2009 ANNUAL REPORT

PENTA WOOD PRODUCTS SITE

Town of Daniels, Wisconsin

Long-Term Response Action

WA No. 004-LRLR-05WE / Contract No. EP-S5-06-01

October 2010

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Abbreviations and Acronyms

µg/L	micrograms per liter
BTEX	benzene, toluene, ethylbenzene, and xylene
CAMU	Corrective Action Management Unit
EMT	Environmental Monitoring Technologies
ES	Enforcement Standard
EW	extraction well
ft^3	cubic feet
g/cm^3	grams per cubic centimeter
gal	gallon
gpm	gallons per minute
GW	groundwater
lb	pound
LNAPL	light nonaqueous phase liquid
MG	million gallons
mg/L	milligrams per liter
MW	monitoring well
ORP	oxidation-reduction potential
PAL	Preventive Action Limit
PCP	pentachlorophenol
PVC	polyvinyl chloride
RA	remedial action
scfm	standard cubic feet per minute
USEPA	U.S. Environmental Protection Agency
WA	Work Assignment
WAM	Work Assignment Manager
WDNR	Wisconsin Department of Natural Resources
WPDES	Wisconsin Pollutant Discharge Elimination System

SECTION 1

Introduction

This annual report documents the groundwater monitoring, groundwater treatment system, and bioventing system operation, hazardous waste generation and disposal, and site inspection and maintenance activities at the Penta Wood Products Site as performed by CH2M HILL for the U.S. Environmental Protection Agency (USEPA) under Work Assignment (WA) No. 004-LRLR-05WE.

SECTION 2

2009 Groundwater Monitoring

The ninth year of post-remedial action (RA) groundwater monitoring at the Penta Wood Products Site included two groundwater sampling events. The semiannual groundwater sampling event was conducted in June 2009 and consisted of sampling five monitoring wells, five residential wells, and one onsite potable well, along with static water level measurements collected at all monitoring wells, and measuring product thickness in monitoring wells where light nonaqueous phase liquid (LNAPL) was present. The annual groundwater sampling event was conducted in October 2009, and consisted of sampling 13 monitoring wells, five residential wells, and one onsite potable well; measuring static water levels in all monitoring wells; and measuring product thickness in monitoring wells where LNAPL was present. This report 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 report, retaining and updating evaluations based on the new data.

The treatment system operated for approximately 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. Since it was restarted on February 27, 2004, the treatment system has been running continuously with the exception of occasional downtime from routine maintenance and repairs. The October 2009 monitoring well results reflect approximately 5.5 years of system operation since the groundwater treatment system was restarted. The groundwater results also reflect approximately 2 years of biovent system operations.

During the groundwater sampling events, samples were collected to monitor groundwater contaminant levels. Parameters that were analyzed include pentachlorophenol (PCP); naphthalene; benzene, toluene, ethylbenzene, and xylene (BTEX); dissolved metals; and natural attenuation parameters. A summary of the analytical results for each sampling event are provided in Appendix A and B.

Water level and LNAPL measurements are made to determine the remaining LNAPL thickness and the groundwater flow direction(s) in the unconfined and semiconfined aquifers. Water level measurements collected during each sampling event to assess groundwater flow direction are provided in Appendix C.

Trends in the distribution and concentrations of PCP and other parameters are used with water level measurements to evaluate the effectiveness of the treatment system in capturing the affected groundwater, also known as capture zone analysis. The capture zone analysis and parameters help to assess the effectiveness of the groundwater and LNAPL extraction, treatment, and natural attenuation.

2.1 Water Levels and LNAPL Measurements

Water levels in all monitoring wells were measured in June and October 2009. A water level indicator was used to measure the distance from the top of the inner well casing to the water

surface. In wells where LNAPL has been previously detected, the depth to the product surface (if present) and water surface were measured from the top of the inner well casing using an oil/water interface probe. Water level and LNAPL thickness measurements are provided in Appendix C.

The following sections provide a discussion of LNAPL thickness and distribution, and the effects the groundwater extraction well network has had on the unconfined and semiconfined aquifers.

2.1.1 LNAPL Thickness

LNAPL was observed in multiple monitoring well during the annual and semiannual sampling events. The observed LNAPL thicknesses are summarized in Table 1.

TABLE 1

2009 Monitoring Well LNAPL Measurement
Penta Wood Products Site

Monitoring Well	Semiannual Event June 2009	Annual Event October 2009
MW-10S	0.54 ft	0.63 ft
MW-18	1.58 ft	1.92 ft
MW-19	1.60 ft	1.46 ft
MW-20	1.45 ft	1.02 ft

Groundwater elevations, oil/water interface measurement data, historic LNAPL thickness data, and other observations are included in Appendix C.

In 2009, the LNAPL thickness measured is at or near the greatest thicknesses ever measured in monitoring wells MW-10S, MW-18, MW-19, and MW-20. The LNAPL appears to be pooling in the hydraulic capture zone resulting from the operation of the extraction wells. MW-19 and MW-20 are located in the same general area of the Corrective Action Management Unit (CAMU) and are surrounded by extraction wells. LNAPL thickness in these two wells has shown a slight decrease in October of 2009 from the spring event. MW-10S and MW-18 are located near the edge of the CAMU and outside the immediate vicinity of the extraction wells. The thickness in these two wells is still showing an increasing thickness as of October 2009.

2.1.2 Capture Zone Analysis

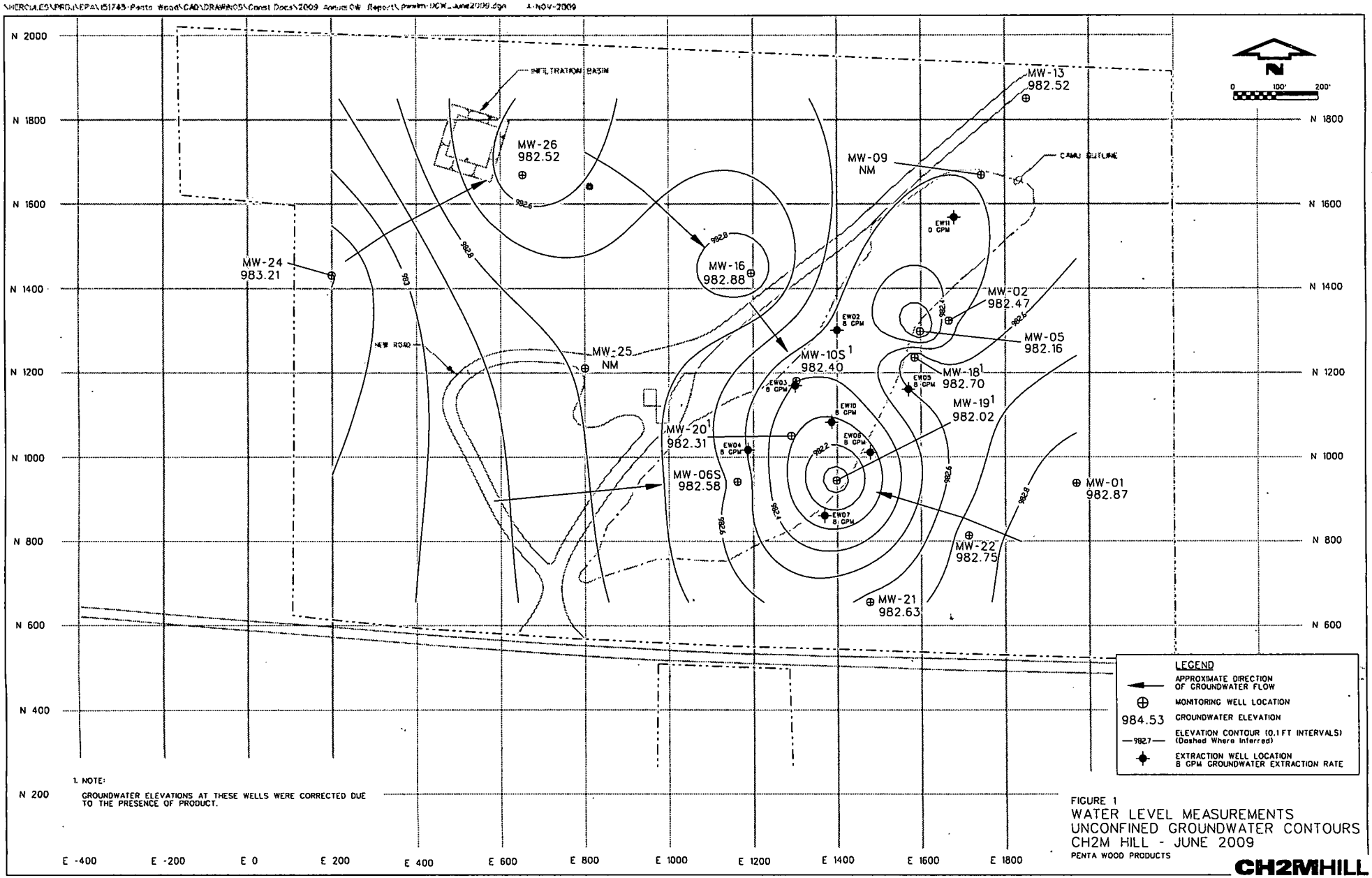
The groundwater extraction system at the Penta Wood Products Site was designed to create a depression in the water table promoting migration of contamination toward the extraction wells and to enhance the LNAPL recovery at the site. The capture effectiveness was primarily evaluated based on site-specific field data including potentiometric surface maps and calculated horizontal gradients as described in the following sections.

Unconfined Aquifer

Potentiometric Surface

The water levels recorded in June 2009 (Figure 1) and October 2009 (Figure 2) continued to show a consistent capture zone in the unconfined aquifer resulting from the operation of the groundwater collection system. The June and October 2009 potentiometric surfaces indicated a groundwater divide existing beneath the site, running from the southwest to the northeast. The capture zone is bounded by MW-09 on the north, MW-16 on the west, and MW-22 on the east, as indicated by the lower water level elevations observed in the monitoring wells located within or adjacent to the CAMU.

The discharge of treated groundwater into the infiltration basin has continued to show minimal to no response on the unconfined aquifer. In the unconfined aquifer, some variability was observed in 2009, although the capture zone appeared to be largely intact. The variability of the water table surface is likely a function of both the influence of the treatment system's pumping wells and varying surface infiltration rates across the site.



1. NOTE:
GROUNDWATER ELEVATIONS AT THESE WELLS WERE CORRECTED DUE TO THE PRESENCE OF PRODUCT.

FIGURE 1
WATER LEVEL MEASUREMENTS
UNCONFINED GROUNDWATER CONTOURS
CH2M HILL - JUNE 2009
PENTA WOOD PRODUCTS

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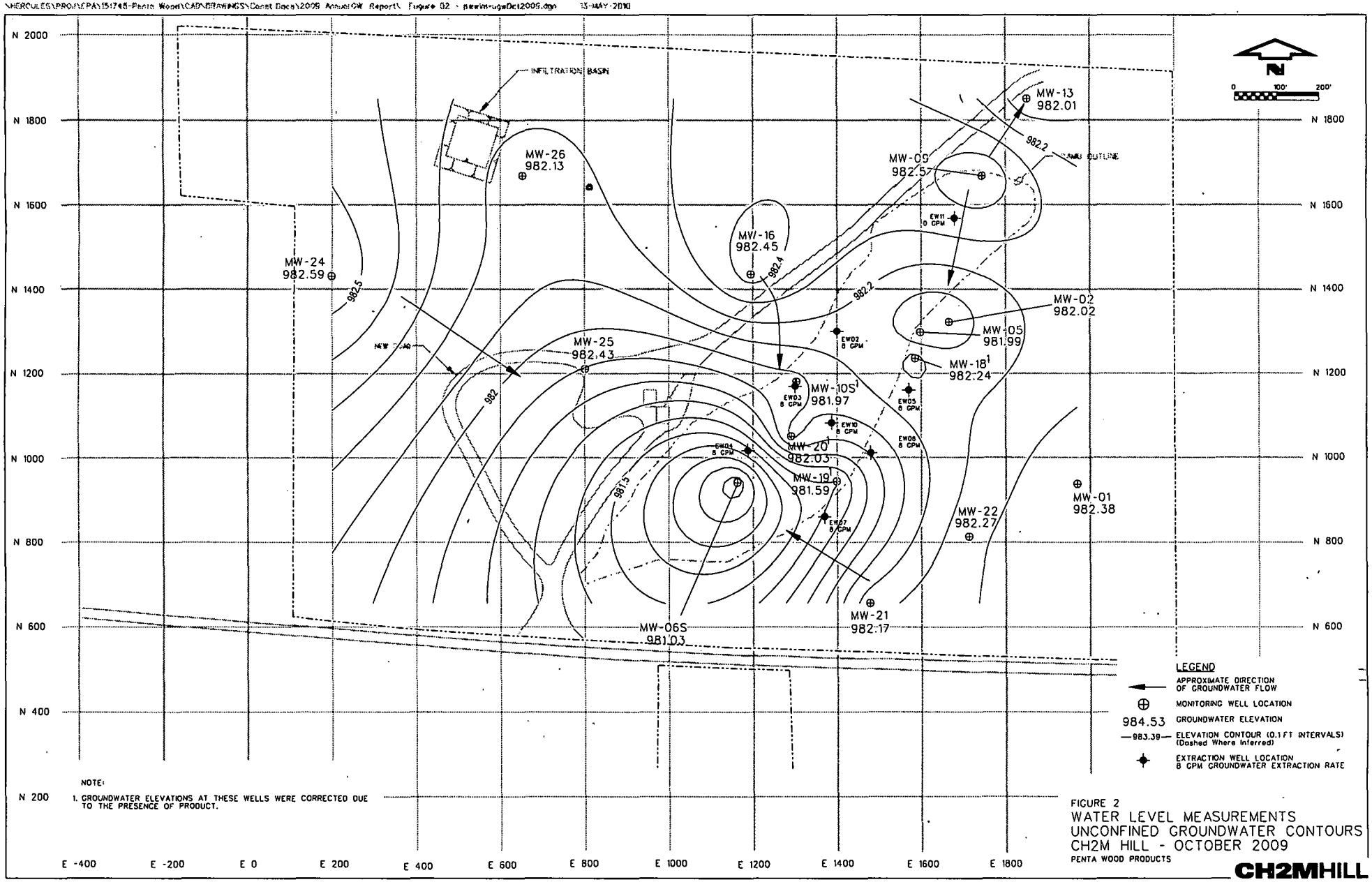
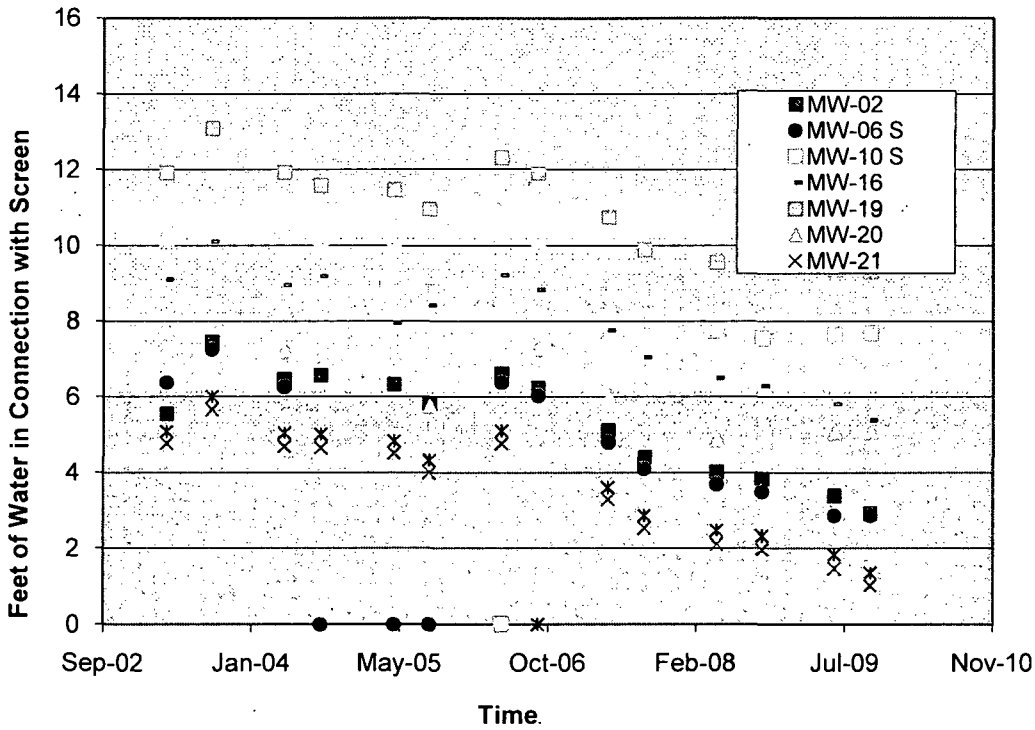

INFILTRATION BASIN
MW-13
982.01
MW-26
982.13
MW-09
982.5
MW-16
982.45
MW-24
982.59
MW-02
982.02
MW-05
981.99
MW-25
982.43
MW-18¹
982.24
MW-10S¹
981.97
MW-20¹
982.03
MW-19¹
981.59
MW-01
982.38
MW-22
982.27
MW-21
982.17
MW-06S
981.03
982.5
982.4
982.2
982
981.5
EW11 0 GPM
EW02 8 GPM
EW03 8 GPM
EW05 8 GPM
EW10 8 GPM
EW04 8 GPM
EW06 8 GPM
EW07 8 GPM
N 2000
N 1800
N 1600
N 1400
N 1200
N 1000
N 800
N 600
N 400
N 200
E -400
E -200
E 0
E 200
E 400
E 600
E 800
E 1000
E 1200
E 1400
E 1600
E 1800
0
100'
200'
LEGEND
APPROXIMATE DIRECTION OF GROUNDWATER FLOW
MONITORING WELL LOCATION
984.53 GROUNDWATER ELEVATION
983.39 ELEVATION CONTOUR (0.1 FT INTERVALS) (Dashed Where Inferred)
EXTRACTION WELL LOCATION 8 GPM GROUNDWATER EXTRACTION RATE
NOTE:
1. GROUNDWATER ELEVATIONS AT THESE WELLS WERE CORRECTED DUE TO THE PRESENCE OF PRODUCT.
FIGURE 2
WATER LEVEL MEASUREMENTS
UNCONFINED GROUNDWATER CONTOURS
CH2M HILL - OCTOBER 2009
PENTA WOOD PRODUCTS
CH2MHILL

Water levels in the unconfined aquifer have been steadily declining in the last ten years 3-4 feet per year on average. This reduction limited or prevented the sampling of some wells, especially when dedicated sampling pumps were used. For example, monitoring well MW-6S was unable to be sampled in October 2009 because of the limited amount of water present in the well and low recharge of the water. Figure 3 shows the declining trend in unconfined monitoring wells groundwater levels since 2002.

FIGURE 3
Amount of Water in Unconfined Wells



Hydraulic Gradients

Horizontal hydraulic gradients were calculated using monitoring wells screened in the unconfined aquifer located inside and outside the capture zone created by the extraction wells. The gradients were calculated for 2004 (which represents the treatment system operation shortly after startup), 2008, and 2009 and are summarized in Table 2.

TABLE 2
Horizontal Hydraulic Gradients in the Unconfined Aquifer
Penta Wood Products Site

Monitoring Well Outside Capture Zone	Monitoring Well Inside Capture Zone	Gradients					
		May 2004	May 2008	June 2009	September 2004	October 2008	October 2009
MW-16	MW-10S	0.0009	0.0011	**0.0017**	**0.0015**	0.0016	0.0017
MW-6S	MW-19	0.0019	0.0023	0.0024	--	--	0.0024 (outward)

TABLE 2
Horizontal Hydraulic Gradients in the Unconfined Aquifer
Penta Wood Products Site

Monitoring Well Outside Capture Zone	Monitoring Well Inside Capture Zone	Gradients					
		May 2004	May 2008	June 2009	September 2004	October 2008	October 2009
MW-22	MW-19	0.0012	0.0016	0.0021	0.0013	--	0.0020
MW-09	MW-05	0.0012	0.0019	--	0.0025	0.0019	0.0013

The horizontal gradients indicate that hydraulic capture was maintained to a greater level in June 2009 than in 2004, and the gradients were very similar to the gradients seen in May 2008. The horizontal gradient calculated between MW-09 and MW-05 in October 2009 is slightly less than in 2007, although it is still slightly greater than was measured in 2004, and still exhibits a significant inward gradient at this location. This gradient may have been slightly decreased since extraction well EW-11 is currently not operating. EW-11 is located outside the high concentration and LNAPL areas.

The gradient from MW-6S to MW-19 showed a direction of west or outwards from the CAMU, which may be explained by an increase in drawdown from extraction well EW-04. There is still evidence of capture in this direction using MW-24 to 6S with an eastward or inward gradient of 0.0011, which is a more representative gradient for this side of the CAMU. The gradients from MW-16 to MW-10S and MW-22 to MW-19 show similar gradients to what was observed in 2007 and are still greater than the gradients seen in 2004.

The calculated hydraulic gradients support the definition of the capture zone created by the extraction wells.

Semiconfined Aquifer

Potentiometric Surface

Groundwater in the semiconfined aquifer exhibited similar flow patterns between June 2009 (Figure 4) and October 2009 (Figure 5) with a groundwater divide that ran north-south beneath the site.

West of this divide, groundwater flow direction was to the west and northwest. Water levels recorded near the extraction wells in June 2009 indicate a localized groundwater depression on the eastern half of the divide that resulted from extraction well pumping. The continued treatment system optimization led to increased capture as shown by the localized depression in the area of the CAMU in June 2009. Continued pumping from extraction wells is expected to result in the continued presence or expansion of the localized depression observed in June 2009.

The October 2009 potentiometric surface map shows the western side of the site has declined more than other parts of the site including the CAMU area. This decline is most likely due to low rainfall during the summer and less infiltration. The extraction wells still appear to be capturing the groundwater in the vicinity of the CAMU.

Hydraulic Gradients

Horizontal hydraulic gradients were calculated using monitoring wells screened in the semiconfined aquifer located inside and outside the capture zone created by the extraction wells. The gradients were calculated for 2004, 2008, and 2009. The calculated gradients are summarized in Table 3.

TABLE 3
Horizontal Hydraulic Gradients in the Semiconfined Aquifer
Penta Wood Products Site

Monitoring Well Outside Capture Zone	Monitoring Well Inside Capture Zone	Gradients					
		May 2004	May 2008	June 2009	September 2004	October 2008	October 2009
MW-12	MW-10	-0.0005	0.0008	0.0008	-0.0034	-0.0011	-0.0034
MW-14	MW-10	-0.0013	0.0010	0.0008	0.0008	-0.0007	0.0006
MW-23	MW-10	-0.0005	0.0008	0.0006	0.0007	-0.0002	0.0005

Operation of the extraction wells and continued treatment system optimization resulted in a capture zone around the extraction wells. This is shown with the positive horizontal gradients in June 2009 and October 2009, supporting potential for flow towards MW-10 and the capture zone. The hydraulic gradients support the conclusion from the potentiometric surface maps that the extent of the June 2009 groundwater capture zone is greater than the extent of the 2004 groundwater capture zone.

