PALL Life Sciences

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November 12, 2010

Ms. Sybil Kolon
Department of Natural Resources & Environment
Jackson State Office Building
301 E. Louis Glick Highway
Jackson, Michigan 49201

Re: Southwest Property/University of Michigan Saginaw Forest Property Areas

Dear Ms. Kolon:

Pall Life Sciences (PLS) has prepared the enclosed Report on Investigations of the Southwest Property/University of Michigan Saginaw Forest Property Areas.

Should you have any questions, please contact me at (734) 913-6130.

Sincerely,

Farsad Fotouhi

Farsad Fotouhi
Vice President
Corporate Environmental Engineering

cc: Ms. Celeste Gill, MDAG
Mr. Michael Caldwell
Mr. Stephen M. O'Rielly, U of M

PALL Life Sciences

Report on Investigations of the

Southwest Property/University of Michigan Saginaw Forest Property Areas

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BACKGROUND

This report presents findings from recent investigations by Pall Life Sciences (PLS) of the Southwest Property/Third Sister Lake Areas. The Southwest Property Area (SPA) refers to a portion of the PLS site located in the southwest portion of the Wagner Road property in the area east and south of Third Sister Lake. Third Sister Lake is on property owned by the University of Michigan (U of M) referred to as the Saginaw Forest.

PLS and the Michigan Department of Natural Resources and Environment (MDNRE) agreed to the installation of a test boring/well near the U of M Caretakers Cabin (located on the south side of Third Sister Lake). The purpose of this boring/well was to further define the extent of 1,4-dioxane in this area down to the bedrock surface. During the installation of the boring, elevated levels of 1,4-dioxane were detected in two sample intervals between 59 and 70 feet below ground surface (bgs). Furthermore, drilling conditions at this location prohibited auger penetration to bedrock. As a result, there was a portion of the Unit E aquifer that was not vertically sampled. PLS and MDNRE agreed to the drilling of another boring/well (MW-127s/d) southwest of the Caretakers Cabin that was not initially planned. This boring/well allowed for another attempt at reaching bedrock, and provided additional data to define the elevated 1,4-dioxane concentrations detected at MW-125.

Questions that remain, which become the focus of this report, are: 1) is it necessary to attempt to reach bedrock at the Caretakers Cabin and collect samples from the portion of the Unit E aquifer not previously sampled, and 2) what is the likely transport mechanism resulting in the elevated levels of 1,4-dioxane on the south side of Third Sister Lake, and 3) what additional investigations, if any, are needed to further investigate this area.

DATA COLLECTION

Boring/Well Installation

PLS recently completed drilling at two locations on the U of M property: near the Caretakers Cabin (MW-125) and approximately 750 feet southwest of the cabin (MW-127s/d). These well locations are shown on Figure 1. Boring/well construction logs for these borings/wells, including Vertical Aquifer Sampling (VAS) data, are provided in Attachment 1.

Near the Caretakers Cabin, a test boring (PLS 10-02)for MW-125 was drilled to a depth of 174 feet bgs using a hollow stem auger drilling rig. Drilling services were provided by Stearns Drilling Company. An on-site geologist was provided by Fishbeck, Thompson, Carr and Huber, Inc. The U of M had a consultant, Bureau Veritas, present during the drilling of this location and MW-127s/d. Simulprobe™ samples were collected during auger advancement through water-bearing zones. These samples were analyzed for 1,4-dioxane by PLS. Sample depth intervals and 1,4-dioxane concentrations are provided on the boring logs in Attachment 1.

MW-125 is constructed of 2-inch galvanized casing, and equipped with a 5-foot stainless steel screen completed at a depth of 65 to 70-feet bgs. This depth corresponds to the depth where the highest 1,4-dioxnae concentrations were detected in Simulprobe™ sampling.

MW-127s/d were installed approximately 750 feet southwest of MW-125. A test boring was drilled to bedrock at this location to bedrock (encountered at 213 feet bgs). Drilling services were provided by Stearns Drilling Company. An on-site geologist was provided by Fishbeck, Thompson, Carr and Huber, Inc. Simulprobe™ samples were collected during auger advancement through water-bearing zones. These samples were analyzed for 1,4-dioxane by PLS. Sample depth intervals and 1,4-dioxane concentrations are provided on the boring logs in Attachment 1.

MW-127s is constructed of 2-inch galvanized casing, and equipped with a 5-foot stainless steel screen completed at a depth of 35 to 40 feet bgs. This depth interval was selected based on a review of the geological conditions at this location. MW-127d is constructed of 2-inch galvanized casing, and equipped with a 5-foot stainless steel screen completed at a depth of 195 to 200 feet bgs. This depth interval was selected based on a review of the geological conditions at this location and a detection of low-levels 1,4-dioxane in the Simulprobe™ sample from this interval.

Water Level/Elevation Data

Water levels were collected from selected Southwest Property/C_3 wells and Unit E wells. The elevation of Third Sister Lake was also surveyed by Atwell.Groundwater level data were collected on October 7, 2010 and the elevation of Third Sister Lake was measured by Atwell on October 14, 2010. All elevation data are provided in Appendix 2.

Water Quality Data

PLS performed VAS during drilling of the new wells, and collected completed well samples after the wells were installed. The samples were analyzed for 1,4-dioxane by PLS. VAS results are on the logs. Water quality data from the completed well samples are provided in Appendix 3.

Water quality data routinely collected from the Caretakers Cabin 1, 2 and 4 wells are also provided in Appendix 3.

FINDINGS

Hydrogeology

Hydrostatigraphy

Three cross sections have been prepared to show possible correlations of the hydrostratigraphy in this area. These cross sections, A-A', B-B', C-C' are shown on Figure 1 and are provided in Appendix 4. Key hydrostratigraphic features on each cross section are described below:

A to A' – This cross section runs along the southern portion of the PLS site then connects to MW-56s/d. This cross section highlights the very thick diamicton (till) sequences at both MW-68 and MW-127. These sequences are absent in the MW-56 area. Thin aquifers are present above and below the thick diamicton. These aquifers appear to be continuous between MW-68 and MW-127.

B to B' – This cross section runs south to north and shows how the Caretakers location relates to the PLS property (Core Area) and ties in on the north to MW-64. Key features of this cross section are the existence of a complex assemblage of interbedded deposits above an elevation of 840 feet NAVD88 (undifferentiated on this cross-section), the presence of what appears to be fairly continuous diamicton possibly extending from the Caretakers Cabin to the area north of the lake, underlain by a thick sand sequence (Unit E).

C to C' – This cross section runs from southwest to northeast and shows how the Caretakers cabin area relates to the SPA. This section ties in GSI-86-01, a boring drilled to bedrock on the PLS property. Key features on this cross section are the continuous diamicton sequence that separates lower sand/gravel sequences (Unit E) from a complex assemblage of interbedded deposits above an elevation of approximately 840 feet NAVD88 (undifferentiated on this cross-section). The lower sand/gravel (Unit E) thickens considerably from the area of MW-127s/d to the north east.

Vertical Groundwater Flow

There is a significant downward hydraulic potentialin the area of the Caretakers Cabin. Water levels have been measured in Third Sister Lake, shallow water bearing deposits, and deep deposits in this area. Recent elevation data from these locations are provided below in Table 1.

Table 1 – Elevation Data

Location	Water Level	Date	Screen Elevation (Approximate)
Third Sister Lake	904.18	10/18/10	NA
MW-78	897.41	10/7/10	856 - 851
MW-125	885.95	10/7/10	840 - 845
Caretakers Well 1	879.43	10/7/10	785 - 781
Caretakers Well 2	879.48	10/7/10	709-717

Note: Elevation Data are in feet (NAVD88).

The water level in Third Sister Lake is almost 25 feet higher than the Unit E. The hydraulic gradient between Third Sister Lake and Unit E is approximately 0.21 feet/foot. The water level in MW-125 (shallow water-bearing zone) is 6.52 feet higher than the Caretakers Well 1 (deeper - Unit E). The vertical hydraulic gradient in Unit E is slightly upward but very minimal, suggesting mostly horizontal flow in this zone.

The significant head difference between Third Sister Lake and the groundwater suggests the lake and the groundwater is not in good communication (otherwise, the head in the shallow zone would be closer to the lake level). It is possible that Third Sister Lake, with its high water level, "pushes" water in the shallow water bearing zones away from it. This may resultin groundwater flowing west from the PLS site to "bifurcate", with a portion of the groundwater in the SPA flowing around the lake to the south.

Horizontal Groundwater Flow – Shallow (Southwest Property/Unit C3)

Water level data were collected from selected Southwest Property/C3 wells. A potentiometric surface map was prepared using the data and is presented as Figure 2.

The lowest hydraulic heads in the area of the Caretakers Cabin are in the area of the SPA. Groundwater levels in the SPA have been lowered due to groundwater extraction. The highest heads in the shallower water-bearing zone are currently in the area to the south of Third Sister Lake (MW-125 and MW-127s). Groundwater in the shallow from the Caretakers Cabin area is interpreted to flow toward the SPA. There is also a potential for groundwater in the Caretakers Cabin area to flow to the west.

Prior to extraction in the SPA, there were no wells in the shallower zone near the Caretakers Cabin. As such, it is not known how the gradients changed over time between this area and SPA since extraction began.

Horizontal Groundwater Flow – Deep (Unit E)

A potentiometric surface map for a portion of the Unit E on the West side of Wagner Road is provided as Figure 3. This map is consistent with previous interpretations made of the Unit E aquifer. Groundwater flow from the Saginaw Forest area is to the north and east. The hydraulic head in MW-127d is similar to (slightly lower – 0.39 feet) than the Caretakers 1 and 2 wells. This is likely due to the considerable thinning of the aquifer in this direction, and not an indication that groundwater flow is toward MW-127d from the Caretakers well locations.

Horizontal and Vertical Distribution of 1,4-Dioxane

Shallow – Southwest Property/Unit C3

Water bearing zones from ground surface to a depth of 170 feet were sampled during the drilling of MW-125. 1,4-Dioxane was not detected until the 49-50.5 feet bgs sample. The 1,4-dioxane concentration in this sample was 45 µg/L.A Simulprobe™ sample was collected from a depth of 59-60.5 feet. This sample had a concentration of 439 µg/L. A diamicton was encountered from approximately 60-66 feet bgs. From 66-72 feet bgs, sand was encountered. A Simulprobe™ sample collected in this sand from 69-70.5 feet bgs had a 1,4-dioxane concentration of 461 µg/L.

MW-125 was installed at depth (65-70 feet bgs) which generally corresponded to the highest 1,4-dioxane concentrations at the boring. A groundwater sample collected from MW-125 on September 13, 2010 had a 1,4-dioxane concentration of 801 u. Another sample collected from the well on October 18, 2010 had a lower concentration of 229 µg/L. The reason for this difference is unknown. Routine monitoring well help establish a water quality trend over time.

Elevated 1,4-dioxane concentrations in the MW-125 boring are present from a depth of 59-70.5feet bgs. Below this interval, a 40 foot thick diamicton (till) is encountered. Hydrostratigraphic cross sections suggest this fine-textured deposit has continuity in this area to the south, north and east. This deposit appears to be limiting, but not eliminating, the downward transfer of 1,4-dioxane in this area.

1,4-Dioxane was not detected in a shallow water bearing zone at MW-127s. The head at MW-127s is also considerably higher than at MW-125. How these two well completion zones correlate is not clear, however, there was only one shallower warm bearing zone at MW-127. As such, the shallow contaminated zone found at MW-125 is either not present at MW-127, or at a much higher head. As such, MW-127 adequately defines the extent of 1,4-dioxane in this area. 1,4-Dioxane has also been absent in groundwater samples collected from the Saginaw Forest supply well installed closer to Liberty, further defining the extent of 1,4-dioxane to the south.

Deep – Unit E

1,4-Dioxane is present in the Unit Eat the Caretakers Cabin in the Caretakers 1 and 2 wells, and in Simulprobe™ samples collected at the MW-125 location. Groundwater quality data from Caretakers 1 well has been monitored since 1999, and groundwater from the Caretakers 2 well has been monitored since it was installed in January of 2001. Data from these wells is provided in Appendix 3.

In both wells, 1,4-dioxane levels appear to have peaked in the Fall of 2005. 1,4-Dioxane levels have consistently been higher in the Caretaker 1 (shallower) well than in Caretaker 2 (deeper) well.

1,4-Dioxane concentrations in Simulprobe™ samples collected during the drilling of MW-125 ranged from 16 to 68 µg/L. These concentrations are generally consistent with those observed in groundwater samples from the Caretakers 1 well. 1,4-Dioxane concentrations appeared to increase with depth.PLS believes this observation is related to the longer time frame it took to collect samples deeper in the aquifer (delays in drilling through difficult formation allowing more time for borehole fluids to exchange with the sample zone).

