the estimated PCP mass removed was about 2,500 pounds (see Table 1).

TABLE 1
PCP Mass Removed with the Groundwater Extraction System: September 27, 2000–September 27, 2001 and February 27, 2004–December 31, 2004
Penta Wood Products Site

Operation Period	Days Operated	Average Flow Rate (gpm)	Average PCP Influent Concentration (µg/L)	PCP Mass Removed (lbs)
9/27/00 to 12/18/00	83	98	12,535	1,224
2/2/01 to 2/8/01	8	60	12,535	72
3/16/01 to 6/10/01	86	75	10,356	802
6/15/01 to 9/27/01	103	46	7,535	429
		Total PCP Mass Removed 2000 to 2001		**2,527**
2/27/04 to 12/31/04	240[1]	80	9,227	2,128
		Total PCP Mass Removed 2000 to 2004		**4,655**

[1] Number of days operated approximated due to numerous start-up/shut-down times

The groundwater extraction system was restarted on February 27, 2004. From February to July 2004, the extraction system operated intermittently. From July to the end of December 2004, the extraction system operated more consistently, with only a few shutdowns. Over 2004, groundwater extraction rates ranged from 72 to 82 gpm. A total volume of approximately 28 million gallons of groundwater, or roughly 2 pore volumes of the extraction zone, were removed between the February restart through the end of the year. PCP influent concentrations in 2004 ranged from 2,600 to 22,600 µg/L. Based on this information, the estimated PCP mass removed was approximately 2,100 pounds (see Table 1).

The total PCP mass removed since September 2000 is about 4,600 pounds. This represents about 57 percent of the dissolved phase PCP mass present prior to operation of the extraction system. However, as shown in Table 2 on the following page, it is estimated that there is considerably more PCP mass adsorbed on the aquifer matrix (11,000 pounds) and more PCP mass present in the LNAPL residual zone (15,000 pounds). It should be noted that the contaminant mass estimates are based on many simplifying assumptions and are expected to be accurate only to within a one order-of-magnitude range. As a result, they are intended as general comparisons of the relative significance of contaminant mass in different media.

Table 3 summarizes the PCP mass estimates for 1994, 1997, 2000, 2002, 2003, and 2004 at the Penta Wood Site.

TABLE 2
Estimate of Saturated Zone Contaminant Mass
Penta Wood Products Site

Contaminant	Parameter	Unconfined MW10S, 19, 20 (Area 1)	Unconfined MW6S, PW01 (Area 2)	Unconfined MW3 (Area 3)	Unconfined MW16 (Area 4)	Semiconfined MW5,10,18 (Area 1)	Semiconfined MW6, PW01 (Area 2)	Semiconfined MW3 (Area 3)	Semiconfined MW12 (Area 4)	Total Contaminant Mass (lb)
	Aquifer Media Volume (CF):	3,540,000	2,790,000	1,800,000	6,100,000	5,900,000	4,650,000	3,000,000	10,200,000	
	Aquifer Water Volume (CF):	1,416,000	1,116,000	720,000	2,440,000	2,360,000	1,860,000	1,200,000	4,080,000	
Mass in 1994 Based on Groundwater Sampling in September, 1994										
PCP	Conc. (µg/L)	77,300	51	2.6	0.3	17,400	2,350	2.6	10,000	
K_d[b] = 0.60	Mass in soil (lb)	18,236	9	0	0	6,842	728	1	6,798	32,614
	Mass in GW (lb)	6,815	4	0.1	0.05	2,557	272	0.2	2,540	12,188
	Total Mass (lb)	25,051	13	0.4	0.2	9,398	1,000	0.7	9,338	44,802
Mass in 1997 Based on Groundwater Sampling in October, 1997										
PCP	Conc. (µg/L)	28,000	3	0.5	0.5	21,600	2,300	0.5	13,000	
K_d[b] = 0.60	Mass in soil (lb)	6,606	1	0	0	8,493	713	0	8,837	24,649
	Mass in GW (lb)	2,468	0	0	0.08	3,174	266	0	3,302	9,211
	Total Mass (lb)	9,074	1	0.1	0.3	11,667	979	0.1	12,139	33,860
Mass in 2000 (Prior to Groundwater Extraction) Based on Groundwater Sampling in April, 2000[a]										
PCP	Conc. (µg/L)	37,000			0.2	15,065			10,300	
K_d[b] = 0.60	Mass in soil (lb)	8,729	0	0	0	5,923	0	0	7,002	21,654
	Mass in GW (lb)	3,262	0	0	0.03	2,214	0	0	2,616	8,092
	Total Mass (lb)	11,991	0	0	0.1	8,137	0	0	9,618	29,746
Mass in 2002 (Following 1 Year of Groundwater Extraction) Based on Groundwater Sampling in August, 2002										
PCP	Conc. (µg/L)	13,797				11,255			4,300	

TABLE 2
Estimate of Saturated Zone Contaminant Mass
Penta Wood Products Site

Contaminant	Parameter	Unconfined MW10S, 19, 20 (Area 1)	Unconfined MW6S, PW01 (Area 2)	Unconfined MW3 (Area 3)	Unconfined MW16 (Area 4)	Semiconfined MW5,10,18 (Area 1)	Semiconfined MW6, PW01 (Area 2)	Semiconfined MW3 (Area 3)	Semiconfined MW12 (Area 4)	Total Contaminant Mass (lb)
K_d[b] = 0.60	Mass in soil (lb)	3,255	0	0	0	4,425	0	0	2,923	10,603
	Mass in GW (lb)	1,216	0	0	0	1,654	0	0	1,092	3,962
	Total Mass (lb)	4,471	0	0	0	6,079	0	0	4,015	14,566
Mass in 2003 (2nd Year Following 1 Year of Groundwater Extraction) Based on Groundwater Sampling in September, 2003										
PCP	Conc. (µg/L)	10,067				5,050			10,000	
K_d[b] = 0.60	Mass in soil (lb)	2,375	0	0	0	1,986	0	0	6,798	11,158
	Mass in GW (lb)	888	0	0	0	742	0	0	2,540	4,170
	Total Mass (lb)	3,262	0	0	0	2,728	0	0	9,338	15,328
Mass in 2004 (Groundwater Extraction System restarted in February 2004) Based on Groundwater Sampling in September, 2004										
PCP	Conc. (µg/L)	10,067[c]				194			9,060	
K_d[b] = 0.60	Mass in soil (lb)	2,375	0	0	0	76	0	0	6,159	8,610
	Mass in GW (lb)	888	0	0	0	29	0	0	2,301	3,218
	Total Mass (lb)	3,262	0	0	0	105	0	0	8,460	11,827

Notes:
Contaminant mass estimates are based on many simplifying assumptions and are expected to be accurate only to within an order-of-magnitude range. As a result they are intended as general comparisons of the relative significance of contaminant mass in different media.
[a]Where April 2000 groundwater data is not available for a MW, April 2001 data is used.
[b]Kd from Hydrogeologic Investigation, Dec. 1994.
c. LNAPL product present in all three wells in this subarea. As a result, PCP concentrations are not reliable. Concentrations are assumed to be similar to 2003.
Soil Density = 1.78 g/cm^3
PCP K_d = 0.6

TABLE 3
Summary of PCP Mass Estimates
Penta Wood Products Site

Location	1994 PCP Mass (lb)	1997 PCP Mass (lb)	April 2000 PCP Mass (lb)	August 2002 PCP Mass (lb)	September 2003 PCP Mass (lb)	September 2004 PCP Mass (lb)	Notes
Unsaturated Zone	115,000	115,000	115,000	115,000	115,000	115,000	No additional data to estimate actual degradation of PCP in unsaturated zone.
LNAPL Residual Zone	15,000	15,000	15,000	15,000	15,000	15,000	No additional data to estimate actual degradation of PCP in LNAPL zone.
Saturated Zone—Adsorbed	33,000	25,000	22,000	11,000	11,000	8,600	Based on groundwater concentration and a PCP kd of 0.6.
Saturated Zone—Dissolved	12,000	9,200	8,100	4,000	4,200	3,200	Based on weighted average groundwater concentrations.
Total PCP Mass	175,000	164,000	160,000	145,000	146,000	141,800	
Removed by LNAPL Recovery System 2000–2001 / 2004	—	—	—	350	—	1,500	Assuming 50% of recovered liquid is LNAPL and LNAPL is 5% PCP.
Removed by GW Extraction System 2000–2001 / 2004	—	—	—	2,500	—	2,100	

Note: Contaminant mass estimates are based on many simplifying assumptions and are expected to be accurate only to within an order-of-magnitude range. As a result, they are intended as general comparisons of the relative significance of contaminant mass in different media.

The volume of liquid waste that was obtained from the separator can be used to make a rough estimate of the volume of LNAPL that was removed by groundwater extraction. While the plant was operating in 2004, approximately 8,850 gallons of liquid waste were captured in the separator; if the assumption is made that one-half of this waste was water, then roughly 4,425 gallons of LNAPL were removed. Assuming an LNAPL density of 0.84 grams per cubic centimeter (g/cm^3) and a PCP concentration of 5 percent, this volume equates to about 1,500 pounds of PCP.

PCP Plume

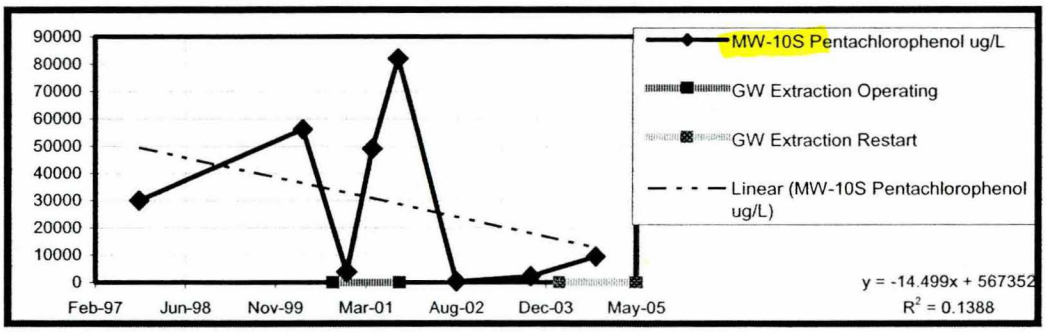
The monitoring well analytical results tables presented in Appendix A are formatted into three unique tables: the May 2004 semiannual sampling results, the September 2004 annual sampling results, and a compilation table that presents annual sampling results from 1997, 2000, 2001, 2002, 2003, and 2004.

To observe PCP trends over time, PCP concentration contours that exceed 1,000 µg/L are presented in Figure 1 of Appendix C. PCP concentration contours that exceed the Wisconsin NR 140 enforcement standard of 1 µg/L are presented in Figure 2 of Appendix C. A comparison of the 1,000 µg/L contour lines in Figure 1 for 1997, 2001 2002, 2003, and 2004 shows that the high concentration plume has shrunk from 1997 to 2004. The high concentration plume shrank a small amount from 2003 to 2004. A greater amount of

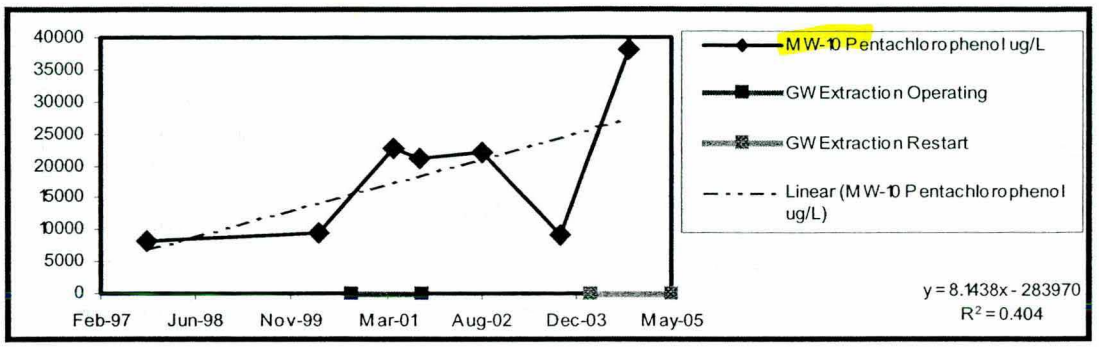
shrinking is not anticipated until a more significant amount of LNAPL is removed, given the large mass of PCP that can solubilize from the LNAPL residual.

The 2004 extent of the plume exceeding 1 µg/L contour, as shown in Figure 2 (Appendix C), remains similar to the 2003 contour. There continues to be a sharp decline in PCP concentrations between the high concentration area where LNAPL is present and the surrounding perimeter of the plume, i.e., the 1,000 µg/L contour is only slightly larger than the 1 µg/L contour. This is likely a combination of the groundwater collection system drawing water towards the center of the plume as well as biodegradation resulting from the availability of oxygen in groundwater around the plume perimeter. It should be noted that there are several well locations where PCP was detected above 1 µg/L far from the actual PCP plume. However, from the analytical run logs, it is suspected that there may have been contaminant carryover on the laboratory instrumentation biasing these wells' PCP results. Therefore, these values have not been included in the delineation of the 1 µg/L PCP isoconcentration contour.

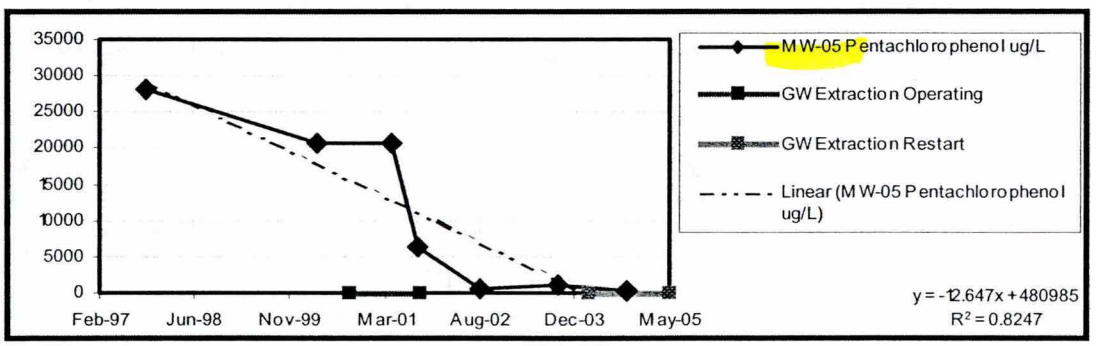
Monitoring well MW-10S shows a sharp drop in PCP, from 56,100 µg/L prior to groundwater extraction to 390 µg/L after the extraction system was started. Since the extraction system was shut down and restarted in 2004, PCP levels rebounded to 2,200 µg/L and 9,490 µg/L in 2003 and 2004, respectively. MW-10S is near the perimeter (within 100 feet) of the high concentration PCP plume in the unconfined aquifer, where relatively clean groundwater has been drawn past the well screen by nearby extraction well EW-03. In 2003 and 2004, free product was observed in the well, explaining why concentrations increased. The free product presence is likely due to extraction well EW-03 pulling product towards it while actively pumping.



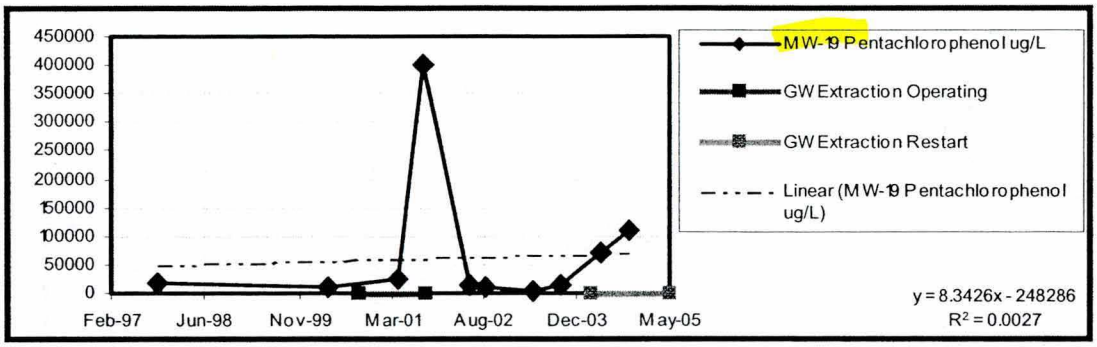
PCP in monitoring well MW-10 increased from 9,530 µg/L shortly before startup of the treatment system to 22,000 µg/L in August 2002. Concentrations in the well did not drop immediately, but by September 2003, concentrations had fallen to 9,000 µg/L. In September 2004, PCP concentrations at MW-10 increased to 38,000 µg/L. This is likely due to the restart of the extraction system in February 2004. MW-10 is very near to extraction well EW-03, which pulls product toward it while actively pumping.



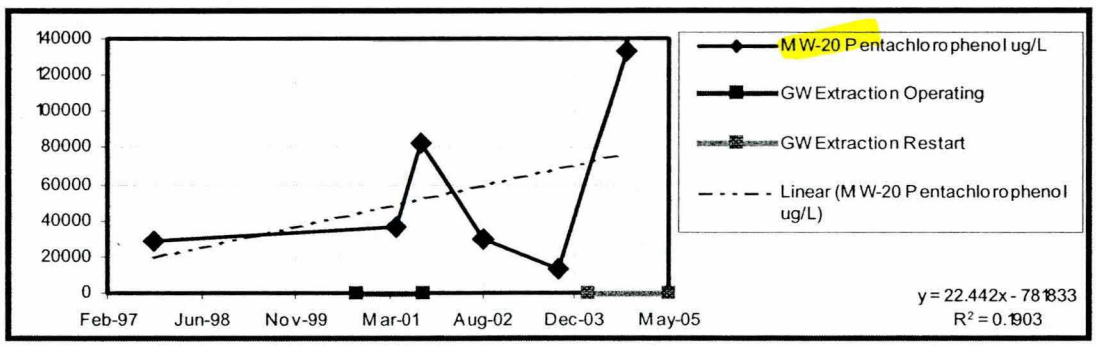
PCP in monitoring well MW-05 dropped sharply from 20,600 to 510 µg/L, most likely due to its proximity to the perimeter of the high concentration PCP plume. Since the extraction system was shut down, PCP levels rebounded slightly to 1,100 µg/L. September 2004 PCP concentrations dropped to 194 µg/L. This area of the plume is being remediated relatively quickly because of the nearby uncontaminated groundwater being drawn radially toward EW-02 and EW-05 since their activation in February 2004, thereby purging the aquifer of PCP. Note the strong downward trend line with a very high coefficient of determination ($R^2 = 0.83$) indicating a good fit of the trend line to the data.



From April 2000 to May 2002, PCP in monitoring well MW-19 increased from 11,000 to 14,000 µg/L. LNAPL was present in this well in all sampling periods from April 2001 onwards, making evaluation of PCP trends difficult since any entrainment of LNAPL droplets in the sample will have large effects on PCP concentrations. A large hit of 400,000 µg/L of PCP occurred in September 2001, possibly because of LNAPL entrainment in the groundwater sample. Because MW-19 is "perched" over a low-permeability till, the area around the well may be more difficult to clean up quickly. In 2003, the PCP concentration increased from 4,900 to 15,000 µg/L. This increase is likely due to MW-19's position just downgradient from the most heavily concentrated portion of the plume. In 2004, PCP concentrations continued to increase to 70,000 µg/L in May and 111,000 µg/L in September. This increase can be attributed to the restart of the extraction system in February 2004, causing product to be pulled toward nearby extraction wells, EW-06 and EW-07.



Monitoring well MW-20 increased from 29,000 µg/L before the startup of the extraction system to 83,000 µg/L near the end of first operation cycle. LNAPL was present in this well in all sampling periods from September 2001 onwards, making evaluation of PCP trends difficult since any entrainment of LNAPL droplets in the sample will have large effects on PCP concentrations. While the extraction system was inactive, PCP concentrations declined. In 2003, PCP concentrations continued to decrease to 13,000 µg/L. This may be due to relatively clean groundwater in the unconfined aquifer, which migrated from the west toward MW-20 under natural conditions present in September 2003. Once the extraction system was restarted in February 2004, PCP concentrations increased to 133,000 µg/L by September 2004. This increase can be attributed to the restart of the extraction system in February 2004, causing product to be pulled toward nearby extraction wells.



The 2004 PCP concentrations in the high concentration perimeter areas (>1,000 µg/L) are largely similar to those of 2003. One exception is the PCP concentration found at MW-05, which has decreased from 1,100 µg/L to 194 µg/L in 1 year. As stated earlier, this change in concentration is attributable to the February 2004 restart of the extraction system.

Naphthalene

Naphthalene was detected in only five monitoring wells in 2004 (MW-10, MW-10S, MW-12, MW-19, and MW-20) at levels above reporting limits. Concentrations ranged from 22.9 to 282 µg/L. All five wells where naphthalene was detected are within the area of concentrated PCP (> 1,000 µg/L).

BTEX

BTEX was detected above reporting limits at several monitoring wells in 2004. All wells where these compounds were detected were located within the area of concentrated PCP. Benzene was detected in two monitoring wells (MW-10 and MW-12) at concentrations ranging from 0.113 to 0.296 µg/L. Toluene and ethylbenzene were detected at four monitoring wells (MW-10, MW-12, MW-19, and MW-20). Toluene concentrations ranged from 0.866 to 8.09 µg/L, while ethylbenzene concentrations ranged from 1.22 to 5.58 µg/L. Xylene was detected in five monitoring wells (MW-10, MW-10S, MW-12, MW-19, and MW-20) with concentrations ranging from 5.42 to 50.3 µg/L.

Total and Dissolved Metals

Both dissolved and total arsenic, copper, iron, manganese, and zinc were sampled in May and September 2004. Dissolved metals samples provide the best indicator of metals present in groundwater because total metal results are often biased high as a result of the presence of suspended solids in samples. When the groundwater sample is acidified for preservation, the metals present as suspended solids are dissolved into the water. The suspended solids are typically orders of magnitude higher in metal concentrations when compared to groundwater. As a result, even a very small amount of suspended solids can have a large effect on total metal concentrations. Turbidity was observed in some of the samples and, in those cases, metals may not have been representative of groundwater.