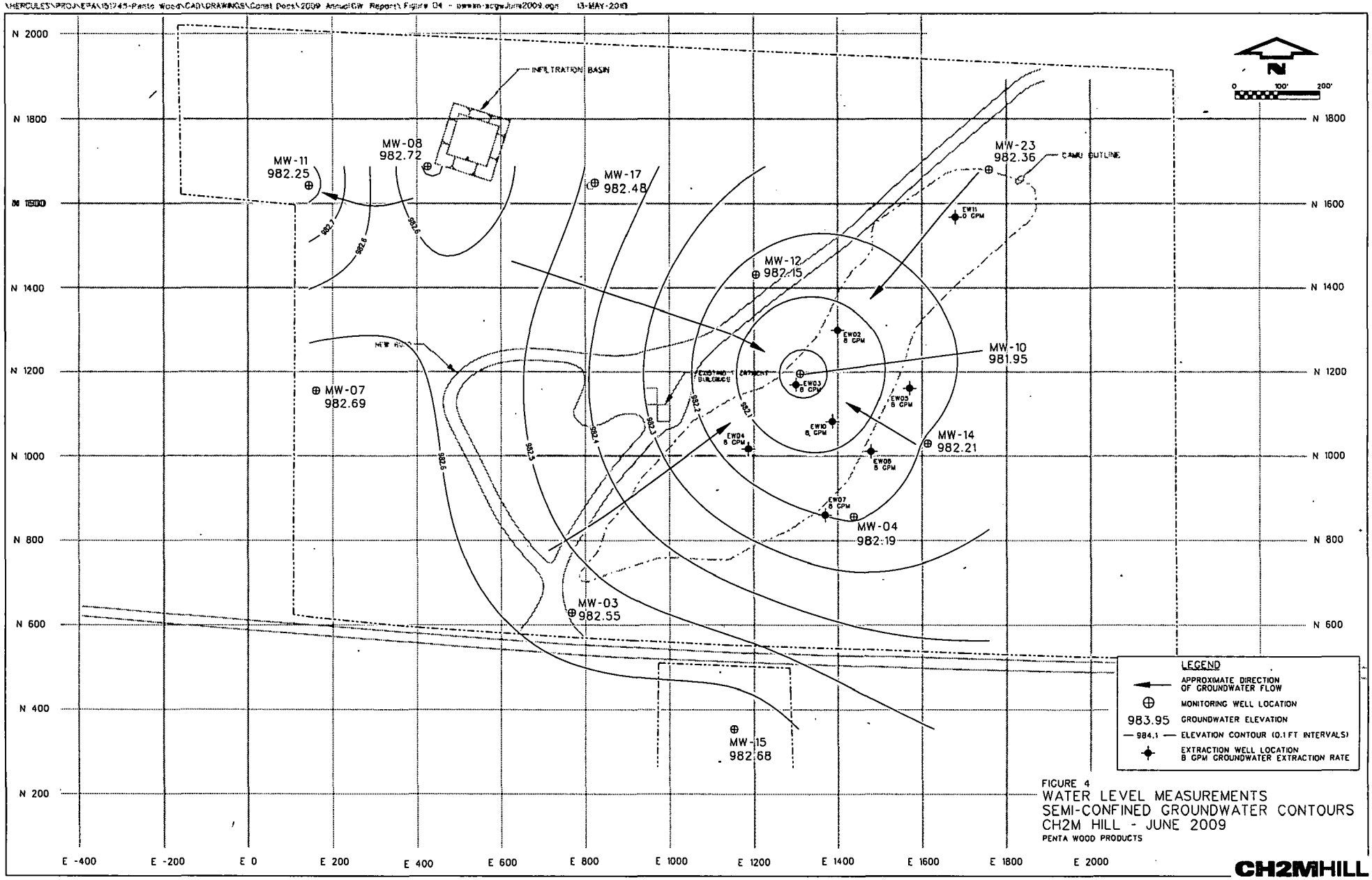


FIGURE 4
WATER LEVEL MEASUREMENTS
SEMI-CONFINED GROUNDWATER CONTOURS
CH2M HILL - JUNE 2009
PENTA WOOD PRODUCTS

CH2MHILL

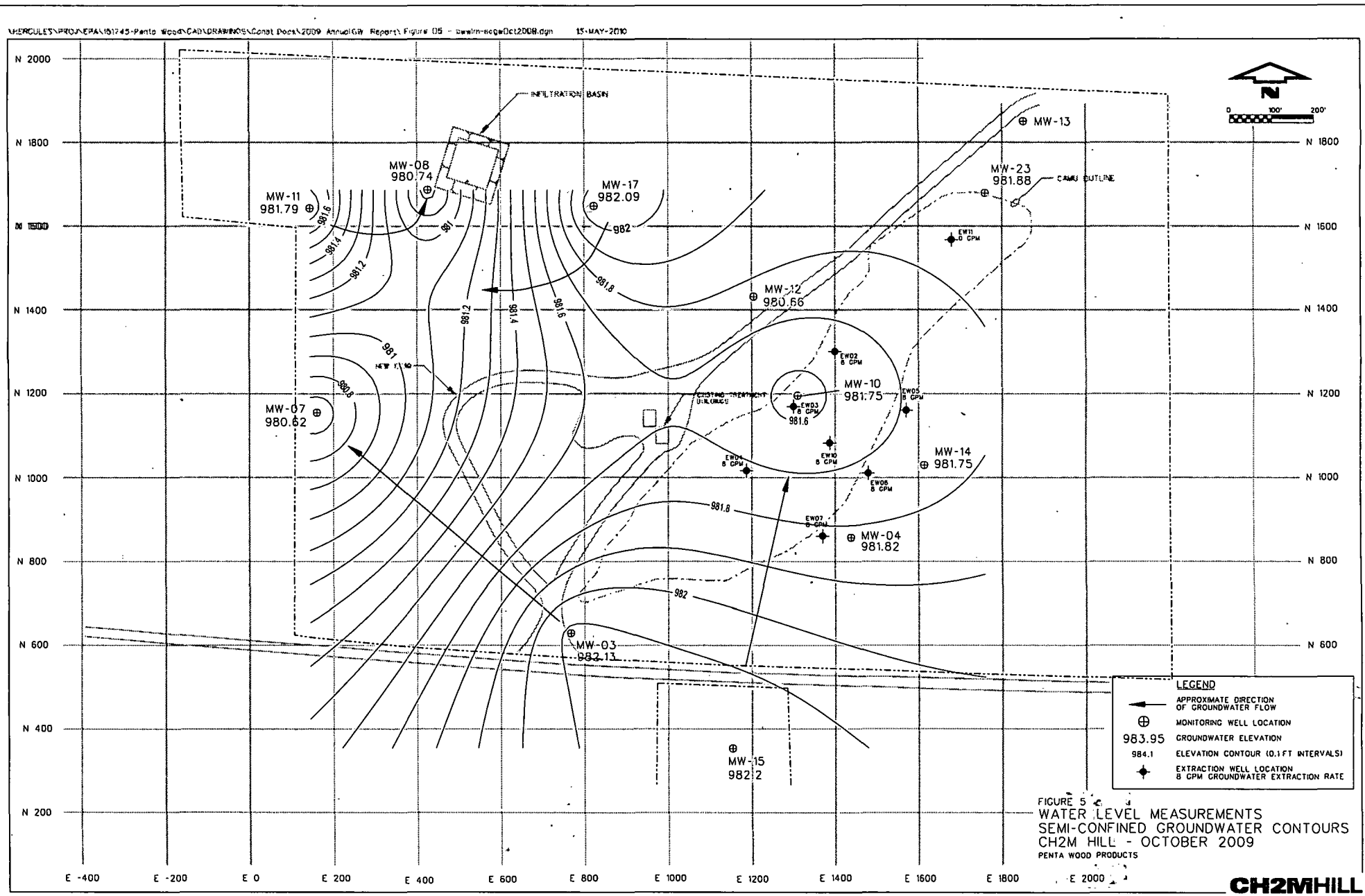


FIGURE 5
WATER LEVEL MEASUREMENTS
SEMI-CONFINED GROUNDWATER CONTOURS
CH2M HILL - OCTOBER 2009
PENTA WOOD PRODUCTS

CH2MHILL

2.2 Groundwater Sampling and Analysis

Groundwater analytical data is presented to evaluate the performance of the RA at the site. The data is analyzed in accordance with the following objectives:

- Confirm that contaminants do not extend to residential drinking water wells.
- 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 re-infiltration on groundwater quality.
- Evaluate the influent data from the groundwater extraction system to determine the amount of PCP removed to date.
- Identify changes needed to groundwater monitoring strategy.

A monitoring well reduction to the sampling program was proposed on August 24, 2007. Where multiple wells are located in the same area and screened in the same aquifer, the sampling program was streamlined to eliminate redundant wells that were not providing additional benefit to the monitoring program. The proposal was approved by USEPA and the Wisconsin Department of Natural Resources (WDNR) and implementation was planned during the semiannual event in 2008; however, because of an unexpected shutdown in 2008 resulting from a power surge, the reduced monitoring well sampling program was first implemented in June 2009.

Environmental Monitoring Technologies (EMT) of Morton Grove, Illinois, analyzed both the semiannual and annual samples. Quality control 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 February 2005). All monitoring well and residential well sample result packages were submitted to the USEPA Region 5 Central Regional Laboratory for data validation.

2.2.1 Residential Well Sampling Procedures

Five residential wells and one onsite potable well were sampled during the semiannual sampling (June 2009) and annual sampling (October 2009).

Semiannual sampling (June 2009) results received from EMT showed that PCP, BTEX, and naphthalene were not detected in the residential wells or in the onsite potable well. Because of a laboratory instrumentation error during the semiannual event, an additional sample was collected in July 2009 from RW-01 for BTEX analysis.

Annual sampling (October 2009) results from EMT showed that PCP was present at low concentrations at one residential well (RW-04). PCP concentrations were 0.15 micrograms per liter (µg/L) in the residential well, exceeding the NR 140 Preventive Action Limit (PAL) of 0.1 µg/L. Since the presence of PCP in the residential wells is not likely and historic results have not shown confirmed PCP detections at the residential wells, RW-04 was resampled. PCP was not detected in the reanalysis; therefore, the initial result was rejected for project use. No other site contaminants (BTEX or naphthalene) were detected in either of the residential well groundwater sampling events. The residential well sample information

(names, addresses, and telephone numbers) and the analytical results were submitted under separate cover to Tom Williams, USEPA Work Assignment Manager (WAM), on September 21, 2009 and December 3, 2009 (Appendix D).

2.2.2 Monitoring Well Sampling Procedures

For the semiannual sampling event conducted in June 2009, five monitoring wells were sampled. The following monitoring wells were selected for this event:

- MW-12
- MW-15
- MW-19
- MW-22
- MW-26

MW-19 was chosen to represent the unconfined groundwater in the LNAPL area; MW-15 was chosen to assess southern, off property contamination; MW-12 and MW-22 were chosen to assess the impacts of plant operation 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. Sampling of these wells was started on June 2, 2009 and completed on June 3, 2009. All monitoring wells were purged of at least three well volumes before sampling. MW-22 was purged and sampled using disposable polyvinyl chloride (PVC) bailers. The remaining monitoring wells were purged and sampled with dedicated Grundfos© pumps installed in 2005.

For the annual sampling event conducted during October 2009, thirteen monitoring wells were sampled. The following monitoring wells were sampled for this event:

- MW-02
- MW-03
- MW-05
- MW-07
- MW-10
- MW-12
- MW-13
- MW-15
- MW-16
- MW-17
- MW-19
- MW-22
- MW-26

The October sampling event was reduced from previous years in accordance with the approved sampling program. Two wells, MW-6S and MW-09, were unable to be sampled during the field event. MW-09 was unable to be sampled during the October sampling event. Substance, likely bentonite, coated the water interface probe when the water level measurement was taken. It was decided that additional water volume would be removed from the well before sampling using the existing dedicated pump; however, it was found that the dedicated pump was not functioning. An attempt to remove the pump was made but an unknown obstruction in the top 3 to 4- feet of the well prevented its removal. The top of the well casing was cut to remove the pump. Attempts to redevelop the well were made but the water remained highly turbid and therefore was not sampled.

Similar to other unconfined aquifer monitoring wells onsite, the water level in MW-6S was approaching the bottom of the well. The small amount of water present in the well and low recovery limited the ability to collect a sample.

Sampling of the wells was completed between October 6 and 8, 2009. Monitoring wells MW-03, MW-05, MW-07, MW-10, MW-12, MW-17, MW-19, and MW-26, were purged and sampled with dedicated Grundfos© Redi-Flo 2 pumps, which were installed in 2005. Wells MW-02, MW-13, MW-15, MW-16 and MW-22 were purged and sampled using disposable PVC bailers.

With the installation of the new dedicated Grundfos© Redi-Flo 2 MP1 pumps in September 2005, more representative sampling occurred because the task of bailing from these wells was eliminated. Bailing of wells that contained free product required repeated passing of the bailer through the LNAPL to sample the groundwater. This caused the introduction of product to the sample and biased results higher than expected. The Grundfos© Redi-Flo 2 pumps allowed for more reliable samples, which could result in lower concentrations being observed.

Results of the semiannual and annual sampling events are discussed in the following sections.

2.2.3 PCP Plume

The monitoring well analytical results tables presented in Appendix A are formatted into two unique tables: the June 2009 semiannual sampling results and the October 2009 annual sampling results.

To observe PCP trends over time the PCP concentration were contoured separately between the semiconfined and the unconfined aquifers. PCP concentration contours that exceed 1,000 µg/L are presented in Figure E-1 (unconfined) and E-3 (semiconfined) of Appendix E. PCP concentration contours that exceed the Wisconsin NR 140 enforcement standard of 1 µg/L are presented in Figure E-2 (unconfined) and E-4 (semiconfined) of Appendix E. Several historic contours are presented to establish a baseline condition before the operation of the groundwater extraction and treatment system. The 2008 contours are also presented to show changes in the contours over the last year.

A comparison of the unconfined 1,000 µg/L PCP contour lines in Figure E-1 (Appendix E) for 1994, 2008, and 2009 shows that the high concentration plume has remained stable from the 1994 baseline. The 1-µg/L contour shown in E-2 is only slightly larger than the 1,000-µg/L contour. This is likely due to a combination of the groundwater collection system drawing water towards the approximate center of the plume and biodegradation resulting from the availability of oxygen in groundwater around the plume perimeter. Further large reductions in the unconfined plume size are not anticipated until a more significant amount of LNAPL is removed, given the large mass of PCP that can solubilize from the LNAPL residual.

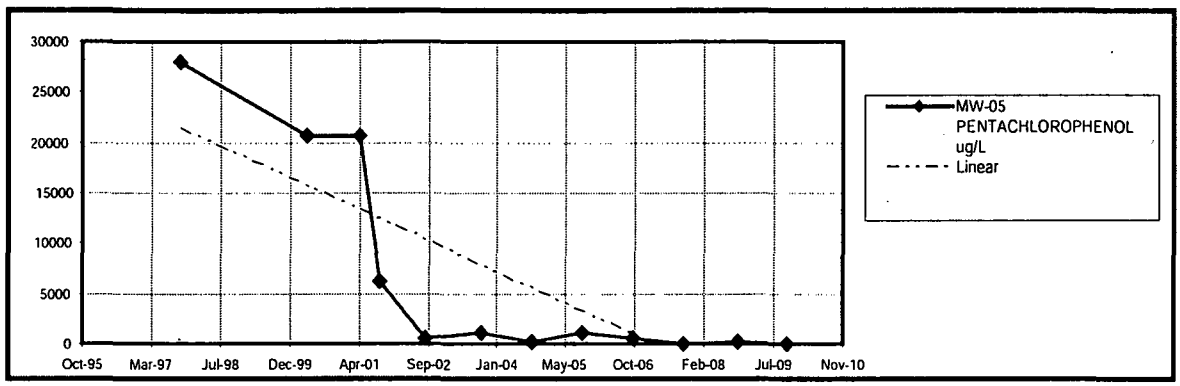
A comparison of the semiconfined 1,000 µg/L PCP contour lines in Figure E-3 (Appendix E) for 1994, 1997, 2003, 2008, and 2009 shows that the high concentration plume in the semiconfined aquifer has shrunk significantly from the 1994 baseline. In October 2009, all wells at the site were reduced in concentration to below the 1,000 µg/L level. In particular, MW-10 and MW-12 had PCP concentration drops from 1,630 and 1,670 µg/L in 2008 to 220 and 295 µg/L in 2009, respectively. The 1 µg/L plume in the semiconfined aquifer as shown in Figure E-4 shrunk in magnitude similar to the 1,000 µg/L, and is anticipated to continue to shrink. PCP trends are discussed below for individual monitoring wells within the PCP plume.

MW-05

PCP concentration in monitoring well MW-05 dropped sharply from 20,600 µg/L, before groundwater treatment system operation, to 33 µg/L in the most recent sample in October 2009 (see Figure 6). PCP concentrations remain low in this area because nearby uncontaminated groundwater is being drawn radially toward EW-02 and EW-05 since their

activation in February 2004, thereby purging the aquifer of PCP. Free product has never been observed in this well. MW-5 is considered a semiconfined aquifer well and like similar wells has shown a significant decrease in PCP.

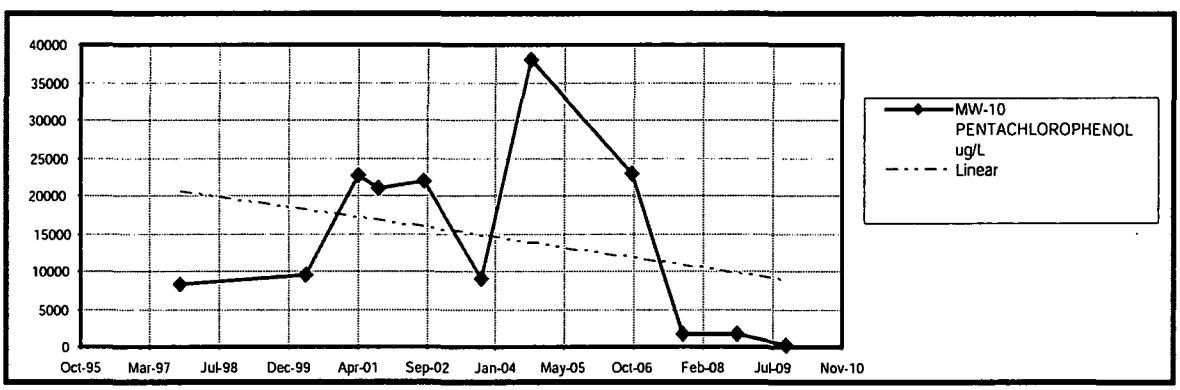
FIGURE 6
MW-05 PCP Concentration



MW-10

PCP in the semiconfined monitoring well MW-10 increased from a concentration of 9,530 µg/L shortly before the startup of the treatment system to 22,000 µg/L in August 2002 (see Figure 7). Concentrations in the well did not drop immediately, but by September 2003, concentrations fell to 9,000 µg/L. In September 2004, PCP concentrations at MW-10 increased to 38,000 µg/L. This is likely a result of the extraction system restart in February 2004. MW-10 is located very close to extraction well EW-03, which pulls product toward it while actively pumping. In September 2006, a concentration of 23,000 µg/L was reported, but by October 2009, PCP concentrations at MW-10 decreased to 220 µg/L.

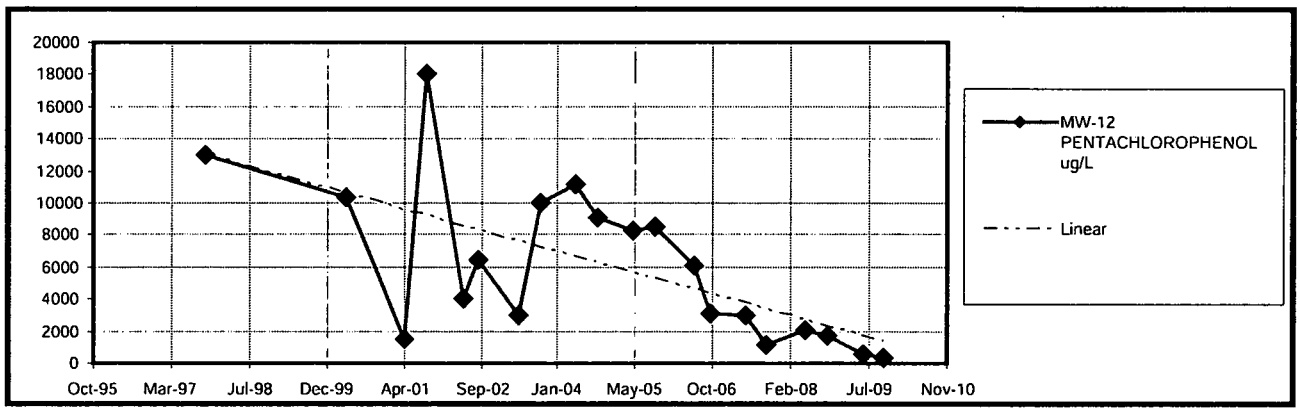
FIGURE 7
MW-10 PCP Concentration



MW-12

Monitoring well MW-12 located in the semiconfined aquifer has shown wide fluctuations in PCP during groundwater collection periods, as shown in Figure 8. Overall, PCP has declined from a concentration of 18,000 µg/L in September 2001 to 295 µg/L in the most recent sample in October 2009. Free product has never been observed in this well.

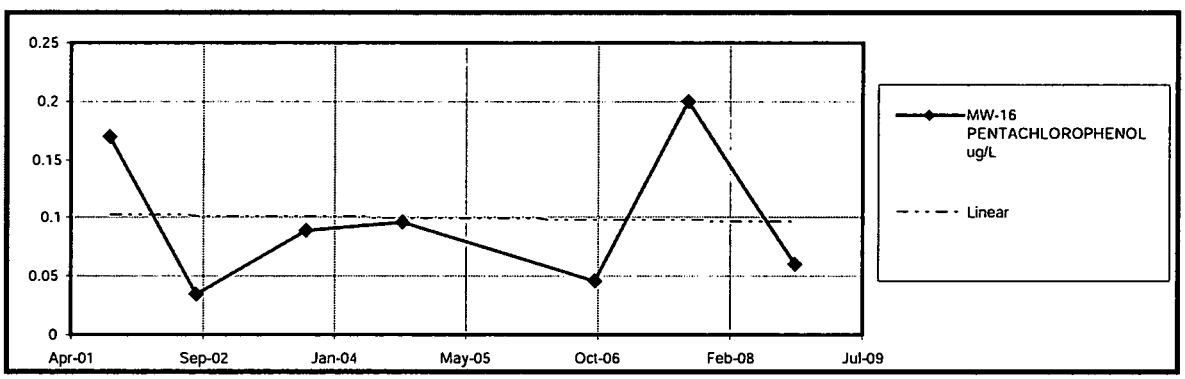
FIGURE 8
MW-12 PCP Concentration



MW-16

Monitoring well MW-16 has shown very low concentrations of PCP or no PCP during groundwater collection periods, as shown in Figure 9. The highest concentration of PCP was observed at 0.2 µg/L in September 2006. PCP was not detected in October 2009. Free product has never been observed in this well. MW-16 is an unconfined well located just outside of the areas with LNAPL present.

