Unit E

PALL Pall Corporation

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August 1, 2005

Ms. Sybil Kolon
Department of Environmental Quality
Jackson State Office Building
301 E. Louis Glick Highway
Jackson, Michigan 49201

Re: Work Plan

Dear Ms. Kolon:

Pall Life Sciences submits the enclosed Work Plan for Groundwater Extraction Wagner Road Unit E Aquifer.

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

Sincerely,

Farsad Fotouhi

Farsad Fotouhi
Vice President
Corporate Environmental Engineering

cc: Rick Mandle
Robert Reichel, MDAG
Alan Wasserman, Esq.
Michael Caldwell, Esq.

PALL LIFE SCIENCES

WORK PLAN FOR GROUNDWATER EXTRACTION

WAGNER ROAD

UNIT E AQUIFER

AUGUST 1, 2005

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INTRODUCTION

Pall Life Sciences (PLS) is providing this Work Plan for Groundwater Extraction (Work Plan) from the Unit E aquifer near Wagner Road, as directed in the December 17, 2004, "Opinion and Order Regarding Remediation of the Contamination of the 'Unit E Aquifer'" (the Order). Actions to be taken at the Wagner Road Area, subject to the limitations expressed in the Order, include the following:

1. Performance of the investigation described in PLS' August 1, 2004, *Work Plan for Test Boring/Well Installation and Aquifer Testing in the Wagner Road Area*, as modified by the Michigan Department of Environmental Quality's (MDEQ) letter of August 19, 2004.

2. Submission of an investigation report to the MDEQ following completion of the aquifer performance test.

3. Submission of a work plan to the MDEQ that will, to the maximum extent feasible, prevent further migration of 1,4-dioxane groundwater contamination above 85 parts per billion eastward into the Unit E aquifer. The Work Plan will identify any required increase in the National Pollutant Discharge Elimination System (NPDES) discharge permit to accommodate such additional treatment.

Installation of the Wagner Road purge well (TW-18) and aquifer tests were completed by May 31, 2005. Details of the TW-18 installation and the aquifer testing, were previously reported to the MDEQ in a report titled *Report of the TW-18 Aquifer Performance Test.*

This Work Plan summarizes PLS' proposal to prevent – to the maximum extent possible -- further downgradient migration of 1,4-dioxane in the Unit E aquifer along Wagner Road.

CAPTURE ZONE ANALYSIS

TW-18 was installed as a test well and potential extraction well for the Unit E aquifer, and was used for an aquifer performance test. The ability of TW-18 to capture the Unit E plume in the Wagner Road area was evaluated by PLS. The steady-state capture zone of TW-18 was analyzed at various flow rates using methods described by Grubb and others (Grubb 1993, Todd 1980). The results were compared to water level measurements collected in a subset of the Unit E monitoring well network prior to and near the end of the 24-hour pumping portion of the May 2005 aquifer test.

CAPTURE ZONE EQUATION

The controlling equation for one-half of the capture zone curve-shape is as follows:

X = -Y / Tan (2πKbiY/Q) where **X** and **Y** are the number of feet in the X or Y direction as defined on a Cartesian grid system where,

Q is the pumping rate (units = L^3/T; cubic feet per day (ft^3/day) or gallons per day [gpd])

K is the hydraulic conductivity (units = L/T; ft/day or gpd/ft^2 [square feet])

b is the aquifer thickness (units = L; ft)

i is the hydraulic gradient of the flow field (units are dimensionless [ft/ft])

Calculating the two-dimensional shape of a capture zone requires three steps. First, the downstream distance from the pumping well to the stagnation point is determined. The stagnation point (X_0) is the point marking the most downgradient edge of the capture zone and is calculated as follows:

$$X_0 = -Q / (2\pi Kbi)$$

Second, the maximum width of the capture zone is calculated. This is the maximum width of the capture zone as X approaches infinity and is given by:

$Y_{max} = \pm Q / (2Kbi)$ where Y_{max} is the half-width of the capture zone as X approaches infinity (effectively, this is the line denoting the width at the most upgradient edge or limit of the capture zone at steady-state conditions).

Third, once Y_{max} is known, smaller values of Y are substituted into the controlling equation that defines the overall curve shape of the capture zone.

WATER LEVEL DATA COLLECTION AND ANALYSIS

Water levels were measured in select Unit E wells on March 23, 2005 (prior to pumping of TW-18), and on March 25, 2005 (during pumping of TW-18). Water levels collected during pumping were measured

near the end of the 24-hour aquifer test generally during the time frame of the 20th to 23rd hour of the test. These data are provided in Appendix A.

Potentiometric surface maps were prepared using the May 23 (prepumping) and May 25 data (near end of pumping), Figures 1 and 2, respectively. The pumping water level (PWL) measurement used in Figure 2 for TW-18 was collected 1 hour before ending the 24-hour pump test. Potentiometric contours for both figures were prepared using Surfer (version 8).

Because the measured PWL in TW-18 includes water-level decline induced by pump inefficiencies (i.e., the well is not 100% efficient), the PWL value used at TW-18 on Figure 2 was adjusted to a theoretical level using the Theis equation. Based on a transmissivity of 20,000 ft^2/day and a storativity of 0.00047, it was determined that the theoretical water level at TW-18 would be approximately 3-feet of drawdown (versus the 12.96 feet of drawdown measured at the well). Using this analysis results in a PWL elevation of 870.97 ft above mean sea level at TW-18.

PROPOSED FLOW RATE FOR PLUME CAPTURE

PLS currently operates two Unit E extraction wells: TW-11 and TW-17. A third Unit E extraction well, TW-12, has been recently turned off due to low contaminant concentrations. The approximate flow rates from TW-11 and TW-17 are 108 and 104 gallons per minute (gpm), respectively. These wells were operating during the time of the TW-18 test and during the water-level measurements.