Between the last Simulprobe™ sample collected (169-170 feet bgs) and the Caretakers 2 well screen (196 to 240 feet bgs), there is approximately 26 feet of aquifer from which Simulprobe™ samples were not collected. This represents approximately 28 percent of the total aquifer thickness.

1,4-Dioxane was detected at a concentration of 2 µg/Lin a Simulprobe™ sample collected from Unit E during the drilling of MW-127. A groundwater sample was collected from MW-127d on October 18, 2010 and analyzed for 1,4-dioxane. This sample was non-detect for 1,4-dioxane This is consistent with water level data which indicates this well is hydraulically upgradient of the Caretakers Well area. MW-127d places a clear southern horizontal boundary of 1,4-dioxane in the Unit E in the Saginaw Forest area.

Transport Processes

Shallow

PLS believes that the most probable mechanism for 1,4-dioxane to migrate toward MW-125 is historic migration driven by historically higher hydraulic heads in the SPA. This potential has diminished or eliminated with extraction in the SPA which have lowered heads in this area considerably. It's difficult to determine how long 1,4-dioxane migrated along the south side of Third Sister Lake.

It is possible that some 1,4-dioxane has migrated to the west/northwest beyond the capture of the SPA extraction wells. Elevated levels of 1,4-dioxane have not been detected at MW-28 or MW-44. Elevated

1,4-dioxane has been detected at MW-56s. It's possible that there is a connection between the Caretakers Cabin area and this well location. If that were the case, fate of 1,4-dioxane from the Caretakers area would be no different than the remainder of the 1,4-dioxane in the area west of Wagner Road (except the Western System). That is, the 1,4-dioxane would migrate generally downward, and/or to the east north east.

Deep - Unit E

1,4-Dioxane in Unit E in the Caretakers Cabin area is believed to be the result of the downward vertical migration of 1,4-dioxane from the shallower water-bearing zone. There is a high vertical gradient between the shallow and deeper zones. Under such conditions and given sufficient time, it is reasonable that 1,4-dioxane could have migrated through the fine-textured deposits separating these zones. Higher 1,4-dioxane concentrations in the Caretaker 1 well (shallower) than Caretaker 2 well is consistent with the transfer of 1,4-dioxane downward from the shallower zone.

CONCLUSIONS AND RECOMMENDATIONS

Based on the investigations conducted by PLS, the following conclusions and recommendations are provided:

1. The most probable transport process for 1,4-dioxane entering the deeper (Unit E) zone in the area of the Caretakers Cabin is the downward migration of 1,4-dioxane from shallow water-bearing zones, promoted by the strong downward hydraulic gradient in this area.

   Horizontal groundwater flow in the Unit E is to the north and east from the Caretakers Cabin area (toward the Prohibition Zone). This is consistent with the fact that the Unit E thins to the south as indicated by data from the MW-127 cluster and MW-68, and the fact that 1,4-dioxane concentrations are low or non-detect in these wells. Based on these findings, PLS concludes that the southern extent of 1,4-dioxane in the Unit E is adequately defined. The Unit E plume is also very well defined to the west with the MW-62 and MW-63 well clusters.

   PLS sees no value to attempting the collection of additional vertical aquifer samples at the Caretakers well location. 1,4-Dioxane concentrations at this location are already known to exceed 85 µg/Lin a thin shallow zone above the Unit E and there are no data to support further expansion of the Unit E plume to the south or west.

2. 1,4-Dioxane in the shallower aquifer has migrated west of the PLS property in thin water-bearing zone and relatively high concentrations. It is likely that this migration occurred prior to the initiation of extraction in the SPA.

   The extent of this 1,4-dioxane has been adequately defined to the southwest by MW-127s. The potential exists that a portion of the plume has migrated west/north west beyond MW-125.

Access to drilling locations in the Saginaw Forest is very difficult. This area is a forestry research station. As such, cutting trees for rig access is very undesirable. PLS recognizes the need for further definition of the contamination detected at MW-125. PLS is proposing the installation of a monitoring well west of MW-125 at the location shown on Figure 4.

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BOREHOLE LOG

BORING/WELL ID: MW-125 (PLS-10-02)

TOTAL DEPTH (ft.): 175'

PROJECT: Pall Life Sciences
SITE LOCATION: Ann Arbor, Michigan
PROJECT NO.: F96502
PROJECT MANAGER: Todd C. Campbell, CPG
LOGGED BY: Todd C. Campbell, CPG

START DATE: 8/25/2010
END DATE: 8/31/2010
TOC ELEV.: 909.97' NAVD 88
GROUND ELEV.: approx. 910.5'
STATIC WATER LVL. 25.8' bgs

DRILLING CO.: Stearns Drilling
DRILLER: Jerry, Ralph, Dan, Pat
RIG TYPE: CME 95
METHOD OF DRILLING: Hollow Stem Auger
SAMPLING METHODS: Split spoon, Simulprobe

NOTES: Field GPS N 42.27480, W083.80584, acc. 20'. Saginaw Forest, west of MW-78

▼ Static Water Level

DESCRIPTION	PID ppm	GRAPHIC LOG	DEPTH (ft. bgl)	Static Water Level	Sample/ Revovery	Sample ID	Blow Counts	WELL CONSTRUCTION DETAIL
SILTY SAND: Sand, fine grained (60%); Silt (40%). Dark brown, well sorted, dry.			0					#5 Sand Pack
			2					Boring PLS-10-02 terminated due to boulder encountered at approximately 40' bgs. Moved approximately 5 feet east to try to advance beyond boulder (2nd attempt at PLS-10-02). Boring advanced to approximately 170-175' where a Boulder was encountered; unable to drill beyond Boulder. Both borings grouted with bentonite grout. MW-125 installed approximately 5' east of original boring.
			4					
SAND: Driller notes Sand, moist.			6					
			8					
SANDY SILT: Silt (50%); Sand, fine grained (50%). Grayish brown, well sorted, very soft, moist.			10	1.4'			0,1, 1,1	
trace Clay (10%).			12					
			14					
SAND AND GRAVEL: Driller notes Sand and Gravel.			16					
			18					
Sand, fine to coarse grained (30/40/30) (75%); Gravel, fine subangular (25%). Grayish brown, poorly sorted, loose, wet.			20	1.5'			1,2, 4,4	
			22					Simulprobe sample 19-20.5' (<1 ug/L)
			24					
			26	▼				Bentonite Grout
			28					
Sand, medium to fine grained (60/40) (80%); trace coarse grained Sand (10%); trace Gravel, fine (10%). Grayish brown, moderately sorted, medium dense, wet.			30	1.5'			4,7, 10	Simulprobe sample 29'-30.5' (<1 ug/L)
			32					
DIAMICTON: Driller notes Till.			34					2" Galvanized Casing
Interbedded Sand seams throughout.			36					
			38					
Silt (60%); Sand, fine grained (20%); Gravel, fine (10%); trace Clay (10%). Grayish brown, poorly sorted, hard, dry. Boulder present at 40.5' bgs at first location. Moved 5' west to drill beyond Boulder.			40	1.5'			8,52 (2")	
			42					
SAND: Driller notes Sand.			44					
			46					Bentonite Grout

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BOREHOLE LOG

BORING/WELL ID: MW-125 (PLS-10-02)

TOTAL DEPTH (ft.): 175'

PROJECT: Pall Life Sciences
SITE LOCATION: Ann Arbor, Michigan
PROJECT NO.: F96502
PROJECT MANAGER: Todd C. Campbell, CPG
LOGGED BY: Todd C. Campbell, CPG

START DATE: 8/25/2010
END DATE: 8/31/2010
TOC ELEV.: 909.97' NAVD 88
GROUND ELEV.: approx. 910.5'
STATIC WATER LVL. 25.8' bgs

DRILLING CO.: Stearns Drilling
DRILLER: Jerry, Ralph, Dan, Pat
RIG TYPE: CME 95
METHOD OF DRILLING: Hollow Stem Auger
SAMPLING METHODS: Split spoon, Simulprobe

NOTES: Field GPS N 42.27480, W083.80584, acc. 20'. Saginaw Forest, west of MW-78

▼ Static Water Level

DESCRIPTION	PID ppm	GRAPHIC LOG	DEPTH (ft. bgl)	Static Water Level	Sample/ Revovery	Sample ID	Blow Counts	WELL CONSTRUCTION DETAIL
SAND AND GRAVEL: Sand, coarse to fine grained (60/30/10) (70%); Gravel, fine (30%), subrounded. Grayish brown, moderately sorted, dense, wet.			48 50 52 54 56 58		0.8'		12,21, 21,19	Simulprobe sample 49'-50.5' (45 ug/L) 2" Galvanized Casing
DIAMICTON: Silt (60%); Sand, fine grained (20%); trace Clay (10%); trace Gravel, fine (10%). Grayish brown, poorly sorted, moist. Interbedded Sand seams throughout.			60 62 64		0.5'		10,12, 12	Simulprobe sample 59'-60.5' (439 ug/L) #5 Sand Pack 2" Stainless Steel Screen (10 slot) Screened Between 65 and 70 Feet Below Ground Surface
SAND: Driller notes Sand. Sand, medium to fine grained (70/30) (90%); trace Silt (10%). Grayish brown, well sorted, medium dense, wet.			66 68 70		1.5'		8,9, 9	Simulprobe sample 69'-70.5' (461 ug/L)
DIAMICTON: Driller notes Till. Silt (50%); Sand, fine to medium grained (70/30) (20%); Clay (20%); Gravel, fine (10%). Grayish brown, poorly sorted, hard, moist.			72 74 76 78 80		0.2'		28,41, 37,38	Added approx. 20 gallons of water to augers
Silt (70%); Clay (20%); trace Sand, fine (10%). Grayish brown, moderately sorted, hard, dry. Silty Sand Seam			82 84 86 88 90 92 94		1.2'		8,13, 32,74	

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BOREHOLE LOG

BORING/WELL ID: MW-125 (PLS-10-02)

TOTAL DEPTH (ft.): 175'

PROJECT: Pall Life Sciences
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DRILLER: Jerry, Ralph, Dan, Pat
RIG TYPE: CME 95
METHOD OF DRILLING: Hollow Stem Auger
SAMPLING METHODS: Split spoon, Simulprobe

NOTES: Field GPS N 42.27480, W083.80584, acc. 20'. Saginaw Forest, west of MW-78

▼ Static Water Level

DESCRIPTION	PID ppm	GRAPHIC LOG	DEPTH (ft. bgl)	Static Water Level	Sample/ Revovery	Sample ID	Blow Counts	WELL CONSTRUCTION DETAIL
Silt (50%), Sand, fine grained (30%); Gravel, fine (10%); trace Clay. Grayish brown, moderately sorted, hard, dry.			94 96 98 100		1.3'		10,28, 75 (5")	
as above.			102 104 106 108 110		2.0'		11,27, 50 (4")	
SAND: Sand, fine to coarse grained (30/40/30) (60%); Gravel, fine (20%); Silt (20%). Grayish brown, poorly sorted, very dense, wet.			112 114 116 118					
DIAMICTON: Silt (60%); Sand, fine grained (20%); trace Clay (10%); trace Gravel, fine (10%). Grayish brown, poorly sorted, moist.			120		0.5'		22, 75 (6")	Simulprobe sample 119'-120.5' (31 ug/L)
SAND: Driller notes Sand and Gravel.			122 124 126					
Gravel, fine to coarse (70%); Sand, coarse to fine grained (30%). Grayish brown, poorly sorted, very dense, wet.			128 130		0.2'		27,100	Simulprobe sample 129'-130.5' (28 ug/L)
Cobbles throughout.			132 134 136					
Sand, coarse to medium grained (80/20) (80%); Gravel, fine, subangular to subrounded (10%); trace Silt (10%). Grayish brown, poorly sorted, very dense, wet.			138 140		0.6'		41,39, 70	Simulprobe sample 139'-140.5' (16 ug/L)

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BOREHOLE LOG

BORING/WELL ID: MW-125 (PLS-10-02)

TOTAL DEPTH (ft.): 175'

PROJECT: Pall Life Sciences
SITE LOCATION: Ann Arbor, Michigan
PROJECT NO.: F96502
PROJECT MANAGER: Todd C. Campbell, CPG
LOGGED BY: Todd C. Campbell, CPG

START DATE: 8/25/2010
END DATE: 8/31/2010
TOC ELEV.: 909.97' NAVD 88
GROUND ELEV.: approx. 910.5'
STATIC WATER LVL. 25.8' bgs

DRILLING CO.: Stearns Drilling
DRILLER: Jerry, Ralph, Dan, Pat
RIG TYPE: CME 95
METHOD OF DRILLING: Hollow Stem Auger
SAMPLING METHODS: Split spoon, Simulprobe