FIGURE 9
MW-16 PCP Concentration

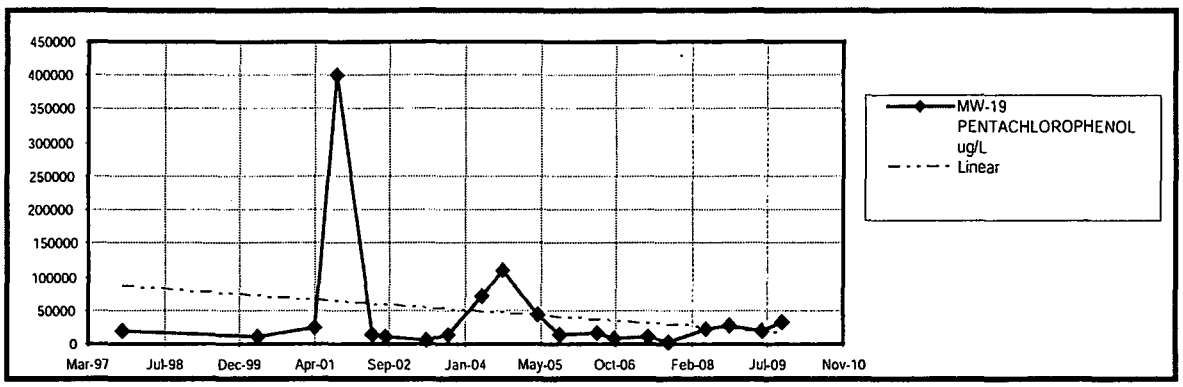


MW-19

LNAPL has been present in MW-19 since monitoring began, and any entrainment of LNAPL droplets in the sample will have notable effects on PCP concentrations, impacting the evaluation of PCP trends. The LNAPL resulted in large variations in PCP concentrations (see Figure 10) that were not indicative of the dissolved phase groundwater concentrations. LNAPL was measured in MW-19 in June 2009 at a thickness of 1.60 feet and a thickness of 1.46 feet in October 2009. The PCP concentrations were measured at 18,600 µg/L in June 2009 and 31,800 µg/L in October 2009, which is similar to what was observed in 2008. Although variability of PCP concentrations in samples collected from wells with LNAPL is expected, the variability of PCP concentrations in this well appears reduced since the installation of dedicated sampling equipment in the well in 2005. This unconfined aquifer

well has not been exhibiting overall consistent drops in PCP over time, most likely because of the LNAPL providing a continual source of PCP.

FIGURE 10
MW-19 PCP Concentration



2.2.4 Naphthalene

Naphthalene was detected in one monitoring well at a level above the reporting limit in 2009: MW-19 with concentrations of 110 µg/L in June 2009 and 137 µg/L in October 2009. The concentration has decreased from 5,260 µg/L to 110 µg/L in MW-19 since 2000.

2.2.5 BTEX

BTEX compounds were detected above the reporting limits at eight monitoring wells in 2009 (MW5, MW-7, MW-10, MW-12, MW-15, MW-19, MW-22 and MW-26). Benzene was not detected in any well. Xylene was detected in MW-05 and MW-07 at a concentration of 0.14 µg/L. Several others have had minor detections.

MW-10

Since 2004, a decrease in concentrations has been observed. The concentration of ethylbenzene has decreased from 5.58 µg/L to 0.072 µg/L, toluene has decreased from 8.09 µg/L to 0.073 µg/L and xylene has decreased from 47.1 µg/L to 0.41 µg/L .

MW-12

The concentrations have remained relatively constant over time. Since 2004, the ethylbenzene concentration has ranged from 1.39 µg/L to 0.073 µg/L and xylene concentrations has ranged from 11.2 µg/L to 0.28 µg/L.

MW-19

The concentrations have remained relatively constant over time. Since 2002, the ethylbenzene concentration has ranged from 2 µg/L to 7.93 µg/L, toluene concentration has ranged from 1 µg/L to 6.66 µg/L, and xylene concentration has ranged from 29 µg/L to 74.6 µg/L.

Ethylbenzene was detected in MW-15 (0.21 µg/L), MW-22 (0.22 µg/L) and MW-26 (0.3 µg/L). None of these wells detected ethylbenzene in the past.

2.2.6 Dissolved Metals

In previous years, both total and dissolved metals analyses were performed on samples collected from monitoring wells. Suspended solids often have a significant impact on total metals concentrations; therefore, total metal concentrations may not be indicative of actual groundwater conditions. Beginning in 2006, total metals analyses were removed from the sampling plan, as they are often biased high as a result of the frequent presence of suspended solids. Dissolved arsenic, copper, iron, manganese, and zinc were sampled in June and October 2009.

Arsenic

Dissolved arsenic was not detected in any of the monitoring wells sampled.

Copper

Dissolved copper was not detected in any of the wells in June 2009. Dissolved copper was detected in one monitoring well in October 2009: MW-22, with a concentration of 13.1 µg/L, below the WDNR PAL of 130 µg/L.

Iron

In June and October 2009, dissolved iron was detected above the WDNR Enforcement Standard (ES) of 0.3 milligrams per liter (mg/L) in the following wells: MW-03, MW-05, MW-07, MW-10, MW-12, MW-15, MW-16, MW-22 and MW-26, with concentrations ranging from 0.301 mg/L (MW-15) to 6 mg/L (MW-05). In addition, dissolved iron was detected in MW-02 at 0.129 mg/L, MW-13 at 0.0661 mg/L, MW-17 at 0.16 mg/L and MW-19 at 0.237 mg/L, below the WDNR ES of 0.3 mg/L. An increase in iron concentrations was observed both at the plume interior wells and at the perimeter wells in 2009. Elevated iron concentrations are an indicator of natural attenuation; therefore, the elevated concentrations suggest natural attenuation is occurring.

Manganese

In June and October 2009, dissolved manganese exceeded the WDNR ES of 0.05 mg/L at six wells (MW-05, MW-07, MW-10, MW-12, MW-19, and MW-22) ranging from 0.109 mg/L (MW-07) to 11.8 mg/L (MW-05). An additional two monitoring wells (MW-03 and MW-16) had dissolved manganese detected at concentrations ranging from 0.0124 mg/L to 0.0486 mg/L below the WDNR ES of 0.05 mg/L. Elevated manganese concentrations are an indicator of natural attenuation. Both plume interior wells and perimeter wells reported slightly higher manganese concentrations in 2009 than 2008. The increase in manganese concentrations in wells throughout the site suggests that natural attenuation is occurring.

Zinc

Dissolved zinc was not detected in any of the monitoring wells sampled.

2.2.7 Natural Attenuation Parameters

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, and 2000 through 2009.

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 the limitations that exist in measurement methods. Installation of the new dedicated Grundfos© Redi-Flo 2 MP1 pumps in 2005 has greatly reduced the potential for measurement-induced errors in natural attenuation parameters. Use of these dedicated pumps minimizes suspended solids in samples and decreases aeration during sample collection. Dedicated downhole Grundfos© Redi-Flo 2 pumps are installed in MW-03, MW-05, MW-07, MW-10, MW-12, MW-17, MW-19, and MW-26.

Oxidation/Reduction

Evaluation of the data generated during 2009, suggested that areas at the perimeter or outside the PCP plume are under slight to strong oxidizing conditions as shown by elevated oxidation-reduction potential (ORP). ORP measurement at wells in the most concentrated area of the PCP plume (greater than 1,000 µg/L) have not been able to be measured because of the possibility of LNAPL affecting the field measurements. It is expected that the wells within the most concentrated area of the PCP plume would exhibit reducing conditions. This is supported by reducing conditions measured in MW-5, located near the fringe of the PCP plume.

Chloride

Elevated chloride concentrations are an indicator of PCP degradation. About 700 µg/L of chloride is produced for each 1,000 µg/L of PCP degraded. Generally, chloride is higher at the plume interior wells than at the perimeter wells. In 2009, the semiconfined wells had chloride levels ranging from 6.54 mg/L (MW-17) to 53.8 mg/L (MW-03). The unconfined wells ranged from 1.97 mg/L (MW-02) to 203 mg/L (MW-26 which is located near the infiltration basin). Historically, MW-03 and MW-21 reported the highest chloride levels, possibly because of their proximity to the highway where influence from seasonal road salting may have caused 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 2009, nitrate levels remained relatively low, ranging from non-detectable (less than 0.05 mg/L) to 5.33 mg/L (MW-15), and remaining comparable to concentrations observed in 2008.

Methane

Methane, a product of anaerobic degradation, was detected in five wells in October 2009 (MW-03, MW-05, MW-07, MW-10, and MW-19) at low concentrations ranging from 0.002 to 0.0210 mg/L. The absence of methane at or above the detection limit in most wells suggests that degradation is occurring primarily under nonmethanogenic, anaerobic, or sulfate-reducing conditions.

Sulfate

Once oxygen and nitrate are depleted, sulfate can also be used as an electron acceptor. Sulfate continues to fluctuate within the plume and has not shown any clear trends. Sulfate levels in 2009 were similar to previous years.

2.2.8 Groundwater Quality near the Infiltration Basin

Large quantities of treated groundwater have been discharged at the site's infiltration basin since the beginning of operation. Approximately 136 million gallons (MG) of groundwater have been re-infiltrated from 2000 through 2009. The water would be expected to displace groundwater over a considerable area. The re-infiltration of the treated groundwater helps to maintain a water balance to offset the extracted volume of water.

Unconfined Aquifer

MW-26 is used to determine the effects that the infiltration basin has on the unconfined aquifer in the area. PCP, methane, manganese, and iron concentrations in MW-26 have remained similar to background levels, as would be expected for the discharge of treated groundwater. Nitrate concentrations have dropped as expected because the source area groundwater has minimal nitrate. Sulfate concentrations have increased from a background value of less than 10 mg/L to a high of 235 mg/L in October 2008. Sulfate was reported as 212 mg/L in October 2009. Significant anaerobic degradation is not occurring near the infiltration basin (MW-26) to deplete the sulfate.

The water discharged at the infiltration basin had been previously extracted from an area of high PCP concentrations and treated to remove dissolved PCP. Chloride does not change significantly during the treatment of the extracted groundwater. A baseline chloride concentration was not measured in MW-26 before the operation of the groundwater treatment system. However, chloride concentrations decreased from 30 mg/L in 2001 to 11 mg/L in 2003 while the treatment system was shut down for renovations. Chloride concentrations increased after the treatment system was restarted in 2004, and have ranged from 17 to 29 mg/L with the most recent concentration of 20.7 mg/L in October 2009.

Semiconfined Aquifer

MW-17 is used to determine the effects of the infiltration basin on the semiconfined aquifer. MW-17 is sampled annually for PCP and natural attenuation parameters. PCP, methane, manganese, and iron in MW-17 have remained similar to background levels. Nitrate concentrations have dropped, as explained above, because the source area groundwater has minimal nitrate. Sulfate concentrations have decreased from a background value of less than 10 mg/L to 6.86 mg/L in October 2009. The water discharged at the infiltration basin was extracted from an area of high PCP concentrations and treated to remove dissolved PCP. Chloride does not change significantly during the treatment of the extracted groundwater. The background chloride level of 4.8 mg/L measured in 1997 has decreased to 2.5 mg/L in October 2009.

Another benefit of re-infiltrating groundwater is that treatment results in aeration and re-oxygenation of the groundwater. Dissolved oxygen has generally increased in MW-17. A groundwater divide in the semiconfined aquifer exists at the location of the infiltration basin; therefore, a portion of this oxygenated water should flow towards the extraction wells and the PCP plume and provide a supply of oxygen for aerobic biodegradation of the PCP.

2.3 Summary

Groundwater treatment system operation and optimization has led to continuous capture of site contaminants. Similar to previous years, the capture zone can be observed in potentiometric surface maps from data collected in June 2009 and October 2009, in both the unconfined and semiconfined aquifers.

LNAPL is present in four unconfined aquifer wells (MW-10S, MW-18, MW-19, and MW-20) and is at or near the largest historic thicknesses observed at the site. The increased thickness in LNAPL is consistent with accumulation in the capture area caused by groundwater extraction drawdown. The appearance of large thicknesses is also due in part to the declining water levels at the site attributed to drought conditions in Northern Wisconsin in the past decade. The LNAPL thickness does appear to be stabilizing in several wells in the most recent measurements.

Results from the residential well and potable well sampling in June 2009 and October 2009, indicate that PCP, BTEX or naphthalene are not present in any residential wells or in the onsite potable well.

The PCP plume exceeding 1,000 µg/L has stayed relatively stable in the unconfined aquifer and is centered on the CAMU around the wells that have exhibited LNAPL historically (MW 20, MW 19, MW-10S and MW-18). The 1 µg/L plume in the unconfined aquifer has shrunk significantly since 1994, where it extended out to MW-13 and currently occupies nearly the same footprint as the 1,000 µg/L plume. The unconfined PCP plume is greatly affected by the presence of LNAPL and, therefore, further reductions in PCP concentrations will most likely be minimal until more LNAPL is removed from this area.

The PCP plume in the semiconfined aquifer shrunk significantly in recent groundwater events. The 1,000 µg/L completely disappeared in the 2009 plume map because of the rapid decline of concentrations in wells MW-12 and MW-10. The 1 µg/L plume in the semiconfined aquifer has shrunk significantly over time and now appears only around the CAMU area where the highest PCP contamination is present.

There has been a significant reduction in PCP concentrations that can be observed through the steady decline of influent concentrations of the treatment system. There have also been large PCP and LNAPL mass removals as a result of treatment system operation. These topics are discussed in detail in Sections 3 and 4. More rapid plume remediation continues to be limited by the continued dissolution of PCP from the LNAPL. Naphthalene and BTEX were present in several wells in the area of elevated 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 to those in 2007.

2.4 Recommendations

A monitoring well reduction to the sampling program was proposed in 2007, to lessen redundant data and it is recommended that the reduced sampling program be continued in 2010.

SECTION 3

Treatment System Operation and Maintenance

The treatment system at the Penta Wood Products Site consists of groundwater extraction and treatment, LNAPL recovery, and bioventing. The groundwater extraction system extracts and treats groundwater containing dissolved phase PCP and depresses the groundwater table exposing more of the LNAPL smear zone. The bioventing system was installed to provide oxygen for the aerobic biodegradation of residual diesel fuel petroleum hydrocarbons and PCP in the LNAPL smear zone. The depressed groundwater table also causes the LNAPL to pool near the LNAPL extraction wells.

Groundwater treatment system discharge monitoring is performed in accordance with the Wisconsin Pollutant Discharge Elimination System (WPDES) permit dated November 2007.

The following sections describe the performance and activities related to the operation of the groundwater extraction and bioventing system.

3.1 Groundwater Extraction System

The groundwater extraction system was operated between September 27, 2000, and September 27, 2001. After 1 year of operation, the system was shut down and the groundwater treatment system was redesigned to include additional pretreatment. The groundwater treatment system was restarted on February 27, 2004, after construction activities were completed. The groundwater treatment system operated intermittently from February to mid-July 2004, and began consistent operation starting in late July 2004. From 2004 through 2009, the extraction system operated consistently with the exception of shutdowns for routine maintenance and service or as a result of system alarms.

The following section describes the groundwater extraction system performance, which includes the estimates of groundwater and PCP extracted, operational and maintenance items, and a discussion of the LNAPL and groundwater extraction wells.

3.1.1 Groundwater Extraction and LNAPL Removal Performance

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 MG of groundwater, or roughly 2 pore volumes of the extraction zone, was removed. PCP influent concentrations were typically in the 5,000 to 14,000 µg/L range. Based on this information, the estimated PCP mass removed was about 2,500 pounds (lbs) (Table 4). The estimated PCP mass removed from the groundwater in 2009 was approximately 445 lbs and 7,473 lbs since the groundwater extraction began in 2000 (Table 4).

In addition to the PCP mass removed through groundwater extraction, PCP mass is removed through the extraction of LNAPL. The volume of liquid waste that was extracted through the LNAPL recovery system can be used to make a rough estimate of the mass of PCP removed by LNAPL extraction. Plant operation through 2009, recovered approximately

38,765 gallons of liquid waste were captured in the separator and disposed of offsite. Before 2008, approximately one half of the liquid waste was water. Continued optimization resulted in relatively pure waste oil being removed from the subsurface and disposed of offsite. 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 1,783 lbs of PCP present in LNAPL removed in 2009 (Table 5).

TABLE 4
PCP Mass Removed with the Groundwater Extraction System
Penta Wood Products Site

Operation Period	Volume of Groundwater Extracted (gallons)	Average PCP Influent Concentration (µg/L)	PCP Mass Removed (lbs)
09/27/00 to 12/18/00	11,712,960[a]	12,535	1,224
02/02/01 to 02/08/01	691,200[a]	12,535	72
03/16/01 to 06/10/01	9,288,000[a]	10,356	802
06/15/01 to 09/27/01	6,822,720[a]	7,535	429
Total PCP Mass Removed from 2000 to 2001			2,527
02/27/04 to 12/31/04	18,548,154	9,227	1,427[b]
01/01/05 to 12/31/05	21,374,796	7,300	1,301[b]
01/01/06 to 12/31/06	14,759,392	6,425	791[b]
01/01/07 to 12/31/07	16,551,336	3,557	491
01/01/08 to 12/31/08	18,118,696	3,255	492
01/01/09 to 12/31/09	18,533,648	2,883	445
Total PCP Mass Removed 2000 to 2009			7,473

Notes:

[a] Volumes are estimated
[b] Values were revised based on measured volumes. Values previously reported were based on estimated volumes.

TABLE 5
PCP Mass Removed from the Free Product Recovery System
Penta Wood Products Site

Operation Period	Amount of Liquid Extracted (gal)	Amount of NAPL Extracted (gal)	Amount of Fuel Oil Removed[c] (gal)	Amount of PCP Removed[d] (gal)	Amount of PCP Removed[d] (lb)
2004	7,640	3,820 [a]	3,629	191	1,338
2005	3,404	1,702 [a]	1,617	85	596
2006	7,550	3,775 [a]	3,586	189	1,322
2007	11,079	5,540 [a]	5,263	277	1,940
2008	4,002	4,002 [b]	3,802	200	1,402
2009	5,090	5,090 [b]	4,836	255	1,783
			17,897	**1,196**	**8,382**

Notes:

[a] Assumes 50% of the extracted liquid is LNAPL

[b] Assumes 100% of the extracted liquid is LNAPL based on system optimization and observations of waste in storage tank.

[c] Assumes LNAPL is 95% of the fuel oil.

[d] Assumes LNAPL is 5% PCP.

In accordance with WPDES permit, PCP concentrations in the influent were measured quarterly and are summarize in Table 6.

The remaining PCP mass in the aquifer matrix is adsorbed on the aquifer matrix, dissolved in the groundwater, and present as in the LNAPL residual zone. The estimated LNAPL remaining in the aquifer matrix (such as soil) and dissolved in the groundwater is shown in Table 7. The estimated PCP mass remaining in the LNAPL is shown in Table 8. It should be noted that the contaminant mass estimates are based on many simplifying assumptions and expected to be accurate only to within a one order-of-magnitude range. As a result, the estimates are intended for general comparisons of the relative significance of contaminant mass in different media. Table 8 summarizes the PCP mass estimates (remaining and removed) for 2009.

Since the system was restarted in 2004, the system extracted over 107 MG of groundwater, or approximately 6 pore volumes. In 2009, the system extracted over 18 MG (over 1 pore volume) and groundwater extraction rates averaged 51gpm while the system was operating. The effective extraction rate over 2009, which includes time for when the extraction wells were not operating, was 38 gpm. With consistent operation, the groundwater extraction system maintained capture of the PCP plume as discussed in the previous section.

TABLE 6
Quarterly PCP Influent Concentrations
Penta Wood Products Site

Date	Influent PCP Concentration (µg/L)
March 2009	3,560
July 2009	3,140
September 2009	2,800
December 2009	2,030

As a result of the system operation, there has been a significant reduction in the annual average PCP influent concentrations since the system was initially started in 2004 (result in November 2004 was 9,140 µg/L).

3.1.2 Groundwater Treatment System Operation and Maintenance

Continued groundwater treatment system optimization since 2008, led to a reduction in carbon changeout frequency, eliminating the need for partial carbon change outs, and decreasing disposal costs. Optimization of the dosage and monitoring of the pretreatment chemical addition resulted in reduced solids loading to the carbon vessels and extended the operating time between carbon change outs. The treatment system can operate 16 to 20 weeks and treat 8.0 MG of water before requiring change out of the lead carbon vessel. In 2007, carbon change outs on the lead 10,000-lb carbon vessels were required every 4 to 5 weeks and typically only treated 2.5 MG of water because of excessive pressure loss in the carbon vessels. The pressure loss was because of solids accumulating in the upper portion of the vessel and resultant clogging of the carbon pore spaces. A total of three carbon changeouts were completed in 2009.

3.1.3 LNAPL Extraction Wells Operation and Maintenance

LNAPL removal performance was improved by routinely adjusting the LNAPL pump depth to account for water level fluctuations. The LNAPL pumps have the intake at the top of the pumps and if the water level changes significantly, the pump depth may be too deep or shallow and pump only water or not pump at all. Therefore, the LNAPL pumps were raised or lowered on a monthly basis in 2009, to ensure the pump was at the appropriate depth. In order to allow this activity to be performed by the site operator easily and safely, a winch was installed and connected to the LNAPL pumps.

TABLE 7
Estimate of PCP Mass Remaining in Soil and Groundwater for 2009
Penta Wood Products Site

Contaminant	Parameter	Unconfined MW-10S, 19, 20 (Area 1)[abc]	Unconfined MW-6S, PW01 (Area 2)[d]	Unconfined MW-3 (Area 3)	Unconfined MW-16 (Area 4)	Semiconfined MW-5,10,18 (Area 1)	Semiconfined MW-6, PW-01 (Area 2)	Semiconfined MW-3 (Area 3)[b]	Semiconfined MW-12 (Area 4)	Total Contaminant Mass (lb)
	Aquifer Media Volume (ft^3):	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 (ft^3):	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 2009 (5th Year Following Groundwater Extraction System restarted in February 2004) Based on Groundwater Sampling in October 2009										
PCP	Conc. (µg/L)	31,800		0.1	0.1	127		0.1	295	
K_d[e] = 0.60	Mass in soil (lb)	7,502	0	0	0	50	0	0	201	7,800
	Mass in GW (lb)	2,804	0.0	0.0	0.0	18.6	0.0	0.0	74.9	2,900
	Total Mass (lb)	**10,306**	**0.0**	**0.0**	**0.0**	**68**	**0**	**0.0**	**275**	**10,700**

Notes:

[a]LNAPL product present in all three wells in this subarea.

[b]MW-10S could not be sampled during the October 2009 sampling event.

[c]MW-20 could not be sampled during the October 2009 sampling event.

[d]MW-6S could not be sampled during the October 2009 sampling event.

[e]K_d from Hydrogeologic Investigation, December 1994.

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.

Soil density = 1.78 g/cm^3; ft^3 = cubic feet; GW = groundwater

TABLE 8
Summary of 2009 PCP Mass Estimates
Penta Wood Products Site

Penta Wood Products Site	PCP Mass (lb)	Notes
PCP Mass Remaining		
LNAPL Residual Zone	6,000	Based on original mass less the mass estimated from recovered LNAPL.
Soil (Saturated zone – Adsorbed)	7,800	Based on groundwater concentration and a PCP K_d of 0.6.
Groundwater (saturated zone – dissolved)	2,900	Based on weighted average groundwater concentrations.
Total PCP Mass Remaining	16,700	
PCP Mass Removed		
Removed by LNAPL Recovery System through 2009	8,382	Assuming LNAPL is 5% PCP and based on actual LNAPL recovered.
Removed by GW Extraction System through 2009	7,473	Estimate was revised based on actual GW extraction volumes and concentrations from 2004 through 2009 (see Table 4).
	14,395	

Note: Remaining 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.

3.2 Bioventing System

The bioventing system was installed to provide oxygen for the aerobic biodegradation of residual diesel fuel petroleum hydrocarbons and PCP in the LNAPL smear zone. As the groundwater extraction system extracts and treats groundwater containing dissolved phase PCP, the groundwater table is depressed, which exposes more of the LNAPL smear zone to the air supplied by the bioventing system.

The bioventing system was first started September 24, 2007. Due to the increases of methane and the frozen ground surface (which prevents upward release of the methane and may result in a lateral spreading of the methane to nearby residences), the biovent system is shut down during the winter months. The system is restarted after the spring ground thaw. In 2009, the biovent system was restarted on May 6, 2009 and operated until November 5, 2009 when the bioventing system was shut down for the winter. In June 2009, the biovent operation was modified to reduce the operating time to 5 days per month. Evaluation of the monitoring data showed that oxygen levels can reach saturation levels within the first several days of blower operation and during one month of not operating, only a small decrease in the oxygen levels are observed. The effectiveness of the biovent, therefore, is not compromised by this pulsed operation, which can provide a reduction in operation costs through the lowered energy consumption.

