403139

Environmental
Resources
Management

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SCANNED

January 10, 2008
41284

Mr. Chris Forrest, P.G.
South Carolina Department of Health
and Environmental Control
Bureau of Water Pollution Control
2600 Bull Street
Columbia, South Carolina 29201

ERM

Subject: Remedial Option Assessment
Wix Filtration Corporation - Dillon, South Carolina
The Affinia Group, Inc.
ERM Project No.: 41284

Dear Mr. Forrest:

Environmental Resources Management (ERM) is pleased to present this assessment of remedial alternatives on behalf of our client, The Affinia Group, Inc. (Affinia) for the Wix Filtration Corporation (Wix) site in Dillon, South Carolina (the "Site") to the South Carolina Department of Health and Environmental Control (SCDHEC). The Site location map is shown as Figure 1. This work is an ongoing effort to evaluate and compare potential remedial alternatives for the Site relative to a suspected historical toluene release area (i.e. "source area").

Historical ground water sampling results indicate that toluene concentrations in ground water at the Site remain above MCLs within the western fenced area of the facility as shown on Table 1. Concentrations of toluene in soil and ground water at the Site indicate that source area concentrations are above MCLs and risk-based preliminary remediation goals for industrial facilities (IPRG) as follows:

- Soil IPRG – 520 milligrams per kilogram
- Ground Water IPRG – 720 micrograms per liter
- Ground Water MCL – 1,000 micrograms per liter

Pursuant to the air-sparge pilot test conducted on August 8, 2007 and documented with results in the August 30, 2007 report submitted to the SCDHEC, ERM assessed two potential methods of remediation: 1)

A20

targeted soil removal coupled with air-sparge/soil vapor extraction (AS/SVE), and 2) monitored natural attenuation (MNA). These two potential remedial technologies were determined to be the best alternatives given the underground utility configuration at the Site within the source area, as shown in Figure 2. The August 30, 2007 report concluded with additional potential in situ technologies under possible consideration including ozone injection, hydrogen peroxide, and excavation. However, both the ozone injection and hydrogen peroxide technologies would prove to be too corrosive to underground utilities within the source area and require constant monitoring. Excavation would be too disruptive to plant operations and present health and safety concerns given the surrounding underground utility configuration within the source area.

The assessments of the AS/SVE and MNA options are detailed herein and included the following items:

- Monitored natural attenuation baseline sampling
- Completion of a monitored natural attenuation model
- Preliminary conceptual design of an AS/SVE remedial system
- Completion of a comparison table discussing advantages and disadvantages of each remedial alternative

This scope of work was limited to the source area and did not include an assessment of remedial options for the entirety of the detected ground water plume. All work procedures and quality assurance and quality control efforts were conducted in accordance with the March 2006, *Quality Assurance Project Plan* (QAPP), as approved by the SCDHEC on March 27, 2006.

SUMMARY OF MONITORED NATURAL ATTENUATION BASELINE ASSESSMENT ACTIVITIES AND RESULTS

Monitored natural attenuation activities included soil and ground water sampling and analysis, as detailed below.

ERM personnel collected one soil sample via hand auger on September 19, 2007. The sample was collected at a depth of six feet below ground surface from location B-1 as shown on Figure 2. This location is across the swale near monitoring well MW-8. Ground water was not encountered when the boring was installed. Soil removed by hand auger was backfilled into the boring.

swale near monitoring well MW-8. Ground water was not encountered when the boring was installed. Soil removed by hand auger was backfilled into the boring.

Ground water samples were collected from six select monitoring wells (MW-2, MW-3, MW-4, MW-5, MW-7, and MW-9) on September 19 and 20, 2007. Each monitoring well was purged and sampled using approved low-flow methods by ERM personnel. Ground water generated during purging of the wells was contained in a labeled, closed-top 30-gallon polyethylene drum for eventual disposal. Ground water sampling logs and field sampling reports are found in Appendix A.

The soil sample and ground water samples were submitted to Pace Analytical Laboratories (Pace), a South Carolina certified laboratory, under Chain-of-Custody for the following analyses in accordance with Environmental Protection Agency (USEPA) approved methods as shown in Appendix B:

<u>Ground Water</u>
- Manganese
- Ferrous Iron
- Nitrate
- Sulfate
- Dissolved Gases
  - Ethene, Ethane, Methane

<u>Soil</u>
- Total Organic Carbon

The results of the September 2007 sampling event were used to develop a MNA model for Site ground water using the BIOSCREEN modeling software and are summarized in Table 2.

COMPARISON OF POTENTIAL REMEDIAL ALTERNATIVES

The two potential alternatives evaluated for the Site include: 1) targeted soil removal coupled with air-sparge/soil vapor extraction (AS/SVE), and 2) MNA. Table 3 provides a comparison of the two potential alternatives. The following sections provide a description of each potential alternative and the assumptions used.

Monitored Natural Attenuation Alternative

In order to evaluate the effectiveness of using MNA at the Site, the mass of toluene within the source area was estimated based on historical toluene concentrations detected in soil and ground water samples collected from the source area (see Table 2). A ground water model was used to evaluate the potential effectiveness of an MNA program at the Wix facility as discussed in the following paragraphs.

MNA Ground Water Modeling – A ground water model was developed based upon site-specific conditions and natural attenuation parameters determined for the Site from sampling data obtained on September 19 and 20, 2007. The potential transport of toluene was simulated using the BIOSCREEN Natural Attenuation model in order to evaluate the potential for using MNA as a remedial option for the Site. The BIOSCREEN model was developed in cooperation with the USEPA by the Air Force Center for Environmental Excellence (AFCEE) for the purposes of evaluating the natural attenuation at sites contaminated with aromatic hydrocarbons, including toluene. The model uses the Domenico analytical solution method to simulate advective transport, dispersion, sorption, and first-order decay of the contaminant of concern (COC).

The model also includes an optional solution to simulate the biodegradation potential of each COC based upon concentrations of electron acceptors (see Table 2). The solution uses an instantaneous reaction based upon the estimated biodegradation capacity for each electron acceptor. The biodegradation capacity is calculated by the model from concentrations of electron acceptors determined from sampling analyses and a utilization factor used by the model. Biodegradation of the COC over time is approximated using the first-order decay and instantaneous reaction solutions included in the model. These two solutions result in a greater attenuation of the COC than that calculated by the advective transport solution alone.

Parameters used by the model to simulate transport include seepage velocity, dispersivities, retardation factors, first-order decay coefficients, and concentrations of electron acceptors. The seepage velocity, retardation factor, and decay coefficient were calculated by the model based upon aquifer properties and chemical properties. The estimated seepage velocity (12 feet per year) used in the model was based upon the ground water gradient calculated from previous sampling events and the average hydraulic conductivities calculated from slug tests (0.65 feet per day). Dispersivities were approximated based upon plume geometry and

apparent contaminant migration potential. Concentrations of electron donors (dissolved oxygen, methane, sulfates, and ferrous iron) used in the model were determined from sampling data obtained during the September 2007 sampling event.

Based upon the concentrations of COCs measured in ground water at monitoring wells MW-1, MW-2, MW-3, and MW-4, toluene was chosen for model analysis to indicate the potential impact from dissolved hydrocarbons at the Site. Model simulations were run for a 30-year period in order to simulate the potential migration of dissolved-phased hydrocarbon concentrations in ground water (see Appendix C). Source area concentrations used in the model were determined by averaging the concentrations detected in monitoring wells MW-1, MW-2, MW-3, and MW-4. Since concentrations of toluene were not detected in wells located downgradient of the source area wells, calibration of the model was not possible.

The potential lateral migration of toluene simulated by the model appears to be a worst-case scenario. Model results indicate that the simulated toluene plume attenuates to below the maximum contaminant level (MCL) and risk-based screening level (RBSL) of 1,000 micrograms per liter within a distance of 300 feet from the source area within a 30-year period. This distance is within the property boundary of the Wix facility. However, the reduction of toluene concentrations below the MCL in the source area may not occur within the 30-year period. Toluene has not been detected at monitoring wells MW-7 and MW-8, located approximately 75 and 180 feet, respectively, from the source area. Stability of the toluene plume should be monitored over the 30-year period for the MNA remediation scenario using monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-7, MW-8, and MW-9. Due to the inherent variability in model predictions for extended simulation periods (e.g. greater than 30 years) without a downgradient calibration point, model simulation periods were limited to a 30-year period. The SCDHEC may require an additional monitoring well in a downgradient location for background calibration purposes during the 30-year period of performance should an existing well prove inadequate.

<u>Comparison of Alternative</u> - The MNA option provides for the least disruption in Site operations, but provides the longest period of performance. The modeling results and historical information for the Site supports a slow degradation rate for the Site. Therefore, the MNA option provides for limited migration of the contaminant plume, but does not

provide for full degradation to below MCLs.

Air-Sparge/Soil Vapor Extraction (AS/SVE) Alternative

For this evaluation, ERM has assumed that a horizontal AS/SVE system will be required. Field observations indicate that shallow soils consist of silty clays, which may require replacement for effective removal of contaminant vapors from subsurface soils above the water table. However, additional testing may indicate that a vertical AS/SVE system is also viable at the Site. Figure 3 shows an approximate influence zone from the AS/SVE alternative.

The preliminary design for the AS/SVE alternative consists of installing five air-sparge wells with a soil vapor extraction system for removal of contaminated vapors that are generated by the air-sparging. The alternative requires excavating the upper four feet of soil (silty clay) in the source area and replacing it with permeable sand for collecting contaminant vapors from the subsurface. The removal of contaminated soil should also have the added benefit of reducing source area concentration. SVE laterals will be emplaced within the excavation and connected to a vacuum blower. Installation of the system will require locking out the electrical service and propane service to the propane tank filling station for one to two days. The system is anticipated to operate for a maximum period of three years at which time the system will be decommissioned.

Comparison of Alternative - The AS/SVE option provides for the greatest potential for reduction of mass, limited mobility, effectiveness, and permanence.

CONCLUSIONS

The comparison evaluation of the potential remedial technologies MNA and AS/SVE is shown in Table 3. The table indicates that AS/SVE would initially be a minor disruption to the Wix facility for up to two days during installation, whereas the MNA option provides for the least disruption to plant operations. The AS/SVE option provides for the greatest potential for reduction of mass, limited mobility, effectiveness, and permanence.

The AS/SVE option has been selected as the optimal remedial strategy to address the source area at the Site. In an effort to provide a site-specific

AS/SVE remedial system design for implementation, it will be necessary to collect additional field data and coordinate with Affinia and Wix personnel as to planned plant shutdowns at some time during 2008. As such, Wix will continue to monitor wells MW-1 through MW-4 and MW-7 on a semi-annual basis until the AS/SVE option has been implemented at which time a re-evaluation of the ground water monitoring strategy will occur.

Should you have any questions regarding this report, please do not hesitate to contact us at 843-856-4270.

Sincerely,

Mark Easterbrook
Project Manager

Hunter Sartain
Senior Remediation Engineer

Attachments

cc: Mr. Richard P. Fahey, Esq. – Vorys Sater Seymour and Pease, LLP
Mr. Keith Clark – The Affinia Group
Mr. James Hiller – ERM
Ms. Melody Christopher – ERM
Mr. Ken McCutcheon – Wix Filtration Corporation
Mr. Paul H. Caulford, Jr. – Wix Filtration Corporation

Tables

Table 1: Historical Summary of Ground Water Analytical Data
Wix Filtration Corporation - Dillon, South Carolina
The Affinia Group, Inc.

Sample Location	Sample Date	Acetone	Benzene	2-Butanone	Chloroethane	cis-1,2-Dichloroethene	1,2-Dichloroethene (Total)	1,1-Dichloroethane	1,1-Dichloroethene	Ethylbenzene	2-Hexanone	Isopropylbenzene	p-Isopropyltoluene	n-Propylbenzene	Toluene	Trichloroethene	Tetrachloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	1,1,1-Trichloroethane	Xylene (Total)	m&p-Xylene	o-Xylene	Total VOCs
		Volatile Organic Compounds - EPA Method 8260 (µg/L)																						
EPA Region IX PRG		5,500	0.35	7,000	4.6	61	181	810	340	1,300	NL	660	NL	240	720	0.028	0.1	12	12	3,200	210	NL	NL	
South Carolina Ground Water Standard (MCL)		NF	5	NF	NF	70	170	NF	7	700	NF	NF	NF	NF	1,000	5	5	NF	NF	200	10,000	NF	NF	
MW-1	05/25/06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	340,000	ND	ND	ND	ND	ND	230	ND	ND	340,230
MW-1	08/08/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	260,000	ND	ND	ND	ND	ND	ND	ND	ND	260,000
MW-2	05/24/06	ND	21	ND	ND	ND	ND	ND	ND	3	ND	ND	ND	ND	11,000	ND	ND	ND	ND	ND	2.8	2.4	ND	11,029.2
MW-2	08/08/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	31,100	ND	ND	ND	ND	ND	ND	ND	ND	31,100
MW-3	05/24/06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	210,000	ND	ND	2,100	ND	ND	ND	ND	ND	212,100
DUP-1 (MW-3)	05/24/06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	220,000	ND	ND	2,100	ND	ND	ND	ND	ND	222,100
MW-3	08/08/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	142,000	ND	ND	ND	ND	ND	ND	ND	ND	142,000
DUP-1 (MW-3)	08/08/07	ND	25.3	ND	ND	2.3	2.3	ND	ND	28.5	5.7	16.3	ND	ND	132,000	ND	ND	134	ND	ND	86.4	39.7	46.7	132,387.2
MW-4	05/24/06	27	27	6.6	ND	4.8	5.1	ND	ND	3.4	ND	ND	ND	1.1	41,000	ND	ND	ND	1.6	ND	9.3	4.1	5.2	41,095.2
MW-4	08/08/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	169,000	ND	ND	ND	ND	ND	ND	ND	ND	169,000
MW-5	01/04/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
MW-6	01/04/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
MW-7	01/04/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
DUP-1 (MW-7)	01/04/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
MW-7	08/08/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	59.7	ND	ND	ND	ND	ND	ND	ND	ND	59.7
MW-7	08/23/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
MW-8	01/04/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
MW-9	01/04/07	ND	ND	ND	ND	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.7	ND	ND	ND	ND	ND	ND	ND	4.70
TW-1	11/18/05	ND	54.1	ND	3.43	3.93	ND	13.9	8.02	39.3	ND	ND	1.88	2.58	140,000	ND	ND	ND	ND	7.52	30.1	ND	ND	140,164.76
TW-2	11/18/05	ND	23.7	ND	ND	2.68	ND	ND	ND	13.8	ND	2.8	3.75	6.49	7,610	ND	ND	28.4	6.64	ND	13	ND	ND	7,711.26

Table 1: Historical Summary of Ground Water Analytical Data
Wix Filtration Corporation - Dillon, South Carolina
The Affinia Group, Inc.