Arsenic. The evaluation of arsenic was made more difficult because dissolved arsenic may be biased low since dissolved arsenic may co-precipitate with iron as oxygen diffuses into the sample after removal from the well. The precipitated arsenic, then, is field filtered out of the sample before analysis. As noted, many wells had to be bailed for purging and sampling. This method can cause aeration during sampling, and the dissolved arsenic results may bias low.

Dissolved arsenic in all May and September 2004 samples were below the WDNR Preventive Action Limit (PAL) of 1 µg/L at all monitoring wells except MW-10. Well MW-10 had a detection of 3.01 µg/L in September 2004. This well is located in the center of the area of concentrated PCP.

Total arsenic did not exceed the WDNR Enforcement Standard (ES) of 10 µg/L in any well in 2004. It exceeded the WDNR PAL of 1.0 µg/L in five wells (MW-02, MW-10, MW-13, MW-21, and MW22), although all results were less than the former PAL of 5.0 µg/L.

The effect of suspended solids on metal results can also be discerned by comparing metal results within a sample. Typically, suspended solids result in the elevation of several metals, such as iron and copper, in similar proportions. This appears to be the case in previous years' samples where arsenic exceeded the PAL. A third line of evidence is the horizontal distribution of metals. If suspended solids are the source of elevated metals, the distribution of elevated metals is random and not associated with the reducing portion of the PCP plume, as is expected when metals are actually present in groundwater.

In summary, arsenic was below the ES in all wells and total arsenic exceeded the WDNR PAL in only five wells, while dissolved arsenic exceeded the WDNR PAL at only one well.

In each case, it is suspected that the exceedance is related to turbidity in the sample and is not indicative of arsenic in groundwater.

Copper. Total copper exceeded the WDNR PAL of 130 µg/L at MW-03 (356 µg/L) in 2004. High turbidity could cause an increase in metal concentrations due to the increase in suspended solids. All other total copper samples were below the WDNR PAL. Copper exceeded the site's reporting limits in six wells (MW-02, MW-05, MW-10, MW-13, MW-19, and MW-20), with concentrations ranging from 13.5 to 87.2 µg/L.

Dissolved copper was detected at 20 wells in 2004, but it did not exceed the WDNR PAL of 130 µg/L. The highest concentration of dissolved copper was found at MW-20 (35.2 µg/L), exceeding the site's reporting limits of 10 µg/L.

Iron. Total iron was detected above the WDNR ES of 0.3 milligrams per liter (mg/L) at 13 wells across the site in 2004, ranging from 0.402 mg/L (MW-19) to 25.8 mg/L (MW-02). Total iron exceeded the WDNR PAL of 0.15 mg/L at three wells in 2004 (MW-02, MW-08, and MW-09) with concentrations ranging from 0.231 mg/L (MW-09) to 0.278 mg/L (MW-03). As noted, the high turbidity of groundwater in some wells likely increases total metal concentrations due to the increase in suspended solids.

Dissolved iron was detected above the WDNR ES at three wells (MW-02, MW-05, and MW-20) in 2004, ranging from 0.662 mg/L (MW-02) to 7.48 mg/L (MW-05).

There is a clear downward trend in both total and dissolved iron concentrations in nearly all monitoring wells, with September 2004 concentrations being the lowest recorded to date. This is expected as the more oxygen-rich groundwater surrounding the site is drawn into the reducing portion of the plume, increasing the oxidation-reduction potential (ORP) to more oxidative conditions.

Manganese. Total manganese was detected and exceeded the WDNR ES of 0.05 mg/L at 12 wells across the site in 2004, ranging from 0.075 mg/L (MW-16) to 7.15 mg/L (MW-05). Again, the high turbidity of groundwater in some of these wells likely causes an increase in metal concentrations due to the increase in suspended solids.

Dissolved manganese exceeded the WDNR ES at six wells across the site, ranging from 1.23 mg/L (MW-12) to 5.65 mg/L (MW-05).

For most wells, there is an overall downward trend in total and dissolved manganese concentrations, with the exception of a few wells, where the trend is less well-defined and displayed some lower manganese concentrations prior to September 2004.

Zinc. Total zinc was detected at 15 wells across the site in 2004, ranging from 0.002 mg/L (MW-08) to 0.273 mg/L (MW-03). There were no WDNR PAL or ES exceedances of total zinc in any wells.

Dissolved zinc was detected at 20 wells in 2004, ranging from 0.002 mg/L (MW-08) to 0.047 mg/L (MW-20). There were no WDNR PAL or ES exceedances of dissolved zinc in any wells.

As with iron, there is a clear downward trend in both total and dissolved zinc concentrations in all wells across the site, with September 2004 concentrations being the lowest recorded to date.

Evaluation of Natural Attenuation

Natural attenuation is a remediation approach that relies on natural processes that work to reduce mass and concentration of contaminants in soil and groundwater. Natural attenuation processes include dispersion, dilution, abiotic transformation, volatilization, sorption, and biodegradation. Biodegradation is often the most important process for compounds that can be transformed or reduced by indigenous microorganisms.

Appendix B contains a table presenting the natural attenuation parameters for each well as measured in 1997, 2000, 2001, 2002, 2003, and 2004.

Limitations in Field Measurements of Natural Attenuation Parameters. The natural attenuation parameters measured in the field may not be truly representative of groundwater because of limitations that exist in the measurement methods.

Initially, dedicated pumps were installed in the wells, which would allow accurate measurement of downhole parameters. However, due to the large hydraulic head (more than 100 feet in some areas), dedicated pumps could not pump at sufficient rates to allow efficient purging to occur. As a result, bailing was used to purge and sample many of the wells. This process can aerate the groundwater and significantly change ORP, dissolved oxygen, and pH readings. The oxygenation may result in the precipitation of iron, arsenic, manganese, and other metals, effectively removing them from dissolved samples during field filtering.

As a result, dissolved metals may not be representative of groundwater. Total metals can be useful in the evaluation of dissolved metal concentrations because most are expected to be in the dissolved phase in reducing areas of the plume. However, if sample locations are frequently turbid (such as MW-03) or if metal casings in wells have corroded, total metals data may not be representative of groundwater conditions. Because of these concerns, evaluation of dedicated downhole pumps for groundwater sampling was undertaken. In August 2003, a new dedicated downhole Grundfos Redi-flo 2 MP1 pump was installed into MW-10 and used during the September 2003 and subsequent sampling events.

Oxidation/Reduction. Evaluation of the data generated during 2004 suggested that the LNAPL area was reducing and the surrounding areas were oxidizing. The 2004 data in general are similar to 2003 data, indicating a relatively stable reducing area of the plume.

Although dissolved oxygen measurements are questionable for the reasons discussed above, a review of the dissolved oxygen data in traditionally aerobic wells failed to show a shift toward anaerobic conditions.

Chloride. Chloride production is an indicator of PCP degradation. About 700 µg/L of chloride is produced for each 1,000 µg/L of PCP degraded. Except for MW-03 and MW-21, chloride is generally higher near the interior wells than the perimeter wells. MW-03 and MW-21 chloride concentrations have been traditionally higher than background. These

wells are near the highway where influence from road salting may be causing elevated chloride concentrations.

Since the beginning of groundwater extraction, correlation between PCP degradation and chloride production has been difficult because as chloride is produced, it is removed by the extraction system, creating a net effect that is difficult to discern.

Nitrate. In August 2002, nitrate levels were less than the detection limit (0.15 mg/L) in all samples except MW-12 (0.46 mg/L) and MW-19 (0.16 mg/L). Since nitrate was not detected in many wells where it traditionally had been detected at much higher levels, nitrate data in August 2002 may have been biased low. Analytical data from September 2003 seemed to confirm this, as most nitrate levels returned to concentrations comparable to those before August 2002, with a range of 1.01 mg/L (MW-06S) to 5.1 mg/L (MW-17). During 2004, nitrate levels remained relatively low, ranging from 0.29 to 4.8 mg/L, and remaining comparable to concentrations observed in 2003.

Methane. Methane, a product of anaerobic degradation, was detected in three wells (MW-01, MW-12, and MW-19) in May 2004 at low concentrations (0.86, 1.34, and 1.13 µg/L, respectively). The absence of methane at or above the detection limit in most wells suggests that degradation is occurring primarily under nonmethanogenic, anaerobic iron, or sulfate-reducing conditions.

Sulfate. Once oxygen and nitrate are depleted, sulfate can also be used as an electron acceptor. Several wells within the plume showed a significant decrease in sulfate in 2003. These wells were thought to be indicating the beginnings of sulfate reduction. However, the decrease in sulfate concentration at these wells is less than an order of magnitude and may simply reflect natural variation within the native groundwater. In 2004, much of the sulfate data collected were rejected upon review of laboratory reports. Those results that were not rejected showed little variation in sulfate concentration from 2003.

Effects of Reinfiltration on Groundwater Quality

Large quantities of treated groundwater were reinjected at the site's infiltration basin in 2000 and 2001. During one year of operation, about 30 million gallons of groundwater were reinfiltrated. The water would be expected to displace groundwater over a considerable area. Assuming that a 20-foot thickness of the aquifer is affected, the area occupied by 30 million gallons equals roughly 15 acres.

Approximately 28 million gallons of groundwater were also reinjected at the infiltration basin during 2004, while the extraction system was operating.

MW-26 is used to determine the effects the infiltration basin has on groundwater in the area. The well, however, was not sampled prior to discharge of groundwater. As a result, MW-08, located about 200 feet upgradient, is used to establish the local background concentrations.

PCP in MW-26 has remained similar to background levels during extraction well operation, after plant shutdown, and during extraction well restart. During treatment system restart, PCP ranged from "below detection limits" to 0.39 µg/L in September 2004.

Based on surrounding background concentrations, chloride increased from an expected background of about 5 mg/L to a range of 10 to 30 mg/L during operation of the

groundwater collection and treatment system. This was expected because the treated groundwater from the source area is elevated in chloride. Chloride had declined slightly in 2003, likely because of the cessation of discharge of treated groundwater. Chloride again increased in 2004 (17 mg/L in May 2004 and 28 mg/L in September 2004), due to the restart of the groundwater extraction system.

Sulfate increased during 2004 at MW-26 (42 mg/L in May 2004 and 120 mg/L in September 2004) during 2004 system operation.

Iron has dropped significantly at MW-26. This was also expected because the aeration of the groundwater results in precipitation and removal of iron from treated groundwater. Nitrate also dropped as expected because the source area groundwater has minimal nitrate.

Another benefit of reinfiltrating groundwater is that treatment results in aeration and reoxygenation of the water. The estimated 28 million gallons of treated groundwater reinfiltrated in 2004 supplies about 1,900 pounds of oxygen (assuming an average of 8 mg/L oxygen) for aerobic biodegradation of PCP at the PCP plume. Assuming all the oxygen is used for PCP degradation, about 2,755 pounds of PCP is degraded. This is an amount similar to the 2,100 pounds of PCP removed in the extraction system.

In previous years, water sourced from the infiltration basin has been shown to migrate towards the PCP plume in both the unconfined and confined aquifers. In 2004, the potentiometric surfaces of both aquifers did not generally follow this pattern observed in past years. This may be due to the frequent start and stop of the extraction well pumps, keeping the potentiometric surface under non-steady-state conditions throughout most of 2004. The movement of groundwater to the west of the infiltration basin could have been influenced by this state of potentiometric instability. It is expected that subsurface groundwater flow will again return to the conditions observed prior to 2003, provided the aquifers are under steady-state conditions.

In summary, infiltration of treated groundwater during 2004 has shown an increase in chloride and sulfate concentrations. Nitrate concentrations have declined. In the future, the reinjection of treated groundwater is expected to accelerate the decline in PCP groundwater concentrations through increased aerobic biological degradation.

Summary

Semiannual groundwater sampling was conducted at the Penta Wood Products Site in May 2004 for five monitoring wells, four residential wells, and one onsite potable well. The fourth post-RA annual groundwater sampling event was conducted in September 2004 and consisted of 20 monitoring wells, five residential wells, and one onsite potable well,.

Water level measurements collected across the site show that the restart of the extraction system has affected groundwater flow patterns during 2004. The effect of pumping on the unconfined and semiconfined aquifers had likely reached steady-state conditions by September 2004.

Results from the residential wells sampled in May and November 2004 showed no detections of PCP. No other contaminant detections were reported in the residential wells sampled in August.

The groundwater extraction system was operated intermittently from February to July 2004, and continuously from July through December 2004. More than 28 million gallons of groundwater, or about 2 pore volumes, were removed from the extraction zone. About 2,100 pounds of PCP was removed.

The PCP plume exceeding 1,000 µg/L has continued to shrink slightly between 1997 and 2004 as a result of groundwater extraction and natural attenuation. The extent of the plume, as defined by the 1 µg/L contour, extends out to MW-13 in the northeast and beyond MW-14 in the southeast. Advective transport of PCP under natural groundwater flow conditions is the most likely cause for this plume expansion (see Appendix C, Figure 2).

Naphthalene and BTEX were present in several wells in the area of concentrated PCP. They are not present in any of the monitoring wells along or outside the plume perimeter.

Evaluation of the natural attenuation parameters revealed similar conditions as in 2003.

During the operational hiatus of the site extraction system (between 2001 and 2004), groundwater near the infiltration basin had been returning to baseline concentrations. Since the restart of the extraction system, infiltration of treated groundwater during 2004 has slightly increased PCP and iron in groundwater as monitored at MW-26. There has also been a significant increase in chloride and sulfate concentrations at MW-26 in 2004. MW-26 nitrate concentrations have declined. In the future, the continued reinjection of treated groundwater is expected to accelerate the decline in PCP groundwater concentrations through increased aerobic biological degradation.

Recommendations

A change in the sampling method from hand bailing to dedicated pumps is recommended. The approximate 100-foot depth to groundwater, which is typical for the site, presents a significant challenge for many commercial pumps. This was demonstrated by the poor performance of the Timco bladder pumps installed in 1997. Research of available alternatives resulted in the purchase of a Grundfos Redi-flo 2 MP1 pump, which was installed in MW-10 before the September 2003 sampling round. The pump was easy to install, performed well at the approximate 100-foot depth, and considerably reduced sampling time. It also resolved issues associated with hand bailing, such as providing more accurate measurement of natural attenuation parameters, minimizing suspended solids in samples, and minimizing aeration during sample collection. It is recommended that more of these pumps should be installed for future sampling events.

It is also recommended that further evaluation of laboratory analytical contaminant carryover during PCP analysis should be undertaken. It is important that lower concentrations of PCP be accurately determined in groundwater beneath the site. In the future, samples will be submitted in three groups representing PCP concentrations from low to high and will be analyzed in that order. The proposed sample groupings are:

1. Wells with PCP < 100 µg/L
2. Wells with PCP > 100 µg/L and no LNAPL in the well
3. Wells with LNAPL

Waste Generation and Disposal Summary

The RA activities at the site result in the generation of hazardous waste. Hazardous waste management procedures for the Penta Wood Products Site (USEPA ID No. WID006176945) are outlined in the Waste Handling Plan (CH2M HILL 2005).

Table 4 summarizes the amount of waste generated and disposed of offsite.

TABLE 4
Hazardous Waste Generation Summary
Penta Wood Products Site, Town of Daniels, WI

Manifest #	Date	Filter Cake (lbs)	Misc. Debris (lbs)	Carbon (lbs)	LNAPL (lbs)	Water (gal)	Yearly Total (lbs)
IL9408187	12/19/2000				5,009		
IL9408188	12/19/2000		200	6,000			
	Total (lb):	**0**	**200**	**6,000**	**5,009**		**11,209**
WIK168068	08/28/2001		400	3,600	4,239		
WIK169159	04/03/2001			44,000			
WIK169160	04/03/2001			8,500	1,927		
	Total (lb):	**0**	**400**	**56,100**	**6,166**		**62,665**
WIK179411	01/08/2002			40,000			
WIK179412	01/08/2002		200	8,000			
WIK179225	04/04/2002		200		3,083		
WIK298473	06/09/2002		1,000		7,707		
IL10328513	06/25/2002					3328	
	Total (lb):	**0**	**1,400**	**48,000**	**10,790**	**27,756**	**87,944**
WIK296620	10/30/2003		600		3,083		
IL10329166	10/30/2003					165	
	Total (lb):	**0**	**600**	**0**	**3,083**	**1,376**	**5,059**
WIK359186	02/11/2004		200	8,000			
WIK359185	02/12/2004			38,000			
WIK359334	05/04/2004			6,000			
2159985	05/19/2004		1200				
WIK359343	05/19/2004	10,700					
WIK278209	05/19/2004			10,000			
WIK376767	06/07/2004	24,000					

TABLE 4
Hazardous Waste Generation Summary
Penta Wood Products Site, Town of Daniels, WI

Manifest #	Date	Filter Cake (lbs)	Misc. Debris (lbs)	Carbon (lbs)	LNAPL (lbs)	Water (gal)	Yearly Total (lbs)
WIK376681	07/12/2004	18,860					
WIK363235	08/05/2004	19,140					
CWM0027842	08/10/2004				25,500		
WIK363114	09/14/2004	18,700					
WIK363151	10/20/2004	15,660					
WIK361532	11/22/2004		1,800	40,000			
WIK448461	11/22/2004	24,900					
WIK361540	12/04/2004				28,022		
WIK446853	12/29/2004	24,000					
	Total (lb):	**155,960**	**3,200**	**102,000**	**374,954**		**836,113**

Misc. Debris assumes 200 lb/drum
Weight of Fuel Oil (LNAPL) = 8.34 lb/gal water x 0.84 density
Weight of Water = 8.34 lb/gal
Weight of Carbon based on 2,000 lb/filter bag

Site Inspection and Maintenance

During 2004, the overall condition of the site was very good. The CAMU cap was heavily vegetated with grasses and no erosion was observed on the CAMU cover. Erosion was observed by the Operator along the north and east ditch during routine site inspections.

In September 2004, Brust Excavating, the erosion control and repair subcontractor, was onsite to perform erosion control repairs. The tasks performed by Brust Excavating included lining new ditches with rock, as well as road repair, diversion berm repair and installation, and general grading. USEPA and CH2M HILL walked the site with Brust Excavating on September 22, 2004, to inspect and approve the repairs.

During the site walk, additional areas of erosion were identified by USEPA. CH2M HILL requested Brust Excavating to prepare cost estimates for the additional work. Brust Excavating indicated that the additional rock needed for lining the ditches could not be obtained until the ground was frozen. It was decided that the rock would be imported during the winter, and the erosion repair work would be conducted in early 2005.

References

CH2M HILL. 2000, revised April 2001. Sampling and Analysis Plan.

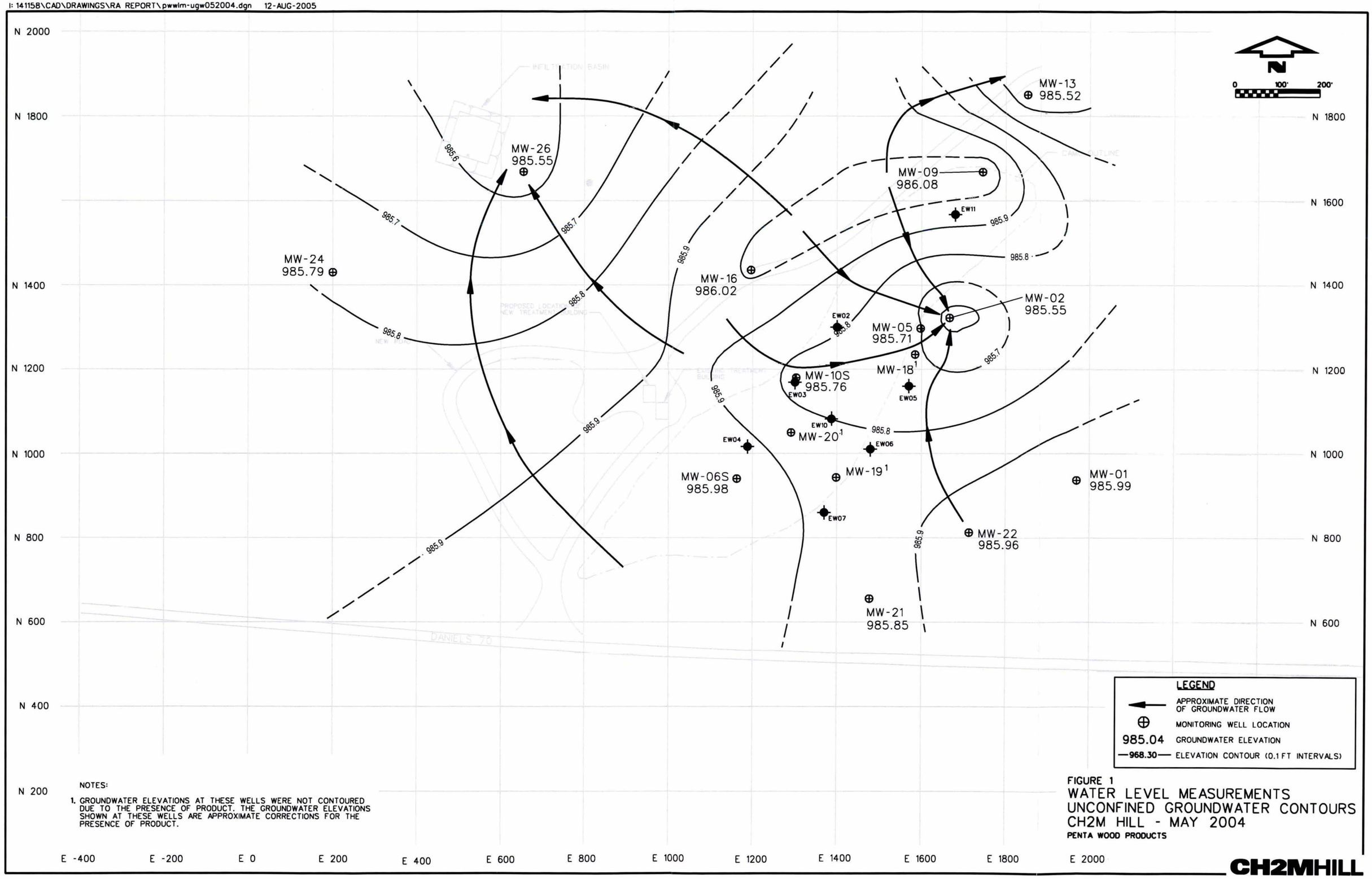
CH2M HILL. 2002. PCP WPDES Permit Effluent Criteria Technical Memorandum. Technical memorandum to USEPA and WDNR. August 1.