3.2.1 Soil Gas Monitoring

Since startup of the bioventing system, carbon dioxide and methane levels have decreased in the bioventing wells; however, the oxygen levels at SG-07S and SG-22 located within the wood chip area have remained at low percentages relative to the other monitored wells. Intermediate wells, deep wells, and shallow wells located outside of the wood chip area have exhibited similar changes in gas composition including increasing oxygen levels and decreasing carbon dioxide levels throughout the months of bioventing activity. Oxygen has generally stabilized for each well at approximately 20 percent. Methane has not been detected or has been found at low concentrations in these wells after the initial startup. No major temperature changes have been observed that would cause concern for a potential fire hazard. Table 9 provides a summary of the baseline measurements prior to startup, measurements right after the biovent system was turned on after the winter, and measurements one month prior to winter shutdown.

Operation of the bioventing system with methane still present in the subsurface during the winter months is a safety concern because the frozen ground surface would result in greater lateral methane migration, possibly to the thawed ground below the treatment building. Because the most important objective of the bioventing system (to maintain oxygen concentrations above 5 percent at the deepest portions of the unsaturated zone where a smear zone of LNAPL is present) was being met with the system off and because of the potential safety hazard, the bioventing system was turned off on November 5, 2009 for the winter.

TABLE 9
Bioventing System Soil Gas Measurement Summary
Penta Wood Products Site

Well ID	O_2 (%)			CO_2 (%)			CH_4 (%)		
	Baseline (09/21/07)	Startup from Winter Shutdown (05/6/09)	1 Month Prior to Winter Shutdown (09/30/09)	Baseline (09/21/07)	Startup from Winter Shutdown (05/06/09)	1 Month Prior to Winter Shutdown (9/30/09)	Baseline (09/21/07)	Startup from Winter Shutdown (05/06/09)	1 Month Prior to Winter Shutdown (9/30/09)
Shallow									
SG-04S	21.2	20.5	20.7	0.1	0.1	0.6	0.1	0.0	0.1
SG-05S	17.8	19.4	19.4	1.7	0.2	0.8	0.0	0.0	0.0
SG-06S	17	20.6	20.8	2.3	0.0	0.1	0.0	0.0	0.0
SG-07S	4.3	0.2	0.5	28.5	20.8	24.5	14.1	12.3	12.5
SG-22	0.9[a]	1.0	2.6	27.3[a]	22.4	2.6	18.3[a]	8.3	8.7
Intermediate									
SG-04I	1.4	13.2	19.2	14.9	1.1	0.4	0.0	0.0	0.0
SG-05I	9.2	19.0	20.3	8.1	0.4	0.4	0.0	0.0	0.0
SG-06I	12.8	20.4	20.8	5.5	0.0	0.1	0.0	0.0	0.0
SG-07I	12.5	17.6	19.2	7.9	1.1	0.7	0.0	0.0	0.0
Deep									
SG-04D	1.7	9.1	19.0	14.6	4.9	0.5	0.0	0.0	0.0
SG-05D	1.6	18.9	20.0	14.7	0.4	0.3	0.0	0.0	0.0
SG-06D	6.1	19.6	20.7	11.7	0.3	0.2	0.0	0.0	0.0
SG-07D	2.0	18.4	18.8	16.5	0.8	0.6	0.0	0.0	0.0
Perimeter									
SG-23 (3 feet)	18.3	20.5	20.9	1.7	0.3	0.1	0.0	0.0	0.0
SG-24 (5 feet)	19.1	20.7	20.9	0.7	0.3	0.1	0.0	0.1	0.0
SG-25 (5 feet)	17.9	20.6	20.8	2.3	0.0	0.1	0.0	0.0	0.0
SG-26 (5 feet)	21.3	20.6	20.8	0.0	0.0	0.1	0.0	0.0	0.0

Note: [a] Reading after well was repaired.

3.2.2 Bioventing System Operation and Maintenance

Process measurements, such as air injection well flow rates and pressures, and vacuum before and pressure after the air injection blower are monitored periodically during the biovent operation. Measured pressures in each well stabilize at approximately 1 pound per square inch . Air flow rates for the deep bioventing wells (EW-02, EW-03, EW-04, EW-05, EW-06, and EW-07) were set between 300 and 430 standard cubic feet per minute (scfm). Air flow rates for each of the shallow bioventing wells (BV-08 and BV-09) were set at approximately 160 scfm. Deep wells were designed for a maximum flow of 500 scfm and shallow wells for a maximum of 200 scfm.

The biovent system was restarted on May 6, 2009, after the spring ground thaw. The system was shut down for the winter on November 5, 2009.

3.3 Summary

The groundwater extraction system operated from January 2009 through December 2009. More than 18 MG of groundwater, or over 1 pore volume, were removed from the extraction zone. An estimated 2,693 lbs of PCP were removed through the combination of LNAPL extraction (2,248 lbs) and dissolved-phase PCP in the extracted groundwater (445 lbs).

The system continued the streamlined operations that were put in place in 2008, that led to increased operation of the groundwater extraction system and enhancement of the groundwater capture. The capture zone observed in 2008 was maintained in 2009. LNAPL appears to be pooling in the area of the groundwater extraction wells because of the localized depression from the extraction wells.

The bioventing system operated for approximately 6 months in 2009. During that time, shallow wells within the wood chip area indicated decreases in methane and carbon dioxide concentrations, but oxygen concentrations increased only slightly in these wells. The intermediate and deep wells, and shallow wells located outside of the wood chip area exhibited similar changes in gas composition with each other and followed the pattern of increasing oxygen levels and decreasing carbon dioxide levels throughout the months of bioventing activity. Oxygen generally stabilized for each well at approximately 20 percent. Methane was not detected or was found at low concentrations in all of these wells.

The bioventing system was shut down for the winter because of concerns about methane migration with the frozen ground surface. However, based on the relatively low oxygen utilization rate observed during previous years, the oxygen is not expected to drop below the 5 percent minimum level for aerobic biodegradation in the deep and intermediate zones while the bioventing is down for the winter months.

Influent concentration of PCP from the groundwater extraction wells has declined over time from approximately 8,000 µg/L in 2004 to approximately 2,500 µg/L in 2009, resulting in an overall decline in mass of PCP removed from the groundwater extraction. The total amount of PCP removed from the environment by the LNAPL recovery and groundwater extraction systems through 2009 is nearly 16,000 lbs. A majority of this mass is estimated to be recovered from the LNAPL.

Trees planted during the previous year have had a 75 percent survival rate. Erosion at the site has been almost entirely halted; runoff basins have not been required to be cleaned because of siltation.

3.4 Recommendations

The bioventing system should continue to operate in 2010, in conjunction with the LNAPL recovery to maximize the biodegradation of LNAPL in the unsaturated zone. Soil gas monitoring will be performed and the bioventing system will be restarted in the spring after snow melts and the ground thaws. Soil gas measurements will be monitored during startup of the bioventing system in the spring and will then be measured at the start of the monthly operation.

Opportunities for continued optimization of the groundwater extraction and treatment system and LNAPL recovery operations will be evaluated throughout the year.

SECTION 4

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 10 summarizes the amount of waste generated and disposed of offsite.

TABLE 10
Hazardous Waste Generation Summary
Penta Wood Products Site

Manifest #	Date	Filter Cake (lbs)	Misc. Debris (lbs)	Carbon (lbs)	LNAPL (lbs)	Water (gal)	Yearly Total (lbs)
IL9408187	12/19/00				5,009		
IL9408188	12/19/00		200	6,000			
2000 Total (lb):		0	200	6,000	5,009*		11,209
WIK168068	08/28/01		400	3,600	4,239		
WIK169159	04/03/01			44,000			
WIK169160	04/03/01			8,500	1,927		
2001 Total (lb):		0	400	56,100	6,166*		62,666
WIK179411	01/08/02			40,000			
WIK179412	01/08/02		200	8,000			
WIK179225	04/04/02		200		3,083		
WIK298473	06/09/02		1,000		7,707		
IL10328513	06/25/02					3,328	
2002 Total (lb):		0	1,400	48,000	10,790*	27,756	87,946
WIK296620	10/30/03		600		3,083		
IL10329166	10/30/03					165	
2003 Total (lb):		0	600	0	3,083*	1,376	5,059
WIK359186	02/11/04		200	8,000			
WIK359185	02/12/04			38,000			
WIK359334	05/04/04			6,000			
2159985	05/19/04		1,200				
WIK359343	05/19/04	10,700					
WIK278209	05/19/04			10,000			

TABLE 10
Hazardous Waste Generation Summary
Penta Wood Products Site

Manifest #	Date	Filter Cake (lbs)	Misc. Debris (lbs)	Carbon (lbs)	LNAPL (lbs)	Water (gal)	Yearly Total (lbs)
WIK376767	06/07/04	24,000					
WIK376681	07/12/04	18,860					
WIK363235	08/05/04	19,140					
CWM0027842	08/10/04				25,500		
WIK363114	09/14/04	18,700					
WIK363151	10/20/04	15,660					
WIK361532	11/22/04		1,800	40,000			
WIK448461	11/22/04	24,900					
WIK361540	12/04/04				28,022		
WIK446853	12/29/04	24,000					
2004 Total (lb):		155,960	3,200	102,000	53,522*		314,682
WIK361592	01/19/05	26,520					
WIK361599	02/02/05	794	140	19,465			
WIK302737	03/09/05	28,100					
WIK390017	03/20/05			24,498			
WIK390019	03/21/05				23,847		
WIK390053	05/04/05		76	18,492			
WIK417972	05/05/05	28,540					
WIK390072	06/20/05	32,960					
WIK390144	07/14/05	5,320	787	19,138			
WIK390188	10/04/05	27,160					
WIK390189	10/04/05		287	23,394			
WIK511343	11/29/05	29,400					
2005 Total (lb):		178,800	1,290	104,987	23,847*		308,924
WIK511358	01/03/06				24,085		
WIK511369	01/24/06	28,500					
WIK511500	02/17/06		200	44,380			
WIK490587	04/05/06	30,760					
WIK490632	05/12/06		800	18,780			
WIK361872	06/20/06	27,080					

TABLE 10
Hazardous Waste Generation Summary
Penta Wood Products Site

Manifest #	Date	Filter Cake (lbs)	Misc. Debris (lbs)	Carbon (lbs)	LNAPL (lbs)	Water (gal)	Yearly Total (lbs)
WIK361873	06/20/06				28,807		
WIK490607	06/20/06		200	18,800			
WIK361868	08/14/06	26,300					
000598697JJK	10/19/06			54,560			
2006 Total (lb):		112,640	1,200	136,520	52,892*		303,252
000600742JJK	01/17/07	29,020					
000600929JJK	01/17/07			40,109			
000603373JJK	02/23/07		600	28,000			
000602277JJK	04/16/07	32,040					
000602276JJK	04/24/07			40,582			
000602279JJK	04/16/07				38,580		
000602527JJK	07/11/07	27,280					
002022149JJK	07/11/07		400	36,484			
001863373JJK	09/13/07	31,700					
002020673JJK	10/16/07			28,581			
003312957JJK	10/16/07		800	23,522			
001863387JJK	10/24/07	32,860					
001863395JJK	12/11/07	21,120					
001863397JJK	12/11/07				39,035		
003358750JJK	12/11/07		400	27,469			
003320508JJK	12/20/07			38,805			
2007 Total (lb):		174,020	2,200	263,552	77,615*		517,387
003358913JJK	01/21/08	21,200					
003320406JJK	03/11/08		1,122	2,000			
003320410JJK	04/03/08			18,922			
003320411JJK	04/08/08	33,680					
003320420JJK	05/13/08	35,380					
003320423JJK	06/16/08	26,280					
003320425JJK	06/16/08				28,036		
004042563JJK	07/16/08	34,260					

TABLE 10
Hazardous Waste Generation Summary
Penta Wood Products Site

Manifest #	Date	Filter Cake (lbs)	Misc. Debris (lbs)	Carbon (lbs)	LNAPL (lbs)	Water (gal)	Yearly Total (lbs)
004197187JJK	08/01/08		1,294	25,045			
004042592JJK	10/27/08	32,520					
004828691JJK	12/09/08	28,080					
004828690JJK	12/09/08		760	24,040			
2008 Total (lb):		211,402	3,176	70,007	28,036		312,621
004828714JJK	01/06/09	25,460					
004825706JJK	02/03/09	28,300					
004825713JJK	03/04/09	29,640					
004825730JJK	04/08/09		706	25,410			
004825728JJK	04/08/09	26,280					
004793713JJK	06/09/09	31,440					
004793715JJK	06/09/09				35,659		
005432433JJK	07/14/09	27,440					
005432439JJK	08/26/09		410	24,347			
005432450JJK	10/01/09	33,700					
003862596JJK	11/17/09	31,580					
2009 Total (lb):		233,840	1,116	49,757	35,659		320,372

Notes:

Miscellaneous 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
gal = gallon

*Volume shows represents amount disposed of offsite and is estimated to be approximately 50% pure LNAPL and 50 percent mixture of water and emulsified LNAPL.

The optimization of the extraction and treatment system and LNAPL recovery system has impacted the hazardous waste generated at the site per year. The amount of carbon disposed of in 2009 continued to decrease from the previous years because of the decrease in carbon change out frequency. The amount of filter cake generated is directly related to the

amount of water treated and has increased because of the increased volume of water being treated by the system. The amount of LNAPL disposal removed appears to have increased in volume in 2009 compared to 2008, largely because of improved maintenance on the extraction pumps and larger thickness of LNAPL because of containment efforts and declining water levels.

SECTION 5

Site Inspection and Maintenance

5.1 Community Relations

No community relations issues were encountered in 2009.

5.2 Site Condition

Trees planted in 2008 continued to be watered and fertilized. A few trees were lost over the winter, however, it was estimated that there was an overall 75 percent survival rate. Erosion at the site was almost entirely halted because of erosion control features that are maintained on the site and runoff basins did not require cleaning in 2009. Additional grass seed and fertilizer is placed around the site to increase the vegetative cover. The grass around the monitoring well, bioventing wells, and extraction wells was also mowed to maintain accessibility in more frequently travelled areas and to minimize biological hazards in these areas.

5.3 Health and Safety

A Health and Safety audit was performed from March 30, 2009 through April 3, 2009. The following are protective measures undertaken following the health and safety audit:

- Several sections of the Health and Safety Plan were updated including: tornado shelters, abrasive blasting, and Hazardous Communication training.
- A chain was installed across access point for LNAPL tank.
- Expired first aid kits were replaced and are currently inspected monthly.
- An exit sign was installed on interior door of the treatment plant.
- Updated labeling on electrical panel boxes was installed.
- Older fuel canisters were replaced with new Nation Fire Protection Agency approved containers.
- Lockout/tagouts for valves were ordered and replaced.
- Well vaults and secondary containments with confined space entry warning tags were labeled.
- Emergency shutoff valves were labeled.
- Carbon monoxide gas produced from an exterior generator was vented away from the building.

5.4 Recommendation

Health and Safety audits should be performed in 2010, to proactively review site operations and evaluate compliance with the health and safety procedures and regulatory requirements.

No new erosion controls at the site are recommended for 2010.

SECTION 6

References

CH2M HILL. 2000. Sampling and Analysis Plan. Revised April 2001.

CH2M HILL. 2005. Waste Handling Plan.

Appendix A
Analytical Results

Penta Wood
Dissolved Gas Results
June 2009 Groundwater Samples-Monitoring Wells

	Field Site Identifier:	01	01	01	01	01	01
	Field Sample Location:	MW-12	MW-12	MW-15	MW-19	MW-22	MW-26
	Sample Interval:	N/A	N/A	N/A	N/A	N/A	N/A
	Matrix:	Water	Water, Dup	Water	Water	Water	Water
	Sample Collection Date:	6/2/2009	6/2/2009	6/2/2009	6/2/2009	6/2/2009	6/2/2009
	Field Sample Identification:	09CP14-13	09CP14-14	09CP14-15	09CP14-16	09CP14-17	09CP14-18
	Laboratory Sample Identification:	09060110-08B	09060110-09B	09060110-03B	09060110-11B	09060110-06B	09060110-04B
Dissolved Gasses	**Units**						
METHANE	ug/l	0.8 UJ	0.8 UJ	0.8 UJ	3.9 J	0.8 UJ	0.8 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

Penta Wood
Dissolved Metal Results
June 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01
Field Sample Location:		MW-12	MW-12	MW-15	MW-19	MW-22	MW-26
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		6/2/2009	6/2/2009	6/2/2009	6/2/2009	6/2/2009	6/2/2009
Field Sample Identification:		09CP14-13	09CP14-14	09CP14-15	09CP14-16	09CP14-17	09CP14-18
Laboratory Sample Identification:		09060110-08C	09060110-09C	09060110-03C	09060110-11C	09060110-06C	09060110-04C
Dissolved Metals (Filtered)	**Units**						
ARSENIC	ug/l	2 U	2 U	2 U	2 U	2 U	2 U
COPPER	ug/l	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
IRON	ug/l	310 =	292 =	301 =	222 =	83.1 =	341 =
MANGANESE	ug/l	1,040 =	1,020 =	10 U	4,050 =	10 U	10 U
ZINC	ug/l	20 U	20 U	20 U	20 U	20 U	20 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

Penta Wood
Semivolatile Results
June 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01
Field Sample Location:		MW-12	MW-12	MW-15	MW-19	MW-22	MW-26
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		6/2/2009	6/2/2009	6/2/2009	6/2/2009	6/2/2009	6/2/2009
Field Sample Identification:		09CP14-13	09CP14-14	09CP14-15	09CP14-16	09CP14-17	09CP14-18
Laboratory Sample Identification:		09060110-08D	09060110-09D	09060110-03D	09060110-11D	09060110-06D	09060110-04D
Semivolatile Organic Compounds	**Units**						
NAPHTHALENE	ug/l	1.0 UJ	1.0 UJ	1.0 UJ	110 J	1.0 UJ	1.0 UJ
PENTACHLOROPHENOL	ug/l	521 J	489 J	0.1 UJ	18,600 J	0.1 UJ	0.1 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

Penta Wood
Volatile Results
June 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01
Field Sample Location:		MW-12	MW-12	MW-15	MW-19	MW-22	MW-26
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		6/2/2009	6/2/2009	6/2/2009	6/2/2009	6/2/2009	6/2/2009
Field Sample Identification:		09CP14-13	09CP14-14	09CP14-15	09CP14-16	09CP14-17	09CP14-18
Laboratory Sample Identification:		09060110-08A	09060110-09A	09060110-03A	09060110-11A	09060110-06A	09060110-04A
Volatile Organic Compounds	**Units**						
BENZENE	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UB
ETHYLBENZENE	ug/l	0.28 J	0.31 J	0.21 J	7.93	0.22 J	0.3 J
TOLUENE	ug/l	2.0 U	2.0 U	2.0 U	6.66	2.0 U	2.0 UB
XYLENES	ug/l	0.88 J	0.96 J	5.0 U	74.6	5.0 U	5.0 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

Penta Wood
Wet Chemistry Results
June 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01
Field Sample Location:		MW-12	MW-12	MW-15	MW-19	MW-22	MW-26
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water	Water, Dup	Water	Water	Water	Water
Sample Collection Date:		6/2/2009	6/2/2009	6/2/2009	6/2/2009	6/2/2009	6/2/2009
Field Sample Identification:		09CP14-13	09CP14-14	09CP14-15	09CP14-16	09CP14-17	09CP14-18
Laboratory Sample Identification:		09060110-08	09060110-0	09060110-03	09060110-11	09060110-06	09060110-04
Wet Chemistry	**Units**						
ALKALINITY, HYDROXIDE (AS CACO3)	mg/l	294 J	302 J	279 J	249 J	70 J	229 J
CHLORIDE (AS CL)	mg/l	12.3	12.4	13.5	12.8	6.92	203
HARDNESS (AS CACO3)	mg/l	363.3	429.3	375.2	317.6	99.6	414.7
NITROGEN, NITRATE (AS N)	mg/l	2.65 J	2.64 J	5.33 J	0.01 UJ	1.97 J	1.83 J
SULFATE (AS SO4)	mg/l	59.9	62.2	6.42	44.7	6.73	2,360
SULFIDE	mg/l	1 U	1 U	1 U	1 U	0.24 J	1 U
TOTAL ORGANIC CARBON	mg/l	3.6 J	1.7 J	1.7 UJ	13	1.7 UJ	1.7 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

Penta Wood
Dissolved Gas Results
October 2009 Groundwater Samples-Monitoring Wells

	Field Site Identifier:	01	01	01	01	01	01	01
	Field Sample Location:	MW-02	MW-03	MW-05	MW-07	MW-10	MW-10	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, Dup	Water
	Sample Collection Date:	10/6/2009	10/7/2009	10/7/2009	10/7/2009	10/7/2009	10/7/2009	10/6/2009
	Field Sample Identification:	10CP01-19	10CP01-20	10CP01-21	10CP01-23	10CP01-25	10CP01-26	10CP01-28
	Laboratory Sample Identification:	09100215-01G	09100291-01G	09100291-04G	09100291-06G	09100291-08G	09100291-07G	09100215-10G
Dissolved Gasses	**Units**							
METHANE	ug/l	0.83 UJ	21 J	17 J	2.4 J	17 J	23 J	0.83 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

Penta Wood
Dissolved Gas Results
October 2009 Groundwater Samples-Monitoring Wells

	Field Site Identifier:	01	01	01	01	01	01	01
	Field Sample Location:	MW-12	MW-13	MW-15	MW-16	MW-17	MW-19	MW-22
	Sample Interval:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Matrix:	Water, Dup	Water	Water	Water	Water	Water	Water
	Sample Collection Date:	10/6/2009	10/7/2009	10/7/2009	10/6/2009	10/6/2009	10/7/2009	10/6/2009
	Field Sample Identification:	10CP01-29	10CP01-27	10CP01-30	10CP01-31	10CP01-32	10CP01-33	10CP01-34
	Laboratory Sample Identification:	09100215-11G	09100291-03G	09100291-02G	09100215-02G	09100215-03G	09100291-05G	09100215-04G
Dissolved Gasses	**Units**							
METHANE	ug/l	0.83 UJ	0.83 UJ	0.83 UJ	0.83 UJ	0.83 UJ	2 J	0.83 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

Penta Wood
Dissolved Gas Results
October 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:	01
Field Sample Location:	MW-26
Sample Interval:	N/A
Matrix:	Water
Sample Collection Date:	10/6/2009
Field Sample Identification:	10CP01-35
Laboratory Sample Identification:	09100215-05G

Dissolved Gasses	**Units**	
METHANE	ug/l	0.83 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

Penta Wood
Dissolved Metal Results
October 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-02	MW-03	MW-05	MW-07	MW-10	MW-10	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, Dup	Water
Sample Collection Date:		10/6/2009	10/7/2009	10/7/2009	10/7/2009	10/7/2009	10/7/2009	10/6/2009
Field Sample Identification:		10CP01-19	10CP01-20	10CP01-21	10CP01-23	10CP01-25	10CP01-26	10CP01-28
Laboratory Sample Identification:		09100215-01E	09100291-01D	09100291-04D	09100291-06D	09100291-08D	09100291-07D	09100215-10E
Dissolved Metals (Filtered)	**Units**							
ARSENIC	ug/l	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
COPPER	ug/l	10 UJ	10 UJ	10 UJ	10 UJ	8.2 J	10 UJ	4 J
IRON	ug/l	129 J	722 J	6,000 J	687 J	1,210 J	704 J	307 J
MANGANESE	ug/l	10 UJ	12.4 J	11,800 J	109 J	2,230 J	2,310 J	987 J
ZINC	ug/l	20 UJ	20 UJ	20 UJ	20 UJ	20 UJ	20 UJ	20 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