NOTES: Field GPS N 42.27480, W083.80584, acc. 20'. Saginaw Forest, west of MW-78

▼ Static Water Level

DESCRIPTION	PID ppm	GRAPHIC LOG	DEPTH (ft. bgl)	Static Water Level	Sample/ Revovery	Sample ID	Blow Counts	WELL CONSTRUCTION DETAIL
			142					
			144					
Cobbles throughout.			146					Added approx. 20 gallons of water to augers
			148					
Sand, coarse to fine grained (30/50/20) (60%); Gravel, fine to coarse (30%); trace Silt (10%). Grayish brown, poorly sorted, very dense, wet.			150		1.0'		23,49, 46	Simulprobe sample 149'-150.5' (20 ug/L)
			152					
			154					
			156					
			158					
Coarse gravel throughout.			160		0.5'		125 (6")	Simulprobe sample 159'-160' (66 ug/L)
			162					
Cobbles/Boulders throughout with possible Till seams throughout.			164					
			166					
			168					
Sand and Gravel as above with Boulder encountered at 170'.			170		1.0'		18, 75 (5")	Simulprobe sample 169'-170' (68 ug/L)
			172					Added approx. 10 gallons of water to augers
			174					

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BOREHOLE LOG

BORING/WELL ID: **MW-127s**

TOTAL DEPTH (ft.): **40'**

PROJECT: Pall Life Sciences
SITE LOCATION: Ann Arbor, Michigan
PROJECT NO.: F96502
PROJECT MANAGER: Todd C. Campbell, CPG
LOGGED BY: Brad Peuler, CPG/Todd C. Campbell, CPG

START DATE: 9/30/10
END DATE: 9/30/10
TOC ELEV.: 911.02' NAVD 88
GROUND ELEV.: approx. 911.5'
STATIC WATER LVL.: 10.11' btoc

DRILLING CO.: Stearns Drilling
DRILLER: Jerry, Ralph, Jake
RIG TYPE: CME 95
METHOD OF DRILLING: Hollow Stem Auger
SAMPLING METHODS: Split spoon, Simulprobe

NOTES: MW-127s is located approx.10' west of MW-127d. Descriptions based on MW-127d.

▼ Static Water Level

DESCRIPTION	PID ppm	GRAPHIC LOG	DEPTH (ft. bgl)	Static Water Level	Sample/ Revovery	Sample ID	Blow Counts	WELL CONSTRUCTION DETAIL
TOPSOIL: Clay/Silt with Sand, fine grained. Dark brown, moderately sorted, moist.			0					#5 Sand Pack
SAND: Sand, fine grained; Silt (30%). Light brown, well sorted, dry. occasional Cobbles.			2					
			4					
SANDY SILT: Silt (50%); Sand, fine to medium grained (70/30) (50%). Brownish gray, well sorted, moist.			6					
Silt (50%); Sand, fine to coarse grained (80/10/10) (30%); Gravel, fine (10%); trace Clay (10%). Grayish brown, moderately sorted, stiff, dry.			8					
			10	▼	1.2'		5,6,6,7	
			12					
			14					
			16					2" Galvanized Casing
			18					Bentonite Grout
Silt (60%); Sand, fine grained (40%). Gray, well sorted, stiff, moist.			20		1.5'		4,6,7,7	
			22					
			24					
			26					
			28					
CLAYEY SILT: Silt (50%); Clay (30%); Sand, fine to coarse grained (40/30/20) (20%). Gray, poorly sorted, very stiff, dry to moist.			30		0.3'		6,8,9,12	
			32					
			34					#5 Sand Pack
SAND: Sand, fine to medium grained (70/30) (90%); Gravel, fine (10%). Brown, well sorted, medium dense, wet.			36		0.3'		7,8,8,12	2" Stainless Steel Screen (10 slot) Screened Between 35 and 40 Feet Below Ground Surface
			38					
			40		0.3'		8,15,25,38	

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BOREHOLE LOG

BORING/WELL ID: **MW-127d (PLS-10-05)**

TOTAL DEPTH (ft.): **215'**

PROJECT: Pall Life Sciences	**START DATE:** 9/21/2010	**DRILLING CO.:** Stearns Drilling
SITE LOCATION: Ann Arbor, Michigan	**END DATE:** 9/29/10	**DRILLER:** Jerry, Ralph, Jake
PROJECT NO.: F96502	**TOC ELEV.:** 911.65' NAVD 88	**RIG TYPE:** CME 95
PROJECT MANAGER: Todd C. Campbell, CPG	**GROUND ELEV.:** approx. 912'	**METHOD OF DRILLING:** Hollow Stem Auger
LOGGED BY: Brad Peuler, CPG/Todd C. Campbell, CPG	**STATIC WATER LVL.:** 32.35' btoc	**SAMPLING METHODS:** Split spoon, Simulprobe

NOTES: Field GPS N42.27407, W.083.80807, acc. 40'. Approx. 750' west sw of Caretaker's cabin.

▼ Static Water Level

DESCRIPTION	PID ppm	GRAPHIC LOG	DEPTH (ft. bgl)	Static Water Level	Sample/ Revovery	Sample ID	Blow Counts	WELL CONSTRUCTION DETAIL
TOPSOIL: Clay/Silt with Sand, fine grained. Dark brown, moderately sorted, moist.			0					#5 Sand Pack
SAND: Sand, fine grained; Silt (30%). Light brown, well sorted, dry. occasional Cobbles.			2					PLS-10-05 grouted with bentonite. MW-127d installed 5' east of boring.
SANDY SILT: Silt (50%); Sand, fine to medium grained (70/30) (50%). Brownish gray, well sorted, moist.			4					
			6					
			8					
Silt (50%); Sand, fine to coarse grained (80/10/10) (30%); Gravel, fine (10%); trace Clay (10%). Grayish brown, moderately sorted, stiff, dry.			10		1.2'		5,6,6,7	
			12					
			14					
			16					2" Galvanized Casing
			18					
Silt (60%); Sand, fine grained (40%). Gray, well sorted, stiff, moist.			20		1.5'		4,6,7,7	
			22					
			24					
			26					
			28					
CLAYEY SILT: Silt (50%); Clay (30%); Sand, fine to coarse grained (40/30/20) (20%). Gray, poorly sorted, very stiff, dry to moist.			30		0.3'		6,8,9,12	
			32					
			34					
SAND: Sand, fine to medium grained (70/30) (90%); Gravel, fine (10%). Brown, well sorted, medium dense, wet. Driller notes interbedded Silt seams throughout.			36		0.3'		7,8,8,12	
			38					
			40		0.3'		8,15,25,38	
DIAMICTON: Silt (60%); Sand, fine grained (20%); Gravel, fine (10%); Clay (10%). Gray, poorly sorted, hard, dry.			42					
			44					Bentonite Grout

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BOREHOLE LOG

BORING/WELL ID: **MW-127d (PLS-10-05)**

TOTAL DEPTH (ft.): **215'**

PROJECT: Pall Life Sciences	**START DATE:** 9/21/2010	**DRILLING CO.:** Stearns Drilling
SITE LOCATION: Ann Arbor, Michigan	**END DATE:** 9/29/10	**DRILLER:** Jerry, Ralph, Jake
PROJECT NO.: F96502	**TOC ELEV.:** 911.65' NAVD 88	**RIG TYPE:** CME 95
PROJECT MANAGER: Todd C. Campbell, CPG	**GROUND ELEV.:** approx. 912'	**METHOD OF DRILLING:** Hollow Stem Auger
LOGGED BY: Brad Peuler, CPG/Todd C. Campbell, CPG	**STATIC WATER LVL.:** 32.35' btoc	**SAMPLING METHODS:** Split spoon, Simulprobe

NOTES: Field GPS N42.27407, W.083.80807, acc. 40'. Approx. 750' west sw of Caretaker's cabin.

▼ Static Water Level

DESCRIPTION	PID ppm	GRAPHIC LOG	DEPTH (ft. bgl)	Static Water Level	Sample/ Revovery	Sample ID	Blow Counts	WELL CONSTRUCTION DETAIL
Silt (50%); Sand, fine grained (20%); Clay (20%); Gravel, fine to coarse (10%). Gray, poorly sorted, hard, dry.			46 48 50 52 54 56 58		1.5'		7,29,75 (5")	
Silt (50%); Sand, fine to medium grained (70/30) (20%); Clay (20%); Gravel, fine (10%). Gray, poorly sorted, hard, dry.			60 62 64 66 68		1.5'		14,32,75 (6")	
			70 72 74 76 78		0.3'		75 (3")	Added approx. 20 gallons of water to augers 2" Galvanized Casing
Silt (40%); Clay (40%); Sand, fine to medium grained (50/50) (10%); Gravel, fine to coarse (10%). Gray, poorly sorted, hard, dry.			80 82 84 86 88		0.2'		100 (6")	Bentonite Grout
			90		0.4'		75 (5")	Added approx. 10 gallons of water to augers

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BOREHOLE LOG

BORING/WELL ID: **MW-127d (PLS-10-05)**

TOTAL DEPTH (ft.): **215'**

PROJECT: Pall Life Sciences
SITE LOCATION: Ann Arbor, Michigan
PROJECT NO.: F96502
PROJECT MANAGER: Todd C. Campbell, CPG
LOGGED BY: Brad Peuler, CPG/Todd C. Campbell, CPG

START DATE: 9/21/2010
END DATE: 9/29/10
TOC ELEV.: 911.65' NAVD 88
GROUND ELEV.: approx. 912'
STATIC WATER LVL.: 32.35' btoc

DRILLING CO.: Stearns Drilling
DRILLER: Jerry, Ralph, Jake
RIG TYPE: CME 95
METHOD OF DRILLING: Hollow Stem Auger
SAMPLING METHODS: Split spoon, Simulprobe

NOTES: Field GPS N42.27407, W.083.80807, acc. 40'. Approx. 750' west sw of Caretaker's cabin.

▼ Static Water Level

DESCRIPTION	PID ppm	GRAPHIC LOG	DEPTH (ft. bgl)	Static Water Level	Sample/ Recovery	Sample ID	Blow Counts	WELL CONSTRUCTION DETAIL
as above.			92 94 96 98 100		0.5'		100 (6")	Added approx. 10 gallons of water to augers
Silt (50%); Clay (30%); Sand, fine grained (10%); trace Gravel, fine. Grayish brown, moderately sorted, hard, dry.			102 104 106 108 110		0.5'		28,75	Added approx. 10 gallons of water to augers
Cobbles.			112 114 116 118 120		0.5'		100 (6")	Added approx. 10 gallons of water to augers
Silt (50%); Clay (20%); Sand, fine grained (20%); trace Gravel, fine. Grayish brown, moderately sorted, hard, dry.			122 124 126 128 130		0.9'		31,75 (5")	Added approx. 10 gallons of water to augers
			132 134 136					Bentonite Grout

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BOREHOLE LOG

BORING/WELL ID: **MW-127d (PLS-10-05)**

TOTAL DEPTH (ft.): **215'**

PROJECT: Pall Life Sciences	**START DATE:** 9/21/2010	**DRILLING CO.:** Stearns Drilling
SITE LOCATION: Ann Arbor, Michigan	**END DATE:** 9/29/10	**DRILLER:** Jerry, Ralph, Jake
PROJECT NO.: F96502	**TOC ELEV.:** 911.65' NAVD 88	**RIG TYPE:** CME 95
PROJECT MANAGER: Todd C. Campbell, CPG	**GROUND ELEV.:** approx. 912'	**METHOD OF DRILLING:** Hollow Stem Auger
LOGGED BY: Brad Peuler, CPG/Todd C. Campbell, CPG	**STATIC WATER LVL.:** 32.35' btoc	**SAMPLING METHODS:** Split spoon, Simulprobe

NOTES: Field GPS N42.27407, W.083.80807, acc. 40'. Approx. 750' west sw of Caretaker's cabin.