CH2M HILL. 2002. PCP WPDES Permit Effluent Criteria at Penta Wood Products Superfund Site, Town of Daniels, WI. Memorandum to USEPA. August 2.

CH2M HILL. 2005. Draft Waste Handling Plan. June.

WNDR. 2005. First Five Year Review Report for Penta Wood Products Superfund Site. March.

I: 141158\CAD\DRAWINGS\RA REPORT\pwwlm-ugw052004.dgn 12-AUG-2005



LEGEND

- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- ⊕ MONITORING WELL LOCATION
- 985.04 GROUNDWATER ELEVATION
- —968.30— ELEVATION CONTOUR (0.1 FT INTERVALS)

NOTES:

1. GROUNDWATER ELEVATIONS AT THESE WELLS WERE NOT CONTOURED DUE TO THE PRESENCE OF PRODUCT. THE GROUNDWATER ELEVATIONS SHOWN AT THESE WELLS ARE APPROXIMATE CORRECTIONS FOR THE PRESENCE OF PRODUCT.

FIGURE 1
WATER LEVEL MEASUREMENTS
UNCONFINED GROUNDWATER CONTOURS
CH2M HILL - MAY 2004
PENTA WOOD PRODUCTS

CH2MHILL

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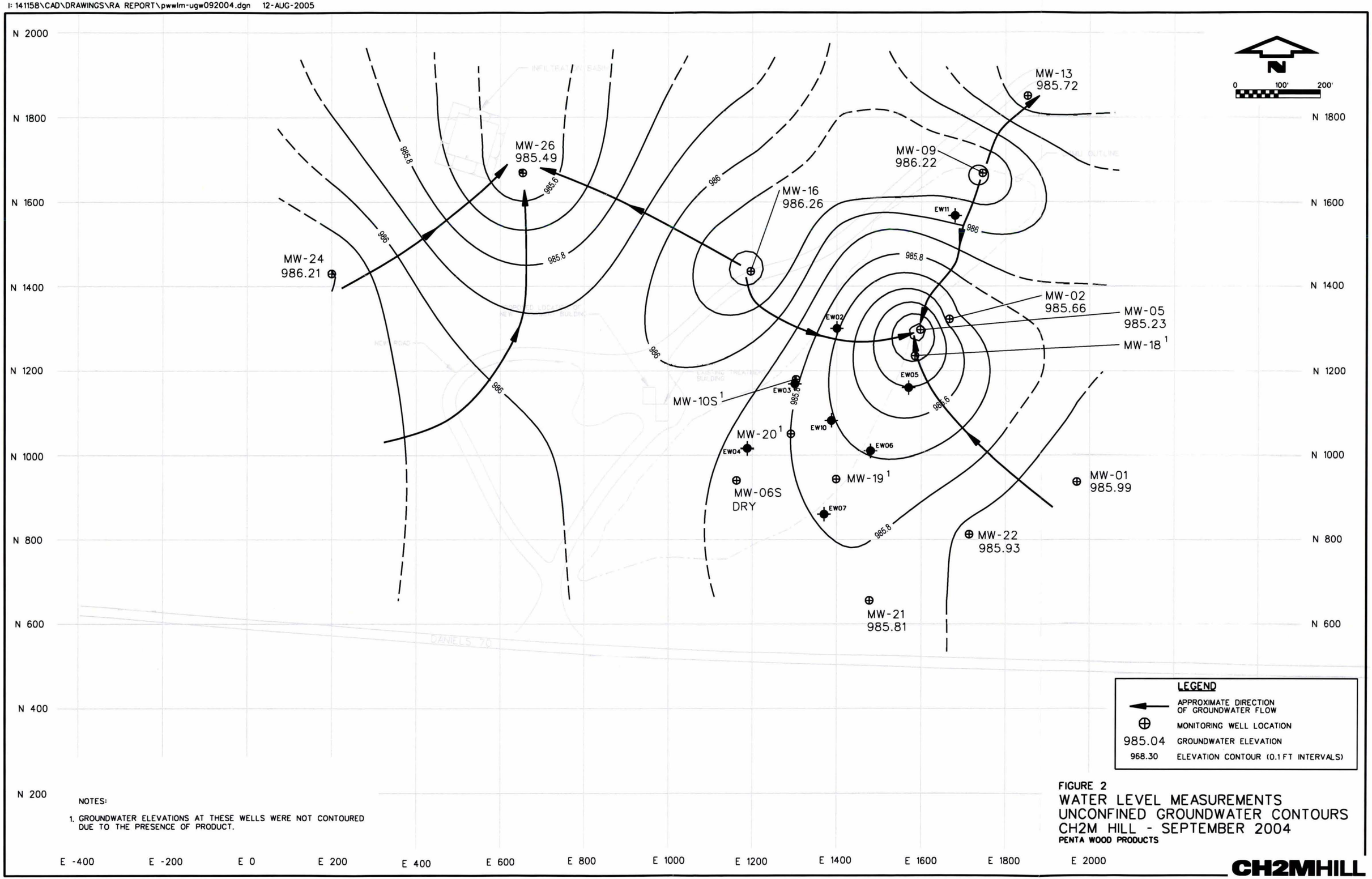

NOTES:

1. GROUNDWATER ELEVATIONS AT THESE WELLS WERE NOT CONTOURED DUE TO THE PRESENCE OF PRODUCT.

FIGURE 2
WATER LEVEL MEASUREMENTS
UNCONFINED GROUNDWATER CONTOURS
CH2M HILL - SEPTEMBER 2004
PENTA WOOD PRODUCTS

CH2MHILL

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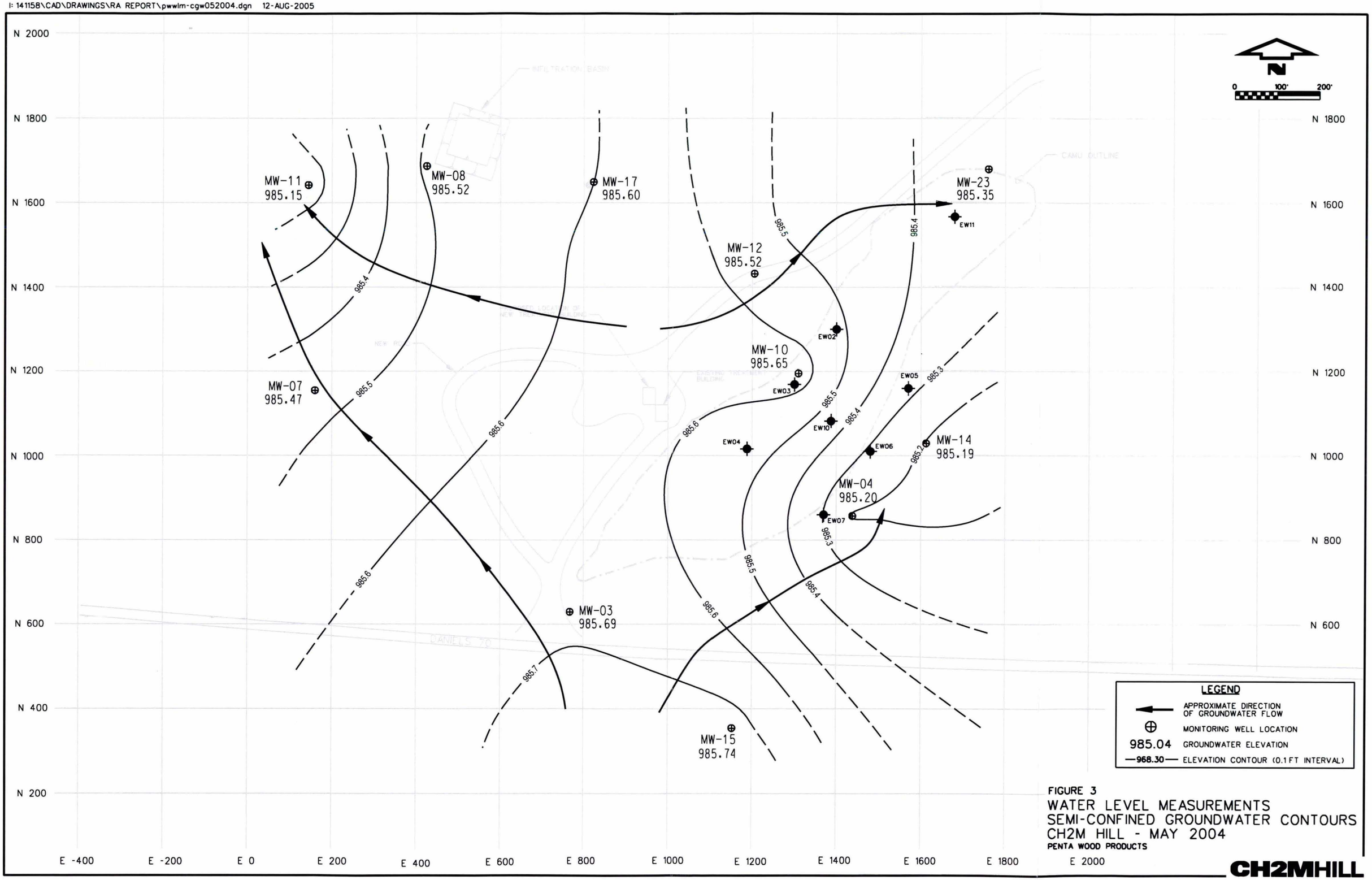

FIGURE 3
WATER LEVEL MEASUREMENTS
SEMI-CONFINED GROUNDWATER CONTOURS
CH2M HILL - MAY 2004
PENTA WOOD PRODUCTS

CH2MHILL

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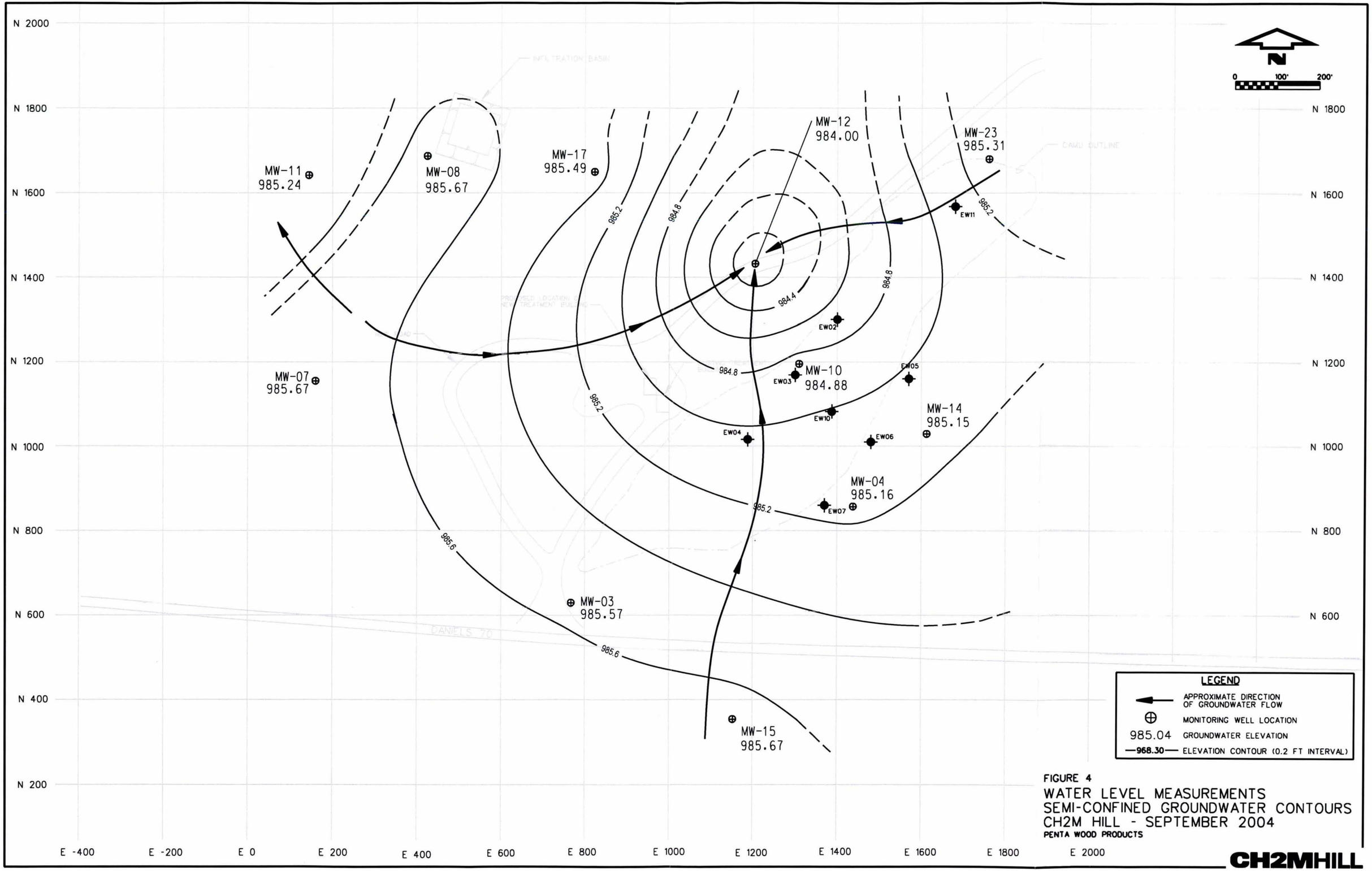

FIGURE 4
WATER LEVEL MEASUREMENTS
SEMI-CONFINED GROUNDWATER CONTOURS
CH2M HILL - SEPTEMBER 2004
PENTA WOOD PRODUCTS

CH2MHILL

Appendix A
Analytical Results

Wet Chemistry Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:	01	01	01	01	01	01	01
Field Sample Location:	MW-01	MW-01	MW-01	MW-02	MW-03	MW-05	MW-07
Sample Interval:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:	Water	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:	5/4/2004	9/21/2004	9/21/2004	9/21/2004	9/21/2004	9/22/2004	9/22/2004
Field Sample Identification:	04CB05-04	04CA14-05	04CA14-07	04CA14-09	04CA14-11	04CA14-13	04CA14-17
Wet Chemistry	**Units**						
ALKALINITY, TOTAL (AS CACO3)	mg/L	147.	130	140	110 J	430 J	250 J	300 J
CHLORIDE (AS CL)	mg/l	4.3 R	2.7	2.7	12 J	62 J	29 J	7.2 J
HARDNESS (AS CACO3)	mg/l	158	776	1,960	921 J	3,250 J	1,490 J	1,560 J
NITROGEN, NITRATE (AS N)	mg/l	2.1 J	1.8 J	1.8 J	1.4 J	3.5 J	0.01 R	3.4 J
SULFATE (AS SO4)	mg/l	2.0 R	5.2 J	4.5 J	4.0 R	8.9 R	24 R	6.8 R
SULFIDE	mg/l	2.20	1.60	1.00 U	1.00 U	1.60	1.00 R	2.00
TOTAL CARBON	mg/l	6.37 J	6.75	7.98	5.23 R	2.16 R	18.8 R	1.98 R

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Wet Chemistry Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-08	MW-09	MW-10	MW-10S	MW-11	MW-12	MW-12
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water	Water	Water
Sample Collection Date:		9/23/2004	9/22/2004	9/23/2004	9/22/2004	9/21/2004	5/4/2004	9/22/2004
Field Sample Identification:		04CA14-19	04CA14-21	04CA14-23	04CA14-25	04CA14-27	04CB05-07	04CA14-29
Wet Chemistry	**Units**							
ALKALINITY, TOTAL (AS CACO3)	mg/L	200	58 J	390	120 J	210	446.	440 J
CHLORIDE (AS CL)	mg/l	15	3.2 J	38	24 J	9.0	29	26 J
HARDNESS (AS CACO3)	mg/l	1,160	776 J	1,640	1,220 J	1,020	443	1,660 J
NITROGEN, NITRATE (AS N)	mg/l	2.4 J	1.8 J	0.0018 J	3.6 J	3.0 J	1.1 J	1.1 J
SULFATE (AS SO4)	mg/l	5.8 J	26 R	18	15 R	6.2 J	14 R	12 R
SULFIDE	mg/l	5.80	1.00 U	1.60	4.20 R	2.40	1.40	3.40
TOTAL CARBON	mg/l	1.40	6.48 R	54.1	7.54 R	14.1	20.2 J	18.2 R

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Wet Chemistry Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-13	MW-15	MW-16	MW-17	MW-19	MW-19	MW-20
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water	Water	Water
Sample Collection Date:		9/21/2004	9/21/2004	9/21/2004	9/22/2004	5/4/2004	9/22/2004	9/22/2004
Field Sample Identification:		04CA14-31	04CA14-33	04CA14-35	04CA14-37	04CB05-08	04CA14-39	04CA14-41
Wet Chemistry	**Units**							
ALKALINITY, TOTAL (AS CACO3)	mg/L	68 J	230	82	190 J	144.	110 J	190 J
CHLORIDE (AS CL)	mg/l	6.5 J	16	3.7	4.1 J	25	15 J	24 J
HARDNESS (AS CACO3)	mg/l	667 J	1,020	1,220	1,100 J	176	1,120 J	1,320 J
NITROGEN, NITRATE (AS N)	mg/l	2.4 J	3.2 J	2.1 J	4.8 J	0.71 J	1.5 J	0.29 J
SULFATE (AS SO4)	mg/l	6.4 R	3.9 J	5.5 J	8.6 R	16 R	23 R	23 R
SULFIDE	mg/l	1.00 U	1.00 U	0.800 J	2.80	1.00 U	3.20	3.00
TOTAL CARBON	mg/l	6.30 R	12.7	4.28	1.67 R	43.7 J	31.3 R	46.3 R

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Wet Chemistry Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-21	MW-21	MW-22	MW-26	MW-26	MW-26	MW-26
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water, Dup	Water	Water, Dup
Sample Collection Date:		5/4/2004	9/21/2004	9/21/2004	5/4/2004	5/4/2004	9/23/2004	9/23/2004
Field Sample Identification:		04CB05-09	04CA14-43	04CA14-45	04CB05-10	04CB05-11	04CA14-47	04CA14-49
Wet Chemistry	**Units**							
ALKALINITY, TOTAL (AS CACO3)	mg/L	165.	150 J	130 J	242.	242.	280	280
CHLORIDE (AS CL)	mg/l	67	63 J	11 J	17	17	28	28
HARDNESS (AS CACO3)	mg/l	188	1,030 J	885 J	284	291	1,670	1,770
NITROGEN, NITRATE (AS N)	mg/l	2.3 J	2.4 J	2.2 J	3.9 J	4.0 J	1.5 J	1.5 J
SULFATE (AS SO4)	mg/l	3.6 R	4.8 R	6.7 R	42 R	44 R	120	170
SULFIDE	mg/l	2.40	0.200 J	1.00 U	3.20	3.40	4.60	5.60
TOTAL CARBON	mg/l	3.12 J	2.76 R	3.86 R	3.75 J	4.35 J	2.40	1.95

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Dissolved Gas Results
For
2004 Groundwater Samples - Residential Wells
Penta Wood

Field Site Identifier:	- 01
Field Sample Location:	DW-01
Sample Interval:	N/A
Matrix:	Water
Sample Collection Date:	5/4/2004
Field Sample Identification:	04CB05-01

Dissolved Gasses	**Units**	
METHANE	ug/l	10.0 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Dissolved Metal Results
For
2004 Groundwater Samples - Residential Wells
Penta Wood

Field Site Identifier:	01
Field Sample Location:	DW-01
Sample Interval:	N/A
Matrix:	Water
Sample Collection Date:	5/4/2004
Field Sample Identification:	04CB05-40

Dissolved Metals (Filtered)	**Units**	
ARSENIC	ug/l	0.280 J
COPPER	ug/l	49.5 R
IRON	ug/l	29.2 R
MANGANESE	ug/l	58.0 R
ZINC	ug/l	2,590 R

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Metal Results
For
2004 Groundwater Samples - Residential Wells
Penta Wood

Field Site Identifier:	01
Field Sample Location:	DW-01
Sample Interval:	N/A
Matrix:	Water
Sample Collection Date:	5/4/2004
Field Sample Identification:	04CB05-01

Metals	Units	
ARSENIC	ug/l	0.243 J
COPPER	ug/l	61.5 R
IRON	ug/l	194 R
MANGANESE	ug/l	108 R
ZINC	ug/l	2,710 R

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Semi-Volatile Organic Compound Results
For
2004 Groundwater Samples - Residential Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		DW-01	DW-01	DW-01	RW-01	RW-01	RW-01	RW-01
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water, Dup	Water	Water, Dup
Sample Collection Date:		5/4/2004	9/28/2004	11/1/2004	5/4/2004	5/4/2004	9/22/2004	9/22/2004
Field Sample Identification:		04CB05-01	04CA14-77	05CA01-09	04CB05-12	04CB05-13	04CA14-53	04CA14-54
Semivolatile Organic Compounds	**Units**							
PENTACHLOROPHENOL	ug/l	0.102 UB	1.08	0.0962 U	0.140 UB	0.134 UB	0.201	1.51

