



## R.E.W. ENVIRONMENTAL CONSULTANTS

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May 9, 2002  
Revised June 10, 2002

Mr. John Bruni  
Bruni Realty  
36 Essex Road  
Ipswich, Massachusetts 01938

RE: Supplemental Site Investigation  
36 Essex Road, Ipswich, Massachusetts

Dear Mr. Bruni:

REW Environmental Consultants, Inc., (REW) has completed a limited evaluation of the property located at 36 Essex Road in Ipswich, Massachusetts, the "site." The purpose was to evaluate subsurface conditions with respect to certain contaminant source locations identified by REW Environmental Consultants, Inc., in our report entitled "Environmental Property Screen," dated May 24, 2000. Following is a synopsis of our findings based on the data we have collected:

### *Environmental Property Screen – Overview*

REW Environmental Consultants, Inc., of Danvers, Massachusetts completed a preliminary environmental site assessment (assessment) of the subject property. The assessment was initiated to identify any potentially existing "recognized environmental conditions."

Recognized Environmental Conditions is an ASTM term and is defined as follows:

The presence or likely presence of any hazardous materials or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of most substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term includes hazardous materials and petroleum products even under conditions in compliance with laws. The term is not intended to include de minimus conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

Based on our evaluation of relevant site conditions, we recommended a subsurface characterization of groundwater focusing on potential contaminant source locations. Specifically, we identified on-site septic system(s) and grease traps (or holding tanks) as potential sources for degrading groundwater quality. A third source area was identified at the outfall of site catch basins.

*Objective*

The objective was to evaluate the quality of soil and groundwater at the site, and to gauge the relative implications with respect to the "Reporting Concentrations and Risk Characterization Standards" of the Massachusetts Contingency Plan, specifically 310 CMR 40.1795, Subpart P and .0900 Subpart I, respectively.

To achieve the above stated objective, we planned a boring program to collect information necessary to confirm or dismiss environmental issues related to the above described findings. Monitoring wells were to be installed to collect water samples. There were two sampling scenarios considered for completing this assessment: (1) authoritative and (2) statistical.

- (1) An authoritative sampling program involves the biased placement of borings based on site history, topography (downgradient areas), preliminary data of characterization, and other site-specific conditions. The use of an authoritative sampling program focuses resources in areas that are believed to have the highest probability of evidencing some degree of contamination. This is a very common, professionally acceptable and effective method for the characterization of properties that have specific and well-documented history.
- (2) A statistical sampling program systematically places borings over the entire site and makes a conclusion concerning the probability of missing a particular-sized area of contamination, if present, at the site. This is more valuable at properties involving large tracts of land and where the exact location and extent of contamination are unknown or random.

In considering the information developed and presented in the initial evaluation, REW determined that an authoritative sampling program was more suitable for the site primarily because of its character (i.e., identifiable areas where there is potential contaminant source locations). As part of the authoritative sampling program, REW proposed to take soil samples from various depths below grade to the groundwater interface (within the capillary fringe or saturated zone) or to refusal. The soil samples taken

within the capillary fringe or saturated zone would increase detection of shallow releases of oil and/or hazardous material, and aid in evaluating the potential for contaminant movement from on and off-site sources.

Following is an overview of the locations that were proposed for this evaluation:

- Install monitoring wells on the downgradient position of the two septic systems. Collect water samples for volatile and chlorinated solvents.
- Advance borings in the locations of the two grease traps and collect soil samples for possible oil and grease.
- Advance shallow borings in the northern area of the site to collect a single composite for the analysis of herbicides and pesticides.
- Install a monitoring well proximate to the outfall for the catch basins. Collect a water sample for petroleum hydrocarbon analysis.

#### *Actual Boring Placement and Advancement*

On April 5, 2002, we advanced five borings in areas that we believe would have the highest probability of evidencing some degree of contamination, if present. With Essex Street forming the southern border, borings were placed as follows:

- One boring (B1) was placed proximate to the outfall for the catch basins. This boring was converted to a monitoring well (MW1).
- One boring (B2) was placed between the Pizza Shop and Market in proximity to the grease trap.
- One boring (B3) was placed near the leaching field located in the central area of the parking lot. This boring was converted to a monitoring well (MW2).
- One boring (B4) was placed on the north side of the restaurant and dry cleaner in proximity to the grease trap.
- One boring (B5) was attempted to be placed on the north side of the restaurant and dry cleaner in proximity to the leaching field. However, sufficient geologic resistance prevented the boring from being achieved. On May 20, 2002, using a backhoe, we set a well in the area leachfield. The well was set below the undisturbed portion of the excavation, which was approximately 5 feet below grade. The well was set to 8 feet below grade.
- In addition to the boring program, we collected a composite sample from the open (vacant) area of land on the northern side for the analysis of herbicides and pesticides.