Penta Wood
Dissolved Metal Results
October 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-12	MW-13	MW-15	MW-16	MW-17	MW-19	MW-22
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water, Dup	Water	Water	Water	Water	Water	Water
Sample Collection Date:		10/6/2009	10/7/2009	10/7/2009	10/6/2009	10/6/2009	10/7/2009	10/6/2009
Field Sample Identification:		10CP01-29	10CP01-27	10CP01-30	10CP01-31	10CP01-32	10CP01-33	10CP01-34
Laboratory Sample Identification:		09100215-11E	09100291-03D	09100291-02D	09100215-02E	09100215-03E	09100291-05D	09100215-04E
Dissolved Metals (Filtered)	**Units**							
ARSENIC	ug/l	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
COPPER	ug/l	4 J	3.2 J	3 J	6.6 J	10 UJ	3.8 J	13.1 J
IRON	ug/l	294 J	50 UJ	293 J	458 J	160 J	237 J	1,560 J
MANGANESE	ug/l	982 J	10 UJ	10 UJ	48.6 J	10 UJ	3,190 J	168 J
ZINC	ug/l	20 UJ	20 UJ	5.4 J	20 UJ	20 UJ	7.2 J	6.7 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

Penta Wood
Dissolved Metal Results
October 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:	01
Field Sample Location:	MW-26
Sample Interval:	N/A
Matrix:	Water
Sample Collection Date:	10/6/2009
Field Sample Identification:	10CP01-35
Laboratory Sample Identification:	09100215-05E

Dissolved Metals (Filtered)	**Units**	
ARSENIC	ug/l	2 UJ
COPPER	ug/l	3.8 J
IRON	ug/l	325 J
MANGANESE	ug/l	10 UJ
ZINC	ug/l	20 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

Penta Wood
Semivolatile Results
October 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-02	MW-03	MW-05	MW-07	MW-10	MW-10	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, Dup	Water
Sample Collection Date:		10/6/2009	10/7/2009	10/7/2009	10/7/2009	10/7/2009	10/7/2009	10/6/2009
Field Sample Identification:		10CP01-19	10CP01-20	10CP01-21	10CP01-23	10CP01-25	10CP01-26	10CP01-28
Laboratory Sample Identification:		09100215-01B	09100291-01A	09100291-04A	09100291-06A	09100291-08A	09100291-07A	09100215-10B
Semivolatile Organic Compounds	**Units**							
NAPHTHALENE	ug/l	0.996 UJ	0.997 UJ	0.998 UJ	0.999 UJ	0.998 UJ	0.996 UJ	0.995 UJ
PENTACHLOROPHENOL	ug/l	2.21 J	0.1 UJ	33.3 J	0.403 J	220 J	214 J	295 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

Penta Wood
Semivolatile Results
October 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-12	MW-13	MW-15	MW-16	MW-17	MW-19	MW-22
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water, Dup	Water	Water	Water	Water	Water	Water
Sample Collection Date:		10/6/2009	10/7/2009	10/7/2009	10/6/2009	10/6/2009	10/7/2009	10/6/2009
Field Sample Identification:		10CP01-29	10CP01-27	10CP01-30	10CP01-31	10CP01-32	10CP01-33	10CP01-34
Laboratory Sample Identification:		09100215-11A	09100291-03A	09100291-02A	09100215-02B	09100215-03B	09100291-05A	09100215-04B
Semivolatile Organic Compounds	**Units**							
NAPHTHALENE	ug/l	0.997 UJ	0.996 UJ	0.999 UJ	0.998 UJ	0.995 UJ	137 J	0.994 UJ
PENTACHLOROPHENOL	ug/l	289 J	0.16 J	0.1 UJ	0.1 UJ	0.1 UJ	31,800 J	0.1 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

Penta Wood
Semivolatile Results
October 2009 Groundwater Samples-Monitoring Wells

Field Site identifier:	01
Field Sample Location:	MW-26
Sample Interval:	N/A
Matrix:	Water
Sample Collection Date:	10/6/2009
Field Sample Identification:	10CP01-35
Laboratory Sample Identification:	09100215-05A

Semivolatile Organic Compounds	**Units**	
NAPHTHALENE	ug/l	0.997 UJ
PENTACHLOROPHENOL	ug/l	0.1 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

Penta Wood
Volatile Results
October 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-02	MW-03	MW-05	MW-07	MW-10	MW-10	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, Dup	Water
Sample Collection Date:		10/6/2009	10/7/2009	10/7/2009	10/7/2009	10/7/2009	10/7/2009	10/6/2009
Field Sample Identification:		10CP01-19	10CP01-20	10CP01-21	10CP01-23	10CP01-25	10CP01-26	10CP01-28
Laboratory Sample Identification:		09100215-01H	09100291-01F	09100291-04F	09100291-06F	09100291-08F	09100291-07F	09100215-10H
Volatile Organic Compounds	**Units**							
BENZENE	ug/l	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ETHYLBENZENE	ug/l	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.072 J	0.094 J	0.073 J
TOLUENE	ug/l	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.073 J	0.083 J	0.4 UJ
XYLENES	ug/l	1 UJ	1 UJ	0.14 J	0.14 J	0.41 J	0.49 J	0.28 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

Penta Wood
Volatile Results
October 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-12	MW-13	MW-15	MW-16	MW-17	MW-19	MW-22
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water, Dup	Water	Water	Water	Water	Water	Water
Sample Collection Date:		10/6/2009	10/7/2009	10/7/2009	10/6/2009	10/6/2009	10/7/2009	10/6/2009
Field Sample Identification:		10CP01-29	10CP01-27	10CP01-30	10CP01-31	10CP01-32	10CP01-33	10CP01-34
Laboratory Sample Identification:		09100215-11H	09100291-03F	09100291-02F	09100215-02H	09100215-03H	09100291-05F	09100215-04H
Volatile Organic Compounds	**Units**							
BENZENE	ug/l	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ETHYLBENZENE	ug/l	0.069 J	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	7.62 J	0.4 UJ
TOLUENE	ug/l	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	5.77 J	0.4 UJ
XYLENES	ug/l	0.28 J	1 UJ	1 UJ	1 UJ	1 UJ	60.7 J	1 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

Penta Wood
Volatile Results
October 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:	01
Field Sample Location:	MW-26
Sample Interval:	N/A
Matrix:	Water
Sample Collection Date:	10/6/2009
Field Sample Identification:	10CP01-35
Laboratory Sample Identification:	09100215-05H

Volatile Organic Compounds	**Units**	
BENZENE	ug/l	0.1 UJ
ETHYLBENZENE	ug/l	0.4 UJ
TOLUENE	ug/l	0.4 UJ
XYLENES	ug/l	1 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

Penta Wood
Wet Chemistry Results
October 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-02	MW-03	MW-05	MW-07	MW-10	MW-10	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, Dup	Water
Sample Collection Date:		10/6/2009	10/7/2009	10/7/2009	10/7/2009	10/7/2009	10/7/2009	10/6/2009
Field Sample Identification:		10CP01-19	10CP01-20	10CP01-21	10CP01-23	10CP01-25	10CP01-26	10CP01-28
Laboratory Sample Identification:		09100215-01	09100291-01	09100291-04	09100291-06	09100291-08	09100291-07	09100215-10
Wet Chemistry	**Units**							
ALKALINITY, TOTAL (AS CACO3)	mg/l	122 J	482 J	256 J	245 J	280 J	282 J	297 J
CHLORIDE (AS CL)	mg/l	1.97 J	53.8 J	8.59 J	12.2 J	9.82 J	9.84 J	13.7 J
HARDNESS (AS CACO3)	mg/l	190.6 J	581.46 J	344.62 J	396.43 J	369.28 J	347.47 J	509.63 J
NITROGEN, NITRATE (AS N)	mg/l	0.81 J	2.55 J	0.05 UJ	1.91 J	0.05 UJ	0.05 UJ	1.84 J
SULFATE (AS SO4)	mg/l	11.6 J	11 J	55.1 J	152 J	58.7 J	59 J	85.4 J
SULFIDE	mg/l	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
TOTAL ORGANIC CARBON	mg/l	5.33 J	3.42 J	3.5 J	14.5 J	4.68 J	2.13 J	3.83 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

Penta Wood
Wet Chemistry Results
October 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:		01	01	01	01	01	01	01
Field Sample Location:		MW-12	MW-13	MW-15	MW-16	MW-17	MW-19	MW-22
Sample Interval:		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix:		Water, Dup	Water	Water	Water	Water	Water	Water
Sample Collection Date:		10/6/2009	10/7/2009	10/7/2009	10/6/2009	10/6/2009	10/7/2009	10/6/2009
Field Sample Identification:		10CP01-29	10CP01-27	10CP01-30	10CP01-31	10CP01-32	10CP01-33	10CP01-34
Laboratory Sample Identification:		09100215-11	09100291-03	09100291-02	09100215-02	09100215-03	09100291-05	09100215-04
Wet Chemistry	**Units**							
ALKALINITY, TOTAL (AS CACO3)	mg/l	294 J	30 J	260 J	40 J	60 J	228 J	147 J
CHLORIDE (AS CL)	mg/l	13.7 J	2.12 J	12.9 J	6.35 J	6.54 J	14.3 J	7 J
HARDNESS (AS CACO3)	mg/l	468.19 J	45.46 J	294.28 J	81.869 J	295.228 J	271.39 J	106.54 J
NITROGEN, NITRATE (AS N)	mg/l	1.83 J	0.77 J	4.74 J	1.03 J	1.65 J	0.05 UJ	5.31 J
SULFATE (AS SO4)	mg/l	84.7 J	9.71 J	6.52 J	36.7 J	6.86 J	42 J	7.53 J
SULFIDE	mg/l	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
TOTAL ORGANIC CARBON	mg/l	3.25 J	13.9 J	1.49 J	1 UJ	1 UJ	20.4 J	8.62 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

Penta Wood
Wet Chemistry Results
October 2009 Groundwater Samples-Monitoring Wells

Field Site Identifier:	01
Field Sample Location:	MW-26
Sample Interval:	N/A
Matrix:	Water
Sample Collection Date:	10/6/2009
Field Sample Identification:	10CP01-35
Laboratory Sample Identification:	09100215-05

Wet Chemistry	**Units**	
ALKALINITY, TOTAL (AS CACO3)	mg/l	227 J
CHLORIDE (AS CL)	mg/l	20.7 J
HARDNESS (AS CACO3)	mg/l	491.28 J
NITROGEN, NITRATE (AS N)	mg/l	1.7 J
SULFATE (AS SO4)	mg/l	212 J
SULFIDE	mg/l	1 UJ
TOTAL ORGANIC CARBON	mg/l	1 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

Appendix B
Natural Attenuation Data

Pentawood 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)	Turbidity (ntu)	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								1.48	<0.005	<0.05	<2	<0.5	<0.05	66.9
DW-01	5/31/2005								1.5 J	<0.004 J	<0.05 J	6.5	<0.002	0.039 J	29 J
DW-01	5/10/2007								1.8	<0.01	<0.100	17 J	<0.002	0.074 J	29
DW-01	9/19/2007								1.5 J	0.0024 J	<0.100	14 J	<0.002	<0.093	27
DW-01	5/20/2008								NT	NT	NT	NT	NT	0.094 UJ	NT
DW-01	10/23/2008								1.79 J	0.0046 J	0.642 J	9.07	0.002 UJ	0.1 UJ	29.6
DW-01	6/3/2009								NT	NT	NT	NT	NT	<0.1	NT
DW-01	10/8/2009								NT	NT	NT	NT	NT	0.1 UJ	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	2.0	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		0.1	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	0.1	7
MW-01	4/29/2003	9.03	383	3.03	26.5	7.13	151.8		2.6	<0.005 J	<0.025	10.0	<0.0005	<0.1 J	4.3
MW-01	9/24/2003	9.22	349	10.23	89.2	7.16	322.6	53.2	2.61	0.036	0.1 J	<2	<0.0005	0.1	3.3
MW-01	5/4/2004	9.15	314	NR	93.8	7.05	217.0	NR	2.1 J	15.0 R	790 R	2.0 R		1.06 J	4.3 R
MW-01	9/21/2004	10.05	279	10.89	97.1	7.07	91.1	160	1.8 J	2.60 J	838.0	5.2 J		0.3	2.7
MW-01	5/10/2005	9.30	540	11.68	102.2	7.08	190.8	155	1.7 J	<0.01	<0.05	14 R	<0.002	0.1	3.6 J
MW-01	9/29/2005	8.96	282	12.12	105.1	7.15	154.6	217	1.9	0.0038 J	<0.05	16.0	<0.002	0.1	6.2
MW-01	5/31/2006	10.76	252	9.33	94.0	7.62	156.3	85	1.6 J	<0.01	<0.05	17.0	<0.002	0.049 J	2.3 J
MW-01	9/25/2006	Well Dry							Well Dry						
MW-01	5/8/2007	8.95	274	9.47	82.5	6.99	87.8	109	1.9 J	0.0063 J	<0.100	15 J	<0.002	0.11 J	2.2 J
MW-01	9/18/2007	9.81	274	11.33	100.6	6.74	180.5	67	3 J	<0.01	<0.100	12 J	<0.002	<0.093	9.4
MW-01	10/21/2008	8.70	276	9.78	84.0	7.17	226.0	58	1.62 J	0.01 UJ	0.388	6.19	0.002 UJ	0.42 UJ	3.91
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	Off Scale	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	Off Scale	1.4 J	0.0222 J	25800.00	4.0 R		1.26	12 J
MW-02	9/28/2005	10.27	358	8.95	88.0	6.26	156.2	Off Scale	<0.1	0.0093 J	0.07	27.0	<0.002	2.2 J	6
MW-02	9/26/2006	11.03	345	2.44	22.5	6.28	205.0	Off Scale	0.12	<0.0026	<0.05	20.0	<0.002	2.3	1.6 J
MW-02	9/19/2007	10.00	350	7.18	65.3	5.95	200.3	Off Scale	0.22 J	0.0065 J	<0.100	16 J	<0.002	3.7	3.6
MW-02	10/21/2008	10.23	299	9.55	92.3	6.37	184.3	395.00	1.1 J	0.0052 J	0.424 J	12.9	0.002 UJ	1.6 J	3.17
MW-02	10/6/2009	9.57	272	4.86	43.0	6.47	212.0	8.20	0.81 J	0.01 UJ	0.129 J	11.6 J	0.00083 UJ	2.21 J	1.97 J
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 measured							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	0.65	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	10.6	3.5 J	4.99 J	278.0	8.9 R		0.37	62 J
MW-03	9/28/2005	10.58	948	24.95	(*)	6.82	242.6	25.9	3.3	0.0067 J	0.1	24.0	<0.002	0.2 J	62.0
MW-03	9/25/2006	Well Dry										Well Dry			
MW-03	9/20/2007	Well Dry										Well Dry			
MW-03	10/21/2008	11.98	1129	1.26	11.8	6.80	63.4	72.8	2.73 J	0.0152 J	2.14	15.2	0.0049 J	0.1 UJ	60.5
MW-03	10/7/2009	12.34	1098	5.05	51.0	6.87	127.0	NR	2.55 J	0.0124 J	0.722 J	11 J	0.021 J	0.1 UJ	53.8 J
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
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	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	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	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		510	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	22.1

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Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm²)	DO (mg/L)	DO (%)	pH	ORP (mV)	Turbidity (ntu)	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	9/22/2004	11.80	749	8.43	82.8	6.53	-98.5	56.8	0.01 R	5,650 J	30.5	24 R		194	29 J
MW-05	9/28/2005	11.13	627	3.27	30.3	6.47	-60.4	0.98	<0.1	7.6	19.0	35.0	0.0230	1100 J	18.0
MW-05	9/26/2006	11.49	736	4.79	46.5	6.64	221.0	0.72	<0.1	8.0	23.0	27.0	0.0087 J	460	16.0
MW-05	9/20/2007	11.60	583	2.95	28.8	6.53	-68.9	0.80	0.1 UJ	7.6	25.0	39 J	0.0098	31	13.0
MW-05	10/22/2008	10.47	552	2.79	26.8	6.74	-73.0	1.08	0.05 UJ	9.7 J	10.5 J	24.8	0.011 J	206	8.68
MW-05	10/7/2009	13.43	631	3.30	29.8	6.69	-75.5	NR	0.05 UJ	11.8 J	6 J	55.1 J	0.017 J	33.3 J	8.59 J
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	Not measured. 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 measured 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 measured due to product in the well.							1.01	0.961	1.10	17	0.1300	0.33	23.9
MW-06S	9/27/2006	CAMU wells not measured							3.9	0.590	<0.05	18	0.0035 J	0.21	18.0
MW-06S	9/20/2007	10.81	569	6.24	57.0	5.86	86.9	NR	4.7 J	0.2	0.51	34 J	0.003	0.099	30
MW-06S	10/23/2008	10.68	227	8.83	79.5	6.60	245.0	NR	7.11 J	0.0653 J	0.438 J	11	0.002 UJ	2.65	28.3
MW-06S	10/8/2009	Well Dry							Well Dry						
MW-07	10/14/1997	10.13	709	8.23	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	5.82	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	7.54	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	208.0		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	1.97	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	14.5	3.4 J	9.75 J	1640 J	6.8 R		5.75	7.2 J
MW-07	9/27/2005	10.44	789	8.01	71.9	5.53	146.0	6.97	1.8	0.016	0.88	130 J	<0.002 J	<0.12	18
MW-07	9/27/2006	11.16	799	5.47	69.1	6.77	220.1	NR	1.8	0.068 J	<0.05	110	0.0043 J	0.087 J	15
MW-07	9/20/2007	10.55	771	7.43	67.2	6.69	120.5	(off scale)	1.5 J	0.022	0.26	170 J	0.0037	<0.093	16
MW-07	10/22/2008	10.26	911	8.76	78.4	7.16	112.3	835	1.54 J	0.0416 J	0.926 J	98.9	0.11 J	<0.1	14.1
MW-07	10/8/2009	10.29	811	10.28	96.1	7.33	183.6	(off scale)	1.91 J	0.109 J	0.687 J	152 J	0.0024 J	0.403 J	12.2 J
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	5.50	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	6.20	57.8	7.79	125.4	4.15	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	2.99	2.4 J	12.0 J	256	5.8 J	3.75 J	1.94	15
MW-08	9/28/2005	11.10	407	8.25	71.0	7.56	195.2	52.2	2.0 J	0.016	0.13	19	0.0026	0.031 J	20
MW-08	9/25/2006	Well Dry							Well Dry						
MW-08	9/20/2007	11.86	543	4.67	43.9	7.34	-50.4	28.0	1.5 J	0.013	0.21	76 J	<0.002	<0.093	21
MW-08	10/22/2008	10.77	560	5.42	48.9	7.61	25.0	30.4	1.92 J	0.0131 J	0.707 J	73.1	0.0008 J	<0.1	24.3
MW-09	10/8/1997	10.59	171	6.30	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
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	73.3	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	5.93	1.8 J	8.51 J	0.24 J	26 R	<10.0 J	2.92	3.2 J
MW-09	9/27/2005	10.45	168	(*)	--	4.33	333.6	0.76	1.9 J	0.0054 J	<0.05	20	<0.002 J	0.57	2.6
MW-09	9/25/2006	Well Dry							Well Dry						
MW-09	9/21/2007	9.85	199	7.20	65.2	5.24	239.5	1.50	3.8 J	0.0041 J	<0.100	15 J	<0.002	0.37	2.6
MW-09	10/22/2008	9.28	205	13.1	122.1	5.84	282.5	3.38	2.48 J	0.01 UJ	0.166 J	14.9	0.002 UJ	<0.1	3.44
MW-09	10/8/2009	Well needs redevelopment; pump was pulled							Well needs redevelopment; pump was pulled						
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

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Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm²)	DO (mg/L)	DO (%)	pH	ORP (mV)	Turbidity (ntu)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
MW-10	10/1/2003								<0.05	1.85	2.59	3	0.00062	9000	22
MW-10	9/23/2004	Not measured due to product in the well							0.0018 J	1.81	0.0241	18	<10.0	38000	38
MW-10	9/29/2005	Well Dry							Well Dry						
MW-10	9/27/2006	Not measured due to product in the well							<0.1	2.6	0.12	24	<0.002	23000 J	14
MW-10	9/20/2007	Not measured due to product in the well							0.68 J	2.7	0.55	25 J	0.0024	1700	20
MW-10	10/23/2008	Not measured due to product in the well							0.05 UJ	2.21 J	1.11 J	28.1	0.006 J	1630	12.4
MW-10	10/7/2009	Not measured due to product in the well							0.05 UJ	2.23 J	1.21 J	58.7 J	0.017 J	220 J	9.82 J
MW-10S	10/15/1997	13.18	339	10.49	100.0	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 measured due to product in the well							1.5	6.03	11.30	8.6	0.0006	49000	11
MW-10S	9/12/2001	Not measured 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 measured due to product in the well							3.41	5.9	<0.05	2	<0.0005	2200	6.7
MW-10S	9/22/2004	Not measured due to product in the well							3.6 J	3740 J	0.0227 J	15 R	<10.0 J	9490	24 J
MW-10S	9/29/2005	Not measured due to product in the well							2.0 J	3.9	<0.05	120 J	<0.002	<0.11	16
MW-10S	9/27/2006	Not measured due to product in the well							1.2	2.5	<0.05	79	<0.002	2700 J	8.6
MW-10S	9/20/2007	Not measured due to product in the well							1.3	1.3	<0.100	69 J	<0.002	24	8.7
MW-10S	10/23/2008	Not measured due to product in the well							Well Dry				0.002 UJ	Well Dry	
MW-10S	10/7/2009	Pump is set above water table; No sample collected							Pump is set above water table; No sample collected						
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	100.0		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	11.3	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	7.76	3.0 J	1.40 J	15.6	6.2 J	<10.0	0.0656	9
MW-11	9/29/2005	11.55	502	8.12	96.9	7.26	177.2	0.32	2.4 J	0.003 J	<0.05	9.7	<0.002	740 J	14
MW-11	9/27/2006	11.91	490	NR	53.8	7.82	159.2	0.16	0.53 J	<0.01 J	<0.05 J	8.8 J	<0.002 J	<0.11	16 J
MW-11	9/20/2007	11.83	520	5.05	47.5	7.54	75.7	0.28	2.4 J	<0.01	<0.100	19 J	<0.002	<0.093	20
MW-11	10/22/2008	11.93	546	6.93	64.6	7.64	208.7	0.20	2.26 J	0.01 UJ	0.533	17.8	0.002 UJ	0.27	19.9
MW-12	10/15/1997	10.16	1044	2.86	25.0	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 measured							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	7.0	6.72	110.0		0.67	1.68	<0.011	17		4300	40
MW-12	8/7/2002	12.21	920	NR	45.9	6.69	150.0		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	0.54	1.17	1.53	<0.05	<2	0.00049 J	10000	30.8
MW-12	5/4/2004	10.64	897	7.50	71.7	7.15	126.2		1.1 J	1480 R	52.7	14 R	1.34 J	11200 J	29
MW-12	9/22/2004	13.49	939	3.87	37.6	6.77	95.6	0.83	1.1 J	1230 J	53.9	12 R	<10.0 J	9060 J	26 J
MW-12	5/12/2005	11.24	1774	2.79	26.4	6.88	176.6	0.46	1.3 J	1.4	<0.05	16 R	<0.002	8300 J	23 J
MW-12	9/27/2005	11.67	760	0.70	6.4	6.56	169.3	4.28	1.1 J	1.3	<0.05	26 J	<0.002 J	8500 J	20
MW-12	6/7/2006	12.10	788	4.85	38.1	6.76	175.9	2.13	2.1 J	1.1 J	0.05 R	32	<0.002	6100 J	21 J
MW-12	9/26/2006	12.39	872	NR	41.5	7.07	214.1	1.29	1.9 J	1.2 J	<0.05	15 J	<0.002 J	3100	14 J
MW-12	5/9/2007	12.15	771	NR	NR	6.60	155.5	0.58	2.4 J	1.1	<0.100	37 J	<0.002	3000 J	13
MW-12	9/19/2007	11.85	737	3.19	30.6	6.79	144.8	1.27	2.8 J	0.82	<0.100	29 J	<0.002	1100	14
MW-12	5/20/2008	11.61	705	1.86	18.2	6.95	168.4	0.00	2 J	1.0	0.1 UJ	25	0.002 UJ	2100 J	12
MW-12	10/21/2008	10.23	706	3.44	31.7	7.06	110.2	0.50	2.96 J	1.14	0.927	31.8	0.002 UJ	1670 J	13.1
MW-12	6/2/2009	12.99	711	9.30	88.8	7.28	131.8	3.70	2.65 J	1.04	0.310	59.9	0.0008 UJ	521 J	12.3
MW-12	10/6/2009	10.97	742	4.88	44.8	7.00	184.4	0.37	1.84 J	0.987 J	0.307 J	85.4 J	0.00083 UJ	295 J	13.7 J
MW-13	10/8/1997	12.79	185	6.00	54.1	6.19	206.7		1.3	0.000027	0.0000067	1.4	<0.01	0.7	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	0.8	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	0.2	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	432	1.86	0.182	0.96	7	<0.0005	2.9	5.1
MW-13	9/21/2004	11.13	208	1.57	13.8	5.60	229.7	151	2.4 J	3.67 J	<0.124 J	6.4 R	<10.0 J	4.67	6.5 J