Sample Location	Sample Date	Volatile Organic Compounds - EPA Method 8260 (µg/L)																						
		Acetone	Benzene	2-Butanone	Chloroethane	cis-1,2-Dichloroethene	1,2-Dichloroethene (Total)	1,1-Dichloroethane	1,1-Dichloroethene	Ethylbenzene	2-Hexanone	Isopropylbenzene	p-Isopropyltoluene	n-Propylbenzene	Toluene	Trichloroethene	Tetrachloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	1,1,1-Trichloroethane	Xylene (Total)	m&p-Xylene	o-Xylene	Total VOCs
EPA Region IX PRG		5,500	0.35	7,000	4.6	61	181	810	340	1,300	NL	660	NL	240	720	0.028	0.1	12	12	3,200	210	NL	NL	
South Carolina Ground Water Standard (MCL)		NF	5	NF	NF	70	170	NF	7	700	NF	NF	NF	NF	1,000	5	5	NF	NF	200	10,000	NF	NF	
TW-3	11/18/05	ND	55	ND	ND	9.15	ND	1.39	1.51	21.9	ND	5.9	1.03	9.85	184,000	ND	1.26	61.1	12.7	ND	44.2	ND	ND	184,224.99
DUP-1 (TW-3)	11/18/05	51.6	57.8	ND	ND	13.3	ND	ND	ND	43.4	ND	12.8	2.48	24.1	184,000	ND	2.07	137	32.3	ND	88.7	ND	ND	184,465.55
EB-1	11/18/05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.41	ND	ND	ND	ND	ND	ND	ND	ND	1.41
EB-1	05/25/06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
EB-1	01/04/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
EB-1	08/08/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
FB-1	11/18/05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
FB-1	05/25/06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
FB-1	01/04/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
FB-1	08/08/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
FB-2	08/23/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
TB-1	11/18/05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.73	ND	ND	ND	ND	ND	ND	ND	ND	2.73
TB-1	01/04/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
TB-2	08/23/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0

Notes:
ND = Not detected above analytical method quantitation limit
µg/L = Micrograms per Liter
VOC = Volatile Organic Compound
DUP = Duplicate sample
MCL = Maximum Contaminant Level
PRG = Preliminary Remediation Goal for tap water - EPA Region IX from October 2004
NL = Not listed in EPA Region IX PRG table from October 2004
NF = Not found in South Carolina Class GB Ground Water Standards or EPA National Primary or Secondary Drinking Water Standards
EB = Equipment rinse blank sample
FB = Field blank sample
TB = Laboratory prepared trip blank

Table: 2 Summary of Baseline Natural Attenuation Parameters
Wix Filtration Corporation - Dillon, South Carolina
The Affinia Group, Inc.

Compounds and Constituents	PRG Standard µg/L	Report Limit µg/L	Ground Water Sample Natural Attenuation Baseline Results in µg/L						Soil Sample Results in mg/kg
			September 20, 2007		September 19, 2007				September 19, 2007
			MW-2	MW-3	MW-4	MW-5	MW-7	MW-9	B-1 (SOIL)
Sulfate	NL	40	ND	ND	4,300	110,000	8,600	10,000	--
Ferrous Iron	11,000*	5,000	4,000	12,000	7,000	9,900	ND	23,800	--
Nitrate	10,000	100	ND	ND	ND	ND	ND	ND	--
Manganese	880	5,000	11.1	62.2	5.6	118	6	21.7	--
Ethane	NL	20	ND	ND	ND	ND	ND	ND	--
Ethene	NL	20	ND	ND	ND	ND	ND	ND	--
Methane	NL	10	6,220	4,890	8,960	ND	10.2	2,870	--
Total Organic Carbon in mg/kg	NL	360	--	--	--	--	--	--	910

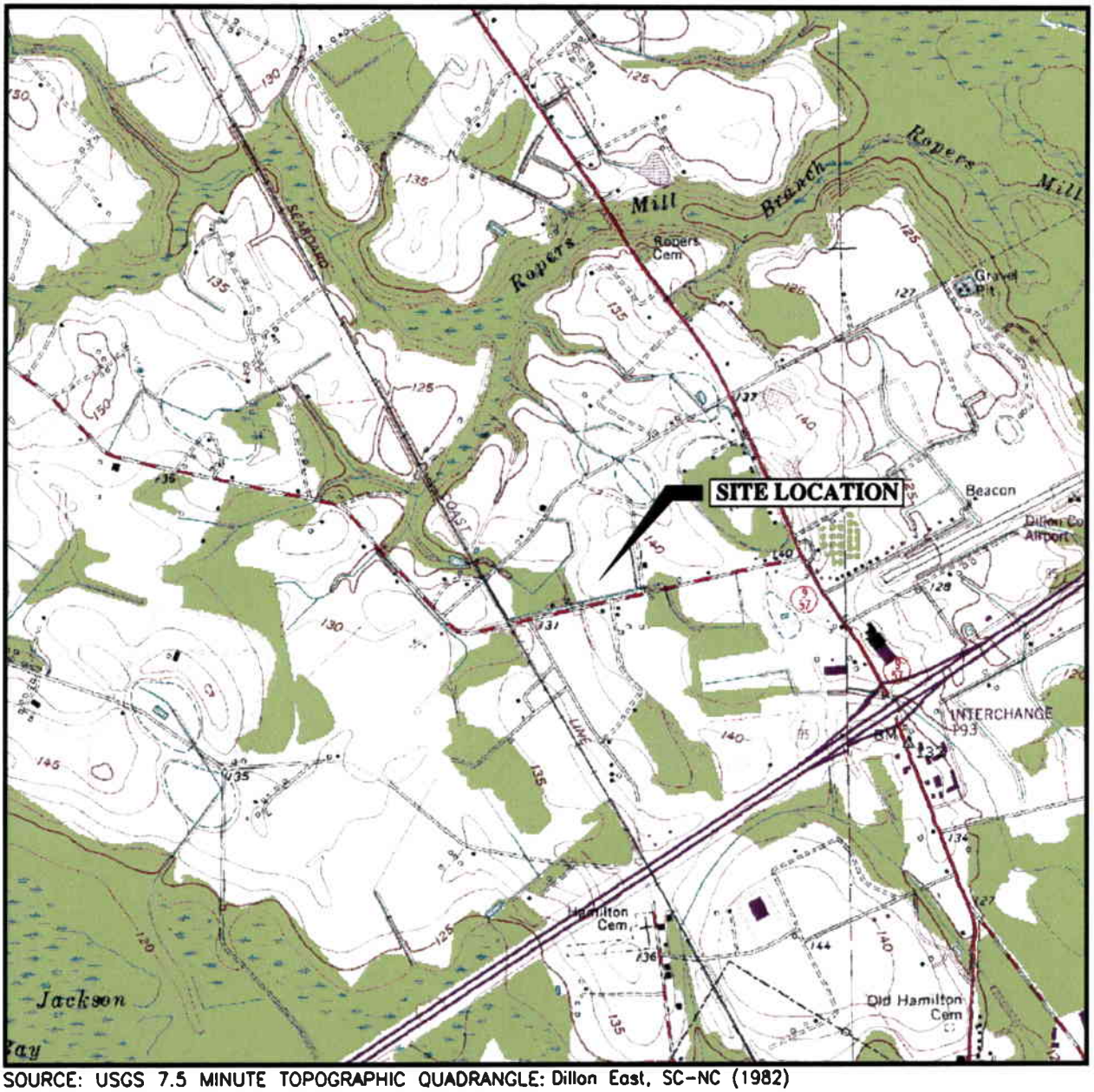
Notes:
mg/L = micrograms per Liter
mg/kg = milligrams per kilogram
* = standards listed are for total iron
MCL = Maximum Contaminant Level is the highest level that is allowed in drinking water according to South Carolina Class GB Ground Water Standards
PRG = Residential Preliminary Remediation Goal - EPA Region IX from October 2004
NL = not listed in EPA Region IX PRG table from October 2004
ND = not detected above reporting limit

Laboratory Analysis by Pace Analytical Laboratories of Huntersville, North Carolina

Table 3: ***Comparison of Potential Remedial Alternatives***
Wix Filtration Corporation - Dillon, South Carolina
The Affinia Group, Inc.

Comparison Criteria	Monitored Natural Attenuation	Air-Sparge/Soil Vapor Extraction
Removal of contaminant mass and volume	The MNA option does not actively remove contaminant mass. Volume of ground water contamination may increase over time.	The AS/SVE option has the potential to result in a significant reduction (>80 percent) in contaminant mass from the suspected historical release area.
Effectiveness and permanence	According to modeling results, toluene concentrations should result in a 40 to 50 percent reduction in the source area. Dissolved concentrations of the contaminant should be contained to the property based upon ground water modeling results. The MNA option may not provide for a permanent reduction of toluene below the MCL in the source area.	The AS/SVE option should be effective in significantly reducing concentrations of toluene within the source area, and may reduce source area concentrations to below the MCL.
Reduction in toxicity and mobility	The MNA option will not reduce the toxicity or mobility of the toluene.	The AS/SVE option does not reduce the toxicity of the contaminant, but should reduce the overall migration potential by reducing the mass within the source area.
Disruption of site services	The MNA option should not disrupt site services.	The AS/SVE option provides some disruption to the Site during installation activities of up to two days. Costs have been included to minimize this impact.
Estimated Period of Performance	30 years	3 years

Figures



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE: Dillon East, SC-NC (1982)

SCALE 1:24000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

CONTOUR INTERVAL 5 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

SOUTH CAROLINA

QUADRANGLE LOCATION

N W E S

FIG1.DWG 02-17-06 1=1 DDP REV

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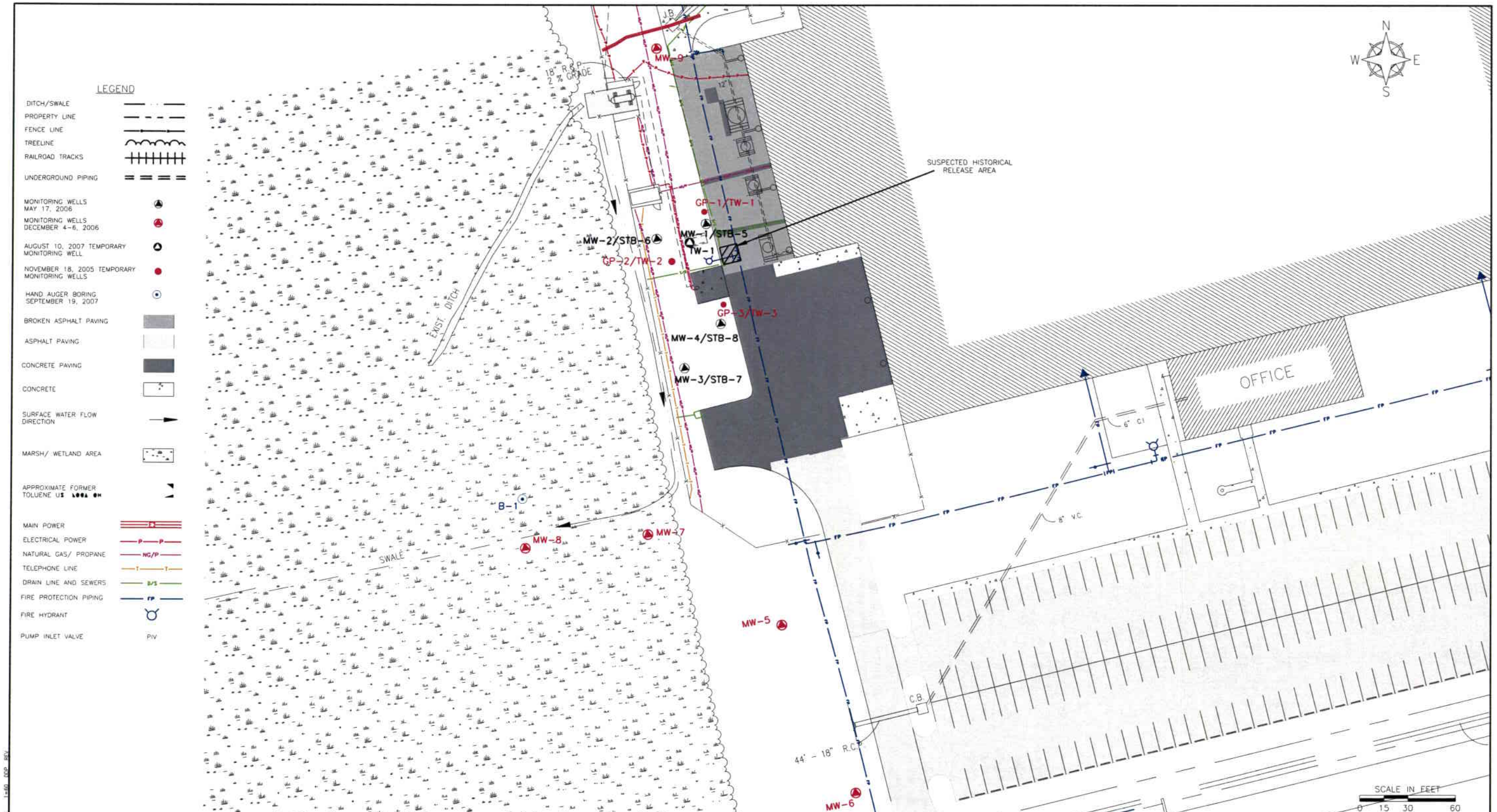
SITE LOCATION MAP
WIX FILTRATION CORPORATION
AFFINIA GROUP, INC.
DILLON, SOUTH CAROLINA