For the activities of April 5, 2002, AM Environmental and Structural Drilling (AM) of Leominster, Massachusetts advanced each boring to the maximum depth at which contamination was expected to be observed or to refusal using a truck-mounted probe. AM collected soil samples using a 2-inch diameter disposable liner inserted in a four-foot stainless steel macro-sampler. The sampler was driven into undisturbed soils by means of hydraulic pressure to retrieve four-foot continuous samples. The intent of the borings was to allow the taking of soil samples based on an interval that would allow for the interpretation of site-related issues. For example, we collected sample specific and sometimes composite samples from the four-foot core and screened the sample headspace for the presence of volatile hydrocarbons using a photoionization detector (i.e., a HNu Meter) instrument.

Prior to the start, between each sample and each boring, REW and AM followed specific decontamination protocol for extracting samples from the liners to prevent possible cross contamination and to protect the integrity of samples being collected. AM utilized a total of 60 linear feet of disposable liners under this boring program.

Attached hereto as **Exhibit A** is plot of the site illustrating locations of borings with respect to certain site attributes.

### ***Surficial Geology***

In general, site surficial geology consists of fine to coarse sands, "some" fine to coarse gravel, "little" silt and cobbles to approximately 12 feet below grade. In the B1 location, marine clay was encountered between 9 feet and 12 feet below grade. The "zone of saturation" was encountered at about 7 feet below grade. However, at B1/MW1, the static level of groundwater was recorded at 2.83 feet below grade. Boring logs are provided as **Appendix A** to this report.

### ***Soil Visual Quality***

As described, soil samples were collected using a truck-mounted probe from various depths. Of the locations that we explored, none of the soil samples exhibited olfactory evidence of contamination. There was no discoloration or staining to the soil recovered in the sampling tubes. A composite soil sample was collected from the open (agriculture) field on the north side of the parcel for the analysis of pesticides and herbicides.

Monitoring wells were installed at the B1 and B3 locations. A third well was installed by hand at or near the B5 location. In general, there was no evidence of a sheen or odor was noted in any of the water samples drawn from the three newly installed wells.

### *Headspace Responses*

As stated, we screened soil sample recoveries for the presence of volatile hydrocarbon compounds using a photoionization detector (PID) instrument. Screening is also referred to as headspace analysis. The methodology which we employed for headspace analysis followed standard industry practices of placing a soil sample into a glass jar sealed with tin-foil and screw covers, warming the sample to ambient temperature, then agitating the sample to disturb volatile gases within the soil pore space, then allowing the sample to equilibrate. REW recorded relative HNu responses from the headspace of each sample, using a HNu Meter (Model HW-101) equipped with a 10.2 electron volt (eV) lamp, by inserting the HNu Meter probe through the tin foil.

The HNu Meter measures the total concentration of hydrocarbon gases in parts per million (ppm) in the sample headspace relative to an isobutylene standard calibration gas. The recorded concentrations are actual instrument responses and are isobutylene equivalents. The HNu does not discriminate among specific compounds and the results merely indicate the presence of hydrocarbon gases not contaminants.

PID responses ranged from no response to 0.2 ppm/v. PID responses of 0.2 ppm/v were documented at B3 and B5. At B3, PID responses of 0.2 ppm/v were documented at approximately 5 feet and 8 feet below grade. At B5, a PID response of 0.2 ppm/v was documented at approximately 5 feet below grade. These responses approach the instrument detection threshold of 0.1 ppm/v, and are not considered to be indicative for the presence of contaminants of a volatile nature. By comparison, the reporting threshold during an underground tank removal is 100 ppm/v. Based on the responses and our field observations, site conditions did not warrant chemical analysis with respect to petroleum-related or volatile compounds. PID responses are tabulated as **Table 1**. Instrument responses are also provided on the boring logs in **Appendix A**.

### *Monitoring Well Construction*

AM constructed two overburden wells using 2 - inch diameter PVC well screen and solid casing. The well screens were set to straddle the water table surface, enabling the potential detection of non-aqueous phase liquids (NAPLs). The well screens were set above and below the water table to account for seasonal fluctuations. Boring and geologic characteristics determined the length of screen used and the final depth of the well. To minimize contamination from surface activities, AM placed a bentonite seal at the union between the riser pipes and screens.

AM set monitoring wells at the B1 and B3 locations as MW-1 and MW-2, respectively. The installation of these wells was to an approximate depth of 12 feet below grade with a screen length of 10 feet. A third well was installed by hand at or near the B5 location to a depth of approximately 8 feet below grade. Refer to **Exhibit A** for the location of the monitoring well with respect to boring placement at the site.