Table 1 shows the values of X_0 and Y_{max} for the various pumping rates used in this analysis.

Table 1 - Values of X_0 and Y_{max} for Various Pumping Rates.

WELL NO.	Q Pumping Rate (gpm)	Q Pumping Rate (ft^3/day)	I Hydraulic gradient (unitless)	K Hydraulic conductivity (approx.) (ft/day)	b Aquifer thickness (approx.) (ft)	Y_{max} (ft)	X_0 Stagnation point (ft)
TW-18	200	38,503	0.00105	200	100	917	-292
TW-18	300	57,754	0.00105	200	100	1,375	-438
TW-18	400	77,005	0.00105	200	100	1,833	-584
TW-18	500	96,257	0.00105	200	100	2,292	-729

MW = monitoring well, TW = purge well
ft = feet; ft^3 = cubic feet; gpm = gallons per minute; gpd = gallons per day

The potentiometric surface under pumping conditions (Figure 2) shows the development of a zone of hydraulic depression. Figure 3 shows the approximate extent of the Unit E 1,4-dioxane plume along with the calculated steady-state capture zones at flow rates of 200, 300, 400, and 500 gpm. When the zone of hydraulic depression is compared to the 200 gpm steady-state capture zone calculated for TW-18, the good correlation between the calculated and measured capture zones suggests the analytical solution at 200 gpm accurately represents the site conditions.

Results indicate that the 200-gpm capture zone extends northward into areas where it intersects the Unit D2 plume. The D2 plume is being purged by multiple purge wells, including the PLS horizontal wells, which are positioned southeast and northeast of TW-18. As such, a 200-gpm flow rate is expected to provide adequate capture of the Unit E plume north of TW-18.

South of TW-18, the 200-gpm capture zone extends almost midway between TW-18 and TW-12 (refer to Figure 3 and cross section W-W', Figure 4) and includes the southern extent of the Unit E plume, as interpreted by the 85 µg/L contour. PLS' interpretation is supported by the data from MW-95, PLS 01-01, and MW-65s,i,d, which show a sharp decline in 1,4-dioxane concentrations in comparison to those found in the center of the plume at the TW-18 location. The water-quality data from PLS-01-01 showed a maximum concentration of 281 microgram per liter (µg/L) when this boring was installed in 2001. Since that time, Unit E extraction well TW-12 was operated from May, 2002 to February, 2005 and its 1,4-dioxane concentrations fell from 564 µg/L to 81 µg/L. The rapid decline in concentrations following initiation of purging from TW-12 indicates that the 1,4-Dioxane in the TW-12 area appears to be isolated from the main body of the Unit E plume found in the TW-18 area. While there remains some uncertainty as to precise location of the southern boundary of the 85 µg/L isoconcentration line, PLS's interpretation

from groundwater data collected from monitoring wells is a reasonable approximation of the 1,4-dioxane plume.

These findings suggest that the calculated steady-state capture zone of TW-18 operating at 200 gpm will capture the Unit E 1,4-dioxane plume along Wagner Road. Because TW-18 is capable of sustaining a flow rate of 200 gpm, and is centrally located along the Unit E plume access, PLS proposed no additional extraction wells along Wagner Road. PLS will continue to operate extraction wells TW-11 and TW-17 in conjunction with TW-18.

PLS anticipates that through slight optimization of the extraction well rates for D2/C3 extraction wells, the current treatment plant handling capacity and NPDES discharge permit will accommodate the proposed 200-gpm flow from TW-18. Based on currently available information, PLS does not believe that the anticipated adjustments to the shallower aquifer purge rates required to accommodate the proposed 200 gpm purge rate for the Unit E will significantly affect the timeframe for completing the shallower aquifer cleanup. As such, PLS believes that its proposed 200 gpm purge program for Wagner Road is consistent with the Court's December 17, 2004 Unit E Order. Any higher purge rate would, however require amendment of PLS current NPDES permit and an increase in the volume discharge limit.

LIMITATIONS OF THIS ANALYSIS

There are many assumptions regarding the use of the steady-state capture zone solution. It should be noted that this equation considers only advective flow and does not consider contaminant transport related effects. Consequently, it is important to note that dispersion is neglected from the capture zone analysis. If dispersion were included in the analysis, there would not be a sharp capture zone boundary, but rather a wide boundary with width proportional to the dispersion coefficient.

TRANSPORT AND TREATMENT OF WATER FROM TW-18

PLS proposes to install pipeline to convey groundwater from the TW-18 extraction well to the existing treatment plant located within the PLS facility.

PLS proposes that groundwater be pumped from the TW-18 extraction well at a rate of 200 gpm, transported to the treatment facility, treated by PLS, and disposed under the current PLS NPDES permit.

PLS anticipates that through slight optimization of the extraction well rates for other operating extraction wells, the current treatment plant handling capacity and NPDES discharge permit will accommodate the proposed 200-gpm flow from TW-18.

Materials

PLS proposes the pipeline be constructed of 6-inch, high-density polyethylene SDR 11 pipe and fittings. This pipe has a pressure rating of 160 pounds per square inch (psi), is highly durable, and resists corrosion. The piping will be connected to the well using standard fittings. Pipe joining will be butt fused using equipment and methods in strict accordance with the pipe manufacturer's recommendations.

System Pressure Testing

All pipe and connections will be subjected to a hydrostatic leak test prior to use. This test procedure consists of filling, an initial expansion phase, a test phase, and depressurizing as outlined in the following paragraph.