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Semi-Volatile Organic Compound Results
For
2004 Groundwater Samples - Residential Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		RW-01	RW-02	RW-02	RW-02	RW-03	RW-03	RW-03
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water	Water	Water
Sample Collection Date:		11/1/2004	5/4/2004	9/22/2004	11/1/2004	5/4/2004	9/22/2004	11/1/2004
Field Sample Identification:		05CA01-11	04CB05-14	04CA14-55	05CA01-12	04CB05-15	04CA14-56	05CA01-13
Semivolatile Organic Compounds	**Units**							
PENTACHLOROPHENOL	ug/l	0.0952 U	0.0252 UB	0.398	0.0962 U	0.0952 U	2.18	0.0962 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Semi-Volatile Organic Compound Results
For
2004 Groundwater Samples - Residential Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01
Field Sample Location:		RW-04	RW-04	RW-04	RW-05	RW-05	RW-05
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water	Water
Sample Collection Date:		5/4/2004	9/22/2004	10/1/2004	5/4/2004	9/22/2004	11/1/2004
Field Sample Identification:		04CB05-16	04CA14-57	05CA01-14	04CB05-17	04CA14-58	05CA01-15
Semivolatile Organic Compounds	**Units**						
PENTACHLOROPHENOL	ug/l	0.100 U	0.266	0.0962 R	0.0935 U	0.293	0.0962 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Volatile Organic Compound Results
For
2004 Groundwater Samples - Residential Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		DW-01	DW-01	RW-01	RW-01	RW-01	RW-01	RW-02
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water, Dup	Water	Water, Dup	Water
Sample Collection Date:		5/4/2004	9/22/2004	5/4/2004	5/4/2004	9/22/2004	9/22/2004	5/4/2004
Field Sample Identification:		04CB05-01	04CA14-51	04CB05-12	04CB05-13	04CA14-53	04CA14-54	04CB05-14
Volatile Organic Compounds	**Units**							
BENZENE	ug/l	0.109 J	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
ETHYLBENZENE	ug/l	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
NAPHTHALENE	ug/l	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
TOLUENE	ug/l	0.153 J	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
XYLENES, TOTAL	ug/l	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Volatile Organic Compound Results
For
2004 Groundwater Samples - Residential Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		RW-02	RW-03	RW-03	RW-04	RW-04	RW-05	RW-05
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water	Water	Water
Sample Collection Date:		9/22/2004	5/4/2004	9/22/2004	5/4/2004	9/22/2004	5/4/2004	9/22/2004
Field Sample Identification:		04CA14-55	04CB05-15	04CA14-56	04CB05-16	04CA14-57	04CB05-17	04CA14-58
Volatile Organic Compounds	**Units**							
BENZENE	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
ETHYLBENZENE	ug/l	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
NAPHTHALENE	ug/l	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
TOLUENE	ug/l	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
XYLENES, TOTAL	ug/l	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Wet Chemistry Results
For
2004 Groundwater Samples - Residential Wells
Penta Wood

Field Site Identifier:	01
Field Sample Location:	DW-01
Sample Interval:	N/A
Matrix:	Water
Sample Collection Date:	5/4/2004
Field Sample Identification:	04CB05-01

Wet Chemistry	Units	
ALKALINITY, TOTAL (AS CACO3)	mg/L	292.
CHLORIDE (AS CL)	mg/l	49
HARDNESS (AS CACO3)	mg/l	309
NITROGEN, NITRATE (AS N)	mg/l	1.8 J
SULFATE (AS SO4)	mg/l	7.9 R
SULFIDE	mg/l	3.20
TOTAL CARBON	mg/l	1.54 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Dissolved Gas Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

	Field Site Identifier:	01	01	01	01	01	01	01
	Field Sample Location:	MW-01	MW-01	MW-01	MW-02	MW-03	MW-05	MW-07
	Sample Interval:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Matrix:	Water	Water	Water, Dup	Water	Water	Water	Water
	Sample Collection Date:	5/4/2004	9/21/2004	9/21/2004	9/21/2004	9/21/2004	9/22/2004	9/22/2004
	Field Sample Identification:	04CB05-04	04CA14-05	04CA14-07	04CA14-09	04CA14-11	04CA14-13	04CA14-17
Dissolved Gasses	**Units**							
METHANE	ug/l	0.863 J	10.0 U	10.0 U	10.0 UJ	5.71 J	10.0 UJ	10.0 UJ

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Dissolved Gas Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

	Field Site Identifier:	01	01	01	01	01	01	01
	Field Sample Location:	MW-08	MW-09	MW-10	MW-10S	MW-11	MW-12	MW-12
	Sample Interval:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Matrix:	Water	Water	Water	Water	Water	Water	Water
	Sample Collection Date:	9/23/2004	9/22/2004	9/23/2004	9/22/2004	9/21/2004	5/4/2004	9/22/2004
	Field Sample Identification:	04CA14-19	04CA14-21	04CA14-23	04CA14-25	04CA14-27	04CB05-07	04CA14-29
Dissolved Gasses	**Units**							
METHANE	ug/l	3.75 J	10.0 UJ	10.0 U	10.0 UJ	10.0 U	1.34 J	10.0 UJ

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Dissolved Gas Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

	Field Site Identifier:	01	01	01	01	01	01	01
	Field Sample Location:	MW-13	MW-15	MW-16	MW-17	MW-19	MW-19	MW-20
	Sample Interval:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Matrix:	Water	Water	Water	Water	Water	Water	Water
	Sample Collection Date:	9/21/2004	9/21/2004	9/21/2004	9/22/2004	5/4/2004	9/22/2004	9/22/2004
	Field Sample Identification:	04CA14-31	04CA14-33	04CA14-35	04CA14-37	04CB05-08	04CA14-39	04CA14-41
Dissolved Gasses	**Units**							
METHANE	ug/l	10.0 UJ	10.0 U	10.0 U	10.0 UJ	1.13 J	10.0 UJ	10.0 UJ

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Dissolved Gas Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-21	MW-21	MW-22	MW-26	MW-26	MW-26	MW-26
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water, Dup	Water	Water, Dup
Sample Collection Date:		5/4/2004	9/21/2004	9/21/2004	5/4/2004	5/4/2004	9/23/2004	9/23/2004
Field Sample Identification:		04CB05-09	04CA14-43	04CA14-45	04CB05-10	04CB05-11	04CA14-47	04CA14-49
Dissolved Gasses	**Units**							
METHANE	ug/l	10.0 U	10.0 UJ	10.0 UJ	10.0 U	10.0 U	10.0 U	10.0 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Dissolved Metal Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-01	MW-01	MW-01	MW-02	MW-03	MW-05	MW-07
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		5/4/2004	9/21/2004	9/21/2004	9/21/2004	9/21/2004	9/22/2004	9/22/2004
Field Sample Identification:		04CB05-28	04CA14-06	04CA14-08	04CA14-10	04CA14-12	04CA14-14	04CA14-18
Dissolved Metals (Filtered)	**Units**							
ARSENIC	ug/l	0.190 J	0.218 J	0.227 J	0.237 J	0.119 J	0.612 J	0.108 J
COPPER	ug/l	0.785 R	0.605 J	0.707 J	3.10 J	1.91 J	1.44 J	0.847 J
IRON	ug/l	29.9 R	18.0 J	21.0 J	662	137 J	7,480 J	25.0 UJ
MANGANESE	ug/l	15.0 R	2.60 J	3.07 J	22.2 J	4.99 J	5,650 J	9.75 J
ZINC	ug/l	2.74 R	4.06 J	3.31 J	7.73 J	4.61 J	5.91 J	2.96 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Dissolved Metal Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-08	MW-09	MW-10	MW-10S	MW-11	MW-12	MW-12
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water	Water	Water
Sample Collection Date:		9/23/2004	9/22/2004	9/23/2004	9/22/2004	9/21/2004	5/4/2004	9/22/2004
Field Sample Identification:		04CA14-20	04CA14-22	04CA14-24	04CA14-26	04CA14-28	04CB05-29	04CA14-30
Dissolved Metals (Filtered)	**Units**							
ARSENIC	ug/l	0.539 J	0.265 J	3.01	0.190 J	0.948 J	0.600 J	0.672 J
COPPER	ug/l	0.660 J	2.88 J	12.4 J	1.79 J	0.366 J	3.95 R	3.91 J
IRON	ug/l	11.0 J	125 U	24.1 J	22.7 J	6.05 J	33.6 R	22.7 J
MANGANESE	ug/l	12.0 J	8.51 J	1,810	3,740 J	1.40 J	1,480 R	1,230 J
ZINC	ug/l	2.09 J	14.9 J	4.23 J	6.07 J	4.05 J	8.80 R	8.10 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Dissolved Metal Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-13	MW-15	MW-16	MW-17	MW-19	MW-19	MW-20
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water	Water	Water
Sample Collection Date:		9/21/2004	9/21/2004	9/21/2004	9/22/2004	5/4/2004	9/22/2004	9/22/2004
Field Sample Identification:		04CA14-32	04CA14-34	04CA14-36	04CA14-38	04CB05-30	04CA14-40	04CA14-42
Dissolved Metals (Filtered)	**Units**							
ARSENIC	ug/l	0.259 J	0.482 J	0.135 J	0.782 J	0.169 J	0.159 J	0.498 J
COPPER	ug/l	1.96 J	0.648 J	0.509 J	0.847 J	5.77 R	6.26 J	35.2 J
IRON	ug/l	125 UJ	5.57 J	25.0 U	13.9 J	31.4	125 U	2,070
MANGANESE	ug/l	3.67 J	0.976 J	0.617 J	45.0 J	3,360 R	2,650	2,320
ZINC	ug/l	5.28 J	8.97 J	2.79 J	2.09 J	6.93 R	16.0 J	47.0 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Dissolved Metal Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-21	MW-21	MW-22	MW-26	MW-26	MW-26	MW-26
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water, Dup	Water	Water, Dup
Sample Collection Date:		5/4/2004	9/21/2004	9/21/2004	5/4/2004	5/4/2004	9/23/2004	9/23/2004
Field Sample Identification:		04CB05-31	04CA14-44	04CA14-46	04CB05-32	04CB05-33	04CA14-48	04CA14-50
Dissolved Metals (Filtered)	**Units**							
ARSENIC	ug/l	0.122 J	0.130 J	0.164 J	0.289 J	0.323 J	0.314 J	0.354 J
COPPER	ug/l	1.28 R	0.955 J	0.473 J	1.24 R	1.19 R	1.57 J	2.01 J
IRON	ug/l	28.6 R	25.0 UJ	25.0 UJ	39.0 R	49.3 R	8.81 J	6.48 J
MANGANESE	ug/l	0.718 R	0.484 J	15.0 UJ	1.23 R	2.07 R	19.3	4.00 J
ZINC	ug/l	4.48 R	3.30 J	2.31 J	4.36 R	4.15 R	4.70 J	3.80 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Metal Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

	Field Site Identifier:	01	01	01	01	01	01	01
	Field Sample Location:	MW-01	MW-01	MW-01	MW-02	MW-03	MW-05	MW-07
	Sample Interval:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Matrix:	Water	Water	Water, Dup	Water	Water	Water	Water
	Sample Collection Date:	5/4/2004	9/21/2004	9/21/2004	9/21/2004	9/21/2004	9/22/2004	9/22/2004
	Field Sample Identification:	04CB05-04	04CA14-05	04CA14-07	04CA14-09	04CA14-11	04CA14-13	04CA14-17
Metals	**Units**							
ARSENIC	ug/l	0.346 J	0.353 J	0.470 J	4.03 J	0.189 J	0.488 J	1.00 UJ
COPPER	ug/l	5.73 R	8.41 J	13.6 J	87.2 J	356 J	17.3 J	1.09 J
IRON	ug/l	790 R	838	1,210	25,800 J	278 J	30,500	1,640 J
MANGANESE	ug/l	135 R	103	158	972 J	6.45 J	7,150	9.86 J
ZINC	ug/l	7.43 R	17.1 J	13.4 J	64.2 J	273 J	13.7 J	4.06 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Metal Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

	Field Site Identifier:	01	01	01	01	01	01	01
	Field Sample Location:	MW-08	MW-09	MW-10	MW-10S	MW-11	MW-12	MW-12
	Sample Interval:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Matrix:	Water	Water	Water	Water	Water	Water	Water
	Sample Collection Date:	9/23/2004	9/22/2004	9/23/2004	9/22/2004	9/21/2004	5/4/2004	9/22/2004
	Field Sample Identification:	04CA14-19	04CA14-21	04CA14-23	04CA14-25	04CA14-27	04CB05-07	04CA14-29
Metals	**Units**							
ARSENIC	ug/l	0.127 J	0.134 J	2.66	1.49 J	0.885 J	0.564 J	1.00 UJ
COPPER	ug/l	0.465 J	2.07 J	28.3	73.1 J	0.620 J	5.50 R	5.09 J
IRON	ug/l	256	231 J	3,550	14,500 J	15.6 J	52.7 R	53.9 J
MANGANESE	ug/l	15.1	16.5 J	2,550	5,460 J	2.81 J	1,730 R	1,540 J
ZINC	ug/l	2.25 J	4.60 J	5.58 J	49.7 J	6.36 J	10.8 R	9.53 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Metal Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

	Field Site Identifier:	01	01	01	01	01	01	01
	Field Sample Location:	MW-13	MW-15	MW-16	MW-17	MW-19	MW-19	MW-20
	Sample Interval:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Matrix:	Water	Water	Water	Water	Water	Water	Water
	Sample Collection Date:	9/21/2004	9/21/2004	9/21/2004	9/22/2004	5/4/2004	9/22/2004	9/22/2004
	Field Sample Identification:	04CA14-31	04CA14-33	04CA14-35	04CA14-37	04CB05-08	04CA14-39	04CA14-41
Metals	**Units**							
ARSENIC	ug/l	1.52	0.468 J	0.277 J	0.0787 J	0.284 J	1.00 UJ	1.00 UJ
COPPER	ug/l	32.4	1.74 J	4.07 J	0.774 J	22.2 R	13.5 J	30.4 J
IRON	ug/l	8,770	36.7	570	11.5 UB	892 R	402 J	1,320 J
MANGANESE	ug/l	357	3.15 J	74.7	0.371 J	4,040 R	3,160 J	2,770 J
ZINC	ug/l	24.3 J	20.8 J	8.71 J	2.46 J	11.6 R	16.7 J	18.7 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Metal Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-21	MW-21	MW-22	MW-26	MW-26	MW-26	MW-26
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water, Dup	Water	Water, Dup
Sample Collection Date:		5/4/2004	9/21/2004	9/21/2004	5/4/2004	5/4/2004	9/23/2004	9/23/2004
Field Sample Identification:		04CB05-09	04CA14-43	04CA14-45	04CB05-10	04CB05-11	04CA14-47	04CA14-49
Metals	**Units**							
ARSENIC	ug/l	2.31 J	1.80 J	2.76 J	0.264 J	0.295 J	1.00 U	1.00 U
COPPER	ug/l	72.5 R	48.2 J	71.6 J	2.62 R	2.37 R	3.73 J	3.10 J
IRON	ug/l	14,000 R	10,300 J	13,600 J	458 R	399 R	620	542
MANGANESE	ug/l	1,970 R	983 J	963 J	17.8 R	15.2 R	24.8	22.2
ZINC	ug/l	46.5 R	32.6 J	48.4 J	10.5 R	7.82 R	7.86 J	6.95 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Semi-Volatile Organic Compound Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-01	MW-01	MW-01	MW-02	MW-03	MW-05	MW-07
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		5/4/2004	9/21/2004	9/21/2004	9/21/2004	9/21/2004	9/22/2004	9/22/2004
Field Sample Identification:		04CB05-04	04CA14-05	04CA14-07	04CA14-09	04CA14-11	04CA14-13	04CA14-17
Semivolatile Organic Compounds	**Units**							
PENTACHLOROPHENOL	ug/l	1.06 J	0.348	0.442	1.26	0.367	194	5.75

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Semi-Volatile Organic Compound Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-08	MW-09	MW-10	MW-10S	MW-11	MW-12	MW-12
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water	Water	Water
Sample Collection Date:		9/23/2004	9/22/2004	9/23/2004	9/22/2004	9/21/2004	5/4/2004	9/22/2004
Field Sample Identification:		04CA14-19	04CA14-21	04CA14-23	04CA14-25	04CA14-27	04CB05-07	04CA14-29
Semivolatile Organic Compounds	**Units**							
PENTACHLOROPHENOL	ug/l	1.94	2.92	38,000	9,490	0.0656 J	11,200 J	9,060 J

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Semi-Volatile Organic Compound Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-13	MW-15	MW-16	MW-17	MW-19	MW-19	MW-20
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water	Water	Water
Sample Collection Date:		9/21/2004	9/21/2004	9/21/2004	9/22/2004	5/4/2004	9/22/2004	9/22/2004
Field Sample Identification:		04CA14-31	04CA14-33	04CA14-35	04CA14-37	04CB05-08	04CA14-39	04CA14-41
Semivolatile Organic Compounds	**Units**							
PENTACHLOROPHENOL	ug/l	4.67	0.279	0.0962 J	2.82	70,000 J	111,000	133,000

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Semi-Volatile Organic Compound Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-21	MW-21	MW-22	MW-26	MW-26	MW-26	MW-26
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water, Dup	Water	Water, Dup
Sample Collection Date:		5/4/2004	9/21/2004	9/21/2004	5/4/2004	5/4/2004	9/23/2004	9/23/2004
Field Sample Identification:		04CB05-09	04CA14-43	04CA14-45	04CB05-10	04CB05-11	04CA14-47	04CA14-49
Semivolatile Organic Compounds	**Units**							
PENTACHLOROPHENOL	ug/l	0.135 UB	0.474	0.220	0.242 UB	0.219 UB	0.393	4.11

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Volatile Organic Compound Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-01	MW-01	MW-01	MW-02	MW-03	MW-05	MW-07
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		5/4/2004	9/21/2004	9/21/2004	9/21/2004	9/21/2004	9/22/2004	9/22/2004
Field Sample Identification:		04CB05-04	04CA14-05	04CA14-07	04CA14-09	04CA14-11	04CA14-13	04CA14-17
Volatile Organic Compounds	**Units**							
BENZENE	ug/l	0.500 U	1.00 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
ETHYLBENZENE	ug/l	5.00 U	1.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
NAPHTHALENE	ug/l	5.00 U	1.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
TOLUENE	ug/l	5.00 U	1.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
XYLENES, TOTAL	ug/l	5.00 U	1.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Volatile Organic Compound Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-08	MW-09	MW-10	MW-10S	MW-11	MW-12	MW-12
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water	Water	Water
Sample Collection Date:		9/23/2004	9/22/2004	9/23/2004	9/22/2004	9/21/2004	5/4/2004	9/22/2004
Field Sample Identification:		04CA14-19	04CA14-21	04CA14-23	04CA14-25	04CA14-27	04CB05-07	04CA14-29
Volatile Organic Compounds	**Units**							
BENZENE	ug/l	0.500 U	0.500 U	0.296 J	5.00 U	1.00 U	0.124 J	0.113 J
ETHYLBENZENE	ug/l	5.00 U	5.00 U	5.58 J	50.0 U	1.00 U	1.39 J	1.22 J
NAPHTHALENE	ug/l	5.00 U	5.00 U	160	51.9	1.00 U	22.9	28.2 J
TOLUENE	ug/l	5.00 U	5.00 U	8.09 J	50.0 U	1.00 U	1.03 J	0.866 J
XYLENES, TOTAL	ug/l	5.00 U	5.00 U	47.1	5.42 J	1.00 U	11.2	9.83

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Volatile Organic Compound Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-13	MW-15	MW-16	MW-17	MW-19	MW-19	MW-20
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water	Water	Water
Sample Collection Date:		9/21/2004	9/21/2004	9/21/2004	9/22/2004	5/4/2004	9/22/2004	9/22/2004
Field Sample Identification:		04CA14-31	04CA14-33	04CA14-35	04CA14-37	04CB05-08	04CA14-39	04CA14-41
Volatile Organic Compounds	**Units**							
BENZENE	ug/l	0.500 U	1.00 U	1.00 U	0.500 U	2.50 U	0.500 U	2.50 U
ETHYLBENZENE	ug/l	5.00 U	1.00 U	1.00 U	5.00 U	2.13 J	3.45 J	3.01 J
NAPHTHALENE	ug/l	5.00 U	1.00 U	1.00 U	5.00 U	201	260	282
TOLUENE	ug/l	5.00 U	1.00 U	1.00 U	5.00 U	1.98 J	2.25 J	3.21 J
XYLENES, TOTAL	ug/l	5.00 U	1.00 U	1.00 U	5.00 U	30.0	50.3	40.3

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Volatile Organic Compound Results
For
2004 Groundwater Samples - Monitoring Wells
Penta Wood

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-21	MW-21	MW-22	MW-26	MW-26	MW-26	MW-26
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water	Water	Water	Water, Dup	Water	Water, Dup
Sample Collection Date:		5/4/2004	9/21/2004	9/21/2004	5/4/2004	5/4/2004	9/23/2004	9/23/2004
Field Sample Identification:		04CB05-09	04CA14-43	04CA14-45	04CB05-10	04CB05-11	04CA14-47	04CA14-49
Volatile Organic Compounds	**Units**							
BENZENE	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
ETHYLBENZENE	ug/l	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
NAPHTHALENE	ug/l	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
TOLUENE	ug/l	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
XYLENES, TOTAL	ug/l	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U

QUALIFIER KEY: "U" - Analyte not found at the listed detection limit; "J" - Estimated Result; "B" - Analyte detected in Blank; No Qualifier - Analyte found; "R" - Rejected; "NR" - Not Reported

Appendix B
Natural Attenuation Data

Penta Wood Products Site
Natural Attenuation Trend Data
Anuual Groundwater Sampling

Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm²)	DO (mg/L)	DO (%)	pH	ORP (mV)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
DW-01	9/24/2003	NT	NT	NT	NT	NT	NT	1.48	<0.005	<0.05	<2	<0.5	<0.05	66.9
DW-01	5/4/2004	NT	NT	NT	NT	NT	NT	1.8 J	0.058 R	0.0292 R	7.9 R	<0.01	0.102 UB	49.0
DW-01	9/28/2004	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	1.08	NT
DW-01	11/1/2004	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0962 U	NT
MW-01	10/9/1997	8.46	475	11.23	96.2	7.32	171.0	6.5	NT	<0.02	6.3	<0.01	2.00	18
MW-01	4/5/2000	8.56	416	10.34	86.5	7.14	290.6	1.6	<0.002	<0.05	2.5	0.0003	<0.5	8.7
MW-01	4/24/2001	8.69	431	9.83	84.6	7.08	168.7	6.5	<0.015	<0.025	13.0	<0.00011	<0.1	24
MW-01	9/11/2001	10.18	370	10.63	NR	7.00	235.8	2.6	0.001	<0.035	<8.2	<0.01	0.5	10
MW-01	5/14/2002	8.89	541	9.68	83.6	7.17	113.7	2.7	0.005	<0.011	7.8	NR	0.13	9
MW-01	8/6/2002	8.82	439	NR	89.2	7.33	241.1	<0.15	0.00095 B	<0.011	7.9	<0.01	0.07	7
MW-01	4/29/2003	9.03	383	3.03	26.5	7.13	151.8	2.6	<0.005 UJ	<0.025	10.0	<0.0005	<0.1 UJ	4.3
MW-01	9/24/2003	9.22	349	10.23	89.2	7.16	322.6	2.61	0.036	0.1 J	<2	<0.0005	0.13	3.3
MW-01	5/4/2004	9.15	314	—	93.8	7.05	217.0	2.10J	0.015U	0.0	2.00J	0.00086J	1.06J	4.30J
MW-01	9/21/2004	10.05	279	10.89	97.1	7.07	91.1	1.80JB	0.0026J	0.018J	5.20JB	<0.01	0.35	2.70B
MW-02	10/9/1997	9.49	143	8.82	77.2	6.42	274.1	1.1	NT	<0.02	17.0	<0.01	<1.0	4
MW-02	4/5/2000	9.47	111	9.59	81.4	6.85	305.8	<0.1	0.003	<0.05	58.3	0.0003	<0.5	1
MW-02	9/12/2001	12.00	172	11.50	99.8	7.62	96.9	2.3	0.057	<0.035	10	<0.01	0.51	6.2
MW-02	8/6/2002	9.96	128	6.31	NR	5.41	380.5	<0.15	0.018	0.0	10.0	<0.01	0.1	3
MW-02	9/24/2003	9.85	172	7.07	62.8	6.19	326.2	2.02	0.443	3.03	3 J	<0.0005	0.28	1 J
MW-02	9/21/2004	10.29	319	1.17	10.7	6.01	182.6	1.40J	0.022J	0.66	4.00R	<0.01	1.26	12.00J
MW-03	10/8/1997	10.34	696	3.52	31.5	6.91	38.4	4.4	0.011	0.3	16.0	<0.01	<1.0	42
MW-03	4/4/2000	Parameters not recorded.						2.8	0.010	0.5	12.5	0.0016	<0.6	64
MW-03	4/25/2001	10.27	1039	3.77	33.8	6.83	169.1	4.42	0.008	0.1	11.0	NT	<0.11	47
MW-03	9/13/2001	11.53	1118	16.44	NR	6.93	99.0	4	0.031	0.9	14.0	<0.01	0.093	58
MW-03	8/7/2002	10.36	1007	4.50	NR	6.74	165.1	<0.15	0.011	0.2	16.0	<0.01	0.1	69
MW-03	9/23/2003	10.32	873	5.68	50.9	7.06	147.3	4.43	0.008 J	<0.001	<2	0.0025	0.31	52.4
MW-03	9/21/2004	10.70	1071	0.38	3.4	6.80	87.2	3.50J	0.00499J	0.137J	8.90R	0.0057J	0.37	62.00J
MW-04	10/9/1997	9.61	228	1.09	8.0	8.41	-137.9	<0.1	NT	0.04	6.3	0.139	<1.0	7.3
MW-04	4/4/2000	9.43	237	1.38	NR	8.49	NR	<0.1	0.047	<0.05	10.8	0.0008	<0.5	9.6

Penta Wood Products Site
Natural Attenuation Trend Data
Anuual Groundwater Sampling

Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm^2)	DO (mg/L)	DO (%)	pH	ORP (mV)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
MW-05	10/10/1997	10.68	887	0.38	3.4	6.24	28.8	<0.1	NT	4.9	15.0	<0.01	28000.0	50
MW-05	4/7/2000	8.76	737	4.81	39.3	6.03	119.4	<0.1	3.350	3.4	34.3	0.0009	20600.0	49
MW-05	4/26/2001	12.29	1018	3.71	36.0	6.40	-39.7	<0.13	11.300	7.6	28.0	NT	20600.0	42
MW-05	9/13/2001	11.45	698	10.19	97.0	6.80	-68.6	0.17	8.500	4.1	22.0	<0.01	6300	29
MW-05	8/7/2002	11.80	589	5.02	NR	6.15	35.2	<0.15	7.840	7.9	21.0	NR	510.0	26
MW-05	9/25/2003	10.60	559	2.99	27.0	6.54	-21.3	<0.05	8.320	13.4	20.0	0.00047 J	1100.0	22.1
MW-05	9/22/2004	11.80	749	8.43	82.8	6.53	-98.5	0.01R	5.650	7.5	24.0R	<0.01	194.0	29.0
MW-06S	10/9/1997	11.26	792	5.25	48.0	6.21	232.1	4.5	NT	0.02	0.9	<0.01	<1.0	72
MW-06S	4/7/2000	Well sampled for VOCs only.												
MW-06S	4/26/2001	12.03	453	2.78	26.7	5.92	142.2	0.87	0.347	<0.025	12	NT	3	14
MW-06S	9/12/2001	Not collected due to product in the well.						1.1	0.8	<0.035	16	<0.01	1.1	12
MW-06S	8/7/2002	12.75	583	NR	41.4	6.08	77.8	<0.15	1.790	3.33	18	0.2700	88 B	17
MW-06S	9/25/2003	Not collected due to product in the well.						1.01	0.961	1.10	17	0.1300	0.33	23.9
MW-07	10/14/1997	10.13	709	8.2	73.0	6.86	6.0	4.9	NT	0.62	6.0	<0.01	<1.0	7.6
MW-07	4/4/2000	9.87	693	5.8	51.5	7.01	156.1	2.7	0.026	0.36	6.1	0.004	<0.5	4.8
MW-07	4/25/2001	12.60	721	7.5	71.2	6.89	127.5	3.6	0.007	0.15	6.5	0.0047	<0.1	8.4
MW-07	9/11/2001	11.04	824	8.36	74.5	6.27	208	3	0.0044	0.23	10	0.012	0.083	23
MW-07	8/7/2002	12.68	812	NR	93.7	6.71	256.3	<0.15	0.004 B	0.305	10	<0.01	0.03	21
MW-07	9/24/2003	10.38	680	6.85	61.6	6.90	98.7	2.97	<0.005	0.09 J	<2	0.0049	0.044 J	12.2
MW-07	9/22/2004	13.90	736	7.89	77.5	6.71	35.2	3.40J	0.00975J	0.025UJ	6.80R	<0.01	5.75	7.20J
MW-08	10/14/1997	9.73	363	4.28	37.2	7.93	12.2	1.4	NT	0.148	4.5	0.0365	<1.0	4.2
MW-08	4/5/2000	10.07	295	3.78	33.5	6.91	252.3	3.5	0.0053	<0.05	6.5	0.0072	<0.5	6.26
MW-08	4/26/2001	11.08	358	5.5	52.3	7.94	151.3	1.52	0.027	<0.025	7.47	0.0116	0.2	3.25
MW-08	9/11/2001	10.49	386	4.08	NR	7.77	29.3	1.5	0.018	0.07	<7.6	<0.01	0.062	3.8
MW-08	8/8/2002	11.80	375	NR	75.2	7.56	160.9	<0.15	0.0053 B	0.011 B	6	<0.01	<0.04	4.2
MW-08	9/25/2003	10.67	414	6.2	57.8	7.79	125.4	2.6	0.006 J	<0.05	<2	0.0092	<0.11	11
MW-08	9/23/2004	11.89	449	5.50	52.8	7.14	11.0	2.40J	0.012J	0.011J	5.80JB	0.00375 J	1.94	15
MW-09	10/8/1997	10.59	171	6.3	54.9	5.63	217.6	4.2	NT	<0.0001	3.4	<0.01	<1.0	45
MW-09	4/5/2000	9.65	153	6.36	44.7	5.78	321.7	1.97	0.0217	<0.05	8.46	0.000396	0.6	3.15
MW-09	4/23/2001	9.62	172	5.21	43.1	5.72	162.7	2.46	0.034	<0.025	27	<0.00012	0.12	3.22

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Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm^2)	DO (mg/L)	DO (%)	pH	ORP (mV)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
MW-09	9/12/2001	11.23	206	5.75	NR	5.54	309.8	3.3	0.016	0.11	<6.8	<0.01	0.76	6.5
MW-09	8/6/2002	9.21	253	1.96	17.3	5.27	391.9	<0.15	0.0063 B	<0.011	22	<0.01	0.54	11
MW-09	9/25/2003	9.22	206	3.53	34.3	5.62	278.7	2.36	0.016	0.24	24	<0.0005	2.3	4.4
MW-09	9/22/2004	11.91	228	4.99	47.5	5.28	148.1	1.80J	0.0851J	0.125U	26.00R	<0.01	2.92	3.20J
MW-10	10/15/1997	10.88	803	0.38	3.4	6.83	-33.2	4.9	NT	0.00219	13	0.0135	3400	35
MW-10	4/6/2000	10.76	988	0.47	4.2	6.82	27.4	1.72	1.59	0.1159	13.8	0.003067	9530	55.9
MW-10	4/26/2001	12.31	1029	4.52	42.8	6.89	-103.5	0.18	2.38	5.65	22	NT	22800	48
MW-10	9/12/2001	11.18	1188	6.55	63.1	6.89	-71.1	0.13	3.2	2.4	23	<0.01	21000	61
MW-10	8/7/2002	14.24	1010	NR	60.9	6.30	-147.8	<0.15	2.54	10.7	20	0.011	22000	56
MW-10	10/1/2003							<0.05	1.85	2.59	3	0.00062	9000	22
MW-10	9/23/2004							0.0018J	1.81	0.0241J	18B	<0.01	38000	38
MW-10S	10/15/1997	13.18	339	10.49	100	7.55	135.6	<0.1	NT	0.0000454	23	<0.01	12000	38
MW-10S	4/7/2000	9.41	599	5.02	41.5	6.37	331.6	<100	10.1	<0.05	138	0.001567	56100	53
MW-10S	4/25/2001	Not collected due to product in the well.						1.5	6.03	11.30	8.6	0.0006	49000	11
MW-10S	9/12/2001	Not collected due to product in the well.						4.7	7.60	0.048	13	<0.01	82000	10
MW-10S	8/7/2002	13.62	431	NR	66.1	6.31	303.8	0.11	7.07	0.0673	14	<0.01	390	10
MW-10S	9/25/2003	Not collected due to product in the well.						3.41	5.9	<0.05	2	<0.0005	2200	6.7
MW-10S	9/22/2004	Not collected due to product in the well.						3.60J	3.74	0.0227	15.00R	<0.01	9490	24
MW-11	10/15/1997	13.98	398	4.86	47.2	7.94	144.3	3.4	NT	<0.0001	12	<0.01	<1.0	7.5
MW-11	4/4/2000	13.24	427	6.57	61.9	7.80	215.5	3.09	<0.002	<0.05	9.41	0.000138	<0.6	6.98
MW-11	4/4/2001	12.98	337	6.98	67.6	7.86	138.5	3.74	<0.015	<0.025	3.48	<0.00011	<0.11	6.25
MW-11	9/10/2001	13.13	414	9.09	NR	7.77	100	3.1	0.00045	<0.035	<7.4	<0.010	0.091	8
MW-11	8/6/2002	13.12	455	5.37	NR	7.58	240.6	<0.15	0.0012 B	<0.011	7.6	<0.01	<0.04	7.8
MW-11	9/23/2003	12.66	396	6.29	60.7	7.81	245.9	2.94	<0.005	<0.05	<2	<0.0005	<0.11	6.7
MW-11	9/21/2004	12.15	494	0.48	4.4	7.64	159.3	3.00JB	1.40J	6.05J	6.20JB	<0.01	0.07J	9.00B
MW-12	10/15/1997	10.16	1044	2.86	25	6.93	41.2	<0.1	NT	0.000267	15	<0.01	5000	48
MW-12	4/6/2000	10.10	1097	0.63	5.6	6.89	169.9	0.483	1.59	0.1128	11.9	0.001553	10300	54.5
MW-12	4/6/2001	Parameters not recorded.						0.43	1.57	0.131	16	0.048	1500	48
MW-12	9/13/2001	11.02	1142	3.95	36.7	6.84	22.2	<0.53	1.4	0.74	16	<0.01	18000	47
MW-12	5/14/2002	10.28	933	0.75	7	6.72	110	0.67	1.68	<0.011	17	NR	4300	40

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Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm^2)	DO (mg/L)	DO (%)	pH	ORP (mV)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
MW-12	8/7/2002	12.21	920	NR	45.9	6.69	150	0.46	1.6	0.105	15	<0.01	6400	37
MW-12	4/29/2003	10.95	982	5.24	47.2	6.80	126.1	0.8	1.56	<0.025	20	<0.05	3000	31
MW-12	9/23/2003	10.89	864	3.07	27.8	6.62	306.1	1.17	1.53	<0.05	<2	0.00049 J	10000	30.8
MW-12	5/4/2004	10.64	897	7.5	71.7	7.15	126.2	1.10J	1.48	0.0336	14	0.00134	11200J	29
MW-12	9/22/2004	13.49	939	3.87	37.6	95.60	95.6	1.10J	1.23J	0.0227	12.00R	<0.01	9060J	26
MW-13	10/8/1997	12.79	185	6	54.1	6.19	206.7	1.3	0.000027	0.0000067	1.4	<0.01	0.70	2.7
MW-13	4/5/2000	9.67	189	8.29	51.5	5.49	296.7	<100	0.112	<0.05	431	0.0003	0.80	4.4
MW-13	4/23/2001	9.08	140	3.44	26.8	5.59	207.9	1.8	0.110	<0.025	35	<0.00012	0.18	3.5
MW-13	9/10/2001	10.69	203	NR	NR	5.54	196.0	2.5	0.027	0.052	<7.5	<0.01	0.69	5.4
MW-13	8/5/2002	11.49	223	5.36	48.3	5.38	333.1	<0.15	0.045	1.31	8.4	<0.01	0.64	6.8
MW-13	9/23/2003	11.16	195	3.50	32.3	5.80	317.0	1.86	0.182	0.96	7	<0.0005	2.90	5.1
MW-13	9/21/2004	11.13	208	1.57	13.8	5.60	229.7	2.40J	3.67	0.125	6.40R	<0.01	4.67	6.5
MW-14	10/9/1997	9.32	252	6.43	56.2	8.09	108.9	1.6	NT	<0.0001	2.4	<0.01	<1.0	8.0
MW-14	4/6/2000	9.10	283	6.92	60.0	7.42	257.3	2.2	<0.002	<0.05	4.1	0.0002	<0.5	15.7
MW-15	10/16/1997	9.29	409	4.49	39.1	8.22	149.8	4.1	NT	0.00001	6.3	<0.01	<1	6.5
MW-15	4/4/2000	8.08	483	10.72	85.1	7.69	284.1	3.5	<0.002	<0.05	10	0.0003	<0.5	12.3
MW-15	4/25/2001	11.79	675	8.73	81.3	7.73	179.4	4.0	<0.015	<0.025	3	<0.0001	<0.11	15.0
MW-15	9/12/2001	9.74	548	9.80	NR	8.00	153.3	3.7	0.000	<0.035	<4.5	<0.01	0.077	17.0
MW-15	8/6/2002	10.24	508	NR	101.4	7.72	285.7	<0.15	<0.00042	<0.011	5	<0.01	<0.04	16.0
MW-15	9/23/2003	9.74	483	9.14	81.7	7.90	213.6	3.8	<0.005	<0.05	<2	<0.0005	<0.1	17.4
MW-15	9/21/2004	9.85	514	8.49	77.4	7.55	73.5	3.20JB	0.00098J	0.0057J	3.90JB	<0.01	0.28	16B
MW-16	10/14/1997	9.86	409	8.57	74.8	6.82	99.4	3.2	NT	0.00002	8.10	<0.01	<1	6.1
MW-16	4/6/2000	9.77	169	8.16	70.0	6.63	310.9	3.9	1.69	<0.05	24.1	<0.001068	<0.5	6.5
MW-16	4/26/2001	10.46	1102	4.72	43.2	6.81	75.6	8.7	0.009	0.03	29.0	<0.00012	<0.11	3.6
MW-16	9/10/2001	Parameters not recorded.						5.8	0.00082	<0.035	11.0	<0.01	0.17	1.8
MW-16	8/6/2002	11.70	247	10.86	NR	6.11	331.3	<0.15	0.0091 B	0.08	13.0	<0.01	0.04	2.0
MW-16	9/23/2003	10.97	216	10.27	93.2	6.34	349.1	3.5	<0.005	<0.05	3 J	<0.0005	0.089 J	6.2
MW-16	9/21/2004	10.68	222	0.07	0.6	6.44	173.9	2.10JB	0.00062J	<0.025	5.50JB	<0.01	0.10J	3.70B
MW-17	10/15/1997	9.26	399	4.53	39.0	7.89	147.2	4.1	NT	<0.0001	10	<0.01	<1	4.8

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MW-17	4/6/2000	9.15	438	4.81	41.8	7.73	254.9	4.2	<0.002	<0.05	<3	0.0001	<0.5	4.9
MW-17	4/26/2001	10.38	412	9.64	85.7	7.77	58.6	5.0	<0.015	<0.025	6.8	NT	0.7	4.1
MW-17	9/11/2001	11.44	457	6.96	62.9	7.49	262	4.4	<0.00027	0.31	<9.3	<0.01	<0.059	4.8
MW-17	8/8/2002	12.88	425	NR	65.8	7.64	204.5	<0.15	<0.00042	<0.011	7.4	<0.01	0.032	4.6
MW-17	9/25/2003	9.80	405	6.45	57.3	7.80	206	5.1	<0.005	<0.05	<2	<0.0005	0.46	4.4
MW-17	9/22/2004	11.02	498	9.13	87.0	7.57	150.5	4.80J	0.045J	0.0139J	8.60R	<0.01	2.82	4.10J
MW-18	10/10/1997	11.51	777	1.03	9.2	6.13	-12.1	<0.1	NT	0.03	11.0	<0.01	8800	49
MW-19	10/16/1997	8.43	662	12.11	103.4	8.23	133.6	3.8	NT	<0.0001	19	<0.01	8900	47
MW-19	4/7/2000	7.80	650	5.02	40.3	6.75	323.2	7.0	<0.002	<0.05	90	0.0003	11000	37.4
MW-19	4/7/2001	Not collected due to product in the well.						3.37	1.79	<0.025	47	NT	25600	39
MW-19	9/12/2001	Not collected due to product in the well.						1.3	1.8	0.071	<9.7	0.0160	400000	19
MW-19	5/13/2002	Not collected due to product in the well.						2	2.07	<0.011	16	NR	14000	33
MW-19	8/8/2002	Not collected due to product in the well.						0.16	3.11	0.218	16	<0.01	11000	22
MW-19	4/29/2003	Not collected due to product in the well.						3	3.59	<0.025	27	0.0024	4900	20
MW-19	9/25/2003	Not collected due to product in the well.						2	4.47	0.05 J	90	0.0057	15000	17.5
MW-19	5/4/2004	No parameters collected.						0.71	3.36	0.031	16	0.00113J	70000	25.0
MW-19	9/22/2004	Not collected due to product in the well.						1.5	2.65	0.125	23R	<0.01	111000	15.0
MW-20	10/15/1997	Dry. Could not collect parameter sample.						NT	NT	NT	NT	<0.01	11000	NT
MW-20	4/26/2001	Parameters not recorded.						<0.13	2.25	0.84	67	NT	36600	24
MW-20	9/12/2001	Not collected due to product in the well.						0.15	2.8	<0.035	24	<0.01	83000	16
MW-20	8/7/2002	Not collected due to product in the well.						<0.15	3.28	0.206	25	<0.01	30000 B	22
MW-20	9/25/2003	Not collected due to product in the well.						<1.25	3.25	0.35	80 J	0.0054	13000	19.4 J
MW-20	9/22/2004	Not collected due to product in the well.						0.29J	2.32	2.07	23R	<0.01	133000	24J
MW-21	2/9/1998	8.50	559	8.35	NT	7.05	177.5	NT	NT	<0.1	9.1	0.011	<1.0	71
MW-21	5/14/2002	9.29	457	10.66	93.5	5.86	152.0	2.0		0.130	7.3	NR	0.1	69
MW-21	8/6/2002	10.72	444	NR	99.0	6.79	297.6	<0.15	0.00063 B	<0.011	9.6	NR	0.04	49
MW-21	4/29/2003	9.91	473	3.72	NR	6.65	144.9	2.5	<0.005	<0.025	12.0	<0.0005	0.2	41
MW-21	9/24/2003	9.30	491	11.13	97.7	6.74	326.0	2.6	<0.005	<0.05	<2	<0.0005	0.063 J	48
MW-21	5/4/2004	10.10	557	—	89.2	6.50	196.3	2.30J	0.00072J	0.029	3.60J	<0.01	0.14UB	67J
MW-21	9/21/2004	9.80	510	10.37	92.5	6.61	102.1	2.40J	0.00048J	0.025UJ	4.80R	<0.01	0.47	63.00J