▼ Static Water Level

DESCRIPTION	PID ppm	GRAPHIC LOG	DEPTH (ft. bgl)	Static Water Level	Sample/ Revovery	Sample ID	Blow Counts	WELL CONSTRUCTION DETAIL
			136					
			138					
			140		1.3'		21,51,50 (3")	
			142					
			144					
			146					
			148					2" Galvanized Casing
Silt/Clay (50/50). Grayish brown, well sorted, hard, dry.			150		1.4'		39,75 (5")	
			152					
			154					
			156					
			158					
			160		1.4'		15,34,50 (4")	
			162					
			164					
			166					
			168					
as above.			170		0.9'		23,75 (5")	Added approx. 10 gallons of water to augers
			172					
			174					
			176					Bentonite Grout
			178					
			180		0.8'		6,10,18	Added approx. 10 gallons of water to augers

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BOREHOLE LOG

BORING/WELL ID: MW-127d (PLS-10-05)

TOTAL DEPTH (ft.): 215'

PROJECT: Pall Life Sciences	**START DATE:** 9/21/2010	**DRILLING CO.:** Stearns Drilling
SITE LOCATION: Ann Arbor, Michigan	**END DATE:** 9/29/10	**DRILLER:** Jerry, Ralph, Jake
PROJECT NO.: F96502	**TOC ELEV.:** 911.65' NAVD 88	**RIG TYPE:** CME 95
PROJECT MANAGER: Todd C. Campbell, CPG	**GROUND ELEV.:** approx. 912'	**METHOD OF DRILLING:** Hollow Stem Auger
LOGGED BY: Brad Peuler, CPG/Todd C. Campbell, CPG	**STATIC WATER LVL.:** 32.35' btoc	**SAMPLING METHODS:** Split spoon, Simulprobe

NOTES: Field GPS N42.27407, W.083.80807, acc. 40'. Approx. 750' west sw of Caretaker's cabin.

▼ Static Water Level

DESCRIPTION	PID ppm	GRAPHIC LOG	DEPTH (ft. bgl)	Static Water Level	Sample/ Revovery	Sample ID	Blow Counts	WELL CONSTRUCTION DETAIL
SAND: Sand, fine to coarse grained (20/50/30) (90%); Gravel, fine (10%). Grayish brown, well sorted, very dense, wet.			182, 184, 186, 188, 190, 192, 194, 196, 198		1.0'		23,75 (5")	Simulprobe sample 188.5-190' (<1 ug/L); Added approx. 10 gallons of water to augers; #5 Sand Pack; 2" Stainless Steel Screen (10 slot) Screened Between 195 and 200 Feet Below Ground Surface
SAND AND GRAVEL: Sand, fine to coarse grained (20/50/30) (70%); Gravel, fine to coarse (30%). Grayish brown, moderately sorted, very dense, wet.			200		0.2'		50 (1")	Simulprobe sample 198.5-199' (2.2 ug/L)
DIAMICTON: Silt (50%); Clay (20%); Sand, fine grained (20%); Gravel, fine (10%). Grayish brown, moderately sorted, hard, dry.			202, 204, 206					Added approx. 20 gallons of water to augers; Added approx. 20 gallons of water to augers
SAND AND GRAVEL: Sand, fine to coarse grained (20/50/30) (70%); Gravel, fine to coarse (30%). Grayish brown, moderately sorted, very dense, wet. driller notes interbedded Clay and Sand seams.			208, 210		1.5'		18,58,100	Added approx. 20 gallons of water to augers
SHALE: Shale, hard (infer from drilling refusal and gamma log).			212, 214		0'		100 (1")	

Appendix 1

Appendix 2

Pall Life Sciences

Southwest Property/Saginaw Forest Property Areas

Water Level Data - October 7, 2010

Well ID	Time	Reading	Top of Casing (feet NAVD88)	Water Level Elev. (feet NAVD88)
Shallow Wells				
MW-8d	11:10	47.93	931.77	883.84
MW-10d	11:43	35.7	913.83	878.13
MW-18d	11:52	37.97	916.92	878.95
MW-18s	11:50	14.55	916.73	902.18
MW-20	11:05	29.69	910.66	880.97
MW-22	11:48	44.11	922.85	878.74
MW-28	8:30	36.44	916.92	880.48
MW-37	11:55	44.36	926.59	882.23
MW-38s	12:05	36.98	917.34	880.36
MW-39s	11:00	28.91	908.67	879.76
MW-44	8:20	31.31	911.22	879.91
MW-45d	11:45	30.45	911.38	880.93
MW-48	11:20	40.89	920.75	879.86
MW-49	11:27	39.6	923.92	884.32
MW-50	11:40	28.84	908.92	880.08
MW-56s	8:35	45.62	924.87	879.25
MW-57	11:15	47.02	926.58	879.56
MW-58s	11:33	29.03	901.59	872.56
MW-58d	11:35	29.38	901.27	871.89
MW-62s	8:55	27.35	910.42	883.07
MW-63s	8:48	29.66	913.12	883.46
MW-75	11:24	46.4	924.68	878.28
MW-78	10:20	15.24	912.65	897.41
MW-125	10:15	24.02	909.97	885.95
MW-126s	10:50	35.54	915.57	880.03
MW-127s	10:00	9.75	911.02	901.27
Deep Wells (Unit E)				
MW-56d	8:36	45.47	924.81	879.34
MW-62d	8:58	30.46	910.74	880.28
MW-63d	8:47	31.61	912.09	880.48
MW-64	11:59	54.66	931.11	876.45
MW-65i	9:33	53.5	928.87	875.37
MW-65s	9:35	53.62	928.95	875.33
MW-65d	9:30	53.19	928.49	875.30
MW-66	12:01	34.13	911.25	877.12
MW-68	9:15	63.78	945.26	881.48
MW-95	9:25	41.13	914.95	873.82
MW-126d	10:52	35.13	915.11	879.98
MW-127d	10:03	32.61	911.65	879.04
Saginaw Forest #1	10:25	34.01	913.44	879.43
Saginaw Forest #2	10:23	31.63	911.11	879.48

ATWELL, LLC
PALL WELL SURVEY
6000165

MONITORING WELLS (OCTOBER 18, 2010)			
WELL NO.	NORTHING (SPC MI S)	EASTING (SPC MI S)	ELEVATION (TOP OF CASING) (NAVD 88)
TOP OF WATER	--	--	904.16
MW 125	282,843.57	13,275,136.95	909.97
MW 127D	282,611.91	13,274,498.42	911.65
MW 127S	282,613.86	13,274,488.21	911.02
MW 126S	284,104.04	13,272,836.24	915.57
MW 126D	284,106.00	13,272,833.58	915.11
MW 124D	285,507.59	13,291,717.62	853.88
MW 124S	285,512.39	13,291,717.34	854.28

Appendix 3

PALL Life Sciences

Pall Life Sciences
600 South Wagner Road
Ann Arbor, MI 48103-9019 USA

734.665.0651 phone
www.pall.com

Analytical Data Report

Printed On: Wednesday, November 10, 2010

Well Name: MW-125

Aquifer:	C3	Date Installed:	8/31/2010	Boring Depth:	175.00 Feet bgl	Screen 1:	65.00 to 70.00 Feet
Map Location:	Q-14	Well Driller:	Stearns Drilling	Ground Elevation:	Feet	Screen 1 Length:	5.00 Feet
X Coordinate:	13275136.95	Well Type:	Monitoring Wells	TOC Elevation:	909.97 Feet amsl	Screen 2:	to Feet
Y Coordinate:	282843.57	Sampling Interval:	Quarterly	TOC to screen bottom:	Feet		
Comments:							

Date and Time Collected		1,4-dioxane Results (ppb)	R.L.	Lab	Bromate Results	R.L.	Lab	Bromide Results	R.L.	Lab	Static Time	Static Reading	Sample Comments
09/13/2010	11:20	801	1.0	PLS		5.0	PLS		10.0	PLS	10:15	25.19	
10/07/2010			1.0	PLS		5.0	PLS		10.0	PLS	10:15	24.02	
10/18/2010	10:55	229	1.0	PLS		5.0	PLS		10.0	PLS	10:30	24.15	

NSP= No sample taken nd=Not detected at or above the reporting limit ppb= parts per billion

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Analytical Data Report

Printed On: Wednesday, November 10, 2010

Well Name: MW-127s

Aquifer:	C3	Date Installed:	9/30/2010	Boring Depth:	40.00 Feet bgl	Screen 1:	35.00 to 40.00 Feet
Map Location:	R-14	Well Driller:	Stearns Drilling	Ground Elevation:	Feet	Screen 1 Length:	5.00 Feet
X Coordinate:	13274488.21	Well Type:	Monitoring Wells	TOC Elevation:	911.02 Feet amsl	Screen 2:	to Feet
Y Coordinate:	282613.86	Sampling Interval:	Quarterly	TOC to screen bottom:	Feet		
Comments:	Saginaw Forest						

Date and Time Collected		1,4-dioxane Results (ppb)	R.L.	Lab	Bromate Results	R.L.	Lab	Bromide Results	R.L.	Lab	Static Time	Static Reading	Sample Comments
10/07/2010			1.0	PLS		5.0	PLS		10.0	PLS	10:00	9.75	
10/18/2010	14:25	nd	1.0	PLS		5.0	PLS		10.0	PLS	14:05	9.94	

NSP= No sample taken nd=Not detected at or above the reporting limit ppb= parts per billion

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Analytical Data Report

Printed On: Wednesday, November 10, 2010

Well Name: MW-127d

Aquifer:	E	Date Installed:	9/29/2010	Boring Depth:	215.00 Feet bgl	Screen 1:	195.00 to 200.00 Feet
Map Location:	R-14	Well Driller:	Stearns Drilling	Ground Elevation:	Feet	Screen 1 Length:	5.00 Feet
X Coordinate:	13274498.42	Well Type:	Monitoring Wells	TOC Elevation:	911.65 Feet amsl	Screen 2:	to Feet
Y Coordinate:	282611.91	Sampling Interval:	Quarterly	TOC to screen bottom:	Feet		
Comments:	Saginaw Forest						

Date and Time Collected		1,4-dioxane Results (ppb)	R.L.	Lab	Bromate Results	R.L.	Lab	Bromide Results	R.L.	Lab	Static Time	Static Reading	Sample Comments
10/07/2010			1.0	PLS		5.0	PLS		10.0	PLS	10:03	32.61	
10/18/2010	13:55	nd	1.0	PLS		5.0	PLS		10.0	PLS	12:55	32.63	

NSP= No sample taken nd=Not detected at or above the reporting limit ppb= parts per billion

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Analytical Data Report

Printed On: Wednesday, October 27, 2010

Well Name: Saginaw Forest Cabin #1

Aquifer:	E	Date Installed:	6/8/1970	Boring Depth:	Feet bgl	Screen 1:	to Feet
Map Location:	Q-14	Well Driller:		Ground Elevation:	911.50 Feet	Screen 1 Length:	4.00 Feet
X Coordinate:	13275076.05	Well Type:	Residential Wells	TOC Elevation:	913.44 Feet amsl	Screen 2:	0.00 to 0.00 Feet
Y Coordinate:	282874.16	Sampling Interval:	Annual	TOC to screen bottom:	132.00 Feet		
Comments:							

Date and Time Collected		1,4-dioxane Results (ppb)	R.L.	Lab	Bromate Results	R.L.	Lab	Bromide Results	R.L.	Lab	Static Time	Static Reading	Sample Comments
12/14/1999		nd	1.0										
03/17/2000		7	1.0										
03/27/2000		8	1.0										
04/27/2000		6	1.0										
05/31/2000		9	1.0										
06/27/2000		7	1.0										
07/19/2000		8	1.0										
08/30/2000		8	1.0										
09/26/2000		10	1.0										
10/24/2000		9	1.0										
11/30/2000		See Comments	1.0										Sample broken.
12/01/2000		11	1.0										
12/20/2000	17:45	12	1.0										
02/08/2001	17:25	14	1.0										
05/10/2001	17:40	14	1.0										
07/24/2001	8:25	21	1.0										
10/01/2001			1.0									31.95	
10/01/2001	7:30	18	1.0	PLS									
04/11/2002	7:24	14	1.0	PLS									
07/18/2002	7:40	14	1.0	PLS									
08/21/2002			1.0									41.23	
09/10/2002	7:40	22	1.0	PLS									
10/16/2002	7:30	25	1.0	PLS									
01/09/2003			1.0									33.42	

NSP= No sample taken nd=Not detected at or above the reporting limit ppb= parts per billion

Analytical Data Report

Printed On: Wednesday, October 27, 2010

Well Name: Saginaw Forest Cabin #1

Aquifer:	E	Date Installed:	6/8/1970	Boring Depth:	Feet bgl	Screen 1:	to Feet
Map Location:	Q-14	Well Driller:		Ground Elevation:	911.50 Feet	Screen 1 Length:	4.00 Feet
X Coordinate:	13275076.05	Well Type:	Residential Wells	TOC Elevation:	913.44 Feet amsl	Screen 2:	0.00 to 0.00 Feet
Y Coordinate:	282874.16	Sampling Interval:	Annual	TOC to screen bottom:	132.00 Feet		
Comments:							