Procedure - Fill the restrained test section completely with water. Gradually pressurize the test section to a test pressure of 200 psi, and maintain test pressure for three (3) hours. Additional water will be required to maintain pressure. Immediately following this initial expansion phase, reduce test pressure by 10 psi, and stop adding test liquid. If the system pressure remains within five percent (5%) of this value for one hour, no leakage is indicated.

Installation And Restoration Methods

The pipeline will be installed to a minimum depth of 42 inches below ground using a trenching machine or by directional drilling. Trenched areas will be backfilled and compacted prior to surface restoration.

The pipeline will be registered in the MISS DIG system. When a request for utility identification is made, PLS will be responsible for staking the pipeline.

PERFORMANCE MONITORING PLAN

It should be noted from the outset that it will be impossible to immediately confirm the effectiveness of the proposed mid-plume capture through performance monitoring. The effectiveness of the capture cannot be confirmed through monitoring until after the portion of the plume immediately downgradient of the capture zone has migrated past the chosen monitoring location. Consequently, PLS is submitting the requested performance monitoring plan described below with the understanding that monitoring results from the proposed performance monitoring plan will not serve as a basis for imposing penalties or for a finding that PLS is in violation of any applicable requirements.

Proposed New Boring/Well Location

PLS proposes to install one boring/well in the area hydraulically downgradient of TW-18. The proposed location for this boring/well is shown on Figure 5. Potential locations for this boring/well are limited due to difficult access (the area is a park, very vegetated, and a wetland/marsh complex).

Well Boring/Well Installation Method

The proposed test boring/well will be drilled using hollow-stem auger drilling methods to depths sufficient to encounter bedrock.

The proposed sampling methods are split-spoon and Simulprobe for collection of soil and soil/groundwater, respectively. Soil samples will be collected as split-spoon samples at 10-foot intervals, beginning at ground surface. Starting at a depth approximately 10 feet below the uppermost water-bearing zone, soil/groundwater samples will be collected using Simulprobe techniques and continue through the aquifer(s) to the total depth of the boring/well. All soil samples will be described/classified based on their physical characteristics during the drilling of each boring by an onsite geologist. In water-bearing units, Simulprobe sampling will be performed at a maximum frequency of every 10 feet. Split-spoon sampling will not be collected at the Simulprobe intervals, as the Simulprobe will account for the soil sampling. If it is not possible to collect a representative groundwater sample (i.e., not able to drive the Simulprobe sampler into undisturbed soil), a temporary well constructed of galvanized riser and stainless steel screen will be installed. The temporary well screen will be set into the aquifer and a K packer assembly will be used to allow for the collection of a representative groundwater sample.

The groundwater samples will be analyzed for 1,4-dioxane by PLS.

Upon reaching the total depth of the boring, as determined by the onsite geologist, the borehole will be geophysically logged using a natural gamma tool. This data will supplement the formation samples and provide additional information regarding site geological conditions.

A monitoring well (or wells) will be installed at the soil boring location for the primary purpose of obtaining representative water-level data and water-quality data (1,4-dioxane concentrations). This may involve installing a nested well or one strategically positioned well. PLS will discuss all well installation plans with the MDEQ. Water quality data will also be considered in the selection of a representative screen zone.

Well(s) will be constructed of either 2-inch polyvinyl chloride or galvanized-steel casing, equipped with a 5-foot stainless-steel well screen. The well will be gravel packed and grouted. The wells will likely be completed as flush mounts, equipped with locking caps and locks.

Soil cuttings derived from the drilling and development water will be transported to PLS for appropriate management.

Monitoring Schedule

PLS proposes that the performance monitoring plan for monitoring 1,4-dioxane under the Wagner Road Work Plan follow the now-existing Unit E monitoring schedules for sampling and water level measurements. Any new well(s) added to the monitoring and extraction well network by this proposed work plan will be added to the collective Unit E sampling schedule.

Table 2 lists wells in the Unit E extraction and monitoring well system and provides a master list for current groundwater quality and water-level sampling frequency. Proposed changes and additions to the master list are highlighted under column headers for Proposed Wagner Road Groundwater and Water Level Frequency.

Groundwater Sampling and Analysis

PLS proposes to collect all groundwater samples using procedures currently used by PLS for routine groundwater monitoring. The groundwater samples will be analyzed for 1,4-dioxane by PLS. PLS may also analyze the samples for other natural water-quality parameters.

Surveying

Vertical elevations and horizontal coordinates for these site features will be recorded using Global Positioning System equipment and referenced to NAVD 88 datum and NAD 83 state plane coordinates.

REPORTING

PLS will provide data from the Wagner Road findings/investigations during quarterly reporting to the MDEQ.

SCHEDULE

PLS is prepared to implement the Work Plan immediately upon approval by the MDEQ. The following are time estimates for various project tasks.

Pipeline Installation – 2-3 months (after obtained all access).