FIGURE **1**



NO.	DATE	APPR.	REVISION	REVISION

WIX FILTRATION CORPORATION

AFFINIA GROUP INC. — DILLON, SOUTH CAROLINA

DRAWN BY DDP	PROJECT ENGINEER MCE
DESIGN ENGINEER –	PROJECT MANAGER MCE

ERM

NOT FOR CONST-RUCTION

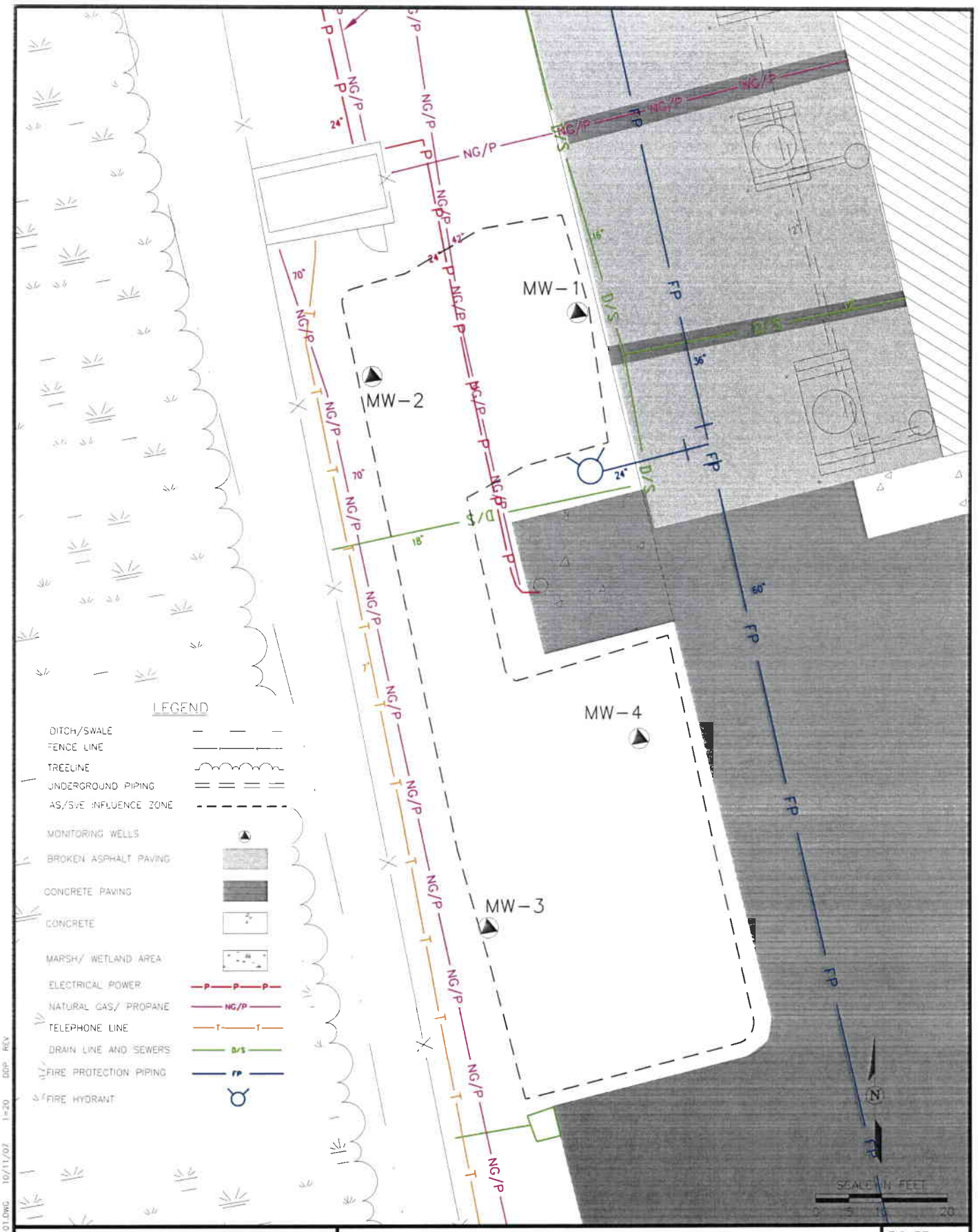
BASEMAP SHOWING GROUND WATER MONITORING WELLS AND SEPTEMBER 2007 HAND AUGER BORING LOCATION

SCALE 1"=60'	DATE JANUARY 2008
PROJECT NO. 41284	AutoCAD 2007 08-01-BASEMAP-01

DRAWING NO. 2

REV. NO.

SHEET 1 OF 1



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SCHEMATIC SHOWING APPROXIMATE INFLUENCE OF AIR SPARGE/ SOIL VAPOR EXTRACTION SYSTEM

FIGURE

3

41284 07-10-SCHM-01.DWG 10/11/07 1=20 DDP REV

Appendix A
ERM Ground Water Sampling
Logs and Field Sampling Reports

FIELD SAMPLING REPORT

ERM

498 Wando Park Blvd Suite 100
Mt. Pleasant, SC 29464
(843) 856-4270

JOB NUMBER: 41284
JOB NAME: Affinia-Wix
SAMPLING POINT (LOCATION): MW-2
DATE: 9/20/07 TIME: 9:55

SAMPLING INFORMATION

SAMPLE I.D. NUMBER: MW-2 HAZARDOUS?: X YES ____ NO ____ UNKNOWN

SOIL SAMPLING DATA:

SAMPLING DATE: ____
TIME: ____

SAMPLER TYPE & MATERIAL Stainless Steel Hand Auger : Geoprobe (polyethylene sleeve) (circle)
SAMPLING DEPTH ____
SAMPLE DESCRIPTION ____

WELL SAMPLING DATA:

SAMPLING DATE: 9/20/07
TIME: 0955

PURGE METHOD & MATERIALS (Peristaltic pump) : hand bailer / polyethylene : teflon / tubing : bailer (circle)
VOLUME OF WATER IN WELL & SAND PACK (gallons) ____
VOLUME OF WATER PURGED (gallons) 1.5 gal
PURGE DATE 9/20/07 START TIME 0915 END TIME 0945
SAMPLER TYPE & MATERIAL (Peristaltic pump) : hand bailer / polyethylene : (teflon / tubing) : bailer (circle)
SAMPLE DESCRIPTION clear

TOTAL WELL DEPTH 17.5 ft. DEPTH TO GROUND WATER 7.74 ft.

CONTAINER TYPE	CONTAINER VOLUME	PRESERVATIVE/PREPARATION	NUMBER	FILTERING	ANALYSIS
plastic	125 ml	unpreserved	1	--	Nitrate
plastic	250 ml	unpreserved	1	--	Ferrous Iron
plastic	250 ml	HNO_3	1	--	Manganese
plastic	250ml	unpreserved	1	--	Sulfate
glass	20 ml	HCl	3	--	Dissolved Gases

FIELD MEASUREMENTS

PARAMETER	EQUIPMENT ID	1st READING	2nd READING	3rd READING	4th READING
pH (STO UNITS)					
TEMP (C)					
SPEC. COND (um/sm)					
TIME					
DATE					

See purge log

GENERAL INFORMATION

WEATHER cloudy, rainy AIR TEMP. 60's

SAMPLES COLLECTED BY MCE and SM

SPECIAL HANDLING SAMPLES PACKED TO 4° C IN COOLER ON ICE

MODE OF SHIPMENT ____ CAR/TRUCK ____ PLANE X COMMER VEH. ____ OTHER

COMMENTS (CALIBRATIONS, FIELD MODIFICATIONS, INSTRUMENT PROBLEMS) ____

N/A: Not Applicable

ERM LOW FLOW/PURGE GROUND WATER SAMPLING LOG

Project: 41284 Site: Wix - Dillon, SC Well No.: MW- 2 Date: 9/20/07
Well Depth: 17.5 Well Diameter: 2-inch Sampling Device: Peristaltic DTW: 7.74
Tubing Type: Teflon-lined poly Measuring Point: TOC Sampling Time: 0955 Sampling Personnel: MCE, SM
Description of Sample Volume of Water Purged: 1.5 gal Rate of Pumping:

Range	0-55	0-9.9	0-19.99	0-14	± 1999	0-800		
		mS/cm	mg/L			NTU	ft.	
TIME	Temp 3%	Cond. 3%	DO 10%	pH 0.1	ORP ±10	Turbidity 10%	Water Level	Water Clarity
915	21.23	224	2.66	4.85	58.6	24.2	8.15	cleaning
920	21.37	227	2.14	4.84	54.2	28.3	8.20	cleaning
925	21.45	225	2.13	4.84	52.0	18.3	8.25	cleaning
930	21.49	225	2.23	4.86	48.9	5.0	8.31	cleaning
935	21.51	226	2.27	4.87	47.4	8.8	8.33	clear
940	21.49	227	2.36	4.89	45.1	8.6	8.35	clear
945	21.46	229	2.40	4.90	43.2	8.0	8.37	clear

Type of sample collected: Ground Water grab sample
Analysis sampled for: MNA Analyses

Information: 2 in. = 617 ml/ft. 4 in. = 2470 ml/ft. $Vol_{sphere} = 4/3\pi r^3$ $Vol_{cyl} = \pi r^2 h$

FIELD SAMPLING REPORT	ERM	498 Wando Park Blvd Suite 100 Mt. Pleasant, SC 29464 (843) 856-4270	JOB NUMBER: 41284 JOB NAME: Affinia-Wix SAMPLING POINT (LOCATION): MW-3 DATE: 9/20/07 TIME: 0830

SAMPLING INFORMATION

SAMPLE I.D. NUMBER: MW-3 HAZARDOUS? X YES ____ NO ____ UNKNOWN

SOIL SAMPLING DATA:

SAMPLING DATE: ____

TIME: ____

SAMPLER TYPE & MATERIAL Stainless Steel Hand Auger : Geoprobe (polyethylene sleeve) (circle)

SAMPLING DEPTH ____

SAMPLE DESCRIPTION ____

WELL SAMPLING DATA:

SAMPLING DATE: 9/20/07

TIME: 0830

PURGE METHOD & MATERIALS Peristaltic pump : hand bailer / polyethylene : teflon / tubing : bailer (circle)

VOLUME OF WATER IN WELL & SAND PACK (gallons) ____

VOLUME OF WATER PURGED (gallons) 1.5 gal

PURGE DATE 9/20/07 START TIME 0756 END TIME 0826

SAMPLER TYPE & MATERIAL Peristaltic pump : hand bailer / polyethylene : teflon / tubing : bailer (circle)

SAMPLE DESCRIPTION clear

TOTAL WELL DEPTH 16.6 ft. DEPTH TO GROUND WATER 7.04 ft.