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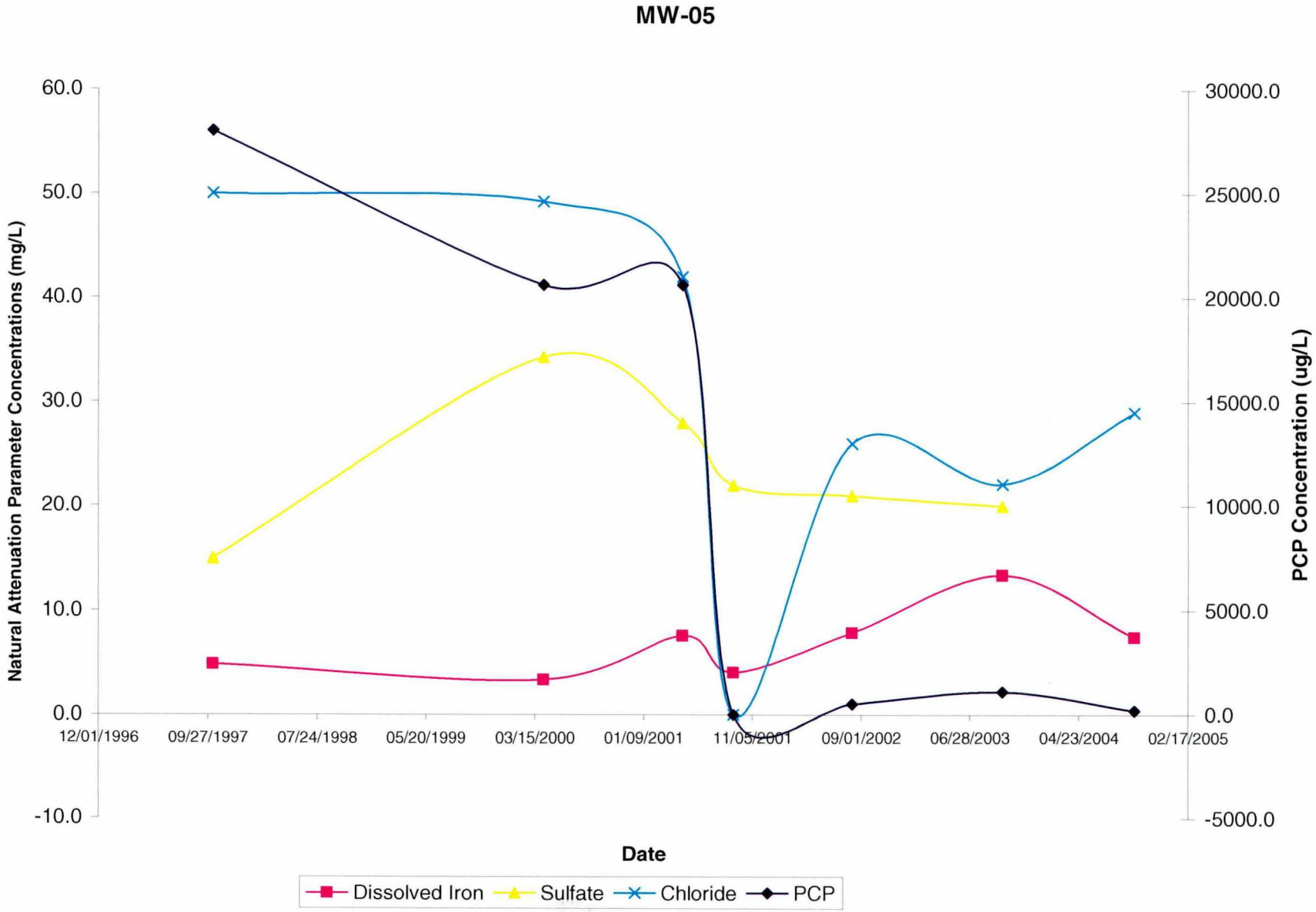
Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm^2)	DO (mg/L)	DO (%)	pH	ORP (mV)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
MW-22	2/9/1998	8.70	558	7.50	NT	6.86	119.5	NT	NT	<0.1	18	0.013	<1.0	56
MW-22	5/14/2002	9.91	423	10.25	91.3	6.77	85.5	3.7 J	0.0035	0.023	14	NR	0.1	18
MW-22	8/6/2002	11.37	343	NR	101.6	6.86	323.7	<0.15	<0.00042	0.025 B	12	<0.01	0.1	7
MW-22	9/24/2003	9.70	303	10.92	96.4	6.89	345.4	2.2	0.542	2.77	3 J	<0.0005	0.3	5
MW-22	9/21/2004	9.78	316	10.59	94.5	6.64	99.3	2.20J	0.015UJ	0.025UJ	6.70R	<0.01	0.2	11.00J
MW-23	2/27/1998	9.63	270	13.68	122.3	7.93	159.0	NT	NT	<0.1	7.6	0.0566	<1.0	8.7
MW-23	9/11/2001	11.57	322	3.21	28.8	7.46	112.6	<0.13	0.029	<0.035	<8.2	<0.01	0.49	10
MW-24	2/8/1998	13.80	524	5.35	NT	6.62	80.0	NT	NT	<0.1	5.2	<0.01	<1	19
MW-24	4/24/2001	15.30	634	3.67	34.9	6.28	209.2	3.6	0.0024	<0.025	12	<0.0001	0.1	36
MW-25	2/9/1998	8.69	808	8.16	NT	6.95	55.0	NT	NT	<0.1	9.9	0.017	<1.0	16
MW-26	4/24/2001	11.24	646	7.73	71.8	7.05	190.2	5.0	<0.015	0.04	10	<0.0001	<0.1	22
MW-26	9/10/2001	Parameters not recorded.						3.2	<0.004	0.1	12	<0.01	0.16	30
MW-26	5/14/2002	12.28	588.00	7.55	72.80	7.11	17.8	3 J	0.00073	<0.011	15	NR	0.1	27
MW-26	8/5/2002	11.30	588.00	NR	66.30	6.52	280.1	<0.15	0.00056 B	<0.011	14	<0.01	0.03	18
MW-26	4/29/2003	10.58	621.00	8.68	79.20	6.53	157.3	3.5	<0.005	<0.025	14	<0.0005	<0.1	18
MW-26	9/23/2003	10.84	513	7.41	67.70	6.7	279.8	3.74	<0.005	<0.05	<2	<0.0005	<0.11	11
MW-26	5/4/2004	11.34	620	7.06	65.10	6.71	143.5	3.90J	0.00123J	0.039	42J	<0.01	0.22UB	17J
MW-26	9/23/2004	13.16	931	8.85	87.20	6.44	63.4	1.50J	0.0193	0.00881J	120B	<0.01	0.39	28
PW-01	10/23/1997	11.10	550	5.00	NT	8.92	185.0	7.7	NT	0.0012	10	0.0195	5	48
PZ-03	2/9/1998	7.50	212	11.02	NT	6.91	164.0	NT	NT	NT	NT	NT	<1	NT

NR - Parameter not Recorded.
NT - Parameter not tested.


MW-05
Natural Attenuation Parameter Concentrations (mg/L)
PCP Concentration (ug/L)
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30.0
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-10.0
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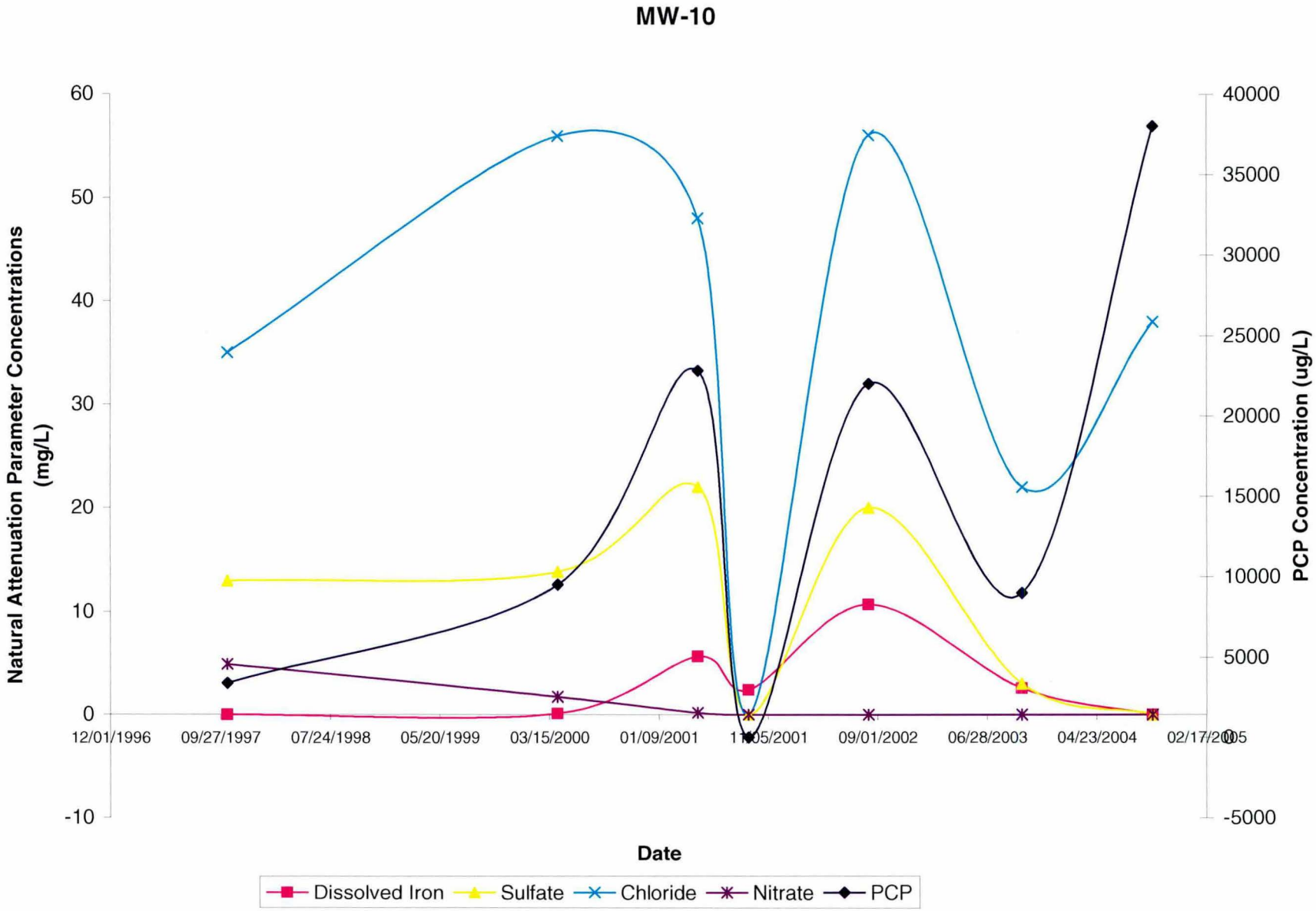
25000.0
20000.0
15000.0
10000.0
5000.0
0.0
-5000.0
12/01/1996
09/27/1997
07/24/1998
05/20/1999
03/15/2000
01/09/2001
11/05/2001
09/01/2002
06/28/2003
04/23/2004
02/17/2005
Date
Dissolved Iron
Sulfate
Chloride
PCP


MW-10
Natural Attenuation Parameter Concentrations (mg/L)
PCP Concentration (ug/L)
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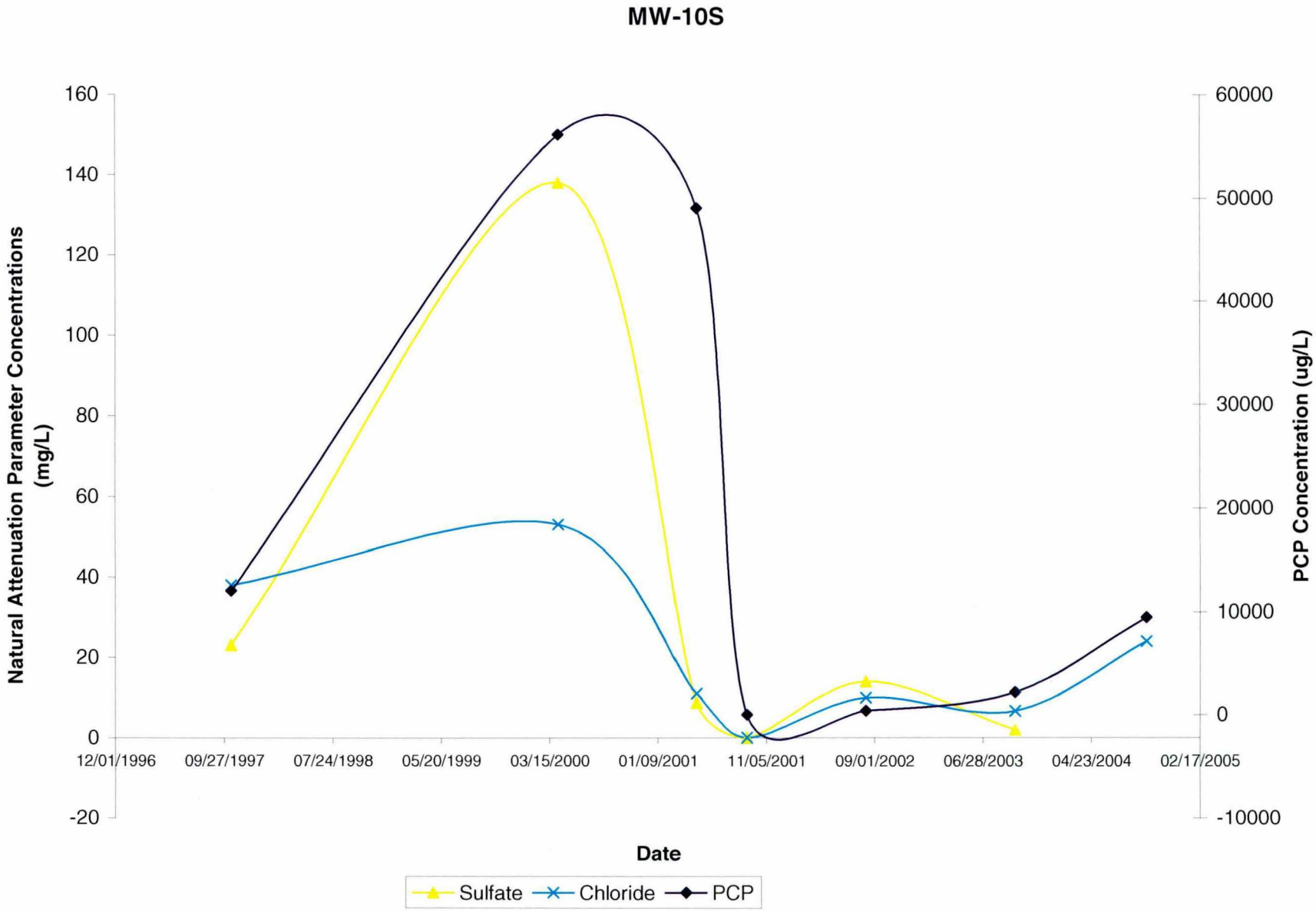
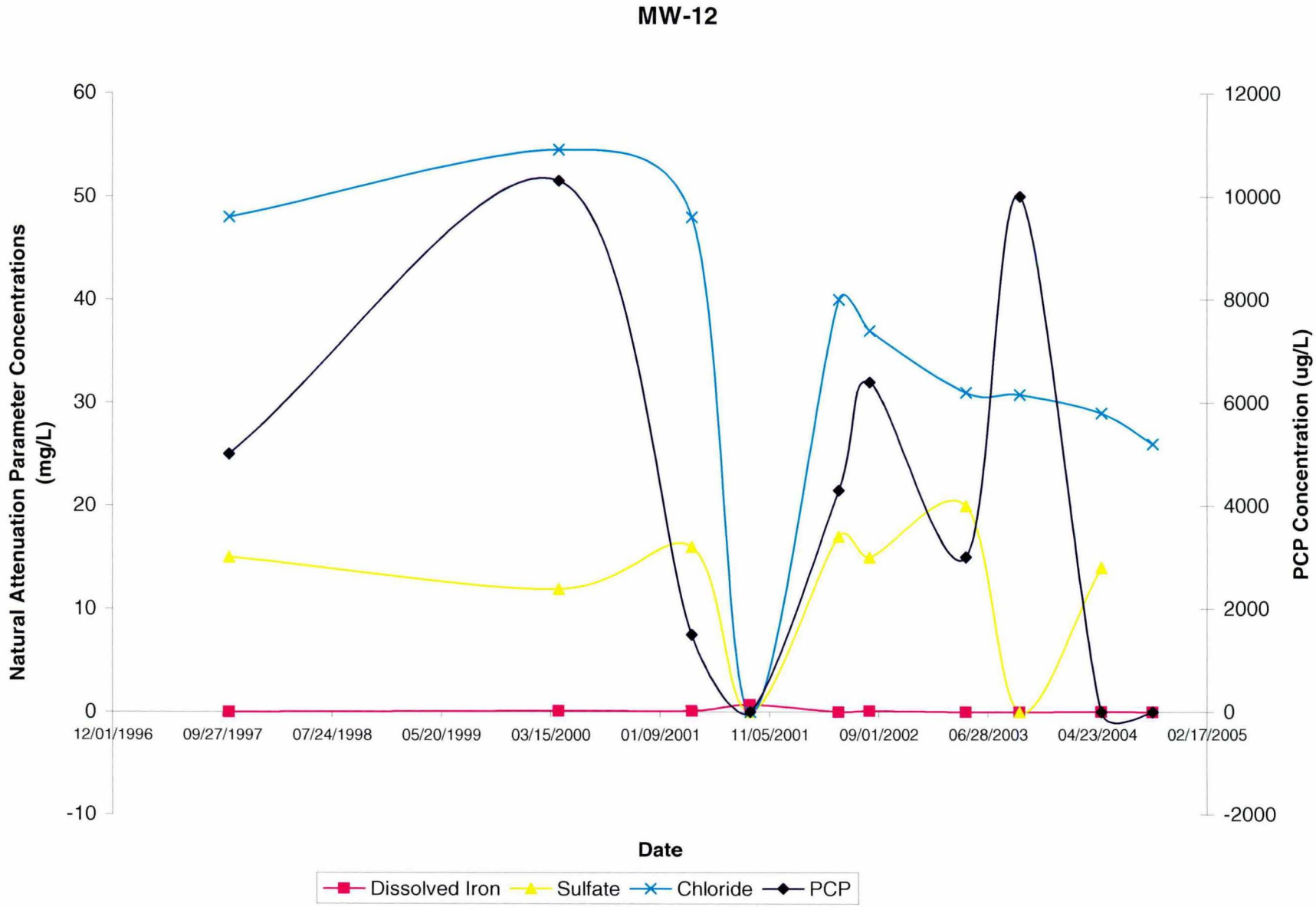
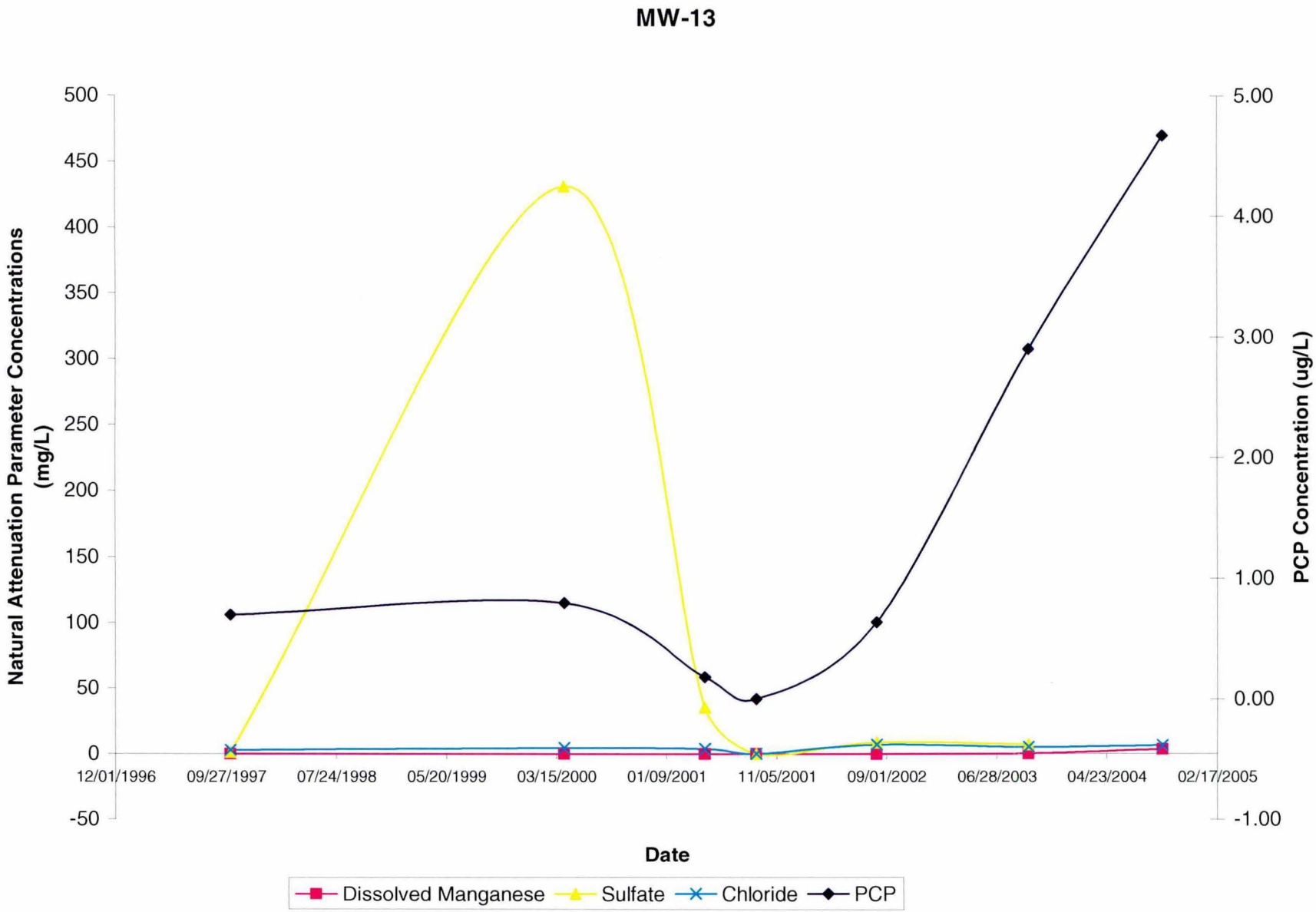
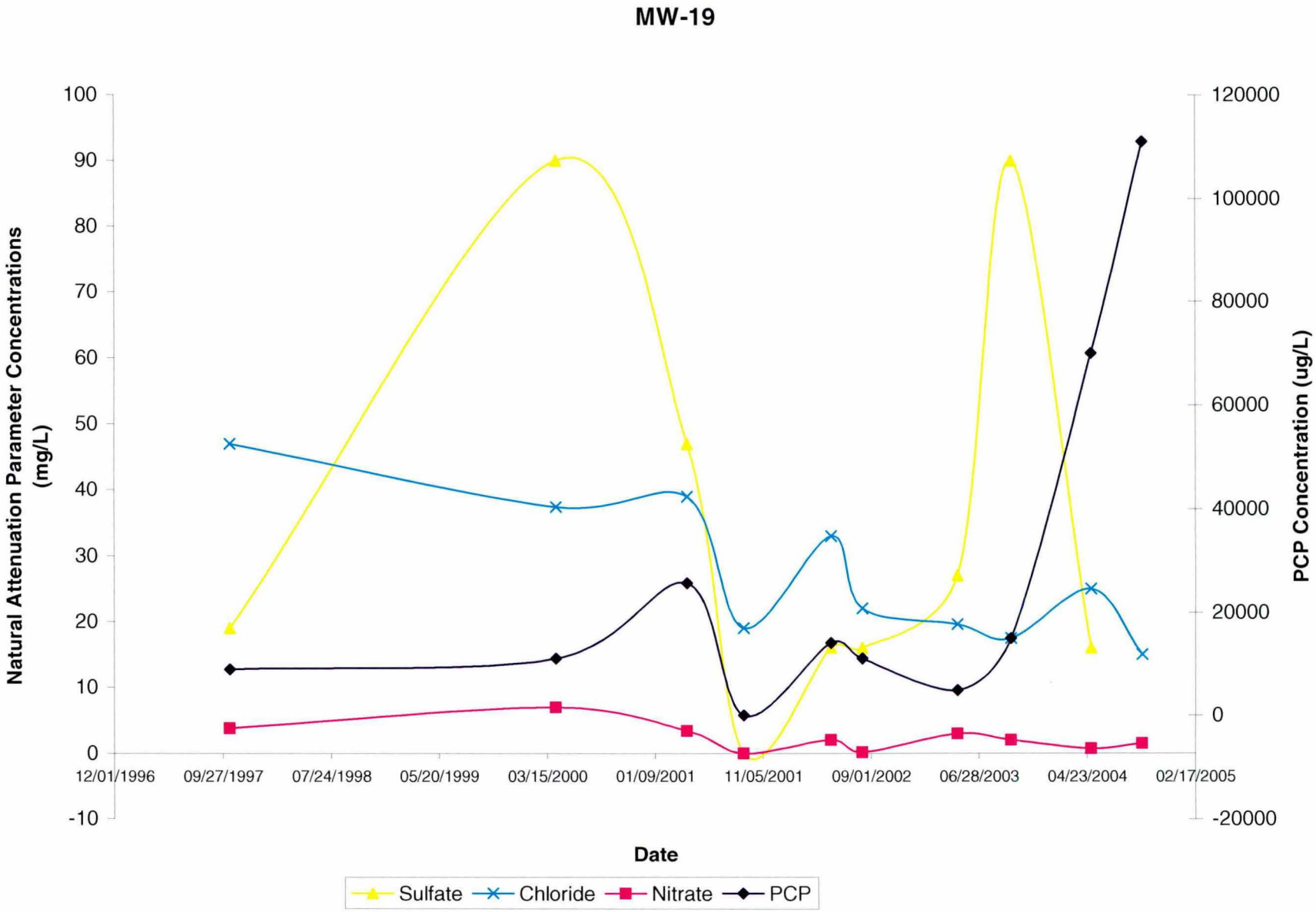
40
30
20
10
0
-10
40000
35000
30000
25000
20000
15000
10000
5000
0
-5000
12/01/1996
09/27/1997
07/24/1998
05/20/1999
03/15/2000
01/09/2001
09/01/2002
06/28/2003
04/23/2004
Date
Dissolved Iron
Sulfate
Chloride
Nitrate
PCP