Date and Time Collected		1,4-dioxane Results (ppb)	R.L.	Lab	Bromate Results	R.L.	Lab	Bromide Results	R.L.	Lab	Static Time	Static Reading	Sample Comments
05/28/2003			1.0								9:20	33.91	
09/08/2003	11:19	30	1.0	PLS							10:27	34.53	
10/13/2003	10:59	31	1.0	PLS							8:21	34.6	
01/02/2004			1.0	PLS							15:01	34.52	
03/08/2004			1.0	PLS							9:13	34.7	
04/16/2004	10:26	45	1.0	PLS							9:49	34.43	
09/15/2004			1.0	PLS							8:48	35.1	
10/22/2004	9:53	42	1.0	PLS							8:53	34.84	
03/14/2005			1.0	PLS							8:56	34.93	
04/21/2005	11:16	44	1.0	PLS		10.0	PLS				10:14	34.87	
09/13/2005			1.0	PLS		5.0	PLS		10.0	PLS	8:40	34.56	
11/07/2005	16:43	49	1.0	PLS		5.0	PLS		10.0	PLS	16:12	34.71	
01/10/2006			1.0	PLS		5.0	PLS		10.0	PLS	13:19	35.64	
03/20/2006			1.0	PLS		5.0	PLS		10.0	PLS	8:37	35.13	
05/18/2006	12:30	44	1.0	PLS		5.0	PLS		10.0	PLS	11:30	35.01	
06/15/2006			1.0	PLS		5.0	PLS		10.0	PLS	11:45	35.28	
09/15/2006			1.0	PLS		5.0	PLS		10.0	PLS	9:01	35.44	
10/16/2006	9:40	42	1.0	PLS		5.0	PLS		10.0	PLS	8:20	35.33	
02/22/2007			1.0	PLS		5.0	PLS		10.0	PLS	9:55	34.54	
03/13/2007			1.0	PLS		5.0	PLS		10.0	PLS	8:50	34.46	
05/18/2007	8:30	37	1.0	PLS		5.0	PLS		10.0	PLS	7:20	34.52	
09/13/2007			1.0	PLS		5.0	PLS		10.0	PLS	10:25	34.61	
10/25/2007	9:45	34	1.0	PLS		5.0	PLS		10.0	PLS	8:40	34.94	
02/25/2008			1.0	PLS		5.0	PLS		10.0	PLS	9:32	34.36	
07/31/2008	10:40	31	1.0	PLS		5.0	PLS		10.0	PLS	8:50	34.51	
09/17/2008			1.0	PLS		5.0	PLS		10.0	PLS	9:20	34.54	
03/17/2009			1.0	PLS		5.0	PLS		10.0	PLS	9:59	33.7	
08/19/2009	9:45	32	1.0	PLS		5.0	PLS		10.0	PLS	8:45	33.81	
09/24/2009			1.0	PLS		5.0	PLS		10.0	PLS	10:17	33.65	
03/09/2010			1.0	PLS		5.0	PLS		10.0	PLS	9:05	33.99	
08/06/2010	9:15	27	1.0	PLS		5.0	PLS		10.0	PLS	8:20	33.96	
09/01/2010			1.0	PLS		5.0	PLS		10.0	PLS	9:24	34.16	

NSP= No sample taken nd=Not detected at or above the reporting limit ppb= parts per billion

Analytical Data Report

Printed On: Wednesday, October 27, 2010

Well Name: Saginaw Forest Cabin #1

Aquifer:	E	Date Installed:	6/8/1970	Boring Depth:	Feet bgl	Screen 1:	to Feet
Map Location:	Q-14	Well Driller:		Ground Elevation:	911.50 Feet	Screen 1 Length:	4.00 Feet
X Coordinate:	13275076.05	Well Type:	Residential Wells	TOC Elevation:	913.44 Feet amsl	Screen 2:	0.00 to 0.00 Feet
Y Coordinate:	282874.16	Sampling Interval:	Annual	TOC to screen bottom:	132.00 Feet		
Comments:							

Date and Time Collected	1,4-dioxane Results (ppb)	R.L.	Lab	Bromate Results	R.L.	Lab	Bromide Results	R.L.	Lab	Static Time	Static Reading	Sample Comments
10/07/2010		1.0	PLS		5.0	PLS		10.0	PLS	10:25	34.01	

NSP= No sample taken nd=Not detected at or above the reporting limit ppb= parts per billion

PALL Life Sciences

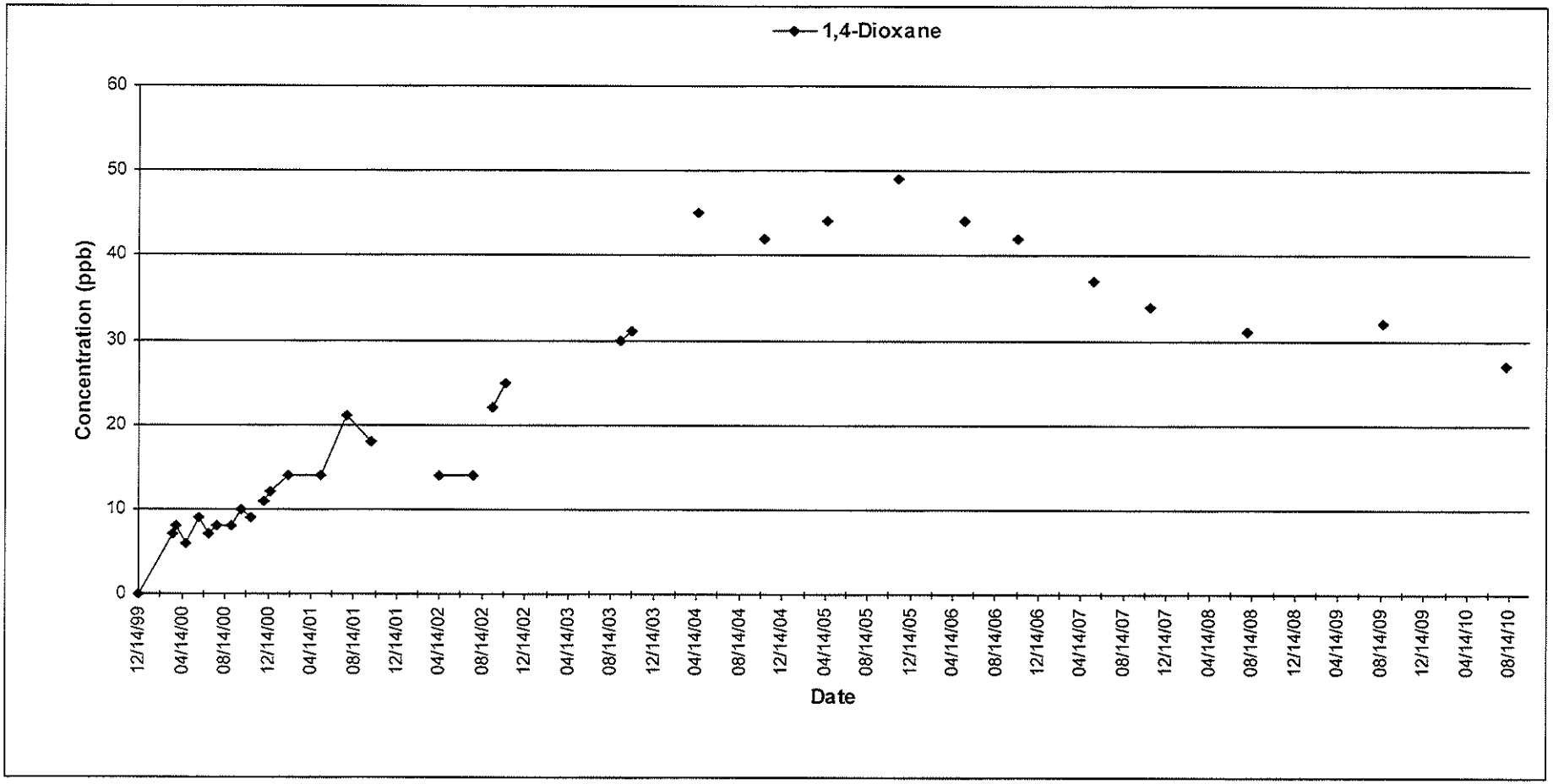
Pall Life Sciences
600 South Wagner Roa
Ann Arbor, MI 48103-9019 US

734.665.0651 phon
www.pall.com

Analytical Data Graph

Well Name: Saginaw Forest Cabin #1

Aquifer:	E	Date Installed:	6/8/1970	Boring Depth:		Feet bgl	Screen 1:		to		Feet
Map Location:	Q-14	Well Driller:		Ground Elevation:	911.50	Feet	Screen 1 Length:	4.00	Feet		
X Coordinate:	13275076.05	Well Type:	Residential Wells	TOC Elevation:	913.44	Feet amsl	Screen 2:	0.00	to	0.00	Feet
Y Coordinate:	282874.16	Sampling Interval:	Annual	TOC to screen bottom:	132.00	Feet					
Comments:											



PALL Life Sciences

Pall Life Sciences
600 South Wagner Roa
Ann Arbor, MI 48103-9019 US

734.665.0651 phon
www.pall.com

Analytical Data Report

Printed On: Wednesday, October 27, 2010

Well Name: Saginaw Forest Cabin #2

Aquifer:	E	Date Installed:	1/17/2001	Boring Depth:	216.00 Feet bgl	Screen 1:	195.00 to 203.00 Feet
Map Location:	Q-14	Well Driller:	Cribley Drilling	Ground Elevation:	909.00 Feet	Screen 1 Length:	8.00 Feet
X Coordinate:	13275048.05	Well Type:	Residential Wells	TOC Elevation:	911.10 Feet amsl	Screen 2:	0.00 to 0.00 Feet
Y Coordinate:	282874.16	Sampling Interval:	Annual	TOC to screen bottom:	204.15 Feet		
Comments:							

Date and Time Collected		1,4-dioxane Results (ppb)	R.L.	Lab	Bromate Results	R.L.	Lab	Bromide Results	R.L.	Lab	Static Time	Static Reading	Sample Comments
01/19/2001	11:14	3	1.0									32.38	
01/22/2001	15:47	2	1.0										
01/24/2001	10:00	3	1.0								8:53	32.72	
02/08/2001	17:05	2	1.0								15:53	32.62	
04/24/2001	14:40	4	1.0								13:30	31.79	
06/11/2001		NSP	1.0								14:16	29.15	
06/14/2001	17:41	2	1.0										
07/24/2001			1.0								8:33	29.73	
07/24/2001	9:48	3	1.0										
07/30/2001			1.0								11:20	29.5	
10/01/2001			1.0								7:38	29.5	
10/01/2001	8:58	nd	1.0	PLS									
04/04/2002			1.0								9:33	29.13	
04/11/2002	8:05	1	1.0	PLS									
07/02/2002			1.0								8:25	30.25	
07/18/2002	9:54	See Comments	1.0										Resampled due to matrix interference.
08/15/2002	10:37	See Comments	1.0									30.15	No sample results- matrix interference.
09/10/2002			1.0									30.88	
09/10/2002	9:00	2	1.0	PLS									
10/02/2002			1.0									30.92	
10/24/2002	14:11	3	1.0	PLS									
01/09/2003			1.0									31.02	
01/22/2003	8:49	6	1.0	PLS									
04/02/2003			1.0								9:46	33.84	

NSP= No sample taken nd=Not detected at or above the reporting limit ppb= parts per billi

Analytical Data Report

Printed On: Wednesday, October 27, 2010

Well Name: Saginaw Forest Cabin #2

Aquifer:	E	Date Installed:	1/17/2001	Boring Depth:	216.00 Feet bgl	Screen 1:	195.00 to 203.00 Feet
Map Location:	Q-14	Well Driller:	Cribley Drilling	Ground Elevation:	909.00 Feet	Screen 1 Length:	8.00 Feet
X Coordinate:	13275048.05	Well Type:	Residential Wells	TOC Elevation:	911.10 Feet amsl	Screen 2:	0.00 to 0.00 Feet
Y Coordinate:	282874.16	Sampling Interval:	Annual	TOC to screen bottom:	204.15 Feet		
Comments:							