CONTAINER TYPE	CONTAINER VOLUME	PRESERVATIVE/PREPARATION	NUMBER	FILTERING	ANALYSIS
plastic	125 ml	unpreserved	1	--	Nitrate
plastic	250 ml	unpreserved	1	--	Ferrous Iron
plastic	250 ml	HNO_3	1	--	Manganese
plastic	250ml	unpreserved	1	--	Sulfate
glass	20 ml	HCl	3	--	Dissolved Gases

FIELD MEASUREMENTS

PARAMETER	EQUIPMENT ID	1st READING	2nd READING	3rd READING	4th READING
pH (STO UNITS)					
TEMP (C)					
SPEC. COND (um/sm)					
TIME					
DATE					

See purge log

GENERAL INFORMATION

WEATHER cloudy, raining AIR TEMP. 60's to 70's

SAMPLES COLLECTED BY MCE and SM

SPECIAL HANDLING SAMPLES PACKED TO 4° C IN COOLER ON ICE

MODE OF SHIPMENT ____ CAR/TRUCK ____ PLANE X COMMER VEH. ____ OTHER

COMMENTS (CALIBRATIONS, FIELD MODIFICATIONS, INSTRUMENT PROBLEMS) ____

N/A: Not Applicable

ERM LOW FLOW/PURGE GROUND WATER SAMPLING LOG

Project: 41284 | Site: Wix - Dillon, SC | Well No.: MW-3 | Date: 9/20/07
Well Depth: 16.6 | Well Diameter: 2-inch | Sampling Device: Peristaltic | DTW: 7.04
Tubing Type: Teflon-lined poly | Measuring Point: TOC | Sampling Time: 0830 | Sampling Personnel: MCE, SM
Description of Sample: clear | Volume of Water Purged: 2 gal | Rate of Pumping:

Range	0-55	0-9.9	0-19.99	0-14	± 1999	0-800		
		µS/cm	mg/L					
TIME	Temp 3%	Cond. 3%	DO 10%	pH 0.1	ORP ±10	Turbidity 10%	Water Level	Water Clarity
0756	21.57	151	2.76	5.16	28.1	165.9	7.48	turbid
0801	21.73	149	2.27	5.15	20.6	55.2	7.66	clearing
0806	21.93	147	2.05	5.16	14.0	29.8	7.81	clearing
0811	21.98	146	2.21	5.16	12.4	19.6	7.87	clearing
0816	22.00	146	2.28	5.18	10.6	9.1	8.02	clear
0821	21.93	146	2.01	5.20	6.1	6.3	8.21	clear
0826	21.97	149	2.09	5.21	2.7	7.2	8.18	clear

Type of sample collected: Ground Water grab sample
Analysis sampled for: MNA Analyses

weather: light rain

Information: 2 in. = 617 ml/ft. 4 in. = 2470 ml/ft. $Vol_{sphere} = 4/3\pi r^3$ $Vol_{cyl} = \pi r^2 h$

FIELD SAMPLING REPORT	ERM	498 Wando Park Blvd Suite 100 Mt. Pleasant, SC 29464 (843) 856-4270	JOB NUMBER: 41284 JOB NAME: Affinia-Wix SAMPLING POINT (LOCATION): MW-4 DATE: 9/19/07 TIME: 1625

SAMPLING INFORMATION

SAMPLE I.D. NUMBER: MW-4 HAZARDOUS?: X YES ____ NO ____ UNKNOWN

SOIL SAMPLING DATA:

SAMPLING DATE. ____ SAMPLER TYPE & MATERIAL Stainless Steel Hand Auger : Geoprobe (polyethylene sleeve) (circle)

TIME: ____ SAMPLING DEPTH ____

SAMPLE DESCRIPTION ____

WELL SAMPLING DATA:

SAMPLING DATE: 9/19/07 PURGE METHOD & MATERIALS Peristaltic pump : hand bailer / polyethylene : teflon / tubing : bailer (circle)

TIME: 1625 VOLUME OF WATER IN WELL & SAND PACK (gallons) ____

VOLUME OF WATER PURGED (gallons) 3/4 gal

PURGE DATE 9/19/07 START TIME 1553 END TIME 1618

SAMPLER TYPE & MATERIAL Peristaltic pump : hand bailer / polyethylene : teflon / tubing : bailer (circle)

SAMPLE DESCRIPTION clear

TOTAL WELL DEPTH 16.9 ft. DEPTH TO GROUND WATER 8.49 ft.

CONTAINER TYPE	CONTAINER VOLUME	PRESERVATIVE/PREPARATION	NUMBER	FILTERING	ANALYSIS
plastic	125 ml	unpreserved	1	--	Nitrate
plastic	250 ml	unpreserved	1	--	Ferrous Iron
plastic	250 ml	HNO_3	1	--	Manganese
plastic	250ml	unpreserved	1	--	Sulfate
glass	20 ml	HCl	3	--	Dissolved Gases

FIELD MEASUREMENTS

See purge log

PARAMETER	EQUIPMENT ID	1st READING	2nd READING	3rd READING	4th READING
pH (STO UNITS)					
TEMP (C)					
SPEC. COND (um/sm)					
TIME					
DATE					

GENERAL INFORMATION

WEATHER cloudy AIR TEMP. 70°

SAMPLES COLLECTED BY MCE and SM

SPECIAL HANDLING SAMPLES PACKED TO 4° C IN COOLER ON ICE

MODE OF SHIPMENT ____ CAR/TRUCK ____ PLANE X COMMER VEH. ____ OTHER

COMMENTS (CALIBRATIONS, FIELD MODIFICATIONS, INSTRUMENT PROBLEMS) ____

N/A: Not Applicable

ERM LOW FLOW/PURGE GROUND WATER SAMPLING LOG

Project: 41284 Site: Wix - Dillon, SC Well No.: MW-4 Date: 9/19/07
Well Depth: 16.9 Well Diameter: 2-inch Sampling Device: Peristaltic DTW: 8.49
Tubing Type: Teflon-lined poly Measuring Point: TOC Sampling Time: 1625 Sampling Personnel: MCE, SM
Description of Sample clear Volume of Water Purged: 3/4 gal Rate of Pumping:

Range	0-55	0-9.9	0-19.99	0-14	± 1999	0-800		
TIME	Temp 3%	Cond. 3% mS/cm	DO 10% mg/L	pH 0.1	ORP ±10	Turbidity 10%	Water Level	Water Clarity
1553	24.16	203	2.65	4.78	40.1	2.8	8.91	clear, odor
1558	24.17	201	1.97	4.76	45.4	2.1	9.01	clear "
1603	24.29	202	2.19	4.76	49.2	2.1	9.05	clear "
1608	24.37	201	2.36	4.77	52.0	1.7	9.11	" "
1613	24.41	201	2.23	4.77	53.6	1.8	9.17	" "
1618	24.46	201	2.22	4.78	53.7	1.8	9.20	" "
~~1623~~								

Type of sample collected: Ground Water grab sample
Analysis sampled for: MNA Analyses

Information: 2 in. = 617 ml/ft. 4 in. = 2470 ml/ft. $Vol_{sphere} = 4/3\pi r^3$ $Vol_{cyl} = \pi r^2 h$

FIELD SAMPLING REPORT	ERM	498 Wando Park Blvd Suite 100 Mt. Pleasant, SC 29464 (843) 856-4270	JOB NUMBER: 41284 JOB NAME: Affinia-Wix SAMPLING POINT (LOCATION): MW-5 DATE: 9/19/07 TIME: 1210

SAMPLING INFORMATION

SAMPLE I.D. NUMBER: MW-5 HAZARDOUS?: X YES ____ NO ____ UNKNOWN

SOIL SAMPLING DATA:

SAMPLING DATE: ____

TIME: ____

SAMPLER TYPE & MATERIAL Stainless Steel Hand Auger : Geoprobe (polyethylene sleeve) (circle)

SAMPLING DEPTH ____

SAMPLE DESCRIPTION ____

WELL SAMPLING DATA:

SAMPLING DATE: 9/19/07

TIME: 1210

PURGE METHOD & MATERIALS Peristaltic pump : hand bailer / polyethylene : teflon / tubing : bailer (circle)

VOLUME OF WATER IN WELL & SAND PACK (gallons) ____

VOLUME OF WATER PURGED (gallons) 2.5 gal

PURGE DATE 9/19/07 START TIME 1138 END TIME 1203

SAMPLER TYPE & MATERIAL Peristaltic pump : hand bailer / polyethylene : teflon / tubing : bailer (circle)

SAMPLE DESCRIPTION clearing

TOTAL WELL DEPTH 15.5 ft. DEPTH TO GROUND WATER 7.29 ft.

CONTAINER TYPE	CONTAINER VOLUME	PRESERVATIVE/PREPARATION	NUMBER	FILTERING	ANALYSIS
plastic	125 ml	unpreserved	1	--	Nitrate
plastic	250 ml	unpreserved	1	--	Ferrous Iron
plastic	250 ml	HNO_3	1	--	Manganese
plastic	250ml	unpreserved	1	--	Sulfate
glass	20 ml	HCl	3	--	Dissolved Gases

FIELD MEASUREMENTS

See purge log

PARAMETER	EQUIPMENT ID	1st READING	2nd READING	3rd READING	4th READING
pH (STO UNITS)					
TEMP (C)					
SPEC. COND (um/sm)					
TIME					
DATE					

GENERAL INFORMATION

WEATHER cloudy AIR TEMP. 70°

SAMPLES COLLECTED BY MCE and SM

SPECIAL HANDLING SAMPLES PACKED TO 4° C IN COOLER ON ICE

MODE OF SHIPMENT ____ CAR/TRUCK ____ PLANE X COMMER VEH. ____ OTHER

COMMENTS (CALIBRATIONS, FIELD MODIFICATIONS, INSTRUMENT PROBLEMS) ____

N/A: Not Applicable

ERM LOW FLOW/PURGE GROUND WATER SAMPLING LOG

Project: 41284 Site: Wix - Dillon, SC Well No.: MW-5 Date: 9/19/07
Well Depth: 15.5' Well Diameter: 2-inch Sampling Device: Peristaltic DTW: 7.29
Tubing Type: Teflon-lined poly Measuring Point: TOC Sampling Time: 1210 Sampling Personnel: MCE, SM
Description of Sample clear Volume of Water Purged: 2.5 gal Rate of Pumping:

Range	0-55	0-9.9	0-19.99	0-14	± 1999	0-800		
TIME	Temp 3%	Cond. 3%	DO 10%	pH 0.1	ORP ±10	Turbidity 10%	Water Level	Water Clarity
1138	21.78	501	2.01	4.17	231	63.7	7.78	slightly turbid
1143	21.74	418	2.29	4.21	222.3	34.8	7.91	clearing
1148	21.85	401	1.58	4.22	229	34	7.91	clearing
1153	21.82	362	1.57	4.22	227.9	32.7	7.91	clearing
1158	21.86	348	1.49	4.25	229.4	31.4	7.91	"
1203	21.95	307	1.53	4.29	229.4	29	7.95	"

Type of sample collected: Ground Water grab sample
Analysis sampled for: MNA Analyses

Information: 2 in. = 617 ml/ft. 4 in. = 2470 ml/ft. $Vol_{sphere} = 4/3\pi r^3$ $Vol_{cyl} = \pi r^2 h$

FIELD SAMPLING REPORT	ERM	498 Wando Park Blvd Suite 100 Mt. Pleasant, SC 29464 (843) 856-4270	JOB NUMBER: 41284 JOB NAME: Affinia-Wix SAMPLING POINT (LOCATION): MW-7 DATE: 9/19/07 TIME: 1455

SAMPLING INFORMATION SAMPLE I.D. NUMBER: MW-7 HAZARDOUS?: X YES ____ NO ____ UNKNOWN

SOIL SAMPLING DATA:

SAMPLING DATE: ____ SAMPLER TYPE & MATERIAL Stainless Steel Hand Auger : Geoprobe (polyethylene sleeve) (circle)

TIME: ____ SAMPLING DEPTH ____

SAMPLE DESCRIPTION ____

WELL SAMPLING DATA:

SAMPLING DATE. 9/19/07 PURGE METHOD & MATERIALS Peristaltic pump : hand bailer / polyethylene teflon / tubing : bailer (circle)

TIME: 1455 VOLUME OF WATER IN WELL & SAND PACK (gallons) ____

VOLUME OF WATER PURGED (gallons) 0.5 gal

PURGE DATE 9/19/07 START TIME 1425 END TIME 1450

SAMPLER TYPE & MATERIAL Peristaltic pump : hand bailer / polyethylene teflon / tubing : bailer (circle)

SAMPLE DESCRIPTION clear

TOTAL WELL DEPTH 18.00 ft. DEPTH TO GROUND WATER 6.81 ft.

CONTAINER TYPE	CONTAINER VOLUME	PRESERVATIVE/PREPARATION	NUMBER	FILTERING	ANALYSIS
plastic	125 ml	unpreserved	1	--	Nitrate
plastic	250 ml	unpreserved	1	--	Ferrous Iron
plastic	250 ml	HNO_3	1	--	Manganese
plastic	250ml	unpreserved	1	--	Sulfate
glass	20 ml	HCl	3	--	Dissolved Gases

FIELD MEASUREMENTS

PARAMETER	EQUIPMENT ID	1st READING	2nd READING	3rd READING	4th READING
pH (STO UNITS)					
TEMP (C)					
SPEC. COND (um/sm)					
TIME					
DATE					

See purge log

GENERAL INFORMATION

WEATHER Cloudy AIR TEMP. 70°

SAMPLES COLLECTED BY MCE and SM

SPECIAL HANDLING SAMPLES PACKED TO 4° C IN COOLER ON ICE

MODE OF SHIPMENT ____ CAR/TRUCK ____ PLANE X COMMER VEH. ____ OTHER

COMMENTS (CALIBRATIONS, FIELD MODIFICATIONS, INSTRUMENT PROBLEMS) ____

N/A: Not Applicable

ERM LOW FLOW/PURGE GROUND WATER SAMPLING LOG

Project: 41284 Site: Wix - Dillon, SC Well No.: MW-7 Date: 9/19/07
Well Depth: 18.00 Well Diameter: 2-inch Sampling Device: Peristaltic DTW: 6.89
Tubing Type: Teflon-lined poly Measuring Point: TOC Sampling Time: 1455 Sampling Personnel: MCE, SM
Description of Sample clear Volume of Water Purged: 0.5 gal Rate of Pumping:

		µS/cm	mg/L			NTU		
Range	*0-55*	*0-9.9*	*0-19.99*	*0-14*	*± 1999*	*0-800*		
TIME	**Temp 3%**	**Cond. 3%**	**DO 10%**	**pH 0.1**	**ORP ±10**	**Turbidity 10%**	**Water Level**	**Water Clarity**
1425	21.22	69	3.10	5.33	188.5	24.8	7.17	cloudy
1430	20.78	66	2.35	5.30	182.4	18.3	7.41	cloudy
1435	20.88	65	2.20	5.29	179.6	23.2	7.34	"
1440	20.99	65	1.92	5.29	181.5	23.4	7.52	"
1445	20.58	64	1.70	5.28	180.2	26	7.63	"
1450	20.31	63	~~[illegible]~~ 1.76	5.29	176.7	26.3	7.72	clear
~~1455~~								

Type of sample collected: Ground Water grab sample
Analysis sampled for: MNA Analyses

Information: 2 in. = 617 ml/ft. 4 in. = 2470 ml/ft. $Vol_{sphere} = 4/3\pi r^3$ $Vol_{cyl} = \pi r^2 h$

FIELD SAMPLING REPORT	ERM	498 Wando Park Blvd Suite 100 Mt. Pleasant, SC 29464 (843) 856-4270	JOB NUMBER: 41284 JOB NAME: Affinia-Wix SAMPLING POINT (LOCATION): MW-9 DATE: 9/19/07 TIME: 1750

SAMPLING INFORMATION

SAMPLE I.D. NUMBER: MW-9 HAZARDOUS?: X YES ____ NO ____ UNKNOWN

SOIL SAMPLING DATA:

SAMPLING DATE: ____

TIME: ____

SAMPLER TYPE & MATERIAL Stainless Steel Hand Auger , Geoprobe (polyethylene sleeve) (circle)

SAMPLING DEPTH ____

SAMPLE DESCRIPTION ____

WELL SAMPLING DATA:

SAMPLING DATE: 9/19/07

TIME: 1750

PURGE METHOD & MATERIALS (Peristaltic pump) : hand bailer / polyethylene : (teflon / tubing) : bailer (circle)

VOLUME OF WATER IN WELL & SAND PACK (gallons) ____

VOLUME OF WATER PURGED (gallons) 1.75 gal

PURGE DATE 9/19/07 START TIME 1712 END TIME 1742

SAMPLER TYPE & MATERIAL (Peristaltic pump) : hand bailer / polyethylene (teflon / tubing) : bailer (circle)

SAMPLE DESCRIPTION clearing

TOTAL WELL DEPTH 15.5 ft. DEPTH TO GROUND WATER 8.06 ft

CONTAINER TYPE	CONTAINER VOLUME	PRESERVATIVE/PREPARATION	NUMBER	FILTERING	ANALYSIS
plastic	125 ml	unpreserved	1	--	Nitrate
plastic	250 ml	unpreserved	1	--	Ferrous Iron
plastic	250 ml	HNO_3	1	--	Manganese
plastic	250ml	unpreserved	1	--	Sulfate
glass	20 ml	HCl	3	--	Dissolved Gases

FIELD MEASUREMENTS

PARAMETER	EQUIPMENT ID	1st READING	2nd READING	3rd READING	4th READING
pH (STO UNITS)					
TEMP (C)					
SPEC. COND (um/sm)					
TIME					
DATE					

See purge log

GENERAL INFORMATION

WEATHER cloudy AIR TEMP. 70°

SAMPLES COLLECTED BY MCE and SM

SPECIAL HANDLING SAMPLES PACKED TO 4° C IN COOLER ON ICE

MODE OF SHIPMENT ____ CAR/TRUCK ____ PLANE X COMMER VEH. ____ OTHER

COMMENTS (CALIBRATIONS, FIELD MODIFICATIONS, INSTRUMENT PROBLEMS) ____

N/A: Not Applicable

ERM LOW FLOW/PURGE GROUND WATER SAMPLING LOG

Project: 41284 Site: Wix - Dillon, SC Well No.: MW- 9 Date: 9/19/07
Well Depth: 15.5 Well Diameter: 2-inch Sampling Device: Peristaltic DTW: 8.06
Tubing Type: Teflon-lined poly Measuring Point: TOC Sampling Time: 1750 Sampling Personnel: MCE, SM
Description of Sample clear Volume of Water Purged: 1.75 Rate of Pumping:

Range	*0-55*	*0-9.9*	*0-19.99*	*0-14*	*± 1999*	*0-800*		
TIME	Temp 3%	Cond. 3%	DO 10%	pH 0.1	ORP ±10	Turbidity 10%	Water Level	Water Clarity
1712	24.31	234	2.24	5.95	-61.6	48.3	8.45	slightly murky
1717	24.36	233	1.71	5.93	-61.5	44.6	8.38	" "
1722	24.38	232	2.22	5.92	-58.4	18.1	8.65	clearing
1727	24.43	231	2.26	5.92	-58.2	22.3	8.82	clearing
1732	24.48	232	2.36	5.91	-56.8	22.7	8.90	clearing
1737	24.50	231	2.24	5.90	-55.0	30.1	8.94	clearing
1742	24.45	229	1.64	5.87	-50.3	25.1	9.11	clearing

Type of sample collected: Ground Water grab sample
Analysis sampled for: MNA Analyses

Information: 2 in. = 617 ml/ft. 4 in. = 2470 ml/ft. $Vol_{sphere} = 4/3\pi r^3$ $Vol_{cyl.} = \pi r^2 h$

FIELD SAMPLING REPORT

ERM

498 Wando Park Blvd Suite 100
Mt. Pleasant, SC 29464
(843) 856-4270

JOB NUMBER: 41284
JOB NAME: Affinia-Wix
SAMPLING POINT (LOCATION): B-1
DATE: 9/19/07 TIME: 1040

SAMPLING INFORMATION

SAMPLE I.D. NUMBER: B-1 (Soil) HAZARDOUS?: ____ YES ____ NO X UNKNOWN

SOIL SAMPLING DATA:

SAMPLING DATE: 9/19/07
TIME: 1040

SAMPLER TYPE & MATERIAL: Stainless Steel Hand Auger / Geoprobe (polyethylene sleeve) (circle)
SAMPLING DEPTH: 6.0 ft.
SAMPLE DESCRIPTION: brownish sandy clay

WELL SAMPLING DATA:

SAMPLING DATE: ____
TIME: ____

PURGE METHOD & MATERIALS: Peristaltic pump : hand bailer / polyethylene : teflon / tubing : bailer (circle)
VOLUME OF WATER IN WELL & SAND PACK (gallons) ____
VOLUME OF WATER PURGED (gallons) ____
PURGE DATE ____ START TIME ____ END TIME ____
SAMPLER TYPE & MATERIAL: Peristaltic pump : hand bailer / polyethylene : teflon / tubing : bailer (circle)
SAMPLE DESCRIPTION ____

TOTAL WELL DEPTH ____ ft. DEPTH TO GROUND WATER ____ ft.

CONTAINER TYPE	CONTAINER VOLUME	PRESERVATIVE/PREPARATION	NUMBER	FILTERING	ANALYSIS
glass	250 ml	unpreserved	1	--	Total Organic Carbon

FIELD MEASUREMENTS

PARAMETER	EQUIPMENT ID	1st READING	2nd READING	3rd READING	4th READING
pH (STO UNITS)					
TEMP (C)					
SPEC COND (um/sm)					
TIME					
DATE					

GENERAL INFORMATION

WEATHER: cloudy AIR TEMP. 70°

SAMPLES COLLECTED BY: MCE and SM

SPECIAL HANDLING: SAMPLES PACKED TO 4° C IN COOLER ON ICE

MODE OF SHIPMENT: ____ CAR/TRUCK ____ PLANE X COMMER VEH. ____ OTHER

COMMENTS (CALIBRATIONS, FIELD MODIFICATIONS, INSTRUMENT PROBLEMS) ____

N/A: Not Applicable

Appendix B
Laboratory Analytical MNA Reports and Chain of Custody Records

Pace Analytical Services, Inc.
2225 Riverside Dr
Asheville, NC 28804
(828)254-7176

Pace Analytical Services, Inc.
9800 Kincey Ave Suite 100
Huntersville, NC 28078
(704)875-9092

September 27, 2007

Mr. Mark Easterbrook
ERM
498 Wando Park Blvd
Suite 100
Mount Pleasant, SC 29464

RE: Project: AFFINIA WIX 41284
Pace Project No.: 924186

Dear Mr. Easterbrook:
Enclosed are the analytical results for sample(s) received by the laboratory on September 21, 2007. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Inorganic Wet Chemistry and Metals analyses were performed at our Pace Asheville laboratory and Organic testing was performed at our Pace Huntersville laboratory unless otherwise footnoted. All Microbiological analyses were performed at the laboratory where the samples were received.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin

kevin.godwin@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
2225 Riverside Dr
Asheville, NC 28804
(828)254-7176

Pace Analytical Services, Inc.
9800 Kincey Ave Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: AFFINIA WIX 41284
Pace Project No.: 924186

Charlotte Certification IDs
North Carolina Wastewater Certification Number: 12
North Carolina Field Services Certification Number: 5342
South Carolina Certification Number: 990060001
South Carolina Bioassay Certification Number: 990060003
Tennessee Certification Number: 04010
Virginia Certification Number: 00213
Florida/NELAP Certification Number: E87627
Kansas Certification Number: E-10364
Louisiana/LELAP Certification Number: 04034
North Carolina Drinking Water Certification Number: 37706

Asheville Certification IDs
Florida/NELAP Certification Number: E87648
Louisiana/LELAP Certification Number: 03095
New Jersey Certification Number: NC011
North Carolina Drinking Water Certification Number: 37712
North Carolina Wastewater Certification Number: 40
North Carolina Bioassay Certification Number: 9
Pennsylvania Certification Number: 68-03578
South Carolina Certification Number: 990300001
South Carolina Bioassay Certification Number: 990300002
Tennessee Certification Number: 2980
Virginia Certification Number: 00072

Eden Certification IDs
North Carolina Drinking Water Certification Number: 37738
Virginia Drinking Water Certification Number: 00424
North Carolina Wastewater Certification Number: 633

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SAMPLE SUMMARY

Project. AFFINIA WIX 41284
Pace Project No.: 924186

Lab ID	Sample ID	Matrix	Date Collected	Date Received
924186001	**B-1 SOIL**	Solid	09/19/07 10:40	09/21/07 09:15
924186002	**MW-5**	Water	09/19/07 12:10	09/21/07 09:15
924186003	**MW-7**	Water	09/19/07 14:55	09/21/07 09:15
924186004	**MW-4**	Water	09/19/07 16:25	09/21/07 09:15
924186005	**MW-3**	Water	09/20/07 08 30	09/21/07 09:15
924186006	**MW-2**	Water	09/20/07 09:55	09/21/07 09:15
924186007	**MW-9**	Water	09/19/07 17 50	09/21/07 09:15

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SAMPLE ANALYTE COUNT

Project: AFFINIA WIX 41284
Pace Project No . 924186

Lab ID	Sample ID	Method	Analytes Reported
924186002	MW-5	EPA 353.2	1
		EPA 6010	1
		SM 3500-Fe D#4	1
924186003	MW-7	EPA 353.2	1
		EPA 6010	1
		SM 3500-Fe D#4	1
924186004	MW-4	EPA 353.2	1
		EPA 6010	1
		SM 3500-Fe D#4	1
924186005	MW-3	EPA 353 2	1
		EPA 6010	1
		SM 3500-Fe D#4	1
924186006	MW-2	EPA 353 2	1
		EPA 6010	1
		SM 3500-Fe D#4	1
924186007	MW-9	EPA 353 2	1
		EPA 6010	1
		SM 3500-Fe D#4	1

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ANALYTICAL RESULTS

Project: AFFINIA WIX 41284
Pace Project No.: 924186

Sample: MW-5 **Lab ID: 924186002** Collected: 09/19/07 12:10 Received: 09/21/07 09:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese	**118**	ug/L	5.0	1	09/23/07 10:00	09/23/07 21:58	7439-96-5	
Iron, Ferrous	Analytical Method. SM 3500-Fe D#4							
Iron, Ferrous	**9.9**	mg/L	2.0	4		09/24/07 09:24		
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/L	0.10	1		09/21/07 23:41		

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ANALYTICAL RESULTS

Project: AFFINIA WIX 41284
Pace Project No.: 924186

Sample: MW-7 **Lab ID: 924186003** Collected: 09/19/07 14.55 Received: 09/21/07 09:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese	**6.0**	ug/L	5.0	1	09/25/07 14:05	09/26/07 19:06	7439-96-5	
Iron, Ferrous	Analytical Method: SM 3500-Fe D#4							
Iron, Ferrous	ND	mg/L	0.50	1		09/24/07 08:30		
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/L	0.10	1		09/21/07 23.41		

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ANALYTICAL RESULTS

Project: AFFINIA WIX 41284
Pace Project No.: 924186

Sample: MW-4 **Lab ID: 924186004** Collected: 09/19/07 16:25 Received: 09/21/07 09:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese	**5.6**	ug/L	5.0	1	09/25/07 14:05	09/26/07 19:13	7439-96-5	
Iron, Ferrous	Analytical Method: SM 3500-Fe D#4							
Iron, Ferrous	**7.0**	mg/L	2.0	4		09/24/07 09:25		
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/L	0.10	1		09/21/07 23:41		

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ANALYTICAL RESULTS

Project. AFFINIA WIX 41284
Pace Project No 924186

Sample: MW-3 **Lab ID: 924186005** Collected: 09/20/07 08:30 Received: 09/21/07 09:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese	**62.2**	ug/L	5.0	1	09/25/07 14:05	09/26/07 19:19	7439-96-5	
Iron, Ferrous	Analytical Method: SM 3500-Fe D#4							
Iron, Ferrous	**12.0**	mg/L	5.0	10		09/24/07 09:49		
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353 2							
Nitrogen, Nitrate	ND	mg/L	0.10	1		09/21/07 23:41		