MW-10S
Natural Attenuation Parameter Concentrations (mg/L)
PCP Concentration (ug/L)
160
140
120
100
80
60
40
20
0
-20
60000
50000
40000
30000
20000
10000
0
-10000
12/01/1996
09/27/1997
07/24/1998
05/20/1999
03/15/2000
01/09/2001
11/05/2001
09/01/2002
06/28/2003
04/23/2004
02/17/2005
Date
Sulfate
Chloride
PCP


MW-12
Natural Attenuation Parameter Concentrations (mg/L)
PCP Concentration (ug/L)
60
50
40
30
20
10
0
-10
12000
10000
8000
6000
4000
2000
0
-2000
12/01/1996
09/27/1997
07/24/1998
05/20/1999
03/15/2000
01/09/2001
11/05/2001
09/01/2002
06/28/2003
04/23/2004
02/17/2005
Date
Dissolved Iron
Sulfate
Chloride
PCP


MW-13
Natural Attenuation Parameter Concentrations (mg/L)
PCP Concentration (ug/L)
500
450
400
350
300
250
200
150
100
50
0
-50
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
12/01/1996
09/27/1997
07/24/1998
05/20/1999
03/15/2000
01/09/2001
11/05/2001
09/01/2002
06/28/2003
04/23/2004
02/17/2005
Date
Dissolved Manganese
Sulfate
Chloride
PCP


MW-19
Natural Attenuation Parameter Concentrations (mg/L)
PCP Concentration (ug/L)
100
90
80
70
60
50
40
30
20
10
0
-10
120000
100000
80000
60000
40000
20000
0
-20000
12/01/1996
09/27/1997
07/24/1998
05/20/1999
03/15/2000
01/09/2001
11/05/2001
09/01/2002
06/28/2003
04/23/2004
02/17/2005
Date
Sulfate
Chloride
Nitrate
PCP

Appendix C

Groundwater Contour Maps
Groundwater Elevations and Observations
Oil Measurements

I:\141158\CAD\DRAWINGS\RI\ pw_2004-pcp_1000 in gw fig01.dgn 12-AUG-2005

N

0 100' 200'

N 2200
N 2000
N 1800
N 1600
N 1400
N 1200
N 1000
N 800
N 600

E 400 E 600 E 800 E 1000 E 1200 E 1400 E 1600 E 1800 E 2000 E 2200 E 2400 E 2600

INFILTRATION BASIN

PROPERTY BOUNDARY

CAMU OUTLINE

EXISTING TREATMENT BUILDING

PROPOSED LOCATION OF NEW TREATMENT BUILDING

NEW ROAD

DANIELS 70

MW 11
1.0 U
0.091
0.04 U
0.11 U
0.07J

MW-08
1.0 U
0.062
0.4 U
0.11 U
1.94 B [1]

MW26
1.0 U
0.16
0.03
0.11 U
0.39 B

MW 17
1.0 U
0.06 U
0.03
0.46
2.82 [1]

MW 13
0.70
0.69
0.64
2.9
4.67

MW23
1.0 U
0.49
NT
NT
NT

MW 12
5,000
18,000
6,400
10,000
9,060

MW 16
1.0 U
0.17
0.04
0.089 J
0.10 J

MW 9
1.0 U
0.76
0.54
2.3
2.92

MW24

EW11

MW 2
1.0 U
0.51
0.1
0.28
1.26 [1]

MW 10
3,400
21,000
22,000
9,000
38,000

EW02

SG04

MW 5
28,000
6,300
510
1,100
194

MW 10S
12,000
82,000
390
2,200
9,490

EW03

EW05

MW 18
8,800
NT
NT
NT
NT

MW 7
1.0 U
0.083
0.03
0.044 J
5.75 [1]

EW10

SG05

MW 14

MW 20
11,000
83,000
30,000
13,000
133,000

EW04

EW06

MW 19
8,900
400,000
11,000
15,000
111,000

MW 1
2.00
0.5
0.07
0.13
0.35

SG07

MW 6

SG06

BV08

SG22

EW07

BV09

MW22
NT
NT
0.10
0.34
0.20

MW 3
1.0 U
0.093
0.1
0.31
0.37

PW 01
NT
NT
5

MW 6S
1.0 U
1.1
88
0.33
NT

MW21
NT
NT
0.04
0.063 J
0.47

MW 4
1.0 U
NT
NT
NT
NT

MW 15
1.0 U
0.077
0.04 U
0.1 U
0.28

LEGEND

EW11	EXTRACTION WELL NEST
BV09	BIOVENTING WELL NEST
SG05	SOIL GAS WELL NEST
	UNCONFINED MONITORING WELL LOCATION
	SEMICONFINED MONITORING WELL LOCATION
MW 7	WELL ID
1.0 U	PCP CONCENTRATIONS IN GROUNDWATER (1997)
0.083	PCP CONCENTRATIONS IN GROUNDWATER (SEPTEMBER, 2001)
0.03	PCP CONCENTRATIONS IN GROUNDWATER (AUGUST, 2002)
0.044 J	PCP CONCENTRATIONS IN GROUNDWATER (2003)
5.75	PCP CONCENTRATIONS IN GROUNDWATER (2004)
NT	NOT TESTED FOR OR NOT DETECTED
	APPROXIMATE EXTENT OF 1000 ug/L PCP CONCENTRATIONS, 1997
	APPROXIMATE EXTENT OF 1000 ug/L PCP CONCENTRATIONS, 2001
	APPROXIMATE EXTENT OF 1000 ug/L PCP CONCENTRATIONS, 2002
	APPROXIMATE EXTENT OF 1000 ug/L PCP CONCENTRATIONS, 2003
	APPROXIMATE EXTENT OF 1000 ug/L PCP CONCENTRATIONS, 2004

[1] NOTE:
RESULTS FROM WELL NOT INCLUDED IN PCP ISOCONCENTRATION DETERMINATION DUE TO POSSIBLE ANALYTICAL BIAS.

FIGURE 1
PENTACHLOROPHENOL
CONCENTRATION CONTOURS
2004, 2003, 2002, 2001, AND 1997

CH2MHILL

I:\14115B\CAD\DRAWINGS\RI\ pw_2004-pcp_1 in gw fig01.dgn 08-JUN-2005

N 2200
N 2000
N 1800
N 1600
N 1400
N 1200
N 1000
N 800
N 600

E 400
E 600
E 800
E 1000
E 1200
E 1400
E 1600
E 1800
E 2000
E 2200
E 2400
E 2600

0 100' 200'

INFILTRATION BASIN

PROPERTY BOUNDARY

CAMU OUTLINE

PROPOSED LOCATION OF NEW TREATMENT BUILDING

NEW ROAD

EXISTING TREATMENT BUILDING

DANIELS 70

MW 11
1.0 U
0.091
0.04 U
0.11 U
0.07J

MW-08
1.0 U
0.062
0.4 U
0.11 U
1.94 B [1]

MW26
1.0 U
0.16
0.03
0.11 U
0.39 B

MW 17
1.0 U
0.06 U
0.03
0.46
2.82 [1]

MW 13
0.70
0.69
0.64
2.9
4.67

MW23
1.0 U
0.49
NT
NT
NT

MW 12
5,000
18,000
6,400
10,000
9,060

MW 16
1.0 U
0.17
0.04
0.089 J
0.10 J

MW 9
1.0 U
0.76
0.54
2.3
2.92

MW 10
3,400
21,000
22,000
9,000
38,000

MW 2
1.0 U
0.51
0.1
0.28
1.26 [1]

MW 5
28,000
6,300
510
1,100
194

MW 20
11,000
83,000
30,000
13,000
133,000

MW 10S
12,000
82,000
390
2,200
9,490

MW 18
8,800
NT
NT
NT
NT

MW 7
1.0 U
0.083
0.03
0.044 J
5.75 [1]

MW 19
8,900
400,000
11,000
15,000
111,000

MW 1
2.00
0.5
0.07
0.13
0.35

MW 6
MW 6S
1.0 U
1.1
88
0.33
NT

MW22
NT
NT
0.10
0.34
0.20

MW 4
1.0 U
NT
NT
NT
NT

MW 3
1.0 U
0.093
0.1
0.31
0.37

PW 01
NT
NT
5

MW21
NT
NT
0.04
0.063 J
0.47

MW 15
1.0 U
0.077
0.04 U
0.1 U
0.28

EW11
EW02
EW03
EW04
EW05
EW06
EW07
EW10
BV08
BV09
SG04
SG05
SG06
SG07
SG22
MW24

LEGEND

EW11	EXTRACTION WELL NEST
BV09	BIOVENTING WELL NEST
SG05	SOIL GAS WELL NEST
	UNCONFINED MONITORING WELL LOCATION
	SEMICONFINED MONITORING WELL LOCATION
MW 7	WELL ID
1.0 U	PCP CONCENTRATIONS IN GROUNDWATER (1997)
0.083	PCP CONCENTRATIONS IN GROUNDWATER (SEPTEMBER, 2001)
0.03	PCP CONCENTRATIONS IN GROUNDWATER (AUGUST, 2002)
0.044 J	PCP CONCENTRATIONS IN GROUNDWATER (2003)
5.75	PCP CONCENTRATIONS IN GROUNDWATER (2004)
NT	NOT TESTED FOR OR NOT DETECTED
	APPROXIMATE EXTENT OF 1.0 ug/L PCP CONCENTRATIONS, 1997
	APPROXIMATE EXTENT OF 1.0 ug/L PCP CONCENTRATIONS, 2001
	APPROXIMATE EXTENT OF 1.0 ug/L PCP CONCENTRATIONS, 2002
	APPROXIMATE EXTENT OF 1.0 ug/L PCP CONCENTRATIONS, 2003
	APPROXIMATE EXTENT OF 1.0 ug/L PCP CONCENTRATIONS, 2004

[1] NOTE:
RESULTS FROM WELL NOT INCLUDED IN PCP ISOCONCENTRATION DETERMINATION DUE TO POSSIBLE ANALYTICAL BIAS.

FIGURE 2
PENTACHLOROPHENOL
CONCENTRATION CONTOURS
2004, 2003, 2002, 2001, AND 1997

CH2MHILL

Appendix D
Residential Well Memoranda

WA# 201 RALR 05WE

CH2M HILL
135 South 84th Street
Suite 325
Milwaukee, WI 53214-1456
Phone 414.272.2426
Fax 414.272.4408

CH2MHILL

July 12, 2004

Mr. Tony Rutter
Remedial Project Manager (SR-6J)
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3590

Subject: Subcontract No. 333, Penta Wood Products, WI
May 2004 Sampling Results
WA No. 201-RALR-05WE, Contract No. 68-W6-0025

Dear Tony:

Attached are the BTEX, napthalene, and pentachlorophenol (PCP) analytical results for the residential and potable well sampling event that took place on May 5, 2004. Analytical Services Center of Lancaster, NY, a Wisconsin-certified laboratory, performed the analyses. The well description information is shown in the following table:

LTRA Residential Well Information
Penta Wood Products – Siren, Wisconsin

Location ID	Resident Name	Resident Address	Resident Phone Number	WI Well #
RW01	Bill Ellis (formerly Skold)	8713 Daniels 70	(715) 349-5840	FG508
RW02	LaVonne Brethorst	8627 Daniels 70	(715) 349-5237	Unknown
RW03	Ken and Sheri Nelson	Daniels 70 (same driveway as V. Engstrom)	(715) 349-8070	JB 251
RW04	Vayne Engstrom	8526 Daniels 70	(715) 349-5212	AN547
RW05	Timothy Tjader	8783 Daniels 70	(715) 349-5192	Unknown

Benzene and toluene were detected at the Penta Wood potable well (DW01), and PCP concentrations were detected at DW01, residential well RW01 (Ellis residence), and its duplicate RW01 DUP. The laboratory reported concentrations of PCP at 0.140 B µg/L and 0.134 B µg/L for RW01 and RW01DUP, respectively. DW01 contained PCP at 0.102 B µg/L. The "B" qualification indicates the presence of PCP in an associated blank.

The cause of the blank contamination was explored further and the method blank associated with these samples was found to contain a detected concentration at 0.074 J µg/L. The *USEPA National Functional Guidelines for Data Validation* states that detected sample concentrations less than the 95% confidence interval (5 X blank concentration) should be qualified "UB" as undetected due to blank contamination. In this case, the 95% confidence interval is 0.37 µg/kg which would result in the qualification of these PCP detections resulting from the method blank contamination. Although qualification of these results is anticipated, please note that this data is preliminary until validated by the USEPA.

If you have any questions or comments please give me a call at 414.272.1052 ext. 476, or Bill Andrae at ext. 341.

Sincerely,

CH2M HILL

Steven Paukner
Project Chemist

c: Stephen Nathan, PO/U.S. EPA, Region 5 (w/o enclosure)
Marshall McReynolds, CO/U.S. EPA, Region 5 (w/o enclosure) c/o Dave Alberts, CS
Bill Andrae, SM/CH2M HILL, Milwaukee
Ike Johnson, PM/CH2M HILL, Milwaukee
Dan Plomb, DPM/CH2M HILL, Milwaukee
Gina Bayer, RTL/CH2M HILL, Milwaukee
Dave Shekoski/CH2M HILL, Milwaukee
Cherie Wilson, AA/CH2M HILL, Milwaukee

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

04CB05-12

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 040510412r Test: SW8260B SDG No. 0405056

Matrix: (soil/water) Water Lab Sample ID: 0405056-17A

Sample wt/vol: 25 (g/mL) mL Sample Type: SAMP

Level: (low/med) LOW Lab File ID: 16020.d

% Moisture: not dec. Date Received: 5/6/2004

GC Column: DB-624(ID: 0.53 (mm) Date Analyzed: 5/10/2004

Soil Extract Volume: (mL) Dilution Factor: 1

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
71-43-2	Benzene	0.500	U
100-41-4	Ethylbenzene	5.00	U
91-20-3	Naphthalene	5.00	U
108-88-3	Toluene	5.00	U
1330-20-7	Xylenes, Total	5.00	U

RW-01
Bill Ellis
8713 Daniels Rd
(715) 349-5840
Well ID: FG508

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

04CB05-13

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 040510412r Test: SW8260B SDG No. 0405056

Matrix: (soil/water) Water Lab Sample ID: 0405056-18A

Sample wt/vol: 25 (g/mL) mL Sample Type: SAMP

Level: (low/med) LOW Lab File ID: 16021.d

% Moisture: not dec. Date Received: 5/6/2004

GC Column: DB-624(ID: 0.53 (mm) Date Analyzed: 5/10/2004

Soil Extract Volume: (mL) Dilution Factor: 1

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
71-43-2	Benzene	0.500	U
100-41-4	Ethylbenzene	5.00	U
91-20-3	Naphthalene	5.00	U
108-88-3	Toluene	5.00	U
1330-20-7	Xylenes, Total	5.00	U

RW-01 DUP
Bill Ellis
8713 Daniels TD
(715) 349-5810
WI well ID FG505

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

04CB05-14

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 040510412r Test: SW8260B SDG No. 0405056

Matrix: (soil/water) Water Lab Sample ID: 0405056-19A

Sample wt/vol: 25 (g/mL) mL Sample Type: SAMP

Level: (low/med) LOW Lab File ID: 16022.d

% Moisture: not dec. Date Received: 5/6/2004

GC Column: DB-624(ID: 0.53 (mm) Date Analyzed: 5/11/2004

Soil Extract Volume: (mL) Dilution Factor: 1

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
71-43-2	Benzene	0.500	U
100-41-4	Ethylbenzene	5.00	U
91-20-3	Naphthalene	5.00	U
108-88-3	Toluene	5.00	U
1330-20-7	Xylenes, Total	5.00	U

RW-02
LaVonne Brathorst
8627 Daniels 70
(715) 349-5237
WI Well ID Unknown

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

04CB05-15

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 040510412r Test: SW8260B SDG No. 0405056

Matrix: (soil/water) Water Lab Sample ID: 0405056-20A

Sample wt/vol: 25 (g/mL) mL Sample Type: SAMP

Level: (low/med) LOW Lab File ID: 16023.d

% Moisture: not dec. Date Received: 5/6/2004

GC Column: DB-624(ID: 0.53 (mm) Date Analyzed: 5/11/2004

Soil Extract Volume: (mL) Dilution Factor: 1

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
71-43-2	Benzene	0.500	U
100-41-4	Ethylbenzene	5.00	U
91-20-3	Naphthalene	5.00	U
108-88-3	Toluene	5.00	U
1330-20-7	Xylenes, Total	5.00	U

RW-03
Ken and Sheri Nelson
Daniels 70
(715) 349-8070
WI well ID: JB 251

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

04CB05-16

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 040510412r Test: SW8260B SDG No. 0405056

Matrix: (soil/water) Water Lab Sample ID: 0405056-21A

Sample wt/vol: 25 (g/mL) mL Sample Type: SAMP

Level: (low/med) LOW Lab File ID: 16024.d

% Moisture: not dec. Date Received: 5/6/2004

GC Column: DB-624(ID: 0.53 (mm) Date Analyzed: 5/11/2004

Soil Extract Volume: (mL) Dilution Factor: 1

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
71-43-2	Benzene	0.500	U
100-41-4	Ethylbenzene	5.00	U
91-20-3	Naphthalene	5.00	U
108-88-3	Toluene	5.00	U
1330-20-7	Xylenes, Total	5.00	U

RW-04
Wayne Engstrom
8526 Daniels Pl
(715) 349-5212
WI Well ID: AN547

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

04CB05-17

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 040510412r Test: SW8260B SDG No. 0405056

Matrix: (soil/water) Water Lab Sample ID: 0405056-22A

Sample wt/vol: 25 (g/mL) mL Sample Type: SAMP

Level: (low/med) LOW Lab File ID: 16025.d

% Moisture: not dec. Date Received: 5/6/2004

GC Column: DB-624(ID: 0.53 (mm) Date Analyzed: 5/11/2004

Soil Extract Volume: (mL) Dilution Factor: 1

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
71-43-2	Benzene	0.500	U
100-41-4	Ethylbenzene	5.00	U
91-20-3	Naphthalene	5.00	U
108-88-3	Toluene	5.00	U
1330-20-7	Xylenes, Total	5.00	U

RW-05
Timothy Tjader
8783 Dahlia Rd
(715) 349-5192
well ID: Unknown

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

04CB05-01

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 040510411r Test: SW8260B SDG No. 0405056