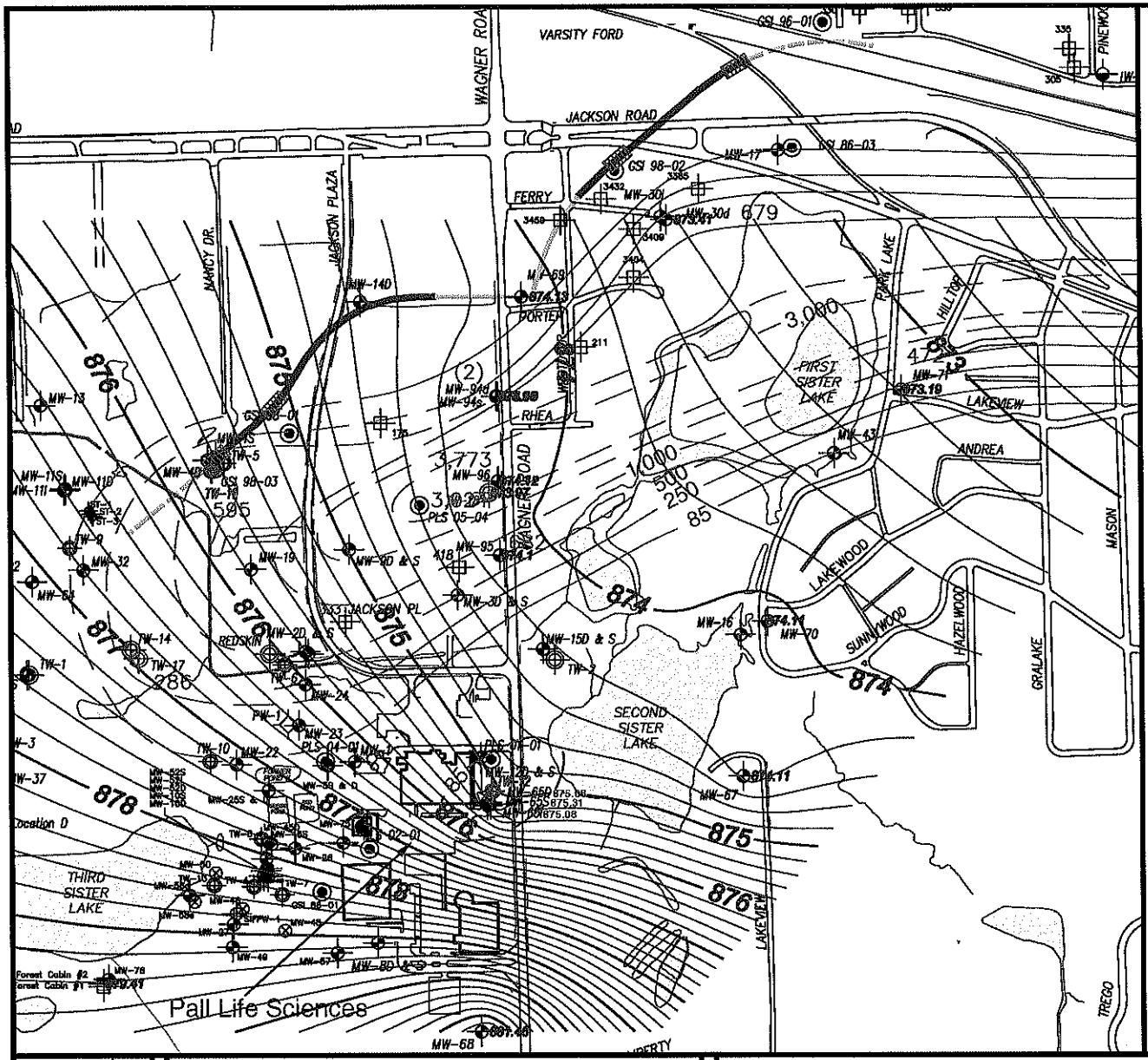
Drilling of test boring/monitoring well(s) east of Wagner Road: 1 month (after obtaining access).

REFERENCES

Todd, D.K., 1980, Groundwater hydrology, 2nd ed. New York: John Wiley.

Grubb, Stuart, 1993, Analytical model for estimation of steady-state capture zones of pumping wells in confined and unconfined aquifers, *Ground Water,* 31, no. 1:27-32.

Figures



LEGEND

- MONITOR WELL
- RESIDENTIAL WELL
- PURGE WELL
- HYDROGEOLOGIC TEST BORING
- UV/OX. TREATMENT SYSTEM
- TEMPORARY PURGE WELL
- Unit E EXTRACTION WELL
- 1,4–DIOXANE ISOCONCENTRATION CONTOUR (ug/L) January–March 2005
- Unit E POTENTIOMETRIC SURFACE CONTOUR (Feet amsl) May 23, 2005 (PRIOR TO START OF UNIT E AQUIFER TEST)

PROPERTY BOUNDARIES ARE PROVIDED BY WASHTENAW COUNTY AND ARE NOT TO SURVEY ACCURACY.