Date and Time Collected		1,4-dioxane Results (ppb)	R.L.	Lab	Bromate Results	R.L.	Lab	Bromide Results	R.L.	Lab	Static Time	Static Reading	Sample Comments
04/30/2003	8:16	5	1.0	PLS									
05/28/2003			1.0								9:25	31.56	
07/02/2003			1.0	PLS							10:41	31.94	
08/11/2003	10:43	4	1.0	PLS									
10/13/2003	8:59	5	1.0	PLS							8:02	32.23	
01/02/2004			1.0	PLS							16:00	32.2	
02/09/2004	9:12	5	1.0	PLS							8:45	32.02	
03/08/2004			1.0	PLS							9:16	32.37	
04/16/2004	9:33	5	1.0	PLS							8:55	32.09	
09/15/2004			1.0	PLS							8:51	32.75	
10/22/2004	11:47	5	1.0	PLS							11:00	32.5	
03/14/2005			1.0	PLS							9:30	32.62	
04/21/2005	9:36	6	1.0	PLS		10.0	PLS				8:26	34.87	
09/13/2005			1.0	PLS		5.0	PLS		10.0	PLS	8:42	32.2	
11/07/2005	15:23	5	1.0	PLS		5.0	PLS		10.0	PLS	14:31	32.38	
01/10/2006			1.0	PLS		5.0	PLS		10.0	PLS	13:22	33.32	
03/20/2006			1.0	PLS		5.0	PLS		10.0	PLS	8:38	32.79	
05/18/2006	14:15	4	1.0	PLS		5.0	PLS		10.0	PLS	13:10	32.66	
06/15/2006			1.0	PLS		5.0	PLS		10.0	PLS	11:47	32.92	
09/15/2006			1.0	PLS		5.0	PLS		10.0	PLS	9:02	33.08	
10/16/2006	12:00	4	1.0	PLS		5.0	PLS		10.0	PLS	10:30	32.94	
02/22/2007			1.0	PLS		5.0	PLS		10.0	PLS	15:20	32.3	
03/13/2007			1.0	PLS		5.0	PLS		10.0	PLS	8:52	32	
05/18/2007	10:45	3	1.0	PLS		5.0	PLS		10.0	PLS	9:25	32.12	
09/13/2007			1.0	PLS		5.0	PLS		10.0	PLS	10:34	32.25	
10/25/2007	11:50	3	1.0	PLS		5.0	PLS		10.0	PLS	10:20	32.65	
02/25/2008			1.0	PLS		5.0	PLS		10.0	PLS	10:21	32.01	
07/31/2008	13:30	2	1.0	PLS		5.0	PLS		10.0	PLS	11:55	31.98	
09/17/2008			1.0	PLS		5.0	PLS		10.0	PLS	9:18	32.14	
03/17/2009			1.0	PLS		5.0	PLS		10.0	PLS	9:58	31.31	
08/19/2009	11:05	2	1.0	PLS		5.0	PLS		10.0	PLS	10:00	31.36	
09/24/2009			1.0	PLS		5.0	PLS		10.0	PLS	10:14	31.26	

NSP= No sample taken nd=Not detected at or above the reporting limit ppb= parts per billi

Analytical Data Report

Printed On: Wednesday, October 27, 2010

Well Name: Saginaw Forest Cabin #2

Aquifer:	E	Date Installed:	1/17/2001	Boring Depth:	216.00 Feet bgl	Screen 1:	195.00 to 203.00 Feet
Map Location:	Q-14	Well Driller:	Cribley Drilling	Ground Elevation:	909.00 Feet	Screen 1 Length:	8.00 Feet
X Coordinate:	13275048.05	Well Type:	Residential Wells	TOC Elevation:	911.10 Feet amsl	Screen 2:	0.00 to 0.00 Feet
Y Coordinate:	282874.16	Sampling Interval:	Annual	TOC to screen bottom:	204.15 Feet		
Comments:							

Date and Time Collected		1,4-dioxane Results (ppb)	R.L.	Lab	Bromate Results	R.L.	Lab	Bromide Results	R.L.	Lab	Static Time	Static Reading	Sample Comments
03/09/2010			1.0	PLS		5.0	PLS		10.0	PLS	9:03	31.62	
08/06/2010	10:10	2	1.0	PLS		5.0	PLS		10.0	PLS	9:20	31.6	
09/01/2010			1.0	PLS		5.0	PLS		10.0	PLS	9:22	31.79	
10/07/2010			1.0	PLS		5.0	PLS		10.0	PLS	10:23	31.63	

NSP= No sample taken nd=Not detected at or above the reporting limit ppb= parts per billi

PALL Life Sciences

Pall Life Sciences
600 South Wagner Road
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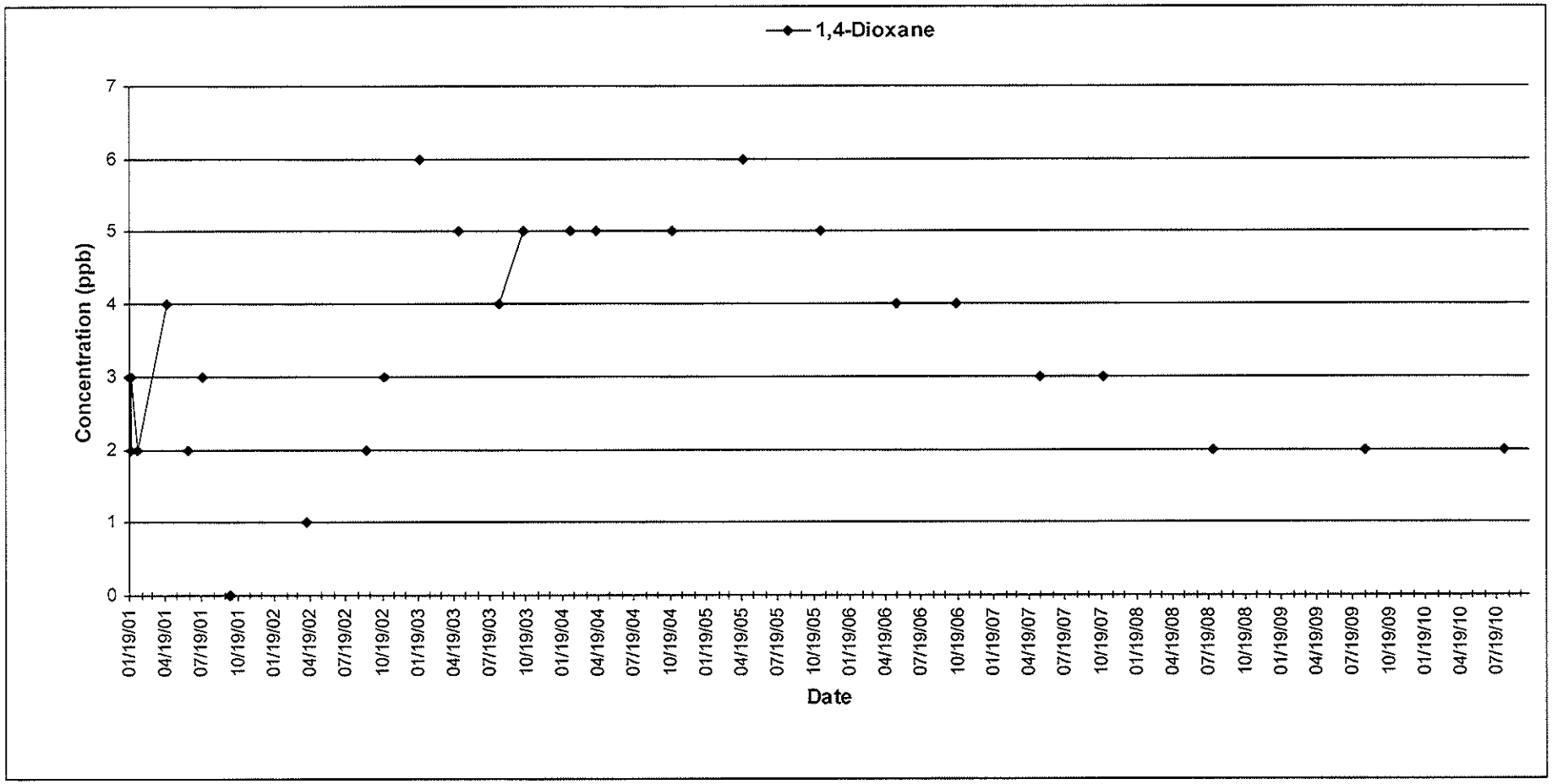
734.665.0651 phone
www.pall.com

Analytical Data Graph

Well Name: Saginaw Forest Cabin #2

Aquifer:	E	Date Installed:	1/17/2001	Boring Depth:	216.00 Feet bgl	Screen 1:	195.00	to	203.00 Feet
Map Location:	Q-14	Well Driller:	Cribley Drilling	Ground Elevation:	909.00 Feet	Screen 1 Length:	8.00	Feet	
X Coordinate:	13275048.05	Well Type:	Residential Wells	TOC Elevation:	911.10 Feet amsl	Screen 2:	0.00	to	0.00 Feet
Y Coordinate:	282874.16	Sampling Interval:	Annual	TOC to screen bottom:	204.15 Feet				
Comments:									



Appendix 4

8065CD/KAW 111010

LEGEND

- 67 - SAMPLE INTERVAL AND 1,4-DIOXANE CONCENTRATION µ/L (Samples Collected By Simlprobe During Installation)
- 130 - 1,4-DIOXANE CONCENTRATION (µ/L) AND COLLECTION DATE (Samples Collected From Well)
- WELL
- WATER LEVEL ELEVATION
- SCREENED INTERVAL
- SAND, GRAVEL, SHALE, CLAY, SILT, DIAMICTON

0 400 800

SCALE IN FEET

VERTICAL EXAGGERATION = 10X

NOTES:
-WATER LEVEL ELEVATIONS ARE THE MOST RECENT AVAILABLE.

FLEIS & VANDENBRINK ENGINEERING, INC.

PALL LIFE SCIENCES
WASHTENAW COUNTY, MI

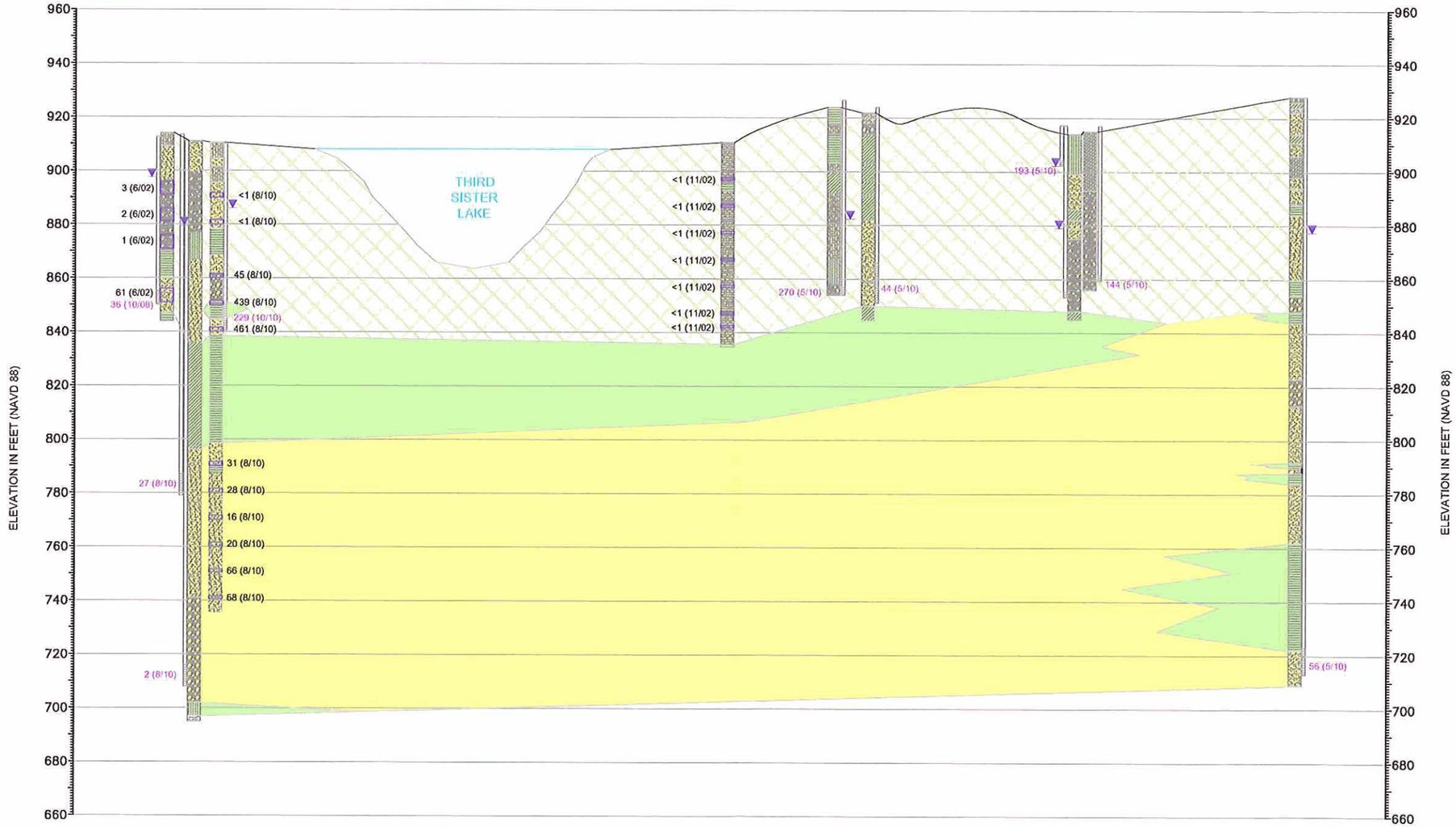
A-A' CROSS SECTION
NOVEMBER 2010

806500/KAW 111010

B
SOUTH

MW-78
SAGINAW FOREST 1 & 2
MW-125
LOCATION D
MW-37
TW-3
MW-18 s & d
TW-1
MW-64

B'
NORTH



LEGEND

0 200 400
SCALE IN FEET
VERTICAL EXAGGERATION = 10X

NOTES:
-LOCATION D SAMPLES COLLECTED USING A HYDROPUNCH.
-MW-18d SAMPLES COLLECTED USING A SCREENED AUGER.
-WATER LEVEL ELEVATIONS ARE THE MOST RECENT AVAILABLE.