### ***Monitoring Well Construction***

REW developed the wells installed by AM on April 8, 2002, by removing a minimum of three well volumes of water using a peristaltic pump and dedicated tubing. REW developed the newly installed third well (MW-3) on May 20, 2002, by removing a minimum of three well volumes of water using a peristaltic pump and dedicated tubing. Development helps remove disturbed sediment in the groundwater caused by drilling and well construction activities and promotes flow into the well from the surrounding aquifer. Following development and allowing each well to recover, we collected groundwater samples from the two newly installed monitoring wells for the analysis of petroleum hydrocarbon, oil and grease, volatile compounds, and chlorinated hydrocarbons.

Except for a two week stabilization period, REW collected groundwater samples according to the U.S. EPA Guidance Document 600/2-85/104; Practical Guide for Groundwater Sampling, and according to the DEP Guidance Document WSC-310-91; Standard References for Monitoring Wells. We used dedicated disposable gloves and tubing to minimize cross-contamination between the two wells and to enhance the integrity of sampling.

We recorded water elevations using a Solinst Water Level indicator before taking water samples on April 8, and May 20, 2002. The groundwater at the time of the referenced readings lies at an average depth of approximately 7.5 feet below grade. Refer to boring logs in **Appendix A** for groundwater measurements.

### ***Results – Soil Analysis***

As stated, a composite soil sample was collected from the open (agriculture) field on the north side of the parcel for the analysis of pesticides and herbicides. According to the analysis, there was no detection of pesticide or herbicide analytes.

### ***Results – Groundwater Analysis***

There was no detection of petroleum hydrocarbon in the groundwater above the method detection limit of 80 µg/l. For VOC, there was detection of dibromochloromethane at 2 µg/l, bromodichloromethane at 8 µg/l and chloroform at 26 µg/l at the MW2 location. There was detection of bromodichloromethane at 10 µg/l and chloroform at 89 µg/l at the MW3 location. Chloroform is possibly the primary source for dibromochloromethane. Aside from common laboratory use, which could result in sample contamination at the laboratory, these chemicals are commonly associated with chlorinated water, disinfectants and cleaners for general (over-the-counter) use.

Well MW-1 and MW-2 were also sampled for general hydrocarbons. Accordingly, there was no detection of hydrocarbons at the MW-1 location above the detection limit of 80 µg/l, which is the outfall for parking lot drains. The reporting threshold is 1 mg/l (or 1,000 µg/l) for the RCGW-2 category. At MW-2, which represents the leachfield area, hydrocarbons were reported at 0.5 mg/l (or 500 µg/l). Under the new MCP, there is no reporting threshold for oil and grease. In our opinion, given the concentration of oil and grease at MW-2, a more specific petroleum characterization is not warranted. The RCGW-2 threshold was applied to characterize the site since the drinking water is town supplied.

#### *MCP Applicability of Findings to Groundwater*

Tabulated as **Table 2** is an analytical summary of site groundwater with a comparison to the MCP "Reporting Concentrations." Accordingly, the detectable concentrations of dibromochloromethane, bromodichloromethane and chloroform do not exceed the Reporting Concentrations or the Risk Characterization Standards of the Massachusetts Contingency Plan, specifically 310 CMR 40.1795, Subpart P and .0900 Subpart I, respectively. A copy of the analytical report is provided as **Appendix B**.

#### *Opinion*

Based on our subsurface evaluation as described and presented above, we have prepared the following synopsis with respect to site conditions.

Soil samples collected via probe methodology exhibited no olfactory evidence of contamination. There was no discoloration or staining to the soil recovered in the sampling tubes.

There were no PID instrument responses to the headspace for seven soil samples that would otherwise indicate potential evidence of contamination of a volatile nature. Based on the responses, site conditions did not warrant chemical analysis with respect to petroleum-related or volatile compounds.

Quantitative analysis of groundwater indicates detection of dibromochloromethane, bromodichloromethane and chloroform at the leaching fields; however, the concentrations do not exceed Reporting Concentrations of the Massachusetts Contingency Plan. Contaminants of these types are probably related to chlorinated waters and/or the cleaning and disinfecting agents used in the commercial buildings.

Based on the data collected and presented in this report including a limited subsurface investigation, REW Environmental Consultants, Inc., found no contamination at concentrations that would be of concern. No further work is recommended.

If you have questions or need a better understanding of the issues, please contact me at 978-777-2055.