UNIT E POTENTIOMETRIC SURFACE - May 23, 2005 Pre-Pump Test

FIGURE NO. 1

PROJECT NO. 036502

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WAGNER ROAD WORK PLAN

fteh

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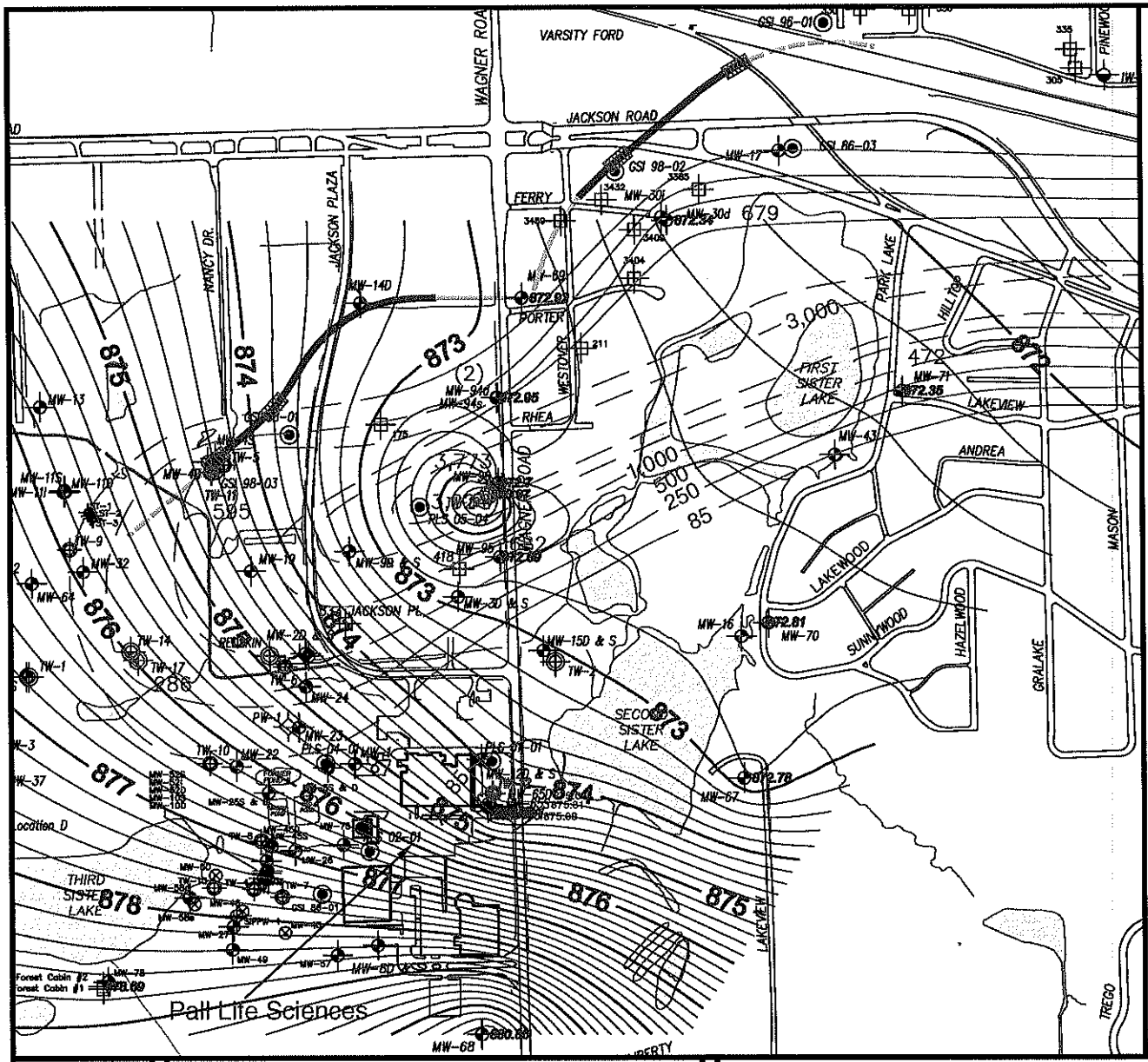

NORTH

0 700 1400

Scale: 1" = 700'

LEGEND

- MONITOR WELL
- RESIDENTIAL WELL
- PURGE WELL
- HYDROGEOLOGIC TEST BORING
- UV/OX. TREATMENT SYSTEM
- TEMPORARY PURGE WELL
- Unit E EXTRACTION WELL
- 1,4-DIOXANE ISOCONCENTRATION CONTOUR (ug/L) January-March 2005
- Unit E POTENTIOMETRIC SURFACE CONTOUR (Feet amsl) May 23, 2005 (WATER LEVELS COLLECTED DURING 22nd & 23rd HOUR OF PUMP TEST)

PROPERTY BOUNDARIES ARE PROVIDED BY WASHTENAW COUNTY AND ARE NOT TO SURVEY ACCURACY.

UNIT E POTENTIOMETRIC SURFACE - May 23, 2005 During Pump Test

FIGURE NO. 2

PROJECT NO. F96002

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WAGNER ROAD WORK PLAN

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LEGEND

- MONITOR WELL
- RESIDENTIAL WELL
- PURGE WELL
- HYDROGEOLOGIC TEST BORING
- UV/OX. TREATMENT SYSTEM
- TEMPORARY PURGE WELL
- Unit E 1,4-DIOXANE ISOCONCENTRATION CONTOUR (ug/L) – January–March 2005
- Unit E POTENTIOMETRIC SURFACE CONTOUR (Feet amsl) – MAY 25, 2005
- CAPTURE ZONE (Gallons per Minute)

NORTH

0 400 800

Scale: 1" = 400'