67 - SAMPLE INTERVAL AND 1,4-DIOXANE CONCENTRATION µ/L (Samples Collected By Simlprobe During Installation Unless Noted)

130 - 1,4-DIOXANE CONCENTRATION (µ/L) AND COLLECTION DATE (Samples Collected From Well)

UNDIFFERENTIATED | SAND | GRAVEL | SHALE | CLAY | SILT | DIAMICTON

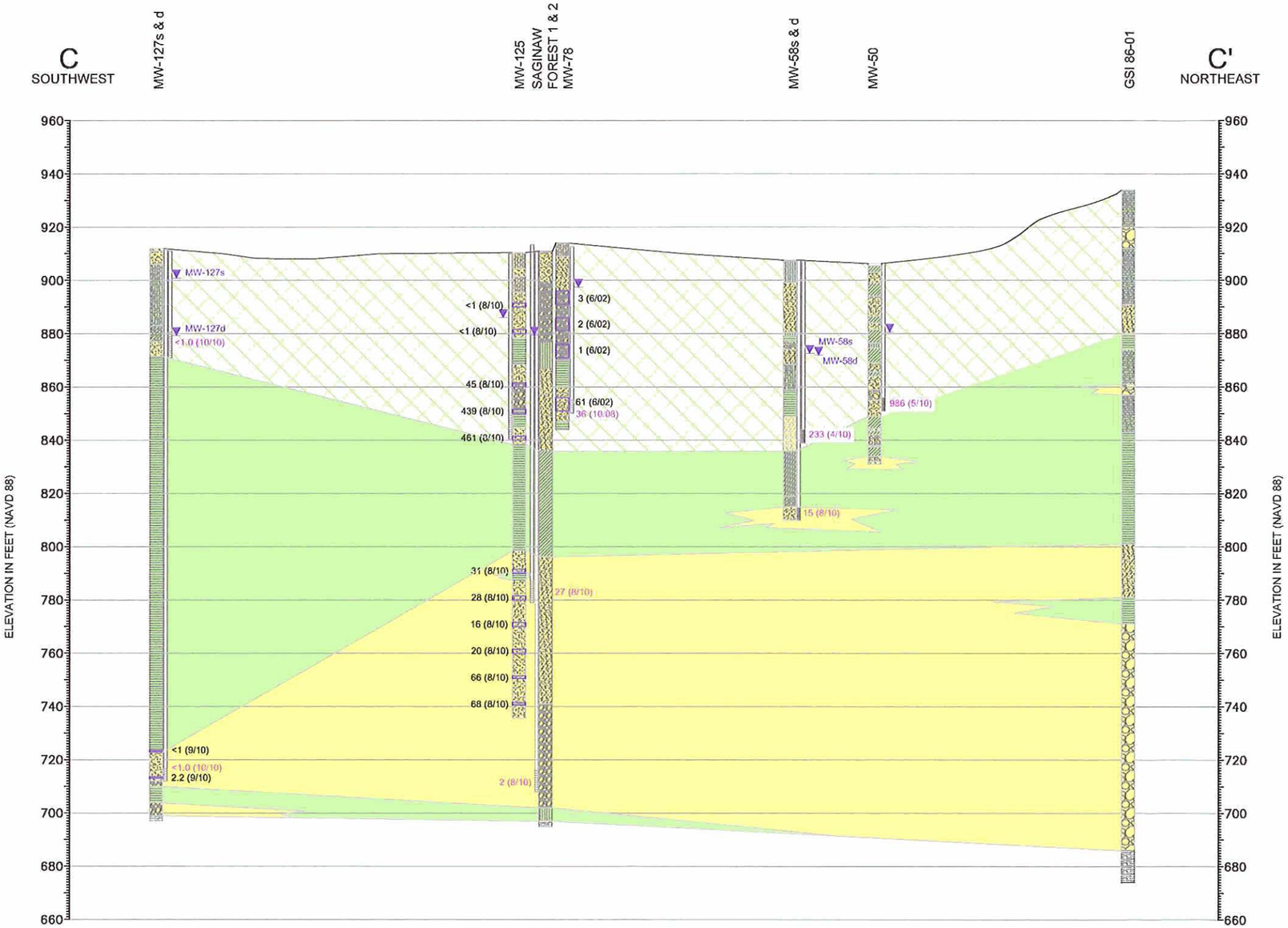
WELL
WATER LEVEL ELEVATION
SCREENED INTERVAL

FLEIS & VANDENBRINK ENGINEERING, INC.

PALL LIFE SCIENCES
WASHTENAW COUNTY, MI

B-B' CROSS SECTION
NOVEMBER 2010

806500/KAW 111010



LEGEND

0 400 800

SCALE IN FEET

VERTICAL EXAGGERATION = 10X

NOTES:
-WATER LEVEL ELEVATIONS ARE THE MOST RECENT AVAILABLE.

67 - SAMPLE INTERVAL AND 1,4-DIOXANE CONCENTRATION µ/L (Samples Collected By Simlprobe During Installation Unless Noted)

130 - 1,4-DIOXANE CONCENTRATION (µ/L) AND COLLECTION DATE (Samples Collected From Well)

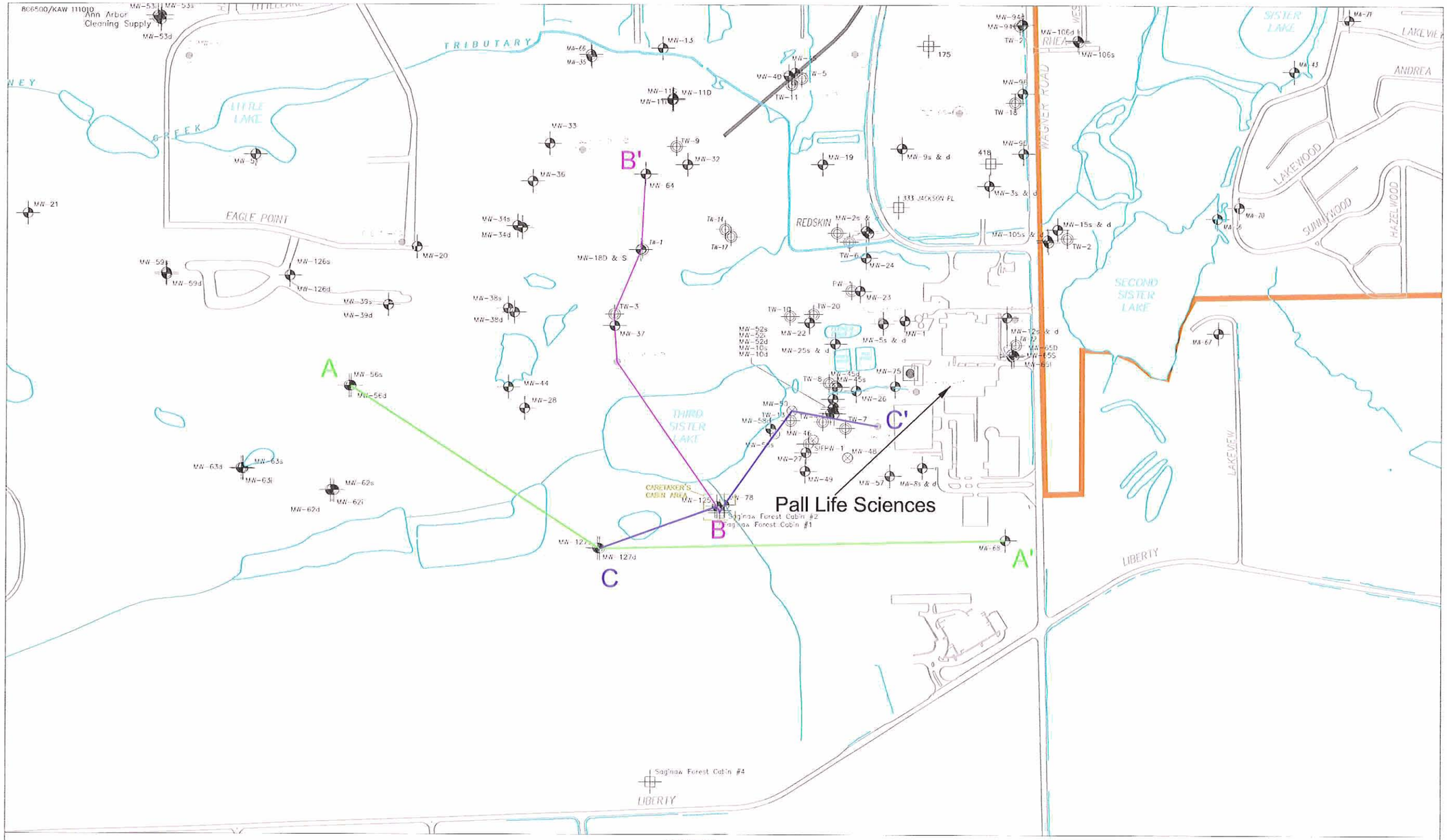
UNDIFFERENTIATED | SAND | GRAVEL | SHALE | CLAY | SILT | DIAMICTON

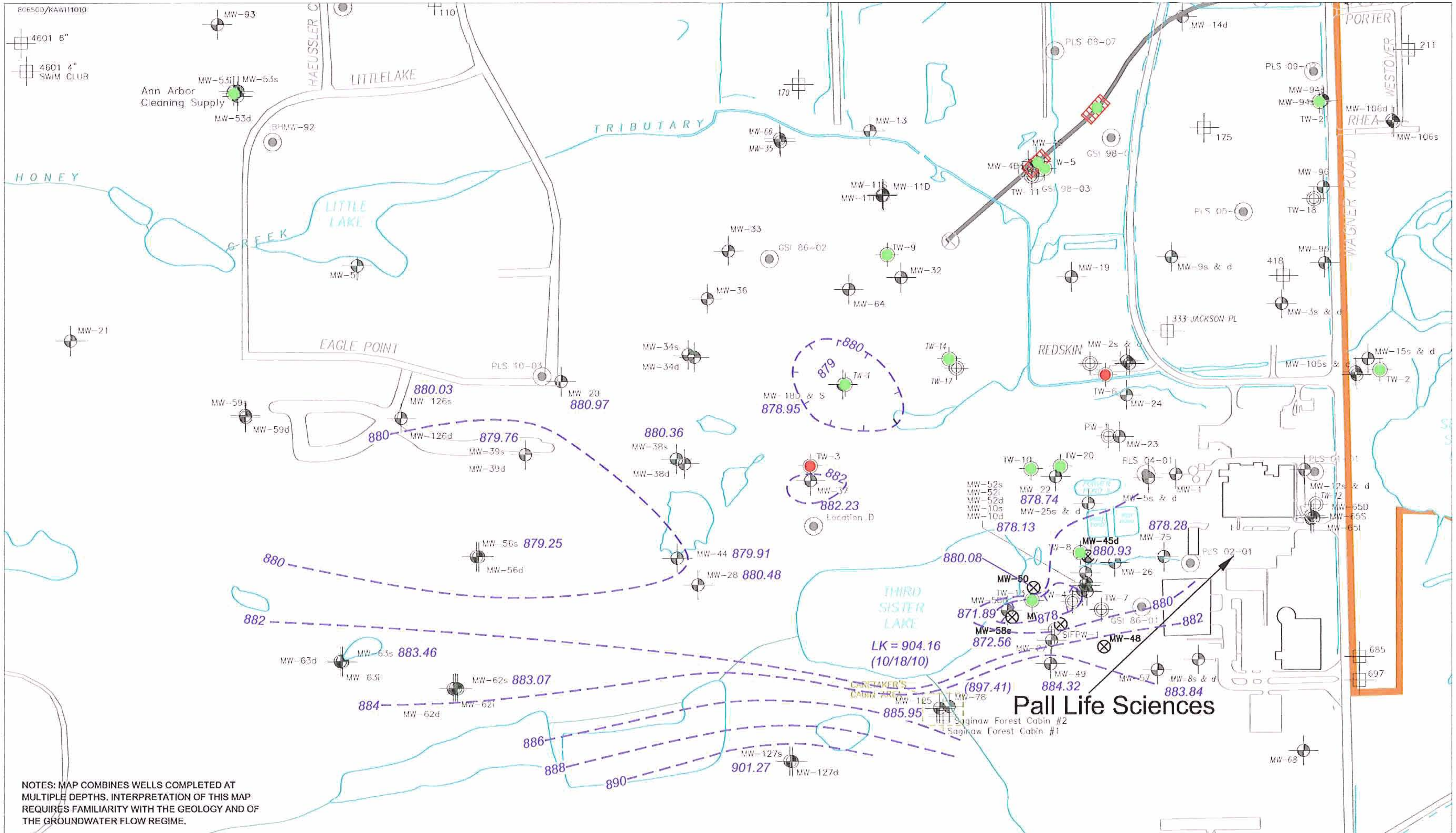
WELL
STATIC WATER LEVEL
SCREENED INTERVAL

PALL LIFE SCIENCES
WASHTENAW COUNTY, MI

C-C' CROSS SECTION
NOVEMBER 2010

FLEIS & VANDENBRINK ENGINEERING, INC.