Matrix: (soil/water) Water Lab Sample ID: 0405056-03A

Sample wt/vol: 25 (g/mL) mL Sample Type: SAMP

Level: (low/med) LOW Lab File ID: 16009.d

% Moisture: not dec. Date Received: 5/6/2004

GC Column: DB-624(ID: 0.53 (mm) Date Analyzed: 5/10/2004

Soil Extract Volume: (mL) Dilution Factor: 1

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
71-43-2	Benzene	0.109	J
100-41-4	Ethylbenzene	5.00	U
91-20-3	Naphthalene	5.00	U
108-88-3	Toluene	0.153	J
1330-20-7	Xylenes, Total	5.00	U

DW-01

POTABLE WELL

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

04CB05-12

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 200401959 Test: SIM PAH SDG No. 0405056

Matrix: (soil/water) Water Lab Sample ID: 0405056-17B

Sample wt/vol: 1020 (g/mL) mL Sample Type: SAMP

Level: (low/med) low Lab File ID: m1817.d

% Moisture: not dec. Date Received: 5/6/2004

Concentrated Extract Volume: 1 (mL) Date Extracted 5/11/2004

Injection Volume: 2 (uL) Date Analyzed: 5/11/2004

GPC Cleanup: (Y/N) N pH: 8 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
87-86-5	Pentachlorophenol	0.140	B

RW-01
Bill Ellis
8713 Daniels Tr
(715) 349-5840
WI Well ID: FG508

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

04CB05-13

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 200401959 Test: SIM PAH SDG No. 0405056

Matrix: (soil/water) Water Lab Sample ID: 0405056-18B

Sample wt/vol: 1000 (g/mL) mL Sample Type: SAMP

Level: (low/med) low Lab File ID: m1818.d

% Moisture: not dec. Date Received: 5/6/2004

Concentrated Extract Volume: 1 (mL) Date Extracted 5/11/2004

Injection Volume: 2 (uL) Date Analyzed: 5/11/2004

GPC Cleanup: (Y/N) N pH: 8 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
87-86-5	Pentachlorophenol	0.134	B

RW-01 DUP
Bill Ellis
8713 DANIELS 70
(715) 349-5840
WI WELL ID: FG508

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

04CB05-14

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 200401959 Test: SIM PAH SDG No. 0405056

Matrix: (soil/water) Water Lab Sample ID: 0405056-19B

Sample wt/vol: 1030 (g/mL) mL Sample Type: SAMP

Level: (low/med) low Lab File ID: m1819.d

% Moisture: not dec. Date Received: 5/6/2004

Concentrated Extract Volume: 1 (mL) Date Extracted 5/11/2004

Injection Volume: 2 (uL) Date Analyzed: 5/11/2004

GPC Cleanup: (Y/N) N pH: 8 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
87-86-5	Pentachlorophenol	0.0252	JB

RW-02
LaVonne Brethorst
8627 Daniels Rd
(715) 349-5237
WI Well ID: UNKNOWN

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

04CB05-15

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 200401959 Test: SIM PAH SDG No. 0405056

Matrix: (soil/water) Water Lab Sample ID: 0405056-20B

Sample wt/vol: 1050 (g/mL) mL Sample Type: SAMP

Level: (low/med) low Lab File ID: m1820.d

% Moisture: not dec. Date Received: 5/6/2004

Concentrated Extract Volume: 1 (mL) Date Extracted 5/11/2004

Injection Volume: 2 (uL) Date Analyzed: 5/11/2004

GPC Cleanup: (Y/N) N pH: 8 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
87-86-5	Pentachlorophenol	0.0952	U

RW-03
KEN and SHERI NELSON
DANIELS 70
(715) 349-8070
WI WELL ID JB 251

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

04CB05-16

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 200401959 Test: SIM PAH SDG No. 0405056

Matrix: (soil/water) Water Lab Sample ID: 0405056-21B

Sample wt/vol: 1000 (g/mL) mL Sample Type: SAMP

Level: (low/med) low Lab File ID: m1821.d

% Moisture: not dec. Date Received: 5/6/2004

Concentrated Extract Volume: 1 (mL) Date Extracted 5/11/2004

Injection Volume: 2 (uL) Date Analyzed: 5/11/2004

GPC Cleanup: (Y/N) N pH: 8 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L	Q
87-86-5	Pentachlorophenol	0.100	U

RW-04
VAYNE ENGSTROM
8526 DANIELS RD
(715) 349-5212
WI WELL ID: AN547

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

04CB05-17

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 200401959 Test: SIM PAH SDG No. 0405056

Matrix: (soil/water) Water Lab Sample ID: 0405056-22B

Sample wt/vol: 1070 (g/mL) mL Sample Type: SAMP

Level: (low/med) low Lab File ID: m1822.d

% Moisture: not dec. Date Received: 5/6/2004

Concentrated Extract Volume: 1 (mL) Date Extracted 5/11/2004

Injection Volume: 2 (uL) Date Analyzed: 5/11/2004

GPC Cleanup: (Y/N) N pH: 8 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
87-86-5	Pentachlorophenol	0.0935	U

RW-05

TIMOTHY TJADER
8783 DANIELS RD
(715) 349-5192
WI WELL ID = UNKNOWN

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

04CB05-01

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 200401959 Test: SIM PAH SDG No.: 0405056

Matrix: (soil/water) Water Lab Sample ID: 0405056-03D

Sample wt/vol: 1050 (g/mL) mL Sample Type: SAMP

Level: (low/med) low Lab File ID: m1812.d

% Moisture: not dec. Date Received: 5/6/2004

Concentrated Extract Volume: 1 (mL) Date Extracted 5/11/2004

Injection Volume: 2 (uL) Date Analyzed: 5/11/2004

GPC Cleanup: (Y/N) N pH: 8 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L	Q
87-86-5	Pentachlorophenol	0.102	B

DW-01

Potable Well

CH2M HILL
135 South 84th Street
Suite 325
Milwaukee, WI 53214-1456
Tel 414.272.2426
Fax 414.272.4408

CH2MHILL

March 4, 2005

184202.CV.05

Mr. Tony Rutter
Remedial Project Manager (SR-6J)
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3590

Subject: Subcontract No. 333, November 2004 Residential Well Sampling Results
Penta Wood Products, Siren, Wisconsin
WA No. 201-RALR-05WE, Contract No. 68-W6-0025

Dear Mr. Rutter:

Attached are the pentachlorophenol (PCP) results for the residential and potable well resampling event that took place on November 1, 2004. In addition, the results from the initial sampling event conducted on September 22, 2004 are also attached. This sampling included the analysis of benzene, ethylbenzene, toluene, xylene (BTEX), and napthalene for the residential and potable wells. All analyses were performed by Analytical Services Center, Inc. (ASC) of Lancaster, New York. The well description information is shown in the following table:

LTRA Residential Well Information
Penta Wood Products – Siren, Wisconsin

Location ID	Resident Name	Resident Address	Resident Phone Number	WI Well #
RW01	Bill Ellis (formerly Skold)	8713 Daniels 70	(715) 349-5840	FG508
RW02	LaVonne Brethorst	8627 Daniels 70	(715) 349-5237	Unknown
RW03	Ken and Sheri Nelson	Daniels 70 (same driveway as V. Engstrom)	(715) 349-8070	JB 251
RW04	Vayne Engstrom	8526 Daniels 70	(715) 349-5212	AN547
RW05	Timothy Tjader	8783 Daniels 70	(715) 349-5192	Unknown

The results of the September 2004 sampling event showed no detections of BTEX and naphthalene. However, PCP concentrations were detected above the reporting limit of 0.1 µg/L at RW-01 (Ellis residence) and RW-02 (Nelson residence). These concentrations were found at 1.51 µg/L and 2.18 µg/L, respectively.

After reviewing the analytical run log, it was found that samples containing elevated concentrations of PCP (9490 µg/L) were analyzed immediately before these residential well samples. Therefore, the concentrations detected in the residential well samples mentioned above may have been influenced by these elevated samples. The laboratory was notified of this issue and reimbursed CH2M HILL the cost associated with resampling and reanalyzing the potable and residential wells for PCP. The resampling event was conducted on November 1, 2004.

The PCP results from the November 2004 resampling event showed no detected concentrations in either the potable well or residential wells, confirming that the previously detected concentrations were a result of laboratory contamination.

If you have any questions or comments please give me a call at 414-272-1052 ext. 476, or Bill Andrae at ext. 341.

Sincerely,

CH2M HILL

William M. Andrae for

Steven Paukner
Project Chemist

enclosure
c: Stephen Nathan, PO/U.S. EPA, Region 5 (w/o enclosure)
Dave Alberts, CO/U.S. EPA, Region 5 (w/o enclosure)
William Schultz, P.E./WDNR, Rhinelander
Bill Andrae, SM/CH2M HILL, Milwaukee
Ike Johnson, PM/CH2M HILL, Milwaukee
Dan Plomb, DPM/CH2M HILL, Milwaukee
Gina Bayer, RTL/CH2M HILL, Milwaukee
Dave Shekoski/CH2M HILL, Milwaukee
Cherie Wilson, AA/CH2M HILL, Milwaukee

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

04CA14-51

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 0409294p1r Test: SW8260B SDG No. 0409269

Matrix: (soil/water) Water Lab Sample ID: 0409269-21A

Sample wt/vol: 25 (g/mL) mL Sample Type: SAMP

Level: (low/med) low Lab File ID: p1171.d

% Moisture: not dec. Date Received: 9/24/2004

GC Column: DB-624(ID: 0.53 (mm) Date Analyzed: 9/29/2004

Soil Extract Volume: (mL) Dilution Factor: 1

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
71-43-2	Benzene	0.500	U
100-41-4	Ethylbenzene	5.00	U
91-20-3	Naphthalene	5.00	U
108-88-3	Toluene	5.00	U
1330-20-7	Xylenes, Total	5.00	U

DW01

Potable Well

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

04CA14-53

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 0410014p1r Test: SW8260B SDG No. 0409269

Matrix: (soil/water) Water Lab Sample ID: 0409269-15A

Sample wt/vol: 25 (g/mL) mL Sample Type: SAMP

Level: (low/med) low Lab File ID: p1209.d

% Moisture: not dec. Date Received: 9/24/2004

GC Column: DB-624(ID: 0.53 (mm) Date Analyzed: 10/1/2004

Soil Extract Volume: (mL) Dilution Factor: 1

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
71-43-2	Benzene	0.500	U
100-41-4	Ethylbenzene	5.00	U
91-20-3	Naphthalene	5.00	U
108-88-3	Toluene	5.00	U
1330-20-7	Xylenes, Total	5.00	U

RW01
Bill Ellis
8713 Daniels 70
WI Well ID# FG508

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

04CA14-54

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 0409294p1r Test: SW8260B SDG No. 0409269

Matrix: (soil/water) Water Lab Sample ID: 0409269-16A

Sample wt/vol: 25 (g/mL) mL Sample Type: SAMP

Level: (low/med) low Lab File ID: p1166.d

% Moisture: not dec. Date Received: 9/24/2004

GC Column: DB-624(ID: 0.53 (mm) Date Analyzed: 9/29/2004

Soil Extract Volume: (mL) Dilution Factor: 1

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
71-43-2	Benzene	0.500	U
100-41-4	Ethylbenzene	5.00	U
91-20-3	Naphthalene	5.00	U
108-88-3	Toluene	5.00	U
1330-20-7	Xylenes, Total	5.00	U

RW01 Dup
Bill Ellis
8713 Daniels 70
WI Well ID# FG508

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

04CA14-55

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 0409294p1r Test: SW8260B SDG No. 0409269

Matrix: (soil/water) Water Lab Sample ID: 0409269-17A

Sample wt/vol: 25 (g/mL) mL Sample Type: SAMP

Level: (low/med) low Lab File ID: p1167.d

% Moisture: not dec. Date Received: 9/24/2004

GC Column: DB-624(ID: 0.53 (mm) Date Analyzed: 9/29/2004

Soil Extract Volume: (mL) Dilution Factor: 1

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
71-43-2	Benzene	0.500	U
100-41-4	Ethylbenzene	5.00	U
91-20-3	Naphthalene	5.00	U
108-88-3	Toluene	5.00	U
1330-20-7	Xylenes, Total	5.00	U

RW02
LaVonne Brethorst
8627 Daniels 70
WI Well ID# Unknown

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

04CA14-56

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 0409294plr Test: SW8260B SDG No. 0409269

Matrix: (soil/water) Water Lab Sample ID: 0409269-18A

Sample wt/vol: 25 (g/mL) mL Sample Type: SAMP

Level: (low/med) low Lab File ID: p1168.d

% Moisture: not dec. Date Received: 9/24/2004

GC Column: DB-624(ID: 0.53 (mm) Date Analyzed: 9/29/2004

Soil Extract Volume: (mL) Dilution Factor: 1

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
71-43-2	Benzene	0.500	U
100-41-4	Ethylbenzene	5.00	U
91-20-3	Naphthalene	5.00	U
108-88-3	Toluene	5.00	U
1330-20-7	Xylenes, Total	5.00	U

RW03

Ken & Sheri Nelson

Daniels 70

WI Well ID# JB251

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

04CA14-57

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 0409294p1r Test: SW8260B SDG No. 0409269

Matrix: (soil/water) Water Lab Sample ID: 0409269-19A

Sample wt/vol: 25 (g/mL) mL Sample Type: SAMP

Level: (low/med) low Lab File ID: p1169.d

% Moisture: not dec. Date Received: 9/24/2004

GC Column: DB-624(ID: 0.53 (mm) Date Analyzed: 9/29/2004

Soil Extract Volume: (mL) Dilution Factor: 1

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
71-43-2	Benzene	0.500	U
100-41-4	Ethylbenzene	5.00	U
91-20-3	Naphthalene	5.00	U
108-88-3	Toluene	5.00	U
1330-20-7	Xylenes, Total	5.00	U

RW04
Vayne Engstrom
8526 Daniels 70
WI Well ID# 4N547

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

04CA14-58

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 0409294p1r Test: SW8260B SDG No. 0409269

Matrix: (soil/water) Water Lab Sample ID: 0409269-20A

Sample wt/vol: 25 (g/mL) mL Sample Type: SAMP

Level: (low/med) low Lab File ID: p1170.d

% Moisture: not dec. Date Received: 9/24/2004

GC Column: DB-624(ID: 0.53 (mm) Date Analyzed: 9/29/2004

Soil Extract Volume: (mL) Dilution Factor: 1

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
71-43-2	Benzene	0.500	U
100-41-4	Ethylbenzene	5.00	U
91-20-3	Naphthalene	5.00	U
108-88-3	Toluene	5.00	U
1330-20-7	Xylenes, Total	5.00	U

RW 05

Timothy Tjader
8783 Daniels 70
WI Well ID# Unknown

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

05CA01-09

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 200404321 Test: SIM PAH SDG No. 0411029

Matrix: (soil/water) Water Lab Sample ID: 0411029-01A

Sample wt/vol: 1040 (g/mL) mL Sample Type: SAMP

Level: (low/med) LOW Lab File ID: m3783.d

% Moisture: not dec. Date Received: 11/2/2004

Concentrated Extract Volume: 1 (mL) Date Extracted 11/4/2004

Injection Volume: 2 (uL) Date Analyzed: 11/5/2004

GPC Cleanup: (Y/N) N pH: 7 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
87-86-5	Pentachlorophenol	0.0962	U

DW01

Potable Well

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

05CA01-11

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 200404321 Test: SIM PAH SDG No. 0411029

Matrix: (soil/water) Water Lab Sample ID: 0411029-03A

Sample wt/vol: 1050 (g/mL) mL Sample Type: SAMP

Level: (low/med) LOW Lab File ID: m3785.d

% Moisture: not dec. Date Received: 11/2/2004

Concentrated Extract Volume: 1 (mL) Date Extracted 11/4/2004

Injection Volume: 2 (uL) Date Analyzed: 11/5/2004

GPC Cleanup: (Y/N) N pH: 7 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
87-86-5	Pentachlorophenol	0.0952	U

RW01
Bill Ellis
8713 Daniels Rd
WI Well ID# FG508

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

05CA01-12

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 200404321 Test: SIM PAH SDG No. 0411029

Matrix: (soil/water) Water Lab Sample ID: 0411029-04A

Sample wt/vol: 1040 (g/mL) mL Sample Type: SAMP

Level: (low/med) LOW Lab File ID: m3786.d

% Moisture: not dec. Date Received: 11/2/2004

Concentrated Extract Volume: 1 (mL) Date Extracted 11/4/2004

Injection Volume: 2 (uL) Date Analyzed: 11/5/2004

GPC Cleanup: (Y/N) N pH: 7 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
87-86-5	Pentachlorophenol	0.0962	U

RW02
LaVonne Brethorst
8627 Daniels 70
WI well ID# Unknown

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

05CA01-13

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 200404321 Test: SIM PAH SDG No. 0411029

Matrix: (soil/water) Water Lab Sample ID: 0411029-05A

Sample wt/vol: 1040 (g/mL) mL Sample Type: SAMP

Level: (low/med) LOW Lab File ID: m3787.d

% Moisture: not dec. Date Received: 11/2/2004

Concentrated Extract Volume: 1 (mL) Date Extracted 11/4/2004

Injection Volume: 2 (uL) Date Analyzed: 11/5/2004

GPC Cleanup: (Y/N) N pH: 7 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
87-86-5	Pentachlorophenol	0.0962	U

RW03
Ken & Sheri Nelson
Daniels 70
WI Well ID# JB 251

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

05CA01-14

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 200404321 Test: SIM PAH SDG No. 0411029

Matrix: (soil/water) Water Lab Sample ID: 0411029-06A

Sample wt/vol: 1040 (g/mL) mL Sample Type: SAMP

Level: (low/med) LOW Lab File ID: m3788.d

% Moisture: not dec. Date Received: 11/2/2004

Concentrated Extract Volume: 1 (mL) Date Extracted 11/4/2004

Injection Volume: 2 (uL) Date Analyzed: 11/5/2004

GPC Cleanup: (Y/N) N pH: 7 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
87-86-5	Pentachlorophenol	0.0962	U

RW04
Vayne Engstrom
8526 Daniels 70
WI Well ID# AN547

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

05CA01-15

Lab Name: Analytical Services Center

Lab Code: EANDE Batch ID: 200404321 Test: SIM PAH SDG No. 0411029

Matrix: (soil/water) Water Lab Sample ID: 0411029-07A

Sample wt/vol: 1040 (g/mL) mL Sample Type: SAMP

Level: (low/med) LOW Lab File ID: m3789.d

% Moisture: not dec. Date Received: 11/2/2004

Concentrated Extract Volume: 1 (mL) Date Extracted 11/4/2004

Injection Volume: 2 (uL) Date Analyzed: 11/5/2004

GPC Cleanup: (Y/N) N pH: 7 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
87-86-5	Pentachlorophenol	0.0962	U

RW05
Timothy Tjader
8783 Daniels 70
WI Well ID# Unknown

CH2M HILL
135 South 84th Street
Suite 325
Milwaukee, WI 53214-1456
Phone 414.272.2426
Fax 414.272.4408

CH2MHILL

September 13, 2004

Mr. Tony Rutter
Remedial Project Manager (SR-6J)
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3590

Subject: Subcontract No. 333, Penta Wood Products, WI
May 2004 Sampling Results
WA No. 201-RALR-05WE, Contract No. 68-W6-0025

Dear Tony:

As a follow up to the May 2004 Sampling Results letter dated July 12, 2004, the validated results of the BTEX, napthalene, and pentachlorophenol (PCP) analytical results for the residential and potable well sampling event that took place on May 5, 2004 have been received by CH2M HILL on August 17, 2004. Data validation was performed by the USEPA Superfund Field Services Section. The well description information is shown in the following table:

LTRA Residential Well Information
Penta Wood Products – Siren, Wisconsin

Location ID	Resident Name	Resident Address	Resident Phone Number	WI Well #
RW01	Bill Ellis (formerly Skold)	8713 Daniels 70	(715) 349-5840	FG508
RW02	LaVonne Brethorst	8627 Daniels 70	(715) 349-5237	Unknown
RW03	Ken and Sheri Nelson	Daniels 70 (same driveway as V. Engstrom)	(715) 349-8070	JB 251
RW04	Vayne Engstrom	8526 Daniels 70	(715) 349-5212	AN547
RW05	Timothy Tjader	8783 Daniels 70	(715) 349-5192	Unknown

As you may recall, PCP concentrations were detected at DW01, residential well RW01 (Ellis residence), and its duplicate RW01 DUP. The laboratory reported concentrations of PCP at 0.140 B µg/L and 0.134 B µg/L for RW01 and RW01DUP, respectively. DW01 contained

PCP at 0.102 B µg/L. The "B" qualification indicates the presence of PCP in an associated blank.

According to the *USEPA National Functional Guidelines for Data Validation*, it states that detected sample concentrations less than the 95% confidence interval (5 X blank concentration) should be qualified "UB" as undetected due to blank contamination. In this case, the 95% confidence interval is 0.37 µg/kg which would result in the qualification of these PCP detections resulting from the method blank contamination. The USEPA validation had indicated the presence of PCP in samples DW01, RW01, and RW01DUP should be qualified as undetected, because the sample results were less than five times the blank result. Therefore, the detected concentrations found in samples DW01, RW01, and RW01DUP are from the presence of PCP in the associated laboratory blank.

If you have any questions or comments please give me a call at 414.272.1052 ext. 476, or Bill Andrae at ext. 341.

Sincerely,

CH2M HILL

Steven Paukner
Project Chemist

c: Stephen Nathan, PO/U.S. EPA, Region 5 (w/o enclosure)
Marshall McReynolds, CO/U.S. EPA, Region 5 (w/o enclosure) c/o Dave Alberts, CS
Bill Andrae, SM/CH2M HILL, Milwaukee
Keli McKenna,ASM/CH2M HILL, Milwaukee
Ike Johnson, PM/CH2M HILL, Milwaukee
Dan Plomb, DPM/CH2M HILL, Milwaukee
Gina Bayer, RTL/CH2M HILL, Milwaukee
Dave Shekoski/CH2M HILL, Milwaukee
Cherie Wilson, AA/CH2M HILL, Milwaukee