Pentawood Products Site
Natural Attenuation Trend Data
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Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm²)	DO (mg/L)	DO (%)	pH	ORP (mV)	Turbidity (ntu)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
MW-13	9/27/2005	12.48	168	(*)	NR	5.19	335.1	221	0.6	0.0071 J	<0.05	19	<0.002 J	0.85	3.1
MW-13	9/25/2006	Well Dry										Well Dry			
MW-13	9/18/2007	11.42	163	7.33	69.0	5.39	311.2	0.50	0.31 J	0.0063 J	<0.100	29 J	<0.002	0.53	2.9
MW-13	10/21/2008	10.50	142	11.66	105.9	5.87	196.4	167	0.45 J	<0.01	0.207	10.1	0.002 UJ	0.31 UJ	1.9 J
MW-13	10/7/2009	12.90	106	8.11	76.8	6.24	54.5	235	0.77 J	0.01 UJ	0.05 UJ	9.71 J	0.00083 UJ	0.16 J	2.12 J
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	26.1	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	4.11	3.2 J	0.976 J	36.70	3.9 J	<10.0	0.3	16.0
MW-15	9/29/2005	11.44	580	10.25	89.3	7.58	163.8	1.50	4.2 J	0.0016 J	<0.05	6	<0.002	<0.11	17.0
MW-15	9/27/2006	11.95	607	NR	89.5	7.84	118.3	3.68	4.7 J	<0.002 B	<0.05 J	5.9 J	<0.002 J	< 0.11	14 J
MW-15	9/19/2007	12.75	574	11.08	106.6	7.01	197.0	1.50	5.7 J	<0.01	<0.100	13 J	<0.002	<0.1	15
MW-15	5/20/2008	12.21	551	8.40	80.5	7.66	136.3	0.80	4.7 J	0.00052 J	0.100 UJ	6.6	0.002 UJ	0.18 J	14
MW-15	10/21/2008	11.78	575	7.56	70.2	7.54	98.6	1.27	6.05 J	<0.01	0.854	6.99	0.002 UJ	0.1 UJ	14.6
MW-15	6/2/2009	13.58	560	8.78	85.0	7.83	159.0	NR	5.33 J	<0.01	0.301	6.42	0.0008 UJ	0.1 UJ	13.5
MW-15	10/7/2009	10.20	576	8.46	75.5	7.65	28.9	16.90	4.74 J	0.01 UJ	0.293 J	6.52 J	0.00083 UJ	0.1 UJ	12.9 J
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 measured							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	0.0	2.0
MW-16	9/23/2003	10.97	216	10.27	93.2	6.34	349.1	29.0	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	6.49	173.9	37.4	2.1 J	0.617 J	0.025	5.5 J	<10.0	0.1	3.7
MW-16	9/29/2005	10.48	373	11.12	97.6	6.79	233.4	12.8	1.5	0.0021 J	<0.05	71 J	<0.002	<0.11	11.0
MW-16	9/26/2006	10.69	278	9.33	87.7	6.45	232.3	51.80	1.2 J	<0.00059 B	<0.05 J	32 J	<0.002 J	0.046 J	4.1 J
MW-16	9/18/2007	10.91	210	11.55	105.1	5.89	318.4	NR	1.2 J	<0.01	<0.100	23 J	<0.002	0.2	4.5
MW-16	10/22/2008	9.15	248	17.98	156.2	6.52	224.5	267.00	0.99 J	0.02 J	0.318 J	43.2	0.002 UJ	0.08 J	7.51
MW-16	10/6/2009	9.61	173	10.62	93.2	7.03	177.8	164.00	1.03 J	0.0486 J	0.458 J	36.7 J	0.00083 UJ	0.1 UJ	6.35 J
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
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	262.0		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	206.0	358	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	8.23	4.8 J	0.045 J	0.0139 J	8.6 R	<10.0 J	2.82	4.1 J
MW-17	9/27/2005	11.94	368	(*)	NR	6.31	325.4	0.23	5.1 J	<0.01	<0.05	7.8	<0.002 J	0.054 J	3.9
MW-17	9/26/2006	11.74	429	NR	61.9	7.75	222.0	1.05	5.5 J	<0.01 J	<0.05 J	6.5 J	<0.002 J	<0.11	2.9 J
MW-17	9/19/2007	10.42	385	10.15	92.6	7.60	113.7	0.30	5.6 J	<0.01	<0.100	14 J	<0.002	<0.099	4.7
MW-17	10/22/2008	10.57	376	7.24	65.7	7.76	126.0	0.66	5.75 J	0.01 UJ	0.374 J	7.75	0.002 UJ	0.095	7.78
MW-17	10/6/2009	11.03	361	9.33	84.8	7.80	167.1	1.69	1.65 J	0.01 UJ	0.16 J	6.86 J	0.00083 UJ	0.1 UJ	6.54 J
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 measured due to product in the well							3.37	1.79	<0.025	47	NT	25600	39
MW-19	9/12/2001	Not measured due to product in the well							1.3	1.8	0.071	<9.7	0.0160	400000	19
MW-19	5/13/2002	Not measured due to product in the well							2	2.07	<0.011	16		14000	33
MW-19	8/8/2002	Not measured due to product in the well							0.16	3.11	0.218	16	<0.01	11000	22
MW-19	4/29/2003	Not measured due to product in the well							3	3.59	<0.025	27	0.0024	4900	20
MW-19	9/25/2003	Not measured due to product in the well							2	4.47	0.05 J	90	0.0057	15000	17.5
MW-19	5/4/2004	Not measured due to product in the well							0.71 J	3.36	0.031	16 R	1.13 J	70000 J	25.0

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Well	Sample Date	Temp. (C)	Specific Cond. (umhos/cm²)	DO (mg/L)	DO (%)	pH	ORP (mV)	Turbidity (ntu)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
MW-19	9/22/2004	Not measured due to product in the well							1.5 J	2.65	<0.124	23 R	<10.0 J	111000	15 J
MW-19	5/10/2005	Not measured due to product in the well							0.76 J	2.3	<0.05	29 R	<0.002	45000 J	18 J
MW-19	9/29/2005	Not measured due to product in the well							0.75	2.7	<0.05	40 J	<0.002	13000 J	19.0
MW-19	6/7/2006	Not measured due to product in the well							0.76 J	2.7 J	<0.05 J	36	<0.002	17000 J	18 J
MW-19	9/27/2006	Not measured due to product in the well							0.66 J	3.1	<0.05	30	<0.002 J	8200 J	14.0
MW-19	5/9/2007	Not measured due to product in the well							0.29 J	2.6	<0.100	59 J	<0.002	11000 J	15
MW-19	9/20/2007	Not measured due to product in the well							0.28 J	3.1	<0.100	42 J	<0.002	3500	17
MW-19	5/20/2008	Not measured due to product in the well							0.44 J	2.9	0.100 UJ	42	<0.002	23000 J	16
MW-19	10/24/2008	Not measured due to product in the well							0.04 J	4.85 J	0.51 J	46.2	0.0021 J	27900	15.9
MW-19	6/2/2009	Not measured due to product in the well							0.01 UJ	4.05	0.222	44.7	0.0039 J	18600 J	12.8
MW-19	10/8/2009	Not measured due to product in the well							0.05 UJ	3.19 J	0.237 J	42 J	0.002 J	31800 J	14.3 J
MW-20	10/15/1997	Well Dry							NT	NT	NT	NT	<0.01	11000	NT
MW-20	4/26/2001	Not measured due to product in the well							<0.13	2.25	0.84	67	NT	36600	24
MW-20	9/12/2001	Not measured due to product in the well							0.15	2.8	<0.035	24	<0.01	83000	16
MW-20	8/7/2002	Not measured due to product in the well							<0.15	3.28	0.206	25	<0.01	30000 B	22
MW-20	9/25/2003	Not measured 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 measured due to product in the well							0.29 J	2.32	2.07	23 R	<10.0 J	133000	24 J
MW-20	10/25/2005	Not measured due to product in the well							2.1 J	2.4	0.14	39 J	<0.002	63000 J	13
MW-20	9/27/2006	Not measured due to product in the well							0.22	4.2	0.094 J	71	<0.002 J	44000 J	16
MW-20	9/20/2007	Not measured due to product in the well							0.1 UJ	4.8	<0.100	98 J	<0.002	9500	18
MW-20	10/23/2008	Not measured due to product in the well							0.13 J	3.4 J	0.462	28.9	0.002 UJ	41000	15.7
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		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		0.0	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	400	2.6	<0.005	<0.05	<2	<0.0005	0.063 J	48
MW-21	5/4/2004	10.10	557	NR	89.2	6.50	196.3	NR	2.3 J	0.718 R	14000 R	3.6 R	<10.0	<0.135 B	67
MW-21	9/21/2004	9.80	510	10.37	92.5	6.61	102.1	365	2.4 J	0.484 J	10300 J	4.8 R	<10.0 J	0.5	63 J
MW-21	5/10/2005	10.47	544	10.89	94.1	6.63	159.6	103	2.8 J	0.00047 J	<0.05	12 R	<0.002	0.3	49 J
MW-21	9/27/2005	10.45	444	13.46	(*)	6.32	129.8	969	2.4 J	0.0098 J	0.036 J	17.0	<0.002 J	0.046 J	47
MW-21	6/1/2006	9.76	496	8.23	62.7	6.77	200.8	684	2.7 J	0.017 J	0.047 J	20.0	<0.002	0.023 J	65 J
MW-21	9/25/2006	Well Dry							Well Dry						
MW-21	5/8/2007	10.64	429	9.20	82.9	6.04	200.1	312	4.2 J	<0.01	<0.100	9.3 J	<0.002	<0.098	33 J
MW-21	9/18/2007	12.17	352	7.89	NR	6.32	235.8	150	3.7 J	<0.01	<0.100	12 J	<0.002	0.13	29
MW-21	10/21/2008	8.57	411	12.83	110.1	6.58	211.3	44.4	2.69 J	<0.01	0.294 J	<7.27	0.002 UJ	0.1 UJ	68.8
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		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	1038	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	777	2.2 J	<15.0 J	<0.025 J	6.7 R	<10.0 J	0.2	11 J
MW-22	9/28/2005	9.70	Meter not working		87.4	6.66	260.8	59.5	1.7 J	0.0013 J	<0.05	18	<0.002	0.16 J	10
MW-22	9/25/2006	Well Dry							Well Dry						
MW-22	9/18/2007	11.85	276	8.23	NR	6.53	227.9	NR	2.5 J	<0.01	<0.100	10 J	<0.002	0.13	8.2
MW-22	5/20/2008	10.05	268	NR	86.6	6.43	273.7	1045.9	2.3 J	0.0036	0.100 UJ	12	0.002 UJ	0.77 J	8.4
MW-22	10/21/2008	10.31	243	12.46	111.0	6.90	238.5	NR	1.48 J	<0.01	0.303 J	6.95	0.002 UJ	0.09 UJ	4.69
MW-22	6/2/2009	9.97	188	NR	NR	7.07	196.7	NR	1.97 J	<0.01	0.083	6.73	0.0008 UJ	0.1 UJ	6.92
MW-22	10/6/2009	8.94	173	10.02	86.6	7.12	187.4	918.00	5.31 J	0.168 J	1.56 J	7.53 J	0.00083 UJ	0.1 UJ	7 J
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	NR	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	NR	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 measured							3.2	<0.004	0.1	12	<0.01	0.16	30

Pentawood 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)	Turbidity (ntu)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	PCP (ug/L)	Chloride (mg/L)
MW-26	5/14/2002	12.28	588	7.55	72.8	7.11	17.8		3 J	0.00073	<0.011	15		0.1	27
MW-26	8/5/2002	11.30	588	NR	66.3	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	8.68	79.2	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	67.7	6.70	279.8	23.7	3.74	<0.005	<0.05	<2	<0.0005	<0.11	11
MW-26	5/4/2004	9.85	172	7.07	62.8	6.19	326.2	NR	3.9 J	1.23 R	0.039	42 R	<10.0	<0.242 B	17
MW-26	9/23/2004	13.16	931	8.85	87.2	6.44	63.4	44.6	1.5 J	19.3	620	120	<10.0	0.393	28
MW-26	5/10/2005	11.49	1120	10.48	97.2	6.92	197.0	NR	2.8 J	0.0018 J	<0.05	200 R	<0.002	0.061 J	26 J
MW-26	9/27/2005	12.13	845	6.77	63.2	6.78	129.2	5.24	1.9 J	<0.01	<0.05	170 J	<0.002 J	0.027 J	25
MW-26	6/7/2006	11.71	830	7.97	74.7	7.00	113.3	2.93	1.8 J	<0.0025 J	<0.05 J	140	<0.002	<0.11	29 J
MW-26	9/27/2006	12.24	1011	7.10	66.6	7.11	227.3	1.03	1.5 J	<0.01 J	<0.05 J	87 J	<0.002 J	<0.11	23 J
MW-26	5/8/2007	11.36	852	7.60	70.4	7.51	60.9	3.07	1.5 J	<0.01	<0.100	210 J	<0.002	<0.093	21 J
MW-26	9/19/2007	11.65	892	6.03	56.2	7.04	129.7	3.40	1.3 J	<0.01	<0.100	220 J	<0.002	<0.095	25
MW-26	5/20/2008	11.80	921	7.06	66.5	7.06	181.1	0.00	1.8 J	<0.0025	0.100 UJ	230	0.002 UJ	0.096 UJ	22
MW-26	10/22/2008	10.88	953	4.74	43.0	6.96	192.9	1.83	2.36 J	0.01 UJ	0.777 J	235	0.002 UJ	<0.1	21.7
MW-26	6/2/2009	13.40	901	15.21	146.0	7.37	195.6	4.10	1.83 J	<0.01	0.341	2360	0.0008UJ	0.1 UJ	203
MW-26	10/6/2009	12.63	845	9.82	96.6	7.15	133.2	0.31	1.7 J	0.01 UJ	0.325 J	212 J	0.00083 UJ	0.1 UJ	20.7 J
PW-01	10/23/1997	11.10	550	5.00	NR	8.92	185.0		7.7	NT	0.0012	10	0.0195	5	48
PZ-03	2/9/1998	7.50	212	11.02	NR	6.91	164.0		NT	NT	NT	NT	NT	<1	NT

(*) Readings outside normal range, instrument response in question.
NR - Parameter not Recorded.
NT - Parameter not tested.

Appendix C
Groundwater Elevations and Observations, and LNAPL Measurements

Water Level and LNAPL Measurements
Pentawood Products Site
2009 Annual Report

					October 2009				
Well	Casing Dia. (inches)	Approx. Well Depth (ft)	TOC Elev. (ft MSL)	Aquifer[a]	New TOC Elev. (ft MSL)	Depth to Water - TOC (ft)	GW Elev. (ft MSL)	GW Elev Corrected (ft MSL)	Comments (DTP=Depth to Product)
MW-01	2	97	1072.32	UC	1072.32	89.94	982.38		
MW-02	2	85	1065.66	UC	1064.85	82.83	982.02		
MW-03	4	182	1129.52	SC	1129.5	147.37	982.13		
MW-04	4	187	1089.86	SC	1087.81	105.99	981.82		
MW-05	4	118	1074.24	UC	1071.73	89.74	981.99		
MW-06 S	2	129.05	1094.59	UC	1108.63	127.60	981.03		
MW-07	4	140.5	1096.42	SC	1096.39	115.77	968.79		
MW-08	4	160	1091.23	SC	1091.28	110.54	975.51		
MW-09	2	54	1020.70	UC	1020.71	12.29	910.17		
MW-10	4	131	1083.90	SC	1089.74	108.19	1077.45		
MW-10 S	2	115.23	1085.34	UC	1090.43	109.01	982.24	983.17	DTP=108.38[b]
MW-11	2	155.5	1085.33	SC	1085.58	103.79	976.57		
MW-12	2	135	1081.86	SC	1081.99	101.33	980.66		
MW-13	2	27	1006.16	UC	1006.1	24.09	982.01		
MW-14	2	175	1078.61	SC	1078.5	96.75	981.75		
MW-15	2	170	1127.13	SC	1127.22	145.02	982.20		
MW-16	2	106.5	1081.88	UC	1081.92	99.47	982.45		
MW-17	2	134	1084.42	SC	1084.5	102.41	982.09		
MW-18	6	116	1076.31	UC	1072.44	91.86	980.58	983.15	DTP=89.94 [c]
MW-19	2	112	1088.00	UC	1088.17	107.84	980.33	982.62	DTP=106.38[d]
MW-20	2	107.5	1087.73	UC	1097.76	116.61	981.15	983.37	DTP=115.59[e]
MW-21	2	114.9	--	UC	1095.7	113.53	982.17		
MW-22	2	105.16	--	UC	1084.7	102.43	982.27		
MW-23	2	125	--	SC	1017.57	35.69	981.88		
MW-24	2	125	--	UC	1084.1	101.51	982.59		
MW-25	2	117.8	--	UC	1095.24	112.81	982.43		
MW-26	2	141		UC	1087.07	104.94	982.13		

[a] UC=Unconfined aquifer; SC=semiconfined aquifer

[b] MW-10S NAPL thickness in ft 0.63

[c] MW-18 NAPL thickness in ft 1.92

[d] MW-19 NAPL thickness in ft 1.46

[e] MW-20 NAPL thickness in ft 1.02

Appendix D
Residential Well Memoranda

CH2M HILL
135 South 84th Street
Suite 325
Milwaukee, WI 53214
Tel 414-272-2426
Fax 414-272-4408

CH2MHILL

September 21, 2009

344511.PC.01

Mr. Thomas G. Williams
Remedial Project Manager (SR-6J)
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3507

Dear Tom:

Subject: Subcontract No. 599, June 2009 Sampling Results
Penta Wood Products Site, Town of Daniels, Wisconsin
Long-Term Response Action (LTRA)
WA No. 004-LRLR-05WE, Contract No. EP-S5-06-01

Please find enclosed the results of the residential and potable well semi-annual groundwater sampling event that took place between June 1, 2009 and June 3, 2009. This sampling event included the analysis of pentachlorophenol (PCP), benzene, ethylbenzene, toluene, xylene (BTEX), and naphthalene. The following table provides information on the residential wells where samples were collected.

LTRA Residential Well Information
Penta Wood Products Site – Town of Daniels, Wisconsin

Location ID	Resident Name	Resident Address	Resident Phone Number	WI Well #
RW01	Bill Ellis (formerly Skold)	8713 Daniels 70	(715) 349-5840	SX 303
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	AN 547
RW05	Timothy Tjader	8783 Daniels 70	(715) 349-5192	Unknown

All analyses were performed by Environmental Monitoring & Technologies, Inc. (EMT) of Morton Grove, Illinois. Analytical results were received by CH2M HILL on July 16, 2009. On June 19, it was brought to the attention of CH2M HILL's project chemist that an instrumentation error occurred during the volatile organic compound (VOC) analysis of RW01 and there was not a sufficient sample remaining to reanalyze. These results were rejected and this residential well and field replicate were resampled for BTEX on July 6, 2009. All of the semi-annual groundwater results, including the results from the resampled residential well, were submitted under the same cover letter on September 21, 2009 to the

U.S. Environmental Protection Agency (USEPA) for validation. The following summary is based on a review of the data prior to receiving final validation results from USEPA.

The results of the June/July 2009 sampling event showed no detections of naphthalene, PCP, or BTEX.

If you have any questions or comments, please contact me at 414.272.1052, ext. 40227, or Keli McKenna at ext. 40561.