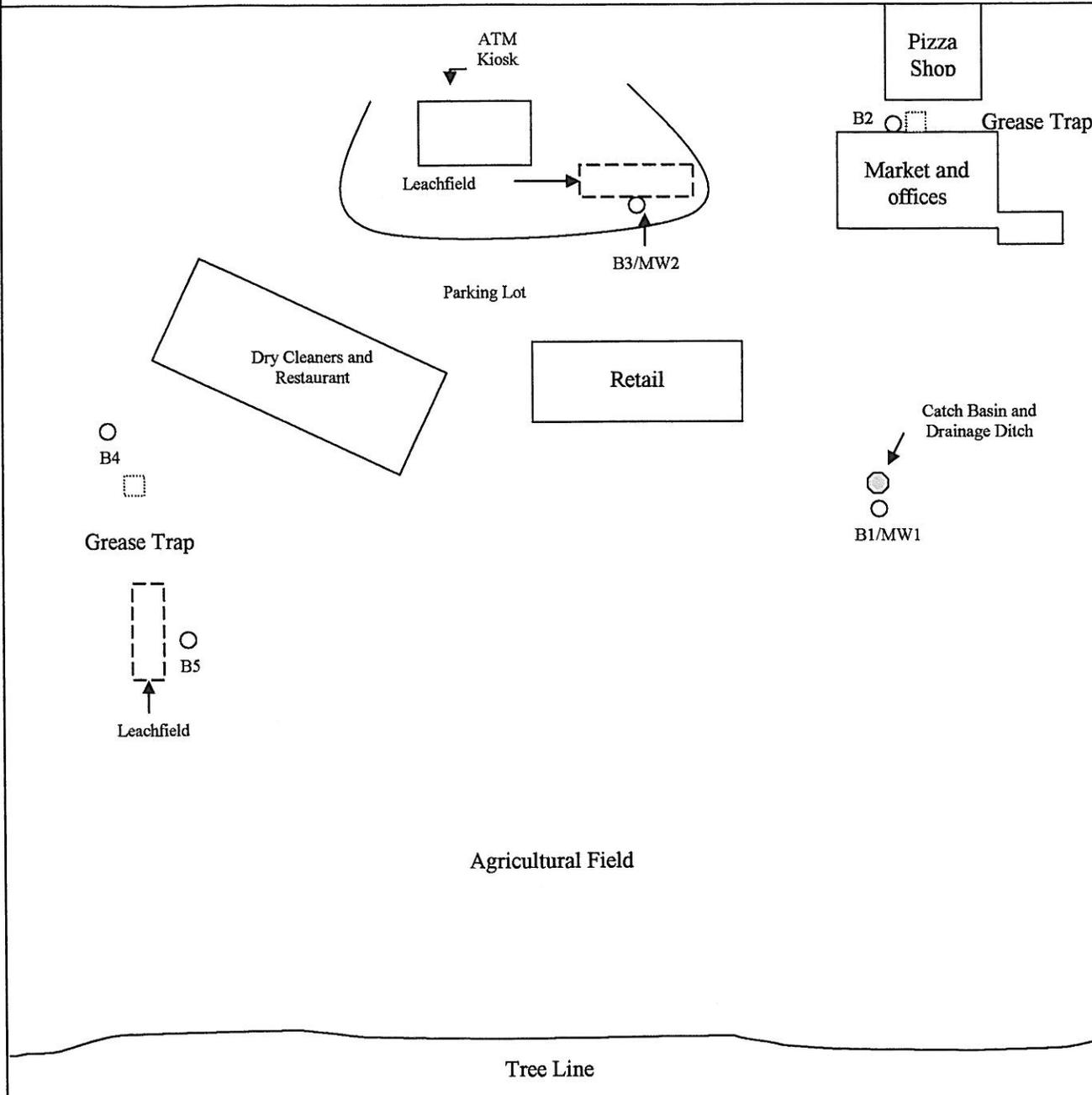
Sincerely,  
REW Environmental Consultants, Inc.

A handwritten signature in cursive script that reads "Dick Warren".

Dick Warren  
Principal

**EXHIBIT**

Essex Road (Route 133)



North Indicator  
No Scale  
For Illustrative Use Only  
Reproduction Scale  
±5%

**EXHIBIT A**  
SITE SKETCH  
36 ESSEX ROAD  
IPSWICH, MASSACHUSETTS

Prepared by:  
REW Environmental Consultants, Inc.  
Danvers, Massachusetts

## TABLES

**Table 1**  
 Field PID Jar Headspace Analytical Screening  
 36 Essex Road  
 Ipswich, Massachusetts

Page: 1 of 1

Address: 36 Essex Road  
 Town: Ipswich  
 Date: April 5, 2002

Sampler: Dan Blanchette

Weather: Clear, Cool 50°F

Comments:

Client: Sample Type: Grab

Sample ID	DC	Reading	BG	Results	Notes