TW-18 CAPTURE ZONE ANALYSIS

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WAGNER ROAD WORK PLAN

PROJECT NO.
F96502

FIGURE NO.
3

PLOT INFO: F:\WORK\96502\DWG\CONTOUR MAPS NEW BASE 2002 WAGNER RD.DWG DATE: 8/1/2005 TIME: 1:21:18 PM USER: ACS
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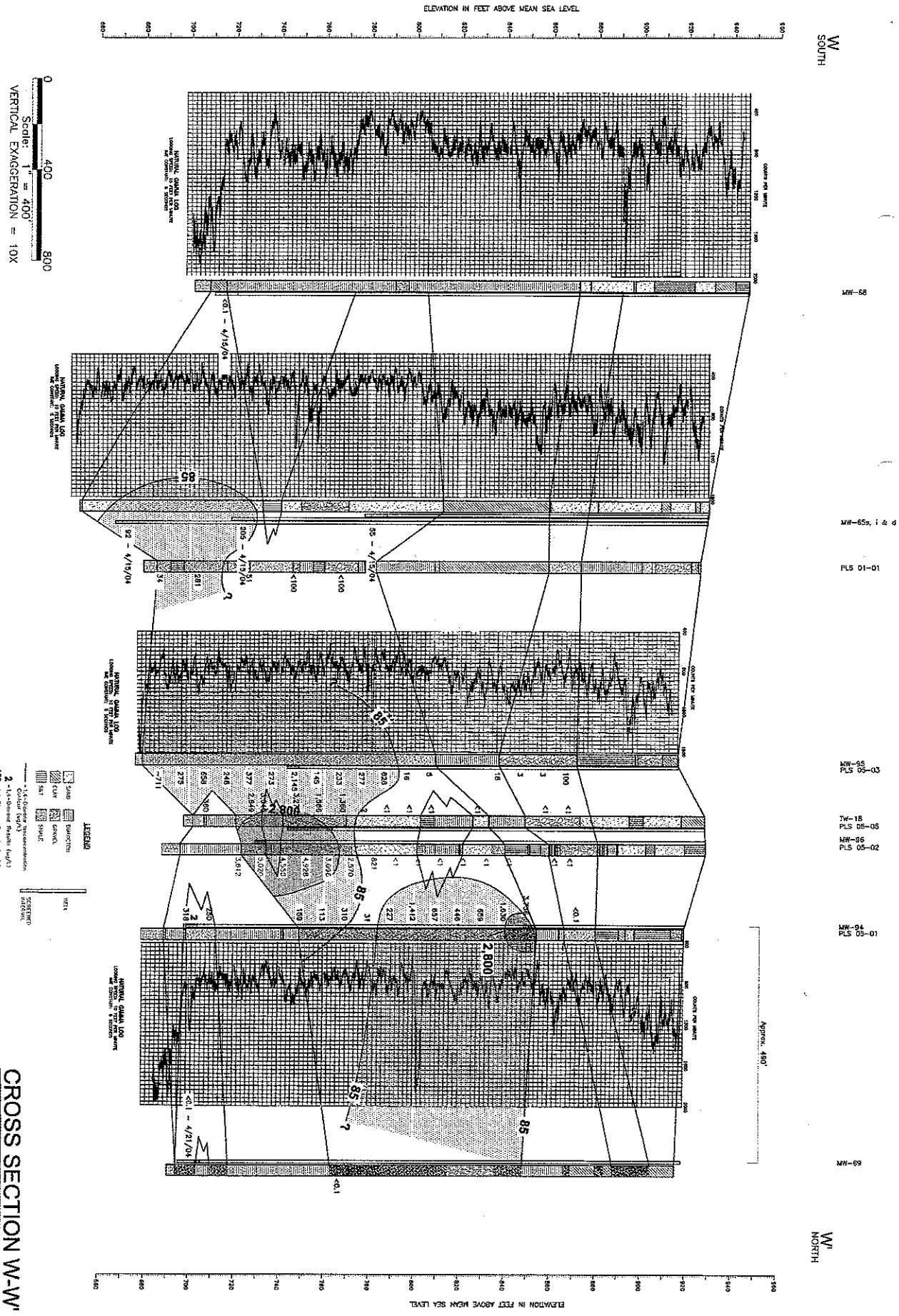

CROSS SECTION W-W'

PROJECT NO.	FIGURE NO.
F96502	4

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TW-18 AQUIFER TEST REPORT

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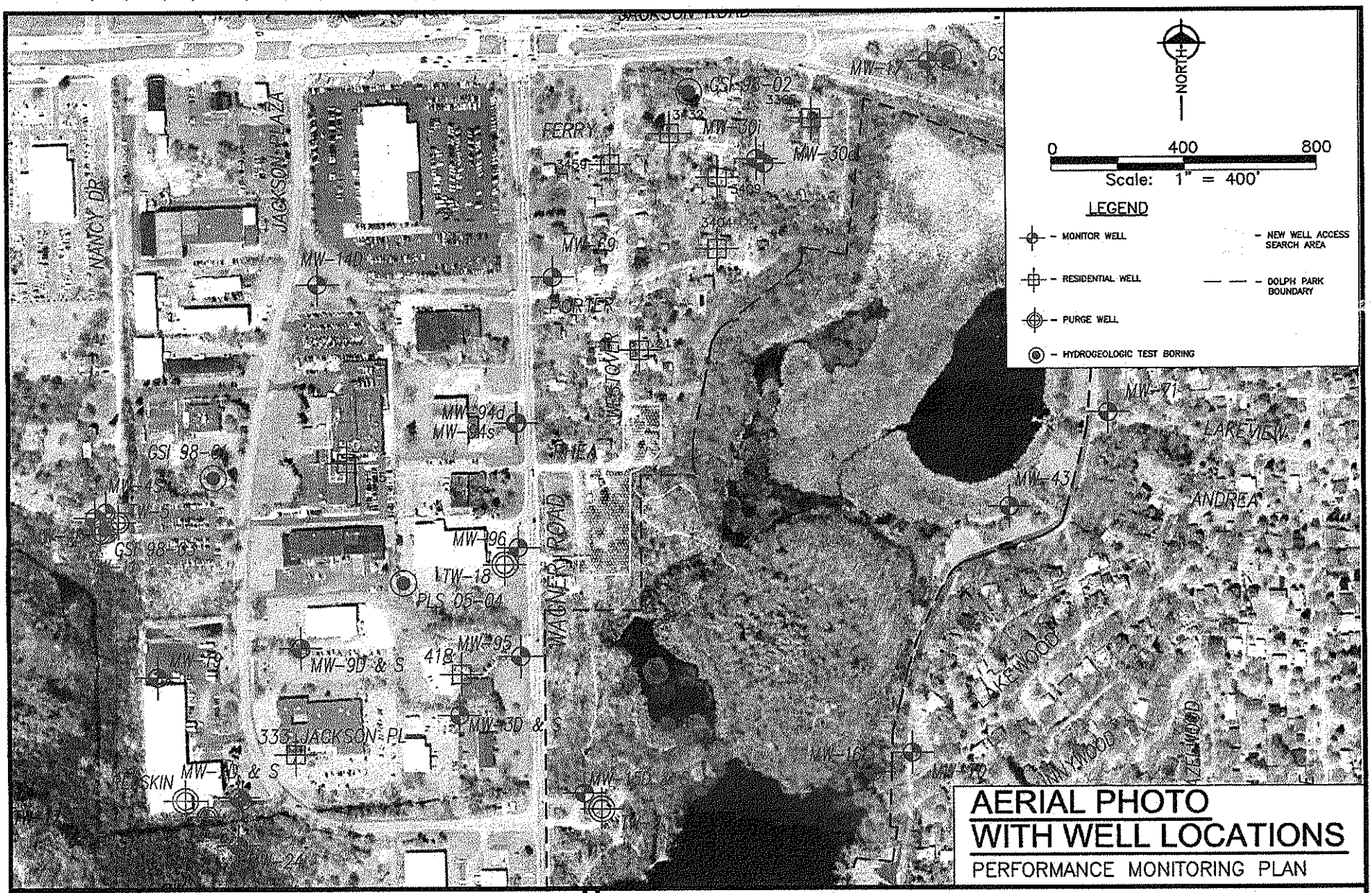