Sincerely,

CH2M HILL

Shannon M. Greene

Shannon Greene
Project Chemist

Enclosure

cc: Pat Vogtman, PO/USEPA Region 5 (w/o enclosure)
Parveen Vij, CO/USEPA Region 5 (w/o enclosure)
Bill Schultz/WDNR
Keli McKenna, SM/CH2M HILL, Milwaukee
Beth Rohde, ASM/CH2M HILL, Milwaukee
Phil Smith, RTL/CH2M HILL, Milwaukee
Ike Johnson, PM/CH2M HILL, Milwaukee
Dan Plomb, DPM/CH2M HILL, Milwaukee
Gina Bayer, QAM/CH2M HILL, Milwaukee
Dave Shekoski, Sample Coordinator/CH2M HILL, Milwaukee
Cherie Wilson, AA/CH2M HILL, Milwaukee

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Report of Laboratory Analysis

CLIENT:	CH2M HILL DW-01	**Client Sample ID:**	09CP14-01
Lab Order:	09060112	**Report Date:**	6/22/2009
Project:	344511/Penta Wood Products Site	**Collection Date:**	6/3/2009 9:15:00 AM
Lab ID:	09060112-10	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Analyst
Semivolatile Organic Compounds GC/MS		**Method: SW8270C**					
Naphthalene	< 0.99	0.99		µg/L	0.407	6/11/2009	MNN
Surrogates:							
2-Fluorobiphenyl	77.6	20-140		%REC		6/11/2009	MNN
4-Terphenyl-d14	102	20-140		%REC		6/11/2009	MNN
Nitrobenzene-d5	71.4	20-140		%REC		6/11/2009	MNN
Solvent Extractable Compounds by HPLC		**Method: SW8321A**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0702	6/11/2009	LBI
Surrogates:							
3,5-Dichlorobenzoic Acid	79.2	40-140		%REC		6/11/2009	LBI
Volatile Organic Compounds by GC/MS		**Method: SW8260B**					
Benzene	< 0.5	0.5		µg/L	0.2	6/12/2009	XN
Ethylbenzene	< 2.	2.		µg/L	0.15	6/12/2009	XN
Toluene	< 2.	2.		µg/L	0.15	6/12/2009	XN
Xylenes, Total	< 5.	5.		µg/L	0.6	6/12/2009	XN
Surrogates:							
4-Bromofluorobenzene	96.8	75-135		%REC		6/12/2009	XN
Fluorobenzene	89.8	75-135		%REC		6/12/2009	XN
Toluene-d8	86.0	75-135		%REC		6/12/2009	XN

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

RW-01

CLIENT:	CH2M HILL	**Client Sample ID:**	09CP14-19
Lab Order:	09060112	**Report Date:**	6/22/2009
Project:	344511/Penta Wood Products Site	**Collection Date:**	6/2/2009 9:05:00 AM
Lab ID:	09060112-02	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Analyst
Semivolatile Organic Compounds GC/MS		**Method: SW8270C**					
Naphthalene	< 1.	1.		µg/L	0.408	6/10/2009	MNN
Surrogates:							
2-Fluorobiphenyl	71.4	20-140		%REC		6/10/2009	MNN
4-Terphenyl-d14	82.2	20-140		%REC		6/10/2009	MNN
Nitrobenzene-d5	65.1	20-140		%REC		6/10/2009	MNN
Solvent Extractable Compounds by HPLC		**Method: SW8321A**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0703	6/11/2009	LBI
Surrogates:							
3,5-Dichlorobenzoic Acid	46.2	40-140		%REC		6/11/2009	LBI
Volatile Organic Compounds by GC/MS		**Method: SW8260B**					
Benzene	0.23	0.5	J	µg/L	0.2	6/12/2009	XN
Ethylbenzene	0.21	2.	J	µg/L	0.15	6/12/2009	XN
Toluene	0.27	2.	J	µg/L	0.15	6/12/2009	XN
Xylenes, Total	< 5.	5.		µg/L	0.6	6/12/2009	XN
Surrogates:							
4-Bromofluorobenzene	103	75-135		%REC		6/12/2009	XN
Fluorobenzene	89.0	75-135		%REC		6/12/2009	XN
Toluene-d8	87.3	75-135		%REC		6/12/2009	XN

Reanalyzed; Data not usable

Qualifiers:	B - Analyte detected in the associated Method Blank	S - Spike Recovery outside accepted recovery limits
	E - Estimated	R - RPD outside accepted recovery limits
	H - Holding Time Exceeded	J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: CH2M HILL RW-01 RE **Client Sample ID:** 09CP14-25
Lab Order: 09070110 **Report Date:** 7/15/2009
Project: 344511/Penta Wood Products Site **Collection Date:** 7/6/2009 10:10:00 AM
Lab ID: 09070110-01 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.5	0.5		µg/L	0.2	7/10/09 17:37	52347	1.00	XN
Ethylbenzene	< 2.	2.		µg/L	0.15	7/10/09 17:37	52347	1.00	XN
Toluene	< 5.	5.		µg/L	0.03	7/7/09 14:32	52311	0.200	XN
Xylenes, Total	< 5.	5.		µg/L	0.6	7/10/09 17:37	52347	1.00	XN
Surrogates:									
4-Bromofluorobenzene	107	75-135		%REC		7/10/09 17:37	52347	1.00	XN
Fluorobenzene	101	75-135		%REC		7/10/09 17:37	52347	1.00	XN
Toluene-d8	107	75-135		%REC		7/10/09 17:37	52347	1.00	XN

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: CH2M HILL RW-01 FR **Client Sample ID:** 09CP14-20
Lab Order: 09060112 **Report Date:** 6/22/2009
Project: 344511/Penta Wood Products Site **Collection Date:** 6/2/2009 9:10:00 AM
Lab ID: 09060112-01 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Analyst
Semivolatile Organic Compounds GC/MS		**Method: SW8270C**					
Naphthalene	< 1.	1.		µg/L	0.41	6/10/2009	MNN
Surrogates:							
2-Fluorobiphenyl	72.8	20-140		%REC		6/10/2009	MNN
4-Terphenyl-d14	82.2	20-140		%REC		6/10/2009	MNN
Nitrobenzene-d5	68.5	20-140		%REC		6/10/2009	MNN
Solvent Extractable Compounds by HPLC		**Method: SW8321A**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0705	6/11/2009	LBI
Surrogates:							
3,5-Dichlorobenzoic Acid	46.0	40-140		%REC		6/11/2009	LBI
Volatile Organic Compounds by GC/MS		**Method: SW8260B**					
Benzene	0.25	0.5	J	µg/L	0.2	6/12/2009	XN
Ethylbenzene	0.29	2.	J	µg/L	0.15	6/12/2009	XN
Toluene	0.3	2.	J	µg/L	0.15	6/12/2009	XN
Xylenes, Total	0.65	5.	J	µg/L	0.6	6/12/2009	XN
Surrogates:							
4-Bromofluorobenzene	103	75-135		%REC		6/12/2009	XN
Fluorobenzene	88.6	75-135		%REC		6/12/2009	XN
Toluene-d8	87.1	75-135		%REC		6/12/2009	XN

Reanalyzed; Data not usable

Qualifiers:
B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT:	CH2M HILL RW-01FRRE	**Client Sample ID:**	09CP14-26
Lab Order:	09070110	**Report Date:**	7/15/2009
Project:	344511/Penta Wood Products Site	**Collection Date:**	7/6/2009 10:10:00 AM
Lab ID:	09070110-02	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.5	0.5		µg/L	0.2	7/10/09 18:12	52347	1.00	XN
Ethylbenzene	< 2.	2.		µg/L	0.15	7/10/09 18:12	52347	1.00	XN
Toluene	< 5.	5.		µg/L	0.03	7/7/09 15:10	52311	0.200	XN
Xylenes, Total	< 5.	5.		µg/L	0.6	7/10/09 18:12	52347	1.00	XN
Surrogates:									
4-Bromofluorobenzene	96.3	75-135		%REC		7/10/09 18:12	52347	1.00	XN
Fluorobenzene	102	75-135		%REC		7/10/09 18:12	52347	1.00	XN
Toluene-d8	106	75-135		%REC		7/10/09 18:12	52347	1.00	XN

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

RW-02

CLIENT:	CH2M HILL	**Client Sample ID:**	09CP14-21
Lab Order:	09060112	**Report Date:**	6/22/2009
Project:	344511/Penta Wood Products Site	**Collection Date:**	6/2/2009 8:10:00 AM
Lab ID:	09060112-04	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Analyst
Semivolatile Organic Compounds GC/MS		**Method: SW8270C**					
Naphthalene	< 1.	1.		µg/L	0.408	6/11/2009	MNN
Surrogates:							
2-Fluorobiphenyl	97.1	20-140		%REC		6/11/2009	MNN
4-Terphenyl-d14	109	20-140		%REC		6/11/2009	MNN
Nitrobenzene-d5	103	20-140		%REC		6/11/2009	MNN
Solvent Extractable Compounds by HPLC		**Method: SW8321A**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0703	6/11/2009	LBI
Surrogates:							
3,5-Dichlorobenzoic Acid	54.7	40-140		%REC		6/11/2009	LBI
Volatile Organic Compounds by GC/MS		**Method: SW8260B**					
Benzene	< 0.5	0.5		µg/L	0.2	6/12/2009	XN
Ethylbenzene	< 2.	2.		µg/L	0.15	6/12/2009	XN
Toluene	< 2.	2.		µg/L	0.15	6/12/2009	XN
Xylenes, Total	< 5.	5.		µg/L	0.6	6/12/2009	XN
Surrogates:							
4-Bromofluorobenzene	97.0	75-135		%REC		6/12/2009	XN
Fluorobenzene	89.1	75-135		%REC		6/12/2009	XN
Toluene-d8	86.7	75-135		%REC		6/12/2009	XN

Qualifiers:

B - Analyte detected in the associated Method Blank
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H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

RW-03

CLIENT: CH2M HILL
Lab Order: 09060112
Project: 344511/Penta Wood Products Site
Lab ID: 09060112-08

Client Sample ID: 09CP14-22
Report Date: 6/22/2009
Collection Date: 6/2/2009 8:55:00 AM
Matrix: Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Analyst
Semivolatile Organic Compounds GC/MS		**Method: SW8270C**					
Naphthalene	< 1.	1.		µg/L	0.409	6/11/2009	MNN
Surrogates:							
2-Fluorobiphenyl	103	20-140		%REC		6/11/2009	MNN
4-Terphenyl-d14	110	20-140		%REC		6/11/2009	MNN
Nitrobenzene-d5	67.2	20-140		%REC		6/11/2009	MNN
Solvent Extractable Compounds by HPLC		**Method: SW8321A**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0703	6/11/2009	LBI
Surrogates:							
3,5-Dichlorobenzoic Acid	51.8	40-140		%REC		6/11/2009	LBI
Volatile Organic Compounds by GC/MS		**Method: SW8260B**					
Benzene	< 0.5	0.5		µg/L	0.2	6/12/2009	XN
Ethylbenzene	< 2.	2.		µg/L	0.15	6/12/2009	XN
Toluene	< 2.	2.		µg/L	0.15	6/12/2009	XN
Xylenes, Total	< 5.	5.		µg/L	0.6	6/12/2009	XN
Surrogates:							
4-Bromofluorobenzene	98.9	75-135		%REC		6/12/2009	XN
Fluorobenzene	88.2	75-135		%REC		6/12/2009	XN
Toluene-d8	88.8	75-135		%REC		6/12/2009	XN

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
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Report of Laboratory Analysis

CLIENT: CH2M HILL RW-04 **Client Sample ID:** 09CP14-23
Lab Order: 09060112 **Report Date:** 6/22/2009
Project: 344511/Penta Wood Products Site **Collection Date:** 6/2/2009 8:35:00 AM
Lab ID: 09060112-07 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Analyst
Semivolatile Organic Compounds GC/MS		**Method: SW8270C**					
Naphthalene	< 1.	1.		µg/L	0.409	6/11/2009	MNN
Surrogates:							
2-Fluorobiphenyl	88.7	20-140		%REC		6/11/2009	MNN
4-Terphenyl-d14	97.7	20-140		%REC		6/11/2009	MNN
Nitrobenzene-d5	77.0	20-140		%REC		6/11/2009	MNN
Solvent Extractable Compounds by HPLC		**Method: SW8321A**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0702	6/11/2009	LBI
Surrogates:							
3,5-Dichlorobenzoic Acid	46.1	40-140		%REC		6/11/2009	LBI
Volatile Organic Compounds by GC/MS		**Method: SW8260B**					
Benzene	< 0.5	0.5		µg/L	0.2	6/12/2009	XN
Ethylbenzene	< 2.	2.		µg/L	0.15	6/12/2009	XN
Toluene	< 2.	2.		µg/L	0.15	6/12/2009	XN
Xylenes, Total	< 5.	5.		µg/L	0.6	6/12/2009	XN
Surrogates:							
4-Bromofluorobenzene	99.8	75-135		%REC		6/12/2009	XN
Fluorobenzene	88.9	75-135		%REC		6/12/2009	XN
Toluene-d8	88.6	75-135		%REC		6/12/2009	XN

Qualifiers:
B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: CH2M HILL RW-05 **Client Sample ID:** 09CP14-24
Lab Order: 09060112 **Report Date:** 6/22/2009
Project: 344511/Penta Wood Products Site **Collection Date:** 6/2/2009 8:45:00 AM
Lab ID: 09060112-05 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Analyst
Semivolatile Organic Compounds GC/MS		**Method: SW8270C**					
Naphthalene	< 1.	1.		µg/L	0.408	6/11/2009	MNN
Surrogates:							
2-Fluorobiphenyl	105	20-140		%REC		6/11/2009	MNN
4-Terphenyl-d14	117	20-140		%REC		6/11/2009	MNN
Nitrobenzene-d5	92.9	20-140		%REC		6/11/2009	MNN
Solvent Extractable Compounds by HPLC		**Method: SW8321A**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0701	6/11/2009	LBI
Surrogates:							
3,5-Dichlorobenzoic Acid	41.8	40-140		%REC		6/11/2009	LBI
Volatile Organic Compounds by GC/MS		**Method: SW8260B**					
Benzene	< 0.5	0.5		µg/L	0.2	6/12/2009	XN
Ethylbenzene	< 2.	2.		µg/L	0.15	6/12/2009	XN
Toluene	< 2.	2.		µg/L	0.15	6/12/2009	XN
Xylenes, Total	< 5.	5.		µg/L	0.6	6/12/2009	XN
Surrogates:							
4-Bromofluorobenzene	95.2	75-135		%REC		6/12/2009	XN
Fluorobenzene	90.5	75-135		%REC		6/12/2009	XN
Toluene-d8	88.2	75-135		%REC		6/12/2009	XN

Qualifiers:
B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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

CH2MHILL

December 3, 2009

Mr. Thomas G. Williams
Remedial Project Manager (SR-6J)
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3507

Subject: Subcontract No. 599, June 2009 Sampling Results
Penta Wood Products Site, Town of Daniels, Wisconsin
Long-Term Response Action (LTRA)
WA No. 004-LRLR-05WE, Contract No. EP-S5-06-01

Dear Tom:

Please find the enclosed results of the residential and potable well semi-annual groundwater sampling event that took place between October 6, 2009 and October 8, 2009. This sampling event included the analysis of pentachlorophenol (PCP), benzene, ethylbenzene, toluene, xylene (BTEX), and naphthalene. The following table provides information on the residential wells where samples were collected.

LTRA Residential Well Information

Penta Wood Products Site – Town of Daniels, Wisconsin

Location ID	Resident Name	Resident Address	Resident Phone Number	WI Well No.
RW01	Bill Ellis (formerly Skold)	8713 Daniels 70	(715) 349-5840	SX 303
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	AN 547
RW05	Timothy Tjader	8783 Daniels 70	(715) 349-5192	Unknown

All analyses were performed by Environmental Monitoring & Technologies, Inc. (EMT) of Morton Grove, Illinois. Analytical results were received by CH2M HILL on October 16, 2009. During a review of the preliminary results, CH2M HILL's project chemist observed a detection of PCP at 0.15 micrograms per liter in residential well RW04. Since the presence of PCP in the residential wells is not likely and historic results have not shown confirmed PCP detections at the residential wells, RW04 was resampled on October 20. PCP was not detected in the reanalysis; therefore, the initial result was rejected for project use.

All of the semi-annual groundwater results, including the results from the resampled residential well, were submitted under the same cover letter on December 3, 2009 to the U.S.

Environmental Protection Agency for validation. The following summary is based on a review of the data before receiving final validation results from USEPA.

The results of the October 2009 sampling event showed no detections of naphthalene, PCP, or BTEX in the residential wells.

If you have any questions or comments, please contact me at 414.272.1052, ext. 40227, or Keli McKenna at ext. 40561.

Sincerely,

CH2M HILL

Shannon M. Greene

Shannon Greene
Project Chemist

Enclosure

cc: Pat Vogtman, PO/USEPA Region 5 (w/o enclosure)
Parveen Vij, CO/USEPA Region 5 (w/o enclosure)
Bill Schultz/WDNR
Keli McKenna, SM/CH2M HILL, Milwaukee
Mike Niebauer, ASM/CH2M HILL, Milwaukee
Phil Smith, RTL/CH2M HILL, Milwaukee
Ike Johnson, PM/CH2M HILL, Milwaukee
Dan Plomb, DPM/CH2M HILL, Milwaukee
Jewelle Keiser, QAM/CH2M HILL, Milwaukee
Dave Shekoski, Sample Coordinator/CH2M HILL, Milwaukee
Cherie Wilson, AA/CH2M HILL, Milwaukee

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Report of Laboratory Analysis

CLIENT:	CH2M HILL	**Client Sample ID:**	10CP01-01
Lab Order:	09100216	**Report Date:**	10/16/2009
Project:	344511/Penta Wood Products Site	**Collection Date:**	10/8/2009 8:55:00 AM
Lab ID:	09100216-07	**Matrix:**	Groundwater

DW-01

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270 / SW3510C**					
Naphthalene	< 0.99	0.99		µg/L	0.408	10/15/09 04:47	54351	0.00100	MNN
Surrogates:									
2-Fluorobiphenyl	75.2	20-140		%REC	0	10/15/09 04:47	54351	0.00100	MNN
4-Terphenyl-d14	87.7	20-140		%REC	0	10/15/09 04:47	54351	0.00100	MNN
Nitrobenzene-d5	64.0	20-140		%REC	0	10/15/09 04:47	54351	0.00100	MNN
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0737	10/12/09	54353	0.000100	LBI
Surrogates:									
3,5-Dichlorobenzoic Acid	43.2	40-140		%REC	0	10/12/09	54353	0.000100	LBI
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.1	0.1		µg/L	0.0400	10/14/09 15:56	54432	0.200	JL
Ethylbenzene	< 0.4	0.4		µg/L	0.0300	10/14/09 15:56	54432	0.200	JL
Toluene	< 0.4	0.4		µg/L	0.0434	10/14/09 15:56	54432	0.200	JL
Xylenes, Total	< 1.	1.		µg/L	0.120	10/14/09 15:56	54432	0.200	JL
Surrogates:									
4-Bromofluorobenzene	84.2	75-135		%REC	0	10/14/09 15:56	54432	0.200	JL
Fluorobenzene	90.4	75-135		%REC	0	10/14/09 15:56	54432	0.200	JL
Toluene-d8	86.9	75-135		%REC	0	10/14/09 15:56	54432	0.200	JL

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

RW-01

CLIENT:	CH2M HILL	**Client Sample ID:**	10CP01-36
Lab Order:	09100216	**Report Date:**	10/16/2009
Project:	344511/Penta Wood Products Site	**Collection Date:**	10/7/2009 10:00:00 AM
Lab ID:	09100216-05	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270 / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.410	10/15/09 03:21	54351	0.00100	MNN
Surrogates:									
2-Fluorobiphenyl	55.9	20-140		%REC	0	10/15/09 03:21	54351	0.00100	MNN
4-Terphenyl-d14	84.4	20-140		%REC	0	10/15/09 03:21	54351	0.00100	MNN
Nitrobenzene-d5	46.8	20-140		%REC	0	10/15/09 03:21	54351	0.00100	MNN
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0724	10/12/09	54353	0.000100	LBI
Surrogates:									
3,5-Dichlorobenzoic Acid	55.7	40-140		%REC	0	10/12/09	54353	0.000100	LBI
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.1	0.1		µg/L	0.0400	10/14/09 14:46	54432	0.200	JL
Ethylbenzene	< 0.4	0.4		µg/L	0.0300	10/14/09 14:46	54432	0.200	JL
Toluene	< 0.4	0.4		µg/L	0.0434	10/14/09 14:46	54432	0.200	JL
Xylenes, Total	< 1.	1.		µg/L	0.120	10/14/09 14:46	54432	0.200	JL
Surrogates:									
4-Bromofluorobenzene	97.1	75-135		%REC	0	10/14/09 14:46	54432	0.200	JL
Fluorobenzene	91.6	75-135		%REC	0	10/14/09 14:46	54432	0.200	JL
Toluene-d8	84.0	75-135		%REC	0	10/14/09 14:46	54432	0.200	JL

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT:	CH2M HILL RW-01FR	**Client Sample ID:**	10CP01-37
Lab Order:	09100216	**Report Date:**	10/16/2009
Project:	344511/Penta Wood Products Site	**Collection Date:**	10/7/2009 10:10:00 AM
Lab ID:	09100216-04	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270 / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.409	10/15/09 02:39	54351	0.00100	MNN
Surrogates:									
2-Fluorobiphenyl	75.7	20-140		%REC	0	10/15/09 02:39	54351	0.00100	MNN
4-Terphenyl-d14	77.4	20-140		%REC	0	10/15/09 02:39	54351	0.00100	MNN
Nitrobenzene-d5	68.0	20-140		%REC	0	10/15/09 02:39	54351	0.00100	MNN
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0726	10/12/09	54353	0.000100	LBI
Surrogates:									
3,5-Dichlorobenzoic Acid	56.7	40-140		%REC	0	10/12/09	54353	0.000100	LBI
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.1	0.1		µg/L	0.0400	10/14/09 14:11	54432	0.200	JL
Ethylbenzene	< 0.4	0.4		µg/L	0.0300	10/14/09 14:11	54432	0.200	JL
Toluene	< 0.4	0.4		µg/L	0.0434	10/14/09 14:11	54432	0.200	JL
Xylenes, Total	< 1.	1.		µg/L	0.120	10/14/09 14:11	54432	0.200	JL
Surrogates:									
4-Bromofluorobenzene	83.3	75-135		%REC	0	10/14/09 14:11	54432	0.200	JL
Fluorobenzene	94.2	75-135		%REC	0	10/14/09 14:11	54432	0.200	JL
Toluene-d8	86.3	75-135		%REC	0	10/14/09 14:11	54432	0.200	JL

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

RW-02

CLIENT:	CH2M HILL	**Client Sample ID:**	10CP01-38
Lab Order:	09100216	**Report Date:**	10/16/2009
Project:	344511/Penta Wood Products Site	**Collection Date:**	10/7/2009 8:30:00 AM
Lab ID:	09100216-06	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270 / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.409	10/15/09 04:04	54351	0.00100	MNN
Surrogates:									
2-Fluorobiphenyl	71.2	20-140		%REC	0	10/15/09 04:04	54351	0.00100	MNN
4-Terphenyl-d14	86.0	20-140		%REC	0	10/15/09 04:04	54351	0.00100	MNN
Nitrobenzene-d5	61.1	20-140		%REC	0	10/15/09 04:04	54351	0.00100	MNN
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0735	10/12/09	54353	0.000100	LBI
Surrogates:									
3,5-Dichlorobenzoic Acid	47.4	40-140		%REC	0	10/12/09	54353	0.000100	LBI
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.1	0.1		µg/L	0.0400	10/14/09 15:21	54432	0.200	JL
Ethylbenzene	< 0.4	0.4		µg/L	0.0300	10/14/09 15:21	54432	0.200	JL
Toluene	< 0.4	0.4		µg/L	0.0434	10/14/09 15:21	54432	0.200	JL
Xylenes, Total	< 1.	1.		µg/L	0.120	10/14/09 15:21	54432	0.200	JL
Surrogates:									
4-Bromofluorobenzene	89.0	75-135		%REC	0	10/14/09 15:21	54432	0.200	JL
Fluorobenzene	87.0	75-135		%REC	0	10/14/09 15:21	54432	0.200	JL
Toluene-d8	88.3	75-135		%REC	0	10/14/09 15:21	54432	0.200	JL

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT:	CH2M HILL RW-03	**Client Sample ID:**	10CP01-39
Lab Order:	09100216	**Report Date:**	10/16/2009
Project:	344511/Penta Wood Products Site	**Collection Date:**	10/7/2009 8:55:00 AM
Lab ID:	09100216-03	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270 / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.409	10/15/09 01:56	54351	0.00100	MNN
Surrogates:									
2-Fluorobiphenyl	64.7	20-140		%REC	0	10/15/09 01:56	54351	0.00100	MNN
4-Terphenyl-d14	74.1	20-140		%REC	0	10/15/09 01:56	54351	0.00100	MNN
Nitrobenzene-d5	57.6	20-140		%REC	0	10/15/09 01:56	54351	0.00100	MNN
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0750	10/12/09	54353	0.000100	LBI
Surrogates:									
3,5-Dichlorobenzoic Acid	50.9	40-140		%REC	0	10/12/09	54353	0.000100	LBI
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.1	0.1		µg/L	0.0400	10/14/09 13:36	54432	0.200	JL
Ethylbenzene	< 0.4	0.4		µg/L	0.0300	10/14/09 13:36	54432	0.200	JL
Toluene	< 0.4	0.4		µg/L	0.0434	10/14/09 13:36	54432	0.200	JL
Xylenes, Total	< 1.	1.		µg/L	0.120	10/14/09 13:36	54432	0.200	JL
Surrogates:									
4-Bromofluorobenzene	92.9	75-135		%REC	0	10/14/09 13:36	54432	0.200	JL
Fluorobenzene	93.0	75-135		%REC	0	10/14/09 13:36	54432	0.200	JL
Toluene-d8	86.0	75-135		%REC	0	10/14/09 13:36	54432	0.200	JL

Qualifiers:

B - Analyte detected in the associated Method Blank
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H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: CH2M HILL RW-04 **Client Sample ID:** 10CP01-40
Lab Order: 09100216 **Report Date:** 10/16/2009
Project: 344511/Penta Wood Products Site **Collection Date:** 10/7/2009 9:20:00 AM
Lab ID: 09100216-01 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270 / SW3510C**					
Naphthalene	< 0.99	0.99		µg/L	0.407	10/14/09 19:32	54351	0.00100	MNN
Surrogates:									
2-Fluorobiphenyl	75.6	20-140		%REC	0	10/14/09 19:32	54351	0.00100	MNN
4-Terphenyl-d14	88.1	20-140		%REC	0	10/14/09 19:32	54351	0.00100	MNN
Nitrobenzene-d5	67.7	20-140		%REC	0	10/14/09 19:32	54351	0.00100	MNN
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	0.15	0.1		µg/L	0.0757	10/12/09	54353	0.000100	LBI
Surrogates:									
3,5-Dichlorobenzoic Acid	53.1	40-140		%REC	0	10/12/09	54353	0.000100	LBI
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.1	0.1		µg/L	0.0400	10/14/09 12:27	54432	0.200	JL
Ethylbenzene	< 0.4	0.4		µg/L	0.0300	10/14/09 12:27	54432	0.200	JL
Toluene	< 0.4	0.4		µg/L	0.0434	10/14/09 12:27	54432	0.200	JL
Xylenes, Total	< 1.	1.		µg/L	0.120	10/14/09 12:27	54432	0.200	JL
Surrogates:									
4-Bromofluorobenzene	99.1	75-135		%REC	0	10/14/09 12:27	54432	0.200	JL
Fluorobenzene	93.5	75-135		%REC	0	10/14/09 12:27	54432	0.200	JL
Toluene-d8	90.5	75-135		%REC	0	10/14/09 12:27	54432	0.200	JL

Reanalyzed ReSult from Reanalysis was used

Qualifiers:

- B - Analyte detected in the associated Method Blank
- E - Estimated
- H - Holding Time Exceeded
- S - Spike Recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT:	CH2M HILL RW-04RE	**Client Sample ID:**	10CP01-42
Lab Order:	09100583	**Report Date:**	10/22/2009
Project:	344511/Penta Wood Products Site	**Collection Date:**	10/20/2009 10:21:00 AM
Lab ID:	09100583-01	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0705	10/22/09	54594	0.000100	LBI
Surrogates:									
3,5-Dichlorobenzoic Acid	45.0	40-140		%REC	0	10/22/09	54594	0.000100	LBI

Qualifiers:	B - Analyte detected in the associated Method Blank	S - Spike Recovery outside accepted recovery limits
	E - Estimated	R - RPD outside accepted recovery limits
	H - Holding Time Exceeded	J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

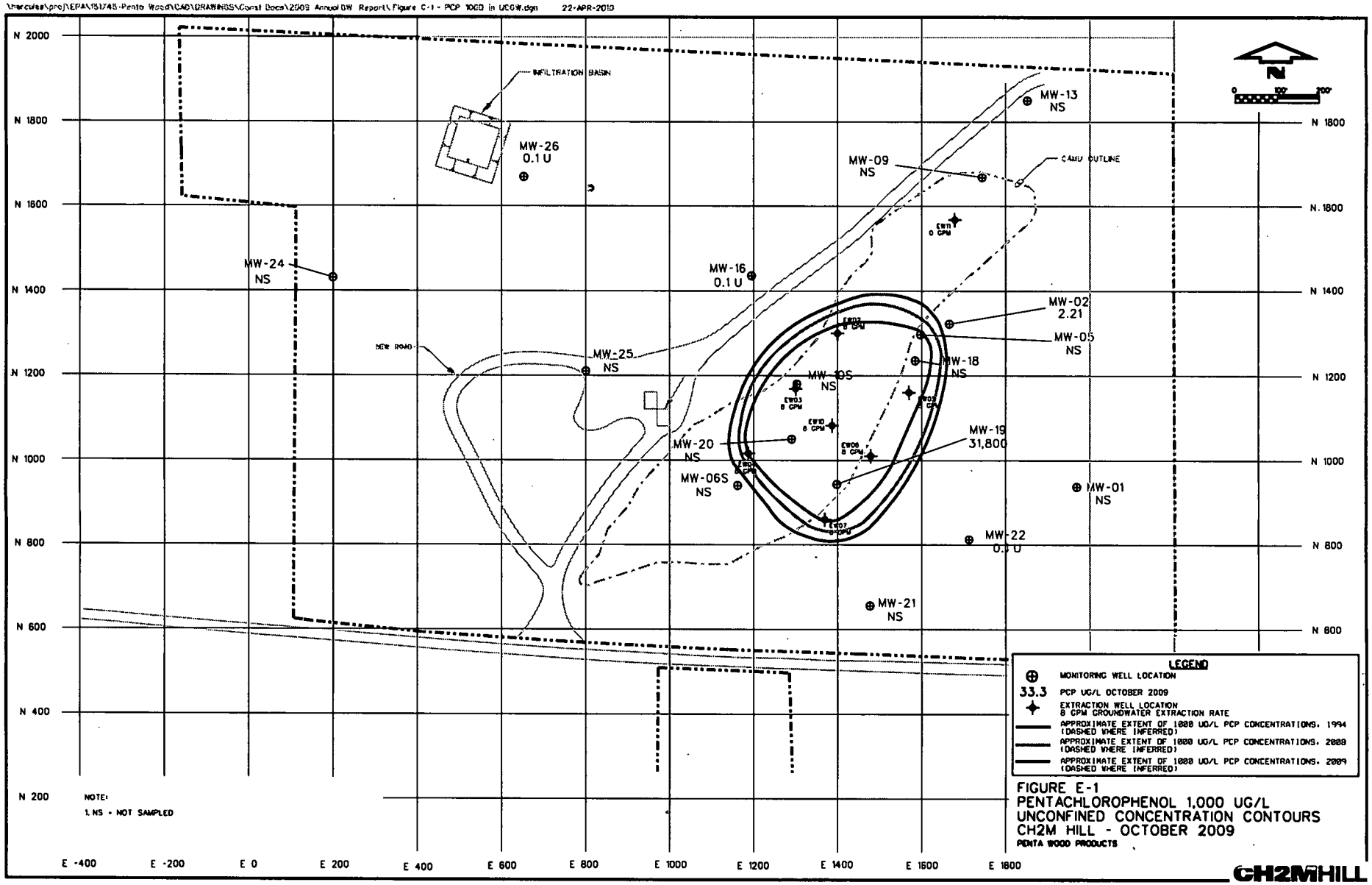
CLIENT:	CH2M HILL RW-05	**Client Sample ID:**	10CP01-41
Lab Order:	09100216	**Report Date:**	10/16/2009
Project:	344511/Penta Wood Products Site	**Collection Date:**	10/7/2009 9:45:00 AM
Lab ID:	09100216-02	**Matrix:**	Groundwater

Analyses	Result	EMT Reporting Limit	Qual	Units	MDL	Date Analyzed	Batch	DF	Analyst
Semivolatile Organic Compounds GC/MS		**Method:**		**SW 8270 / SW3510C**					
Naphthalene	< 1.	1.		µg/L	0.409	10/15/09 01:13	54351	0.00100	MNN
Surrogates:									
2-Fluorobiphenyl	103	20-140		%REC	0	10/15/09 01:13	54351	0.00100	MNN
4-Terphenyl-d14	124	20-140		%REC	0	10/15/09 01:13	54351	0.00100	MNN
Nitrobenzene-d5	96.1	20-140		%REC	0	10/15/09 01:13	54351	0.00100	MNN
Solvent Extractable Compounds by HPLC		**Method:**		**SW 8321 / SW3510C**					
Pentachlorophenol	< 0.1	0.1		µg/L	0.0735	10/12/09	54353	0.000100	LBI
Surrogates:									
3,5-Dichlorobenzoic Acid	41.5	40-140		%REC	0	10/12/09	54353	0.000100	LBI
Volatile Organic Compounds by GC/MS		**Method:**		**SW 8260B / SW5030A**					
Benzene	< 0.1	0.1		µg/L	0.0400	10/14/09 13:01	54432	0.200	JL
Ethylbenzene	< 0.4	0.4		µg/L	0.0300	10/14/09 13:01	54432	0.200	JL
Toluene	< 0.4	0.4		µg/L	0.0434	10/14/09 13:01	54432	0.200	JL
Xylenes, Total	< 1.	1.		µg/L	0.120	10/14/09 13:01	54432	0.200	JL
Surrogates:									
4-Bromofluorobenzene	90.8	75-135		%REC	0	10/14/09 13:01	54432	0.200	JL
Fluorobenzene	88.6	75-135		%REC	0	10/14/09 13:01	54432	0.200	JL
Toluene-d8	85.5	75-135		%REC	0	10/14/09 13:01	54432	0.200	JL

Qualifiers:

B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
J - Analyte detected below quantitation limits

Appendix E
Groundwater Contour Maps


\\hercules\proj\EPA\351745-Penta Wood\CAD\DRAWINGS\Const Docs\2009 Annual GW Report\Figure C-1 - PCP 1000 in UCGW.dgn 22-APR-2010
INFILTRATION BASIN
MW-26
0.1 U
MW-13
NS
MW-09
NS
CAMU OUTLINE
MW-24
NS
MW-16
0.1 U
MW-02
2.21
MW-05
NS
NEW ROAD
MW-25
NS
MW-18
NS
MW-19S
NS
MW-20
NS
MW-19
31,800
MW-06S
NS
MW-01
NS
MW-22
0.1 U
MW-21
NS
N 2000
N 1800
N 1600
N 1400
N 1200
N 1000
N 800
N 600
N 400
N 200
E -400
E -200
E 0
E 200
E 400
E 600
E 800
E 1000
E 1200
E 1400
E 1600
E 1800
NOTE:
1. NS = NOT SAMPLED
LEGEND
MONITORING WELL LOCATION
33.3 PCP UG/L OCTOBER 2009
EXTRACTION WELL LOCATION
8 GPM GROUNDWATER EXTRACTION RATE
APPROXIMATE EXTENT OF 1000 UG/L PCP CONCENTRATIONS, 1994 (DASHED WHERE INFERRED)
APPROXIMATE EXTENT OF 1000 UG/L PCP CONCENTRATIONS, 2008 (DASHED WHERE INFERRED)
APPROXIMATE EXTENT OF 1000 UG/L PCP CONCENTRATIONS, 2009 (DASHED WHERE INFERRED)
FIGURE E-1
PENTACHLOROPHENOL 1,000 UG/L
UNCONFINED CONCENTRATION CONTOURS
CH2M HILL - OCTOBER 2009
PENTA WOOD PRODUCTS
CH2MHILL

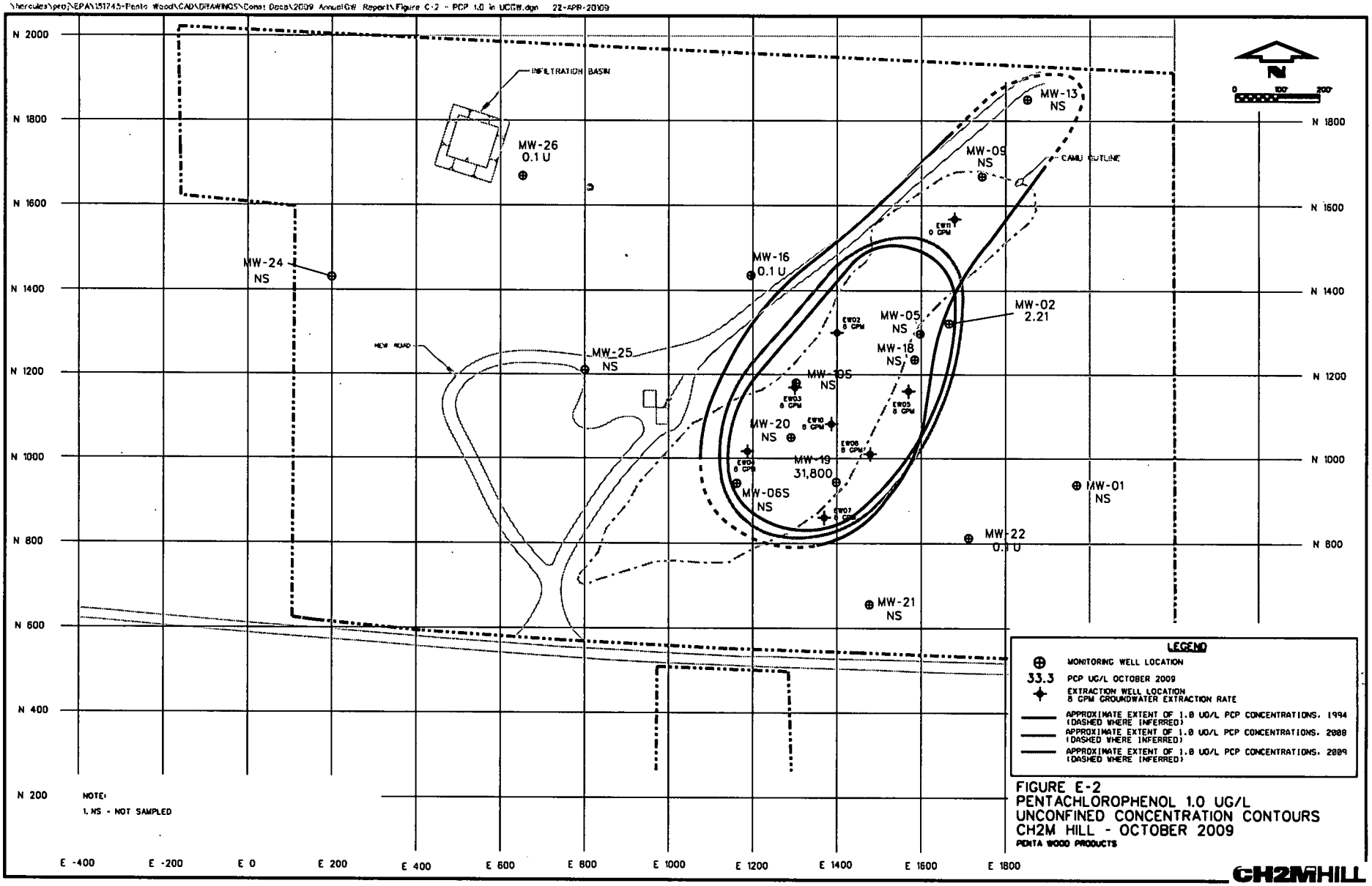
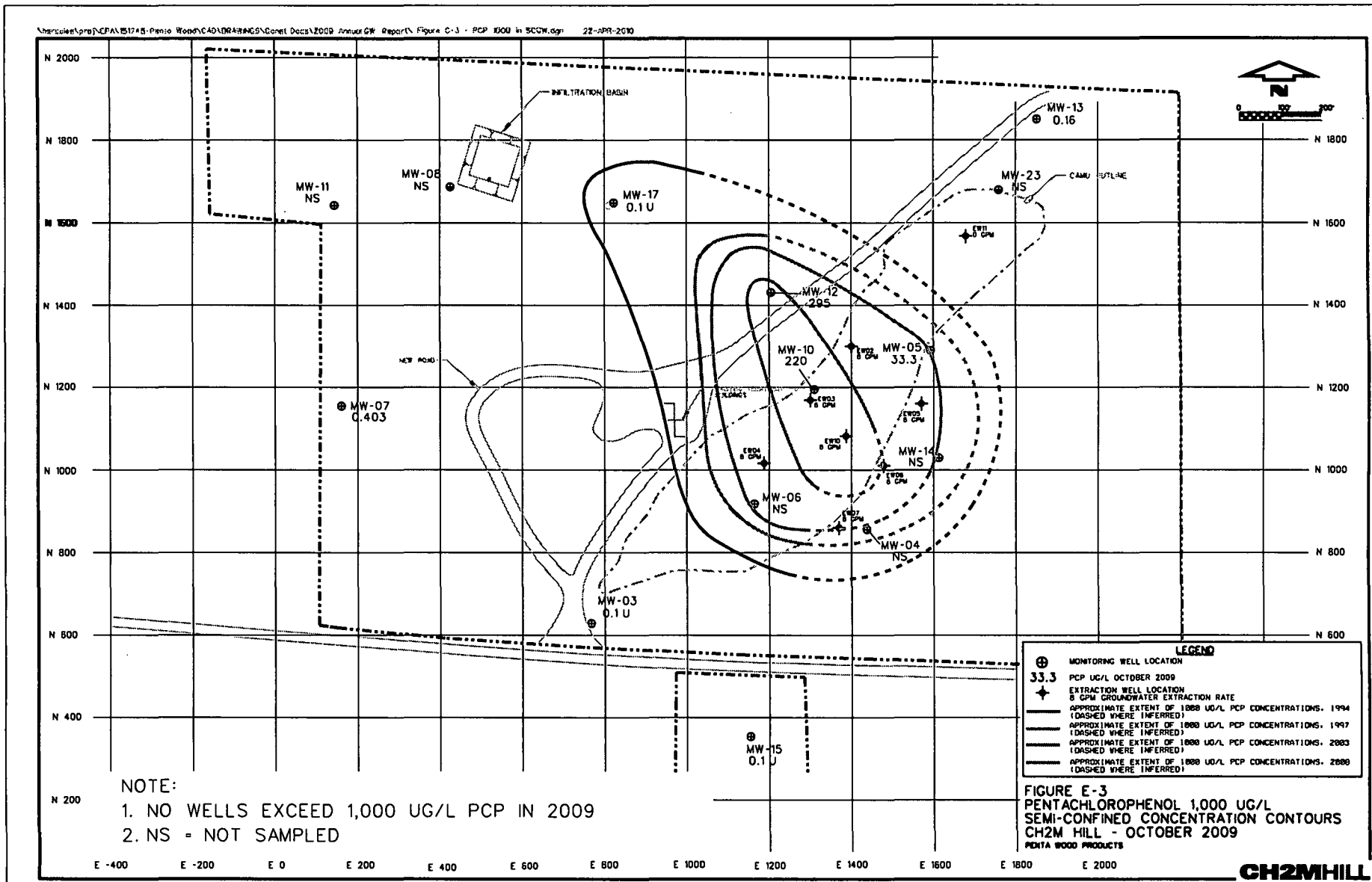


FIGURE E-2
PENTACHLOROPHENOL 1.0 UG/L
UNCONFINED CONCENTRATION CONTOURS
CH2M HILL - OCTOBER 2009
PENTA WOOD PRODUCTS

CH2MHILL


INFILTRATION BASIN
MW-13
0.16
MW-23
NS
CAMU OUTLINE
MW-08
NS
MW-11
NS
MW-17
0.1 U
MW-12
295
MW-10
220
MW-05
33.3
MW-07
0.403
MW-14
NS
MW-06
NS
MW-04
NS
MW-03
0.1 U
MW-15
0.1 U
N 2000
N 1800
N 1600
N 1400
N 1200
N 1000
N 800
N 600
N 400
N 200
E -400
E -200
E 0
E 200
E 400
E 600
E 800
E 1000
E 1200
E 1400
E 1600
E 1800
E 2000
LEGEND
MONITORING WELL LOCATION
33.3 PCP UG/L OCTOBER 2009
EXTRACTION WELL LOCATION
5 GPM GROUNDWATER EXTRACTION RATE
APPROXIMATE EXTENT OF 1000 UG/L PCP CONCENTRATIONS, 1994 (DASHED WHERE INFERRED)
APPROXIMATE EXTENT OF 1000 UG/L PCP CONCENTRATIONS, 1997 (DASHED WHERE INFERRED)
APPROXIMATE EXTENT OF 1000 UG/L PCP CONCENTRATIONS, 2003 (DASHED WHERE INFERRED)
APPROXIMATE EXTENT OF 1000 UG/L PCP CONCENTRATIONS, 2009 (DASHED WHERE INFERRED)
NOTE:
1. NO WELLS EXCEED 1,000 UG/L PCP IN 2009
2. NS = NOT SAMPLED
FIGURE E-3
PENTACHLOROPHENOL 1,000 UG/L
SEMI-CONFINED CONCENTRATION CONTOURS
CH2M HILL - OCTOBER 2009
PENTA WOOD PRODUCTS
CH2MHILL

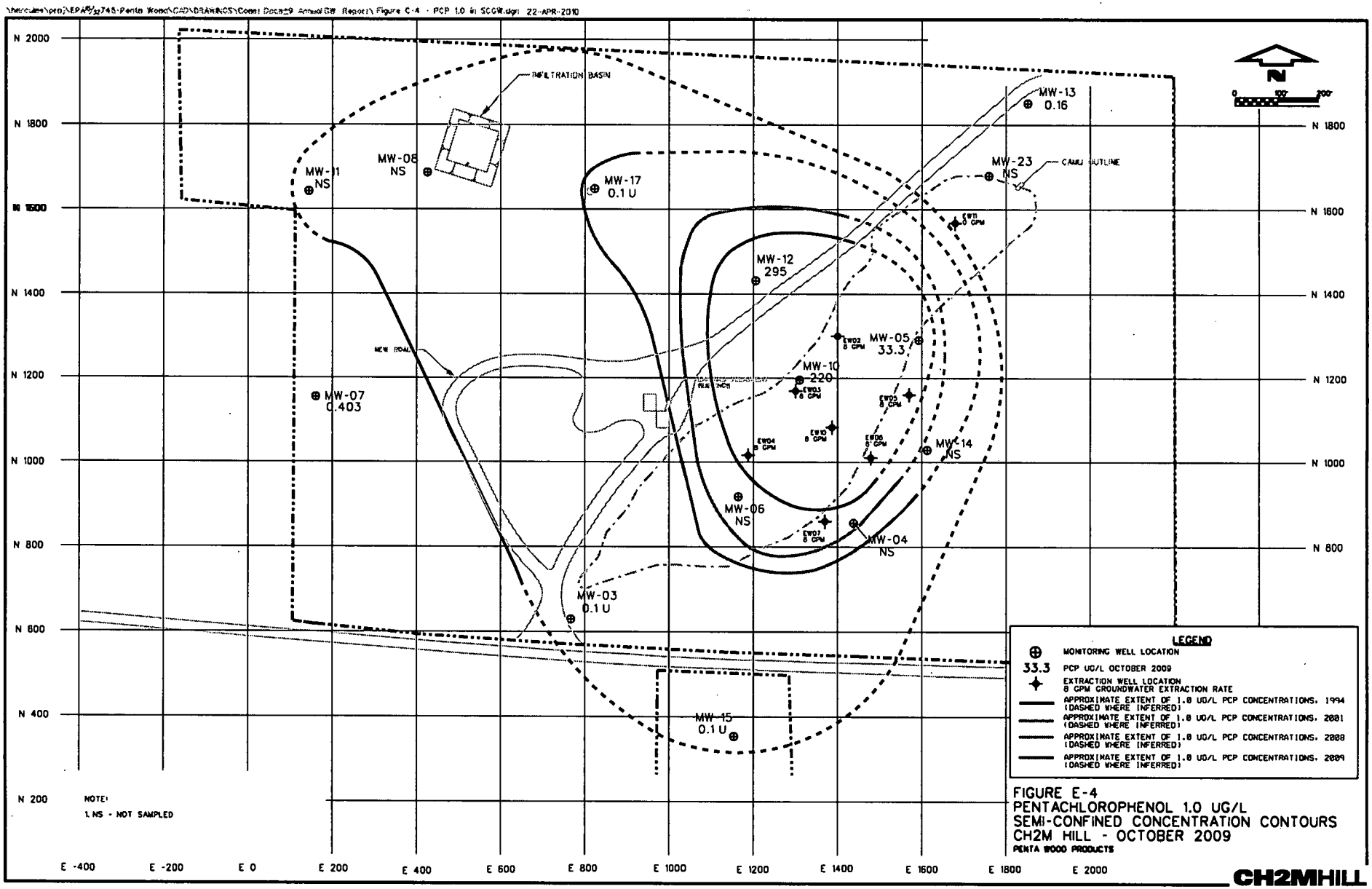


FIGURE E-4
PENTACHLOROPHENOL 1.0 UG/L
SEMI-CONFINED CONCENTRATION CONTOURS
CH2M HILL - OCTOBER 2009
PENTA WOOD PRODUCTS

CH2MHILL