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ANALYTICAL RESULTS

Project: AFFINIA WIX 41284
Pace Project No.: 924186

Sample: MW-2 **Lab ID: 924186006** Collected: 09/20/07 09:55 Received: 09/21/07 09:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese	**11.1**	ug/L	5.0	1	09/25/07 14:05	09/26/07 19:29	7439-96-5	
Iron, Ferrous	Analytical Method: SM 3500-Fe D#4							
Iron, Ferrous	**4.0**	mg/L	2.0	4		09/24/07 09:33		
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/L	0.10	1		09/21/07 23:41		

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ANALYTICAL RESULTS

Project: AFFINIA WIX 41284
Pace Project No.: 924186

Sample: MW-9 **Lab ID: 924186007** Collected: 09/19/07 17:50 Received: 09/21/07 09:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Manganese	**21.7**	ug/L	5.0	1	09/25/07 14:05	09/26/07 19:32	7439-96-5	
Iron, Ferrous	Analytical Method: SM 3500-Fe D#4							
Iron, Ferrous	**23.8**	mg/L	5.0	10		09/24/07 09:48		
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/L	0.10	1		09/21/07 23:41		

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QUALITY CONTROL DATA

Project: AFFINIA WIX 41284
Pace Project No.: 924186

QC Batch: WETA/1240 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, Unpres.
Associated Lab Samples: 924186002, 924186003, 924186004, 924186005, 924186006, 924186007

METHOD BLANK: 19276
Associated Lab Samples: 924186002, 924186003, 924186004, 924186005, 924186006, 924186007

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Nitrogen, Nitrate	mg/L	ND	0.10	

LABORATORY CONTROL SAMPLE: 19277

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	5	5.3	107	90-110	

MATRIX SPIKE SAMPLE: 19278

Parameter	Units	924186002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	ND	5	5.2	104	75-125	

SAMPLE DUPLICATE: 19279

Parameter	Units	924186003 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, Nitrate	mg/L	ND	ND	0	20	

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QUALITY CONTROL DATA

Project: AFFINIA WIX 41284
Pace Project No.: 924186

QC Batch: MPRP/1207
QC Batch Method EPA 3010
Analysis Method: EPA 6010
Analysis Description. 6010 MET
Associated Lab Samples: 924186002

METHOD BLANK: 19371
Associated Lab Samples: 924186002

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Manganese	ug/L	ND	5.0	

LABORATORY CONTROL SAMPLE: 19372

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	500	512	102	80-120	

MATRIX SPIKE SAMPLE: 19373

Parameter	Units	924226001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	ND	500	488	98	75-125	

SAMPLE DUPLICATE 19374

Parameter	Units	924226002 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese	ug/L	ND	4J	0	20	

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QUALITY CONTROL DATA

Project: AFFINIA WIX 41284
Pace Project No.: 924186

QC Batch: WET/1506 Analysis Method: SM 3500-Fe D#4
QC Batch Method: SM 3500-Fe D#4 Analysis Description: Iron, Ferrous
Associated Lab Samples. 924186002, 924186003, 924186004, 924186005, 924186006, 924186007

METHOD BLANK. 19413
Associated Lab Samples: 924186002, 924186003, 924186004, 924186005, 924186006, 924186007

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Iron, Ferrous	mg/L	ND	0.50	

SAMPLE DUPLICATE: 19414

Parameter	Units	924086001 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	ND	ND	0	20	

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QUALITY CONTROL DATA

Project: AFFINIA WIX 41284
Pace Project No.. 924186

QC Batch: MPRP/1217 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples. 924186003, 924186004, 924186005, 924186006, 924186007

METHOD BLANK: 19802
Associated Lab Samples: 924186003, 924186004, 924186005, 924186006, 924186007

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Manganese	ug/L	ND	5.0	

LABORATORY CONTROL SAMPLE: 19803

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	500	522	104	80-120	

MATRIX SPIKE SAMPLE. 19812

Parameter	Units	924186003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	6.0	500	530	105	75-125	

SAMPLE DUPLICATE: 19813

Parameter	Units	924186004 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese	ug/L	5.6	5.6	2	20	

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QUALIFIERS

Project: AFFINIA WIX 41284
Pace Project No: 924186

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable

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(612)607-1700

September 26, 2007

Client Services
Pace Analytical Charlotte
9800 Kincey Ave.
Suite 100
Huntersville, NC 28078

RE: Project: 924186 ERM
Pace Project No.: 1059497

Dear Client Services:
Enclosed are the analytical results for sample(s) received by the laboratory on September 21, 2007. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Julie Thieschafer

julie.thieschafer@pacelabs.com
Project Manager

Florida (Nelap) Certification #: E87605
Illinois Certification #: 200011
Iowa Certification #. 368
Minnesota Certification #: 027-053-137
Wisconsin Certification #. 999407970

Enclosures

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
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SAMPLE SUMMARY

Project. 924186 ERM
Pace Project No.. 1059497

Lab ID	Sample ID	Matrix	Date Collected	Date Received
924186002	**MW-5**	Water	09/19/07 12:10	09/21/07 09:15
924186003	**MW-7**	Water	09/19/07 14:55	09/21/07 09:15
924186004	**MW-4**	Water	09/19/07 16:25	09/21/07 09:15
924186005	**MW-3**	Water	09/20/07 08:30	09/21/07 09:15
924186006	**MW-2**	Water	09/20/07 09:55	09/21/07 09:15
924186007	**MW-9**	Water	09/19/07 17:50	09/21/07 09:15

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SAMPLE ANALYTE COUNT

Project: 924186 ERM
Pace Project No.: 1059497

Lab ID	Sample ID	Method	Analytes Reported
924186002	**MW-5**	EPA 3810 Modified	3
924186003	**MW-7**	EPA 3810 Modified	3
924186004	**MW-4**	EPA 3810 Modified	3
924186005	**MW-3**	EPA 3810 Modified	3
924186006	**MW-2**	EPA 3810 Modified	3
924186007	**MW-9**	EPA 3810 Modified	3

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ANALYTICAL RESULTS

Project: 924186 ERM
Pace Project No.: 1059497

Sample: MW-5 **Lab ID: 924186002** Collected: 09/19/07 12:10 Received: 09/21/07 09:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3810 AIR Headspace	Analytical Method: EPA 3810 Modified							
Ethane	ND	ug/L	20.0	1		09/25/07 13:17	74-84-0	
Ethene	ND	ug/L	20.0	1		09/25/07 13:17	74-85-1	
Methane	ND	ug/L	10.0	1		09/25/07 13:17	74-82-8	

Sample: MW-7 **Lab ID: 924186003** Collected: 09/19/07 14:55 Received: 09/21/07 09:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3810 AIR Headspace	Analytical Method: EPA 3810 Modified							
Ethane	ND	ug/L	20.0	1		09/25/07 13:30	74-84-0	
Ethene	ND	ug/L	20.0	1		09/25/07 13:30	74-85-1	
Methane	**10.2**	ug/L	10.0	1		09/25/07 13:30	74-82-8	

Sample: MW-4 **Lab ID: 924186004** Collected: 09/19/07 16:25 Received: 09/21/07 09:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3810 AIR Headspace	Analytical Method: EPA 3810 Modified							
Ethane	ND	ug/L	20.0	1		09/25/07 13:40	74-84-0	
Ethene	ND	ug/L	20.0	1		09/25/07 13:40	74-85-1	
Methane	**8960**	ug/L	10.0	1		09/25/07 13:40	74-82-8	

Sample: MW-3 **Lab ID: 924186005** Collected: 09/20/07 08:30 Received: 09/21/07 09:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3810 AIR Headspace	Analytical Method: EPA 3810 Modified							
Ethane	ND	ug/L	20.0	1		09/25/07 13:51	74-84-0	
Ethene	ND	ug/L	20.0	1		09/25/07 13:51	74-85-1	
Methane	**4890**	ug/L	10.0	1		09/25/07 13:51	74-82-8	

Sample: MW-2 **Lab ID: 924186006** Collected: 09/20/07 09:55 Received: 09/21/07 09:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3810 AIR Headspace	Analytical Method: EPA 3810 Modified							
Ethane	ND	ug/L	20.0	1		09/25/07 14:02	74-84-0	
Ethene	ND	ug/L	20.0	1		09/25/07 14:02	74-85-1	
Methane	**6220**	ug/L	10.0	1		09/25/07 14:02	74-82-8	

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ANALYTICAL RESULTS

Project: 924186 ERM
Pace Project No 1059497

Sample: MW-9 **Lab ID: 924186007** Collected: 09/19/07 17.50 Received: 09/21/07 09:15 Matrix. Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3810 AIR Headspace	Analytical Method: EPA 3810 Modified							
Ethane	ND	ug/L	20.0	1		09/25/07 14:15	74-84-0	
Ethene	ND	ug/L	20.0	1		09/25/07 14:15	74-85-1	
Methane	**2870**	ug/L	10.0	1		09/25/07 14:15	74-82-8	

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(612)607-1700

QUALITY CONTROL DATA

Project: 924186 ERM
Pace Project No.: 1059497

QC Batch: AIR/6079 Analysis Method: EPA 3810 Modified
QC Batch Method: EPA 3810 Modified Analysis Description: 3810 AIR HEADSPACE
Associated Lab Samples: 924186002, 924186003, 924186004, 924186005, 924186006, 924186007

METHOD BLANK: 391672
Associated Lab Samples: 924186002, 924186003, 924186004, 924186005, 924186006, 924186007

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Ethane	ug/L	ND	20.0	
Ethene	ug/L	ND	20.0	
Methane	ug/L	ND	10.0	

LABORATORY CONTROL SAMPLE & LCSD: 391673 391674

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	129	125	114	110	70-130	3	30	
Ethene	ug/L	106	121	120	114	113	70-130	.9	30	
Methane	ug/L	60.7	68.9	64.8	114	107	70-130	6	30	

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QUALIFIERS

Project: 924186 ERM
Pace Project No.: 1059497

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

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1241 Bellevue Street, Suite 9
Green Bay, WI 54302
920-469-2436, Fax: 920-469-8827

Analytical Report Number: 888807

Client: PACE ANALYTICAL SERVICES, INC

Lab Contact: Eric Wied

Project Name: ERM

Project Number: 924186

Lab Sample Number	Field ID	Matrix	Collection Date
888807-001	B-1 (SOIL) 924186001	SOIL	09/19/07 10:40
888807-002	MW-5 924186002	WATER	09/19/07 12:10
888807-003	MW-7 924186003	WATER	09/19/07 14:55
888807-004	MW-4 924186004	WATER	09/19/07 16:25
888807-005	MW-3 924186005	WATER	09/20/07 08:30
888807-006	MW-2 924186006	WATER	09/20/07 09:55
888807-007	MW-9 924186007	WATER	09/19/07 17:50

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample comments. Release of this final report is authorized by Laboratory management, as is verified by the following signature. This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc. The sample results relate only to the analytes of interest tested.

Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

REPORT OF LABORATORY ANALYSIS

ACCREDITED IN ACCORDANCE WITH nelac

Approval Signature E. Wied

Date 09.26.07

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 888807

Client : PACE ANALYTICAL SERVICES, INC
Project Name : ERM
Project Number : 924186
Field ID : B-1 (SOIL) 924186001

Matrix Type : SOIL
Collection Date : 09/19/07
Report Date : 09/26/07
Lab Sample Number : 888807-001

INORGANICS

Test	Result	EQL	Dilution	Units	Code	Anl Date/Time	Prep Method	Anl Method
TOC as NPOC	910	360	1	mg/kg		09/26/07 09:55 AM	SW846 M9060	SW846 M9060
					Prep Date/Time:	09/25/07 06:33 AM	**Anl By:**	GM

All soil results are reported on a dry weight basis unless otherwise noted.

Pace Analytical Services, Inc.