AERIAL PHOTO WITH WELL LOCATIONS

PERFORMANCE MONITORING PLAN

FIGURE NO. 5

PROJECT NO. F96502

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WAGNER ROAD WORK PLAN

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Tables

Table 2						
Performance Monitoring - Wagner Road Area						
Unit E System						
Pall Life Sciences Inc.						
Well I.D	**Purpose of Monitoring**	**Existing Unit E Master Groundwater Quality and Water Level Frequency**	**Proposed Wagner Road Groundwater Quality Frequency**	**Proposed Wagner Road Water Level Frequency**	**Most Recent 1,4-dioxane Concentration (mg/L)**	**Date of Most Recent Sample**
TW-18	1	Not set	Monthly	Monthly		
TW-17	1	Not set			309	06/09/05
TW-16		Not set				
TW-15	1	Monthly	Monthly	Monthly	85	06/27/05
TW-12	1	Extraction Monthly	Monthly (if operating)	Monthly (if opertating)	81	02/07/05
TW-11	1	Extraction Monthly	Monthly	Monthly	529	06/09/05
MW-96	2	Quarterly	Quarterly	Quarterly	3849	04/12/05
MW-95	2	Quarterly	Quarterly	Quarterly	672	04/12/05
MW-94d	2, 3	Quarterly	Quarterly	Quarterly	2	04/12/05
MW-91	2	Quarterly	Quarterly	Quarterly	nd	07/14/05
MW-90	2	Quarterly	Quarterly	Quarterly	9	05/04/05
MW-89	2	Quarterly	Quarterly	Quarterly	nd	05/04/05
MW-88	2	Quarterly	Quarterly	Quarterly	1285	04/26/05
MW-87s	2	Quarterly	Quarterly	Quarterly	385	04/26/05
MW-87d	2	Quarterly	Quarterly	Quarterly	646	04/26/05
MW-86	2	Quarterly	Quarterly	Quarterly	nd	05/04/05
MW-85	2	Quarterly	Quarterly	Quarterly	1247	04/26/05
MW-84s	2	Quarterly	Quarterly	Quarterly	248	04/08/05
MW-84d	2	Semi-Annual	Semi-Annual	Semi-Annual	nd	04/08/05
MW-83s	2	Semi-Annual	Semi-Annual	Semi-Annual	234	04/06/05
MW-83d	2	Semi-Annual	Semi-Annual	Semi-Annual	nd	04/06/05
MW-82s	2	Quarterly	Quarterly	Quarterly	19	05/05/05
MW-82d	2	Semi-Annual	Semi-Annual	Semi-Annual	nd	05/05/05
MW-81	2	Quarterly	Quarterly	Quarterly	276	07/14/05
MW-80		Not set	Not set	Not set		
MW-79	2	Semi-Annual	Semi-Annual	Semi-Annual	652	04/08/05
MW-76s	2	Quarterly	Quarterly	Quarterly	115	04/04/05
MW-76i	2	Quarterly	Quarterly	Quarterly	12	04/04/05
MW-76d	2	Semi-Annual	Semi-Annual	Semi-Annual	2	04/04/05
MW-72s	2	Quarterly	Quarterly	Quarterly	84	05/05/05
MW-72d	2	Quarterly	Quarterly	Quarterly	3096	05/05/05
MW-71	2	Quarterly	Quarterly	Quarterly	659	04/18/05
MW-70	2	Semi-Annual	Semi-Annual	Semi-Annual	nd	04/18/05
MW-69	2, 3	Semi-Annual	Semi-Annual	Semi-Annual	nd	04/15/05
MW-68	2	Semi-Annual	Semi-Annual	Semi-Annual	nd	04/01/05
MW-67	2	Semi-Annual	Semi-Annual	Semi-Annual	nd	05/04/05