866500/KAW 111010
Ann Arbor Cleaning Supply
TRIBUTARY
LITTLE LAKE
EAGLE POINT
REDSKIN
THIRD SISTER LAKE
SECOND SISTER LAKE
SISTER LAKE
LAKEWOOD
SUNNYWOOD
HAZELWOOD
ANDREA
LAKEVIEW
WAGNER ROAD
LIBERTY
CARETAKER'S CABIN AREA
Saginaw Forest Cabin #1
Saginaw Forest Cabin #2
Saginaw Forest Cabin #4
Pall Life Sciences
A
A'
B
B'
C
C'
NORTH
SCALE IN FEET
LEGEND
- MONITOR WELL
- RESIDENTIAL WELL (Active/Non-Active)
- PURGE WELL
- SOIL BORING
- TEMPORARY PURGE WELL
- PROHIBITION ZONE BOUNDARY
FLEIS & VANDENBRINK ENGINEERING, INC.
PALL LIFE SCIENCES
WASHTENAW COUNTY, MI
SITE & CROSS SECTION LOCATION MAP
FIGURE 1



NORTH

0 400 800
SCALE IN FEET

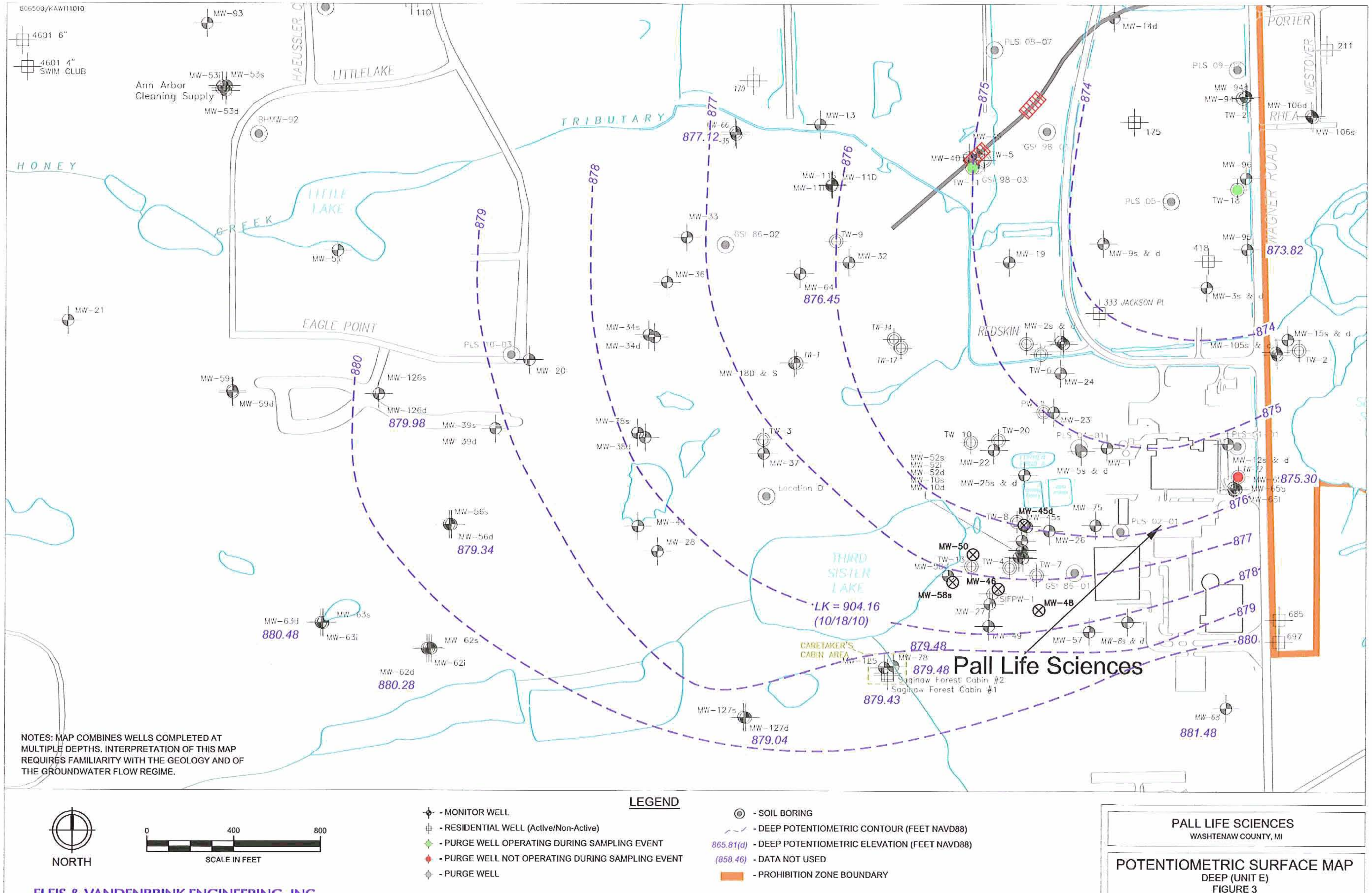
LEGEND

- MONITOR WELL
- RESIDENTIAL WELL (Active/Non-Active)
- PURGE WELL OPERATING DURING SAMPLING EVENT
- PURGE WELL NOT OPERATING DURING SAMPLING EVENT
- PURGE WELL
- SOIL BORING
- SHALLOW POTENTIOMETRIC CONTOUR (FEET NAVD88)
- 865.81(d) - SHALLOW POTENTIOMETRIC ELEVATION (FEET NAVD88)
- (858.46) - DATA NOT USED
- PROHIBITION ZONE BOUNDARY

PALL LIFE SCIENCES
WASHTENAW COUNTY, MI

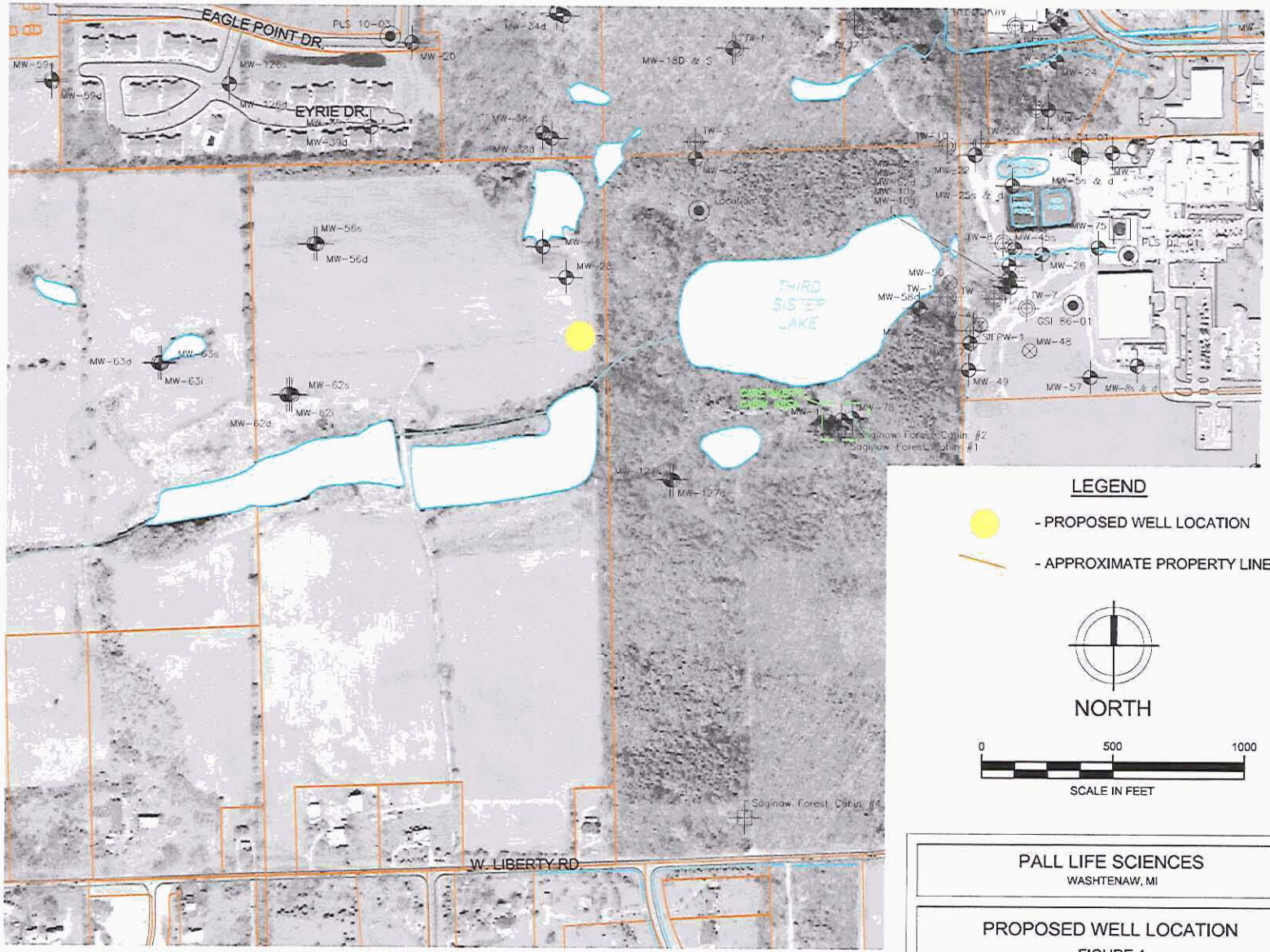
POTENTIOMETRIC SURFACE MAP
PORTIONS OF UNIT C3 AND SOUTHWEST PROPERTY
FIGURE 2

FLEIS & VANDENBRINK ENGINEERING, INC.



806500/KAW111010
HONEY CREEK
TRIBUTARY
LITTLE LAKE
THIRD SISTER LAKE
LK = 904.16
(10/18/10)
EAGLE POINT
LITTLELAKE
HAEUSSLER CT
REDSKIN
PORTER
RHEA
WESTOVER
WAGNER ROAD
333 JACKSON PL
Ann Arbor Cleaning Supply
CARETAKER'S CABIN AREA
Saginaw Forest Cabin #2
Saginaw Forest Cabin #1
Pall Life Sciences
877.12
876.45
873.82
875.30
879.98
879.34
880.48
880.28
879.48
879.43
879.04
881.48
NOTES: MAP COMBINES WELLS COMPLETED AT MULTIPLE DEPTHS. INTERPRETATION OF THIS MAP REQUIRES FAMILIARITY WITH THE GEOLOGY AND OF THE GROUNDWATER FLOW REGIME.
NORTH
0 400 800
SCALE IN FEET
LEGEND
- MONITOR WELL
- RESIDENTIAL WELL (Active/Non-Active)
- PURGE WELL OPERATING DURING SAMPLING EVENT
- PURGE WELL NOT OPERATING DURING SAMPLING EVENT
- PURGE WELL
- SOIL BORING
- DEEP POTENTIOMETRIC CONTOUR (FEET NAVD88)
865.81(d) - DEEP POTENTIOMETRIC ELEVATION (FEET NAVD88)
(858.46) - DATA NOT USED
- PROHIBITION ZONE BOUNDARY
FLEIS & VANDENBRINK ENGINEERING, INC.
PALL LIFE SCIENCES
WASHTENAW COUNTY, MI
POTENTIOMETRIC SURFACE MAP
DEEP (UNIT E)
FIGURE 3

80650/KAW111010



LEGEND

- PROPOSED WELL LOCATION
- APPROXIMATE PROPERTY LINE

NORTH

0 500 1000

SCALE IN FEET

PALL LIFE SCIENCES
WASHTENAW, MI

PROPOSED WELL LOCATION
FIGURE 4

2010 806500

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