1241 Bellevue Street
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920-469-2436

Analytical Report Number: 888807

Client : PACE ANALYTICAL SERVICES, INC
Project Name : ERM
Project Number : 924186
Field ID : MW-5 924186002

Matrix Type : WATER
Collection Date : 09/19/07
Report Date : 09/26/07
Lab Sample Number : 888807-002

INORGANICS

Test	Result	EQL	Dilution	Units	Code	Anl Date/Time	Prep Method	Anl Method
Sulfate	110	40	10	mg/L		09/25/07 05:53 PM	EPA 300.0	EPA 300.0
					Prep Date/Time:			Anl By: GLH

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 888807

Client : PACE ANALYTICAL SERVICES, INC
Project Name : ERM
Project Number : 924186
Field ID : MW-7 924186003

Matrix Type : WATER
Collection Date : 09/19/07
Report Date : 09/26/07
Lab Sample Number : 888807-003

INORGANICS

Test	Result	EQL	Dilution	Units	Code	Anl Date/Time	Prep Method	Anl Method
Sulfate	8.6	4.0	1	mg/L		09/24/07 11:30 PM	EPA 300.0	EPA 300.0
						Prep Date/Time:		Anl By:

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 888807

Client : PACE ANALYTICAL SERVICES, INC
Project Name : ERM
Project Number : 924186
Field ID : MW-4 924186004

Matrix Type : WATER
Collection Date : 09/19/07
Report Date : 09/26/07
Lab Sample Number : 888807-004

INORGANICS

Test	Result	EQL	Dilution	Units	Code	Anl Date/Time	Prep Method	Anl Method
Sulfate	4.3	4.0	1	mg/L		09/25/07 12:07 AM	EPA 300.0	EPA 300.0
						Prep Date/Time:		Anl By: GLH

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 888807

Client : PACE ANALYTICAL SERVICES, INC
Project Name : ERM
Project Number : 924186
Field ID : MW-3 924186005

Matrix Type : WATER
Collection Date : 09/20/07
Report Date : 09/26/07
Lab Sample Number : 888807-005

INORGANICS

Test		Result	EQL	Dilution	Units	Code	Anl Date/Time	Prep Method	Anl Method
Sulfate	<	4.0	4.0	1	mg/L		09/25/07 12:19 AM	EPA 300.0	EPA 300.0
							Prep Date/Time:		Anl By: GLH

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 888807

Client : PACE ANALYTICAL SERVICES, INC
Project Name : ERM
Project Number : 924186
Field ID : MW-2 924186006

Matrix Type : WATER
Collection Date : 09/20/07
Report Date : 09/26/07
Lab Sample Number : 888807-006

INORGANICS

Test		Result	EQL	Dilution	Units	Code	Anl Date/Time	Prep Method	Anl Method
Sulfate	<	4.0	4.0	1	mg/L		09/25/07 12:31 AM	EPA 300.0	EPA 300.0
							Prep Date/Time:		Anl By: GLH

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 888807

Client : PACE ANALYTICAL SERVICES, INC
Project Name : ERM
Project Number : 924186
Field ID : MW-9 924186007

Matrix Type : WATER
Collection Date : 09/19/07
Report Date : 09/26/07
Lab Sample Number : 888807-007

INORGANICS

Test	Result	EQL	Dilution	Units	Code	Anl Date/Time	Prep Method	Anl Method
Sulfate	10	4.0	1	mg/L		09/25/07 12:43 AM	EPA 300.0	EPA 300.0
						Prep Date/Time:		Anl By: GLH

Qualifier Codes

Flag	Applies To	Explanation
A	Inorganic	Analyte is detected in the method blank. Method blank criteria is evaluated to the laboratory method detection limit. Additionally, method blank acceptance may be based on project specific criteria or determined from analyte concentrations in the sample and are evaluated on a sample by sample basis.
B	Inorganic	The analyte has been detected between the method detection limit and the reporting limit.
B	Organic	Analyte is present in the method blank. Method blank criteria is evaluated to the laboratory method detection limit. Additionally, method blank acceptance may be based on project specific criteria or determined from analyte concentrations in the sample and are evaluated on a sample by sample basis.
C	All	Elevated detection limit.
D	All	Analyte value from diluted analysis or surrogate result not applicable due to sample dilution.
E	Inorganic	Estimated concentration due to matrix interferences. During the metals analysis the serial dilution failed to meet the established control limits of 0-10%. The sample concentration is greater than 50 times the IDL for analysis done on the ICP or 100 times the IDL for analysis done on the ICP-MS. The result was flagged with the E qualifier to indicate that a physical interference was observed.
E	Organic	Analyte concentration exceeds calibration range.
F	Inorganic	Due to potential interferences for this analysis by Inductively Coupled Plasma techniques (SW-846 Method 6010), this analyte has been confirmed by and reported from an alternate method.
F	Organic	Surrogate results outside control criteria.
G	All	The result is estimated because the concentration is less than the lowest calibration standard concentration utilized in the initial calibration. The method detection limit is less than the reporting limit specified for this project.
H	All	Preservation, extraction or analysis performed past holding time.
HF	Inorganic	This test is considered a field parameter, and the recommended holding time is 15 minutes from collection. The analysis was performed in the laboratory beyond the recommended holding time
J	All	Concentration detected equal to or greater than the method detection limit but less than the reporting limit.
K	Organic	Detection limit may be elevated due to the presence of an unrequested analyte.
L	All	Elevated detection limit due to low sample volume.
M	Organic	Sample pH was greater than 2
N	All	Spiked sample recovery not within control limits.
O	Organic	Sample received overweight.
P	Organic	The relative percent difference between the two columns for detected concentrations was greater than 40%.
Q	All	The analyte has been detected between the limit of detection (LOD) and limit of quantitation (LOQ). The results are qualified due to the uncertainty of analyte concentrations within this range
S	Organic	The relative percent difference between quantitation and confirmation columns exceeds internal quality control criteria. Because the result is unconfirmed, it has been reported as a non-detect with an elevated detection limit.
U	All	The analyte was not detected at or above the reporting limit.
V	All	Sample received with headspace.
W	All	A second aliquot of sample was analyzed from a container with headspace.
X	All	See Sample Narrative
Z	Organics	This compound was separated in the CCV standard but it did not meet the resolution criteria as set forth in SW846.
&	All	Laboratory Control Spike recovery not within control limits
*	All	Precision not within control limits.
+	Inorganic	The sample result is greater than four times the spike level: therefore, the percent recovery is not evaluated.
<	All	The analyte was not detected at or above the reporting limit.
1	Inorganic	Dissolved analyte or filtered analyte greater than total analyte; analyses passed QC based on precision criteria.
2	Inorganic	Dissolved analyte or filtered analyte greater than total analyte; analyses failed QC based on precision criteria.
3	Inorganic	BOD result is estimated due to the BOD blank exceeding the allowable oxygen depletion.
4	Inorganic	BOD duplicate precision not within control limits. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
5	Inorganic	BOD result is estimated due to insufficient oxygen depletion. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
6	Inorganic	BOD laboratory control sample not within control limits. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
7	Inorganic	BOD result is estimated due to complete oxygen depletion. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
8	Inorganic	Sample was received unpreserved. Sample was preserved either at the time of receipt or at the time of sample preparation.
9	Inorganic	Sample was received with insufficient preservation. Acid was added either at the time of receipt or at the time of sample preparation.

Pace Analytical Services, Inc.

Analysis Summary by Laboratory

1241 Bellevue Street
Green Bay, WI 54302

Test Group Name	888807-001	888807-002	888807-003	888807-004	888807-005	888807-006	888807-007
SULFATE		B	B	B	B	B	B
TOC AS NPOC	B						

Code	SC Certification
B	83006001

Pace Analytical Services, Inc.

QC Summary

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436
Fax: 920-469-8827

Batch: 888807
Lab Section: WETCHEM
QC Batch Number: 25002
Prep Method: EPA 300.0
Analytical Method: EPA 300.0

QC Type	Client Sample ID	Lab Sample ID
MB	WCG2308-009MB	WCG2308-009MB
LCS	WCG2308-009MBLCS	WCG2308-009MBLCS
MS	888445-016MS	888445-016MS
MS	888445-010MS	888445-010MS
MSD	888445-016MSD	888445-016MSD
MSD	888445-010MSD	888445-010MSD

Client Sample ID	Lab Sample ID	MB ID
MW-5 924186002	888807-002	MB
MW-4 924186004	888807-004	MB
MW-2 924186006	888807-006	MB
MW-7 924186003	888807-003	MB
MW-3 924186005	888807-005	MB
MW-9 924186007	888807-007	MB

Test Name	Method Blank Result Conc	LCS Spiked Conc	LCS Recovery Conc	LCS Recovery %	C	LCSD Spiked Conc	LCSD Recovery Conc	LCSD Recovery %	C	LCS/LCSD RPD %	C	LCS/LCSD Control Limits LCL %	UCL %	RPD %	Parent Sample Number	Parent Result Conc	MS Spiked Conc	MS Recovery Conc	MS Recovery %	C	MSD Spiked Conc	MSD Recovery Conc	MSD Recovery %	C	MS/MSD RPD %	C	MS/MSD Control Limits LCL %	UCL %	RPD %
Sulfate	< 4	16.0	14.9	93.1		---	---	---		---		90	110	20	888445-010	31.7	16.0	47.2	96.8		---	---	---	+	---		90	110	20
Sulfate	< 4	16.0	14.9	93.1		---	---	---		---		90	110	20	888445-016	38.4	16.0	54.6	101.0		16.0	54	97.3		1.1		90	110	20

Conc = mg/L unless otherwise noted
C = QC Code, see Qualifer Sheet
Parent Result is reported down to MDL in order to allow Validation of this worksheet
The %R and RPD results are calculated from raw data values with more significant figures than are reported on this form.

Report Date: 9/26/2007
QC Batch Number: 25002

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately

2 coolers

Page: 1 of 1

1138007

Section A Required Client Information
Company: ERM
Address: 498 Wando Park Blvd. Suite 100, Mt. Pleasant, SC
Email To: mark.easterbrook@erm.com
Phone: 843-856-4220 Fax: 856-6283
Requested Due Date/TAT:

Section B Required Project Information
Report To: Mark Easterbrook
Copy To: —
Purchase Order No:
Project Name: Affinia - Wix
Project Number: 41284

Section C Invoice Information
Attention: Mark Easterbrook
Company Name: ERM
Address: — same —
Pace Quote Reference:
Pace Project Manager: Kevin Godwin
Pace Profile #: 1369-3,2

REGULATORY AGENCY: NPDES, GROUND WATER, DRINKING WATER, UST, RCRA, OTHER
Site Location STATE: SC

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start Date	Composite Start Time	Composite End/Grab Date	Composite End/Grab Time	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	TOC	Sulfate	Ferrous Iron	Nitrate	Manganese	Dissolved Gases	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	B-1 (Soil)	SL	G			9/19	10:40		1	1									X							924186001
2	MW-5	WT	G			9/19	12:10		7	3		1	3						X	X	X	X	X	X		2
3	MW-7	WT	G			9/19	14:55		7	3		1	3							X	X	X	X	X		3
4	MW-4	WT	G			9/19	16:25		7	3		1	3							X	X	X	X	X		4
5	MW-3	WT	G			9/20	08:30		7	3		1	3							1	1	1	1	3		5
6	MW-2	WT	G			9/20	09:55		7	3		1	3							1	1	1	1	3		6
7	MW-9	WT	G			9/19	17:50		7	3		1	3							1	1	1	1	3		7
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Mark Easterbrook/ERM	9/20	1430	Erin L. Waters	9/21/07	9:15	2.8	yes	no	yes

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Mark Easterbrook
SIGNATURE of SAMPLER: Mark Easterbrook
DATE Signed (MM/DD/YY): 9/20/07

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days

Appendix C
Bioscreen Model

Wix Source Area Mass Calculations

Ground Water:

Source Area Volume:

176 ft x 80 ft x 10 ft x 0.3 = 42,240 cu ft = 315,955 gallons = 1,195,890 liters

Source Area Mass:

1,195,890 liters x 150 mg/l = 1.79×10^8 mg = 179 Kg say 180 Kg

Soil:

Source Area Volume:

20 ft x 10 ft x 5 ft = 1,000 cu ft

Source Area Mass:

Mass = volume (liters) x bulk density (Kg/L) x soil concentration (mg/Kg) x 10^{-6} Kg/mg

1,000 cu ft x 28.3 L/cu ft x 1.6 Kg/L x 7,970 mg/kg x 10^{-6} Kg/mg = 360 Kg

Total Source Area Mass: 180 Kg + 360 Kg = 540 Kg

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.4

Affinia-Wix
Toluene
Run Name

Data Input Instructions:

115 ↑ or 0.02

1. Enter value directly....or
2. Calculate by filling in grey cells below. (To restore formulas, hit button below).

Variable* ▸ Data used directly in model.

20 ▸ Value calculated by model. (Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	Vs	11.9	(ft/yr)
or		↑ or	
Hydraulic Conductivity	K	2.3E-04	(cm/sec)
Hydraulic Gradient	i	0.015	(ft/ft)
Porosity	n	0.3	(-)

2. DISPERSION

Longitudinal Dispersivity*	alpha x	10.0	(ft)
Transverse Dispersivity*	alpha y	1.0	(ft)
Vertical Dispersivity*	alpha z	0.0	(ft)
or		↑ or	
Estimated Plume Length	Lp		(ft)

3. ADSORPTION

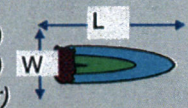
Retardation Factor*	R	1.6	(-)
or		↑ or	
Soil Bulk Density	rho	1.6	(kg/l)
Partition Coefficient	Koc	133	(L/kg)
FractionOrganicCarbon	foc	9.1E-4	(-)

4. BIODEGRADATION

1st Order Decay Coeff*	lambda	4.6E-1	(per yr)
or		↑ or	
Solute Half-Life	t-half	1.50	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	1.3	(mg/L)
Delta Nitrate*	NO3		(mg/L)
Observed Ferrous Iron*	Fe2+	9.5	(mg/L)
Delta Sulfate*	SO4	39	(mg/L)
Observed Methane*	CH4	3.8	(mg/L)

5. GENERAL

Modeled Area Length*	600	(ft)
Modeled Area Width*	300	(ft)
Simulation Time*	30	(yr)



6. SOURCE DATA

Source Thickness in Sat.Zone* 10 (ft)

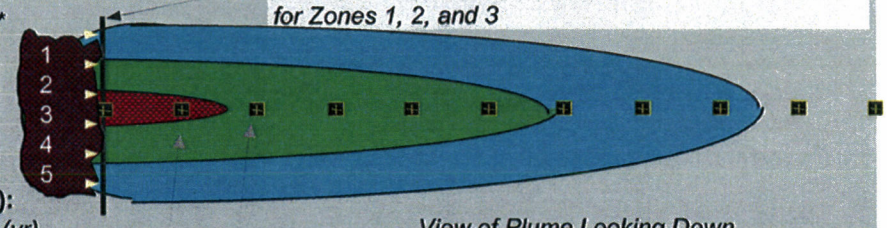
Source Zones:

Width* (ft)	Conc. (mg/L)*
10	1
30	15
50	150
30	15
10	1

Source Halflife (see Help):

40	40	(yr)
Inst. React.	↑ 1st Order	
Soluble Mass	540	(Kg)
In Source NAPL, Soil		

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Dist. from Source (ft)	Concentration (mg/L)
0	150.0
60	
120	
180	
240	
300	
360	
420	
480	
540	
600	

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE

View Output

RUN ARRAY

View Output

Help

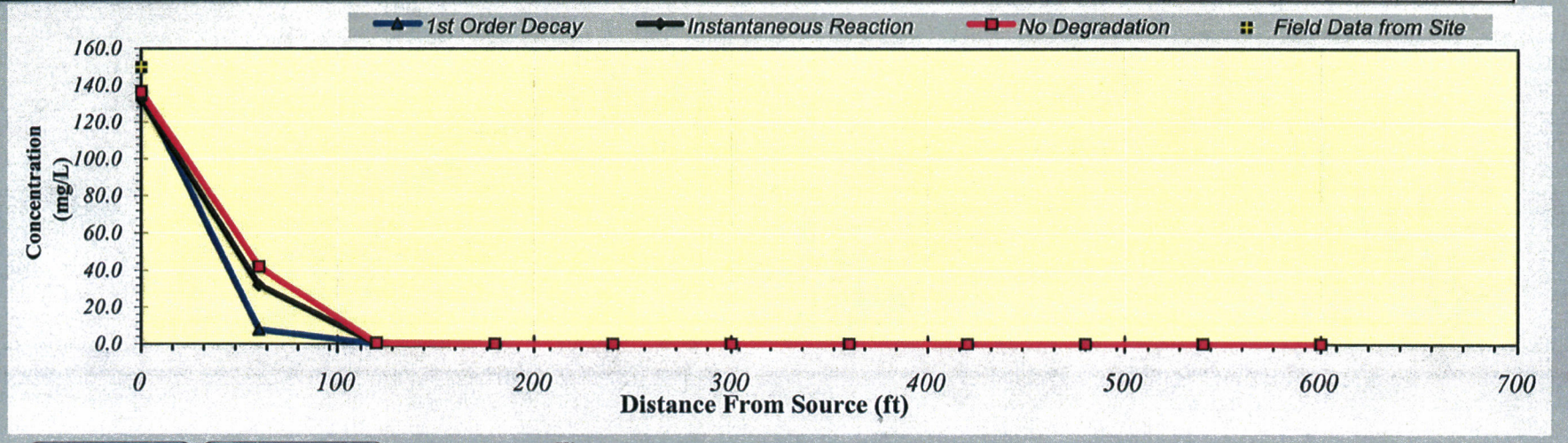
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	60	120	180	240	300	360	420	480	540	600
No Degradation	136.473	42.086	0.630	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1st Order Decay	136.473	7.945	0.065	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	132.445	32.081	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	150.000										



Replay Animation

Next Timestep

Prev Timestep

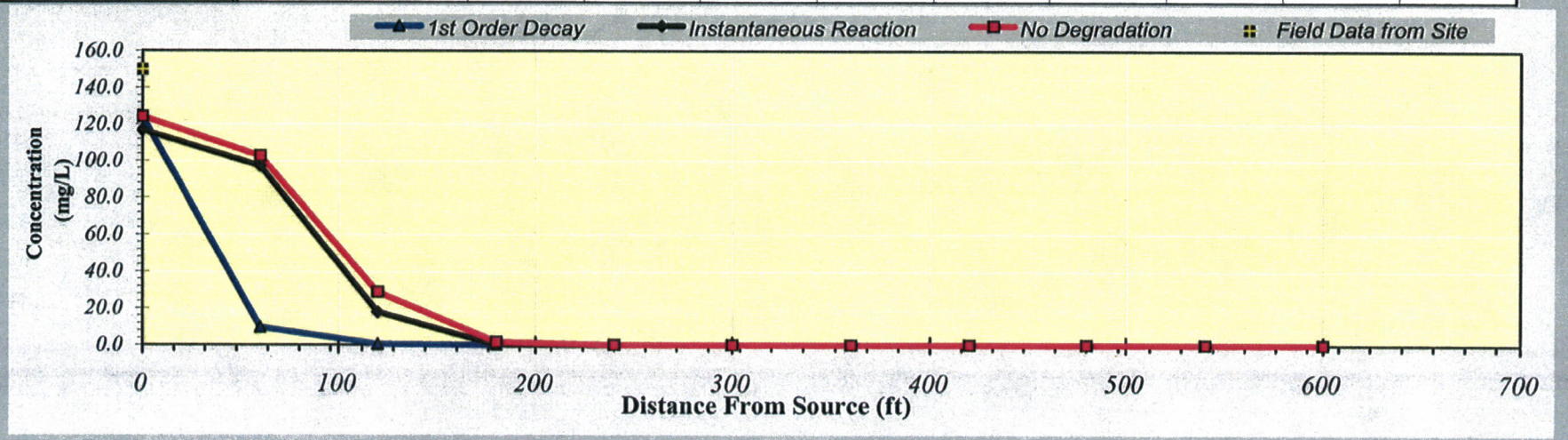
Time: 6 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	60	120	180	240	300	360	420	480	540	600
No Degradation	124.166	102.562	28.821	1.572	0.014	0.000	0.000	0.000	0.000	0.000	0.000
1st Order Decay	124.166	9.665	0.569	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	116.773	97.039	17.781	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	150.000										



Replay Animation

Next Timestep

Prev Timestep

Time:

12 Years

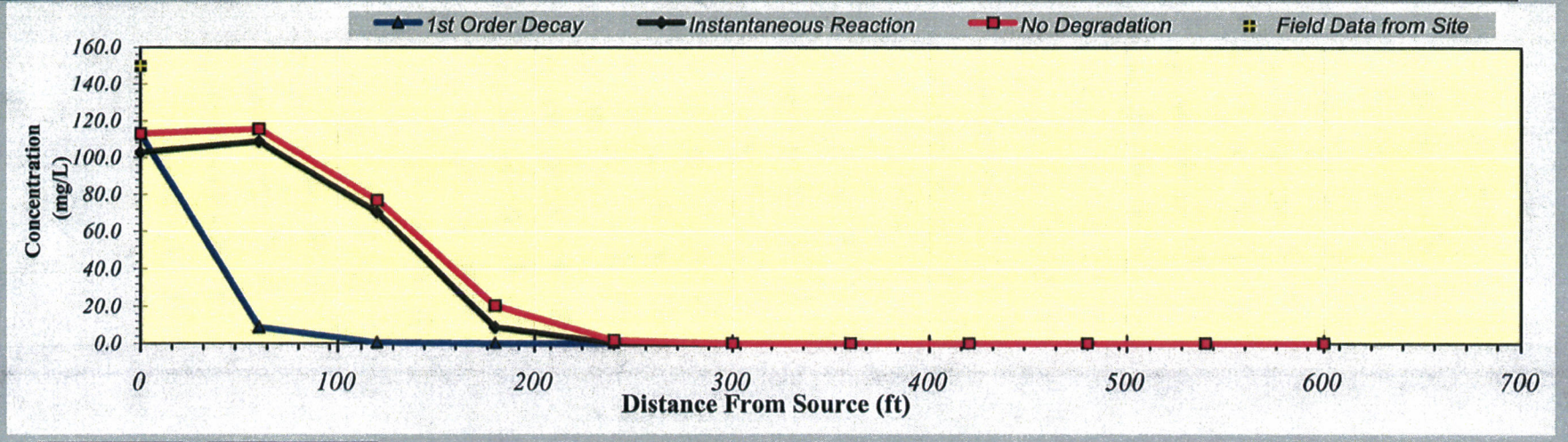
Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	60	120	180	240	300	360	420	480	540	600
No Degradation	112.969	115.472	76.784	20.475	1.810	0.047	0.000	0.000	0.000	0.000	0.000
1st Order Decay	112.969	8.849	0.648	0.039	0.002	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	102.783	108.710	70.335	8.758	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	150.000										



Replay Animation

Next Timestep

Prev Timestep

Time:

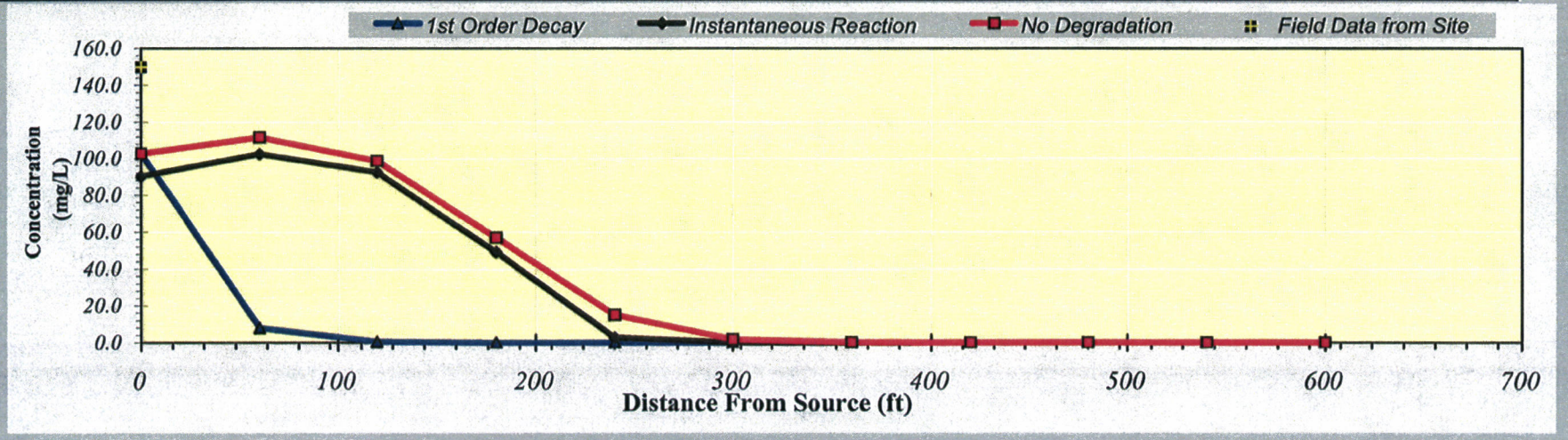
18 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	60	120	180	240	300	360	420	480	540	600
No Degradation	102.781	111.667	98.748	56.870	14.982	1.721	0.079	0.001	0.000	0.000	0.000
1st Order Decay	102.781	8.052	0.594	0.043	0.003	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	90.292	102.478	92.475	49.244	2.775	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	150.000										



Replay Animation

Next Timestep

Prev Timestep

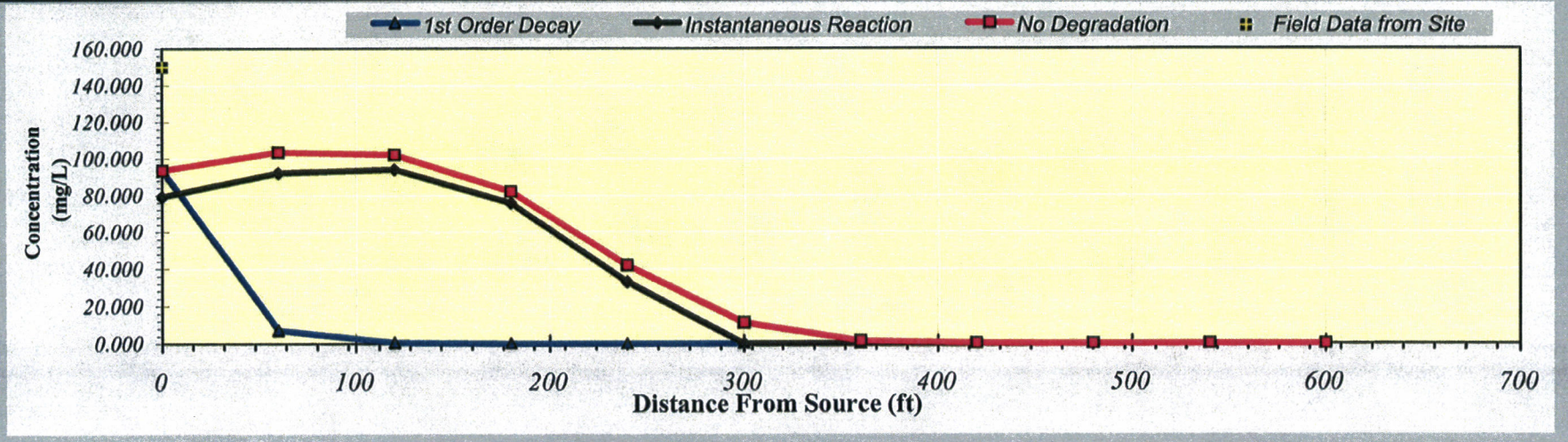
Time: 24 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	60	120	180	240	300	360	420	480	540	600
No Degradation	93.513	103.516	102.046	81.924	41.956	11.205	1.522	0.099	0.003	0.000	0.000
1st Order Decay	93.513	7.326	0.540	0.040	0.003	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	79.140	91.987	94.017	75.701	33.011	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	150.000										



Replay Animation

Next Timestep

Prev Timestep

Time: 30 Years

Return to Input

Recalculate This Sheet