Table 2						
Performance Monitoring - Wagner Road Area						
Unit E System						
Pall Life Sciences Inc.						
Well I.D	**Purpose of Monitoring**	**Existing Unit E Master Groundwater Quality and Water Level Frequency**	**Proposed Wagner Road Groundwater Quality Frequency**	**Proposed Wagner Road Water Level Frequency**	**Most Recent 1,4-dioxane Concentration (mg/L)**	**Date of Most Recent Sample**
MW-66	2	Semi-Annual	Semi-Annual	Semi-Annual	nd	04/13/05
MW-65s	2	Semi-Annual	Semi-Annual	Semi-Annual	45	04/25/05
MW-65i	2	Semi-Annual	Semi-Annual	Semi-Annual	56	04/25/05
MW-65d	2	Semi-Annual	Semi-Annual	Semi-Annual	81	04/25/05
MW-64	2	Semi-Annual	Semi-Annual	Semi-Annual	207	06/09/05
MW-63d	2	Semi-Annual	Semi-Annual	Semi-Annual	nd	04/08/05
MW-62d	2	Semi-Annual	Semi-Annual	Semi-Annual	nd	04/01/05
MW-59d	2	Semi-Annual	Semi-Annual	Semi-Annual	nd	04/07/05
MW-56d	2	Semi-Annual	Semi-Annual	Semi-Annual	nd	04/01/05
MW-30d	2	Quarterly	Quarterly	Quarterly	879	04/14/05
IW-2	2	Semi-Annual			2	04/19/05
IW-1	2	Unknown			nd	06/27/02
373 Pinewood Deep	2	Semi-Annual	Semi-Annual	Semi-Annual	nd	04/15/05
371 Parkland Plaza #2	2	Unknown	Unknown	Unknown	nd	01/29/01
371 Parkland Plaza #1	2	Unknown	Unknown	Unknown	1	01/29/01
Saginaw Forest Cabin #2	2	Semi-Annual	Semi-Annual	Semi-Annual	6	04/21/05
Saginaw Forest Cabin #1	2	Semi-Annual	Semi-Annual	Semi-Annual	44	04/21/05
NEW Monitoring wells			Quarterly	Quarterly		
1 = Monitor water quality trends and calculate mass removed.						
2 = Monitor for water quality changes.						
3 = Monitor for lateral expansion of the Western System plume.						
Note: All samples will be analyzed for 1,4-dioxane by PLS.						
nd = non detect						

Appendices

STATIC WATER LEVEL DOCUMENTATION

PROJECT NAME: Pall Life Sciences TW-18 Aquifer Pump Test

PROJECT NUMBER: F96502

SITE LOCATION: Ann Arbor, Michigan

Date	Time	Well Number	Top of Casing Elevation (ft)	Depth to Water from TOC (ft)	Groundwater Elevation (ft)	Remarks
5/23/2005	8:45	MW-30d	937.60	64.19	873.41	Pretest Data
5/23/2005	10:59	MW-65s	929.43	54.12	875.31	
5/23/2005	11:01	MW-65i	929.35	54.27	875.08	
5/23/2005	11:03	MW-65d	928.97	53.72	875.25	
5/23/2005	9:38	MW-66	911.73	34.82	876.91	
5/23/2005	9:52	MW-67	925.42	51.31	874.11	
5/23/2005	11:05	MW-68	945.74	64.28	881.46	
5/23/2005	10:04	MW-69	922.11	47.98	874.13	
5/23/2005	10:16	MW-70	911.96	37.85	874.11	
5/23/2005	10:12	MW-71	914.21	41.02	873.19	
5/23/2005	10:24	MW-72s	942.95	71.01	871.94	
5/23/2005	10:26	MW-72d	942.52	71.07	871.45	
5/23/2005	11:15	MW-94s	918.56	44.61	873.95	
5/23/2005	11:14	MW-94d	918.74	44.55	874.19	
5/23/2005	11:35	MW-95	915.45	41.35	874.10	
5/23/2005	11:37	MW-96	927.36	53.24	874.12	
5/23/2005	10:47	Sag Forest 2	911.58	32.17	879.41	
5/23/2005	12:18	TW-18	930.38	56.41	873.97	Survey/Water level taken from stand pipe
						Note: Elevations taken from database
						MW-94s/d, MW-95, MW-96 taken from
						field notes.

Completed by: _____ (signature)

_____ (date)

STATIC WATER LEVEL DOCUMENTATION

PROJECT NAME: Pall Life Sciences TW-18 Aquifer Pump Test

PROJECT NUMBER: F96502

SITE LOCATION: Ann Arbor, Michigan

Date	Time	Well Number	Top of Casing Elevation (ft)	Depth to Water from TOC (ft)	Groundwater Elevation (ft)	Remarks
5/25/2005	6:49	MW-30d	937.60	65.26	872.34	Pumping Conditions
5/25/2005	6:37	MW-65s	929.43	55.02	874.41	
5/25/2005	6:39	MW-65i	929.35	55.02	874.33	
5/25/2005	6:40	MW-65d	928.97	54.60	874.37	
5/25/2005	9:27	MW-66	911.73	35.36	876.37	
5/25/2005	9:40	MW-67	925.42	52.64	872.78	
5/25/2005	9:34	MW-68	945.74	64.88	880.86	
5/25/2005	6:04	MW-69	922.11	49.19	872.92	
5/25/2005	6:14	MW-70	911.96	39.15	872.81	
5/25/2005	6:20	MW-71	914.21	41.86	872.35	
5/25/2005	6:25	MW-72s	942.95	71.65	871.30	
5/25/2005	6:28	MW-72d	942.52	71.74	870.78	
5/25/2005	7:06	MW-94s	918.56	45.85	872.71	
5/25/2005	7:04	MW-94d	918.74	45.79	872.95	
5/25/2005	6:58	MW-95	915.45	42.76	872.69	
5/25/2005	7:08	MW-96	927.36	54.66	872.70	
5/25/2005	9:14	Sag Forest 2	911.58	32.89	878.69	
5/25/2005	9:00	TW-18	930.38	69.37	861.01	Survey/Water level taken from stand pipe
						Note: Elevations taken from database
						MW-94s/d, MW-95, MW-96 taken from
						field notes.

Completed by: _____ (signature)

_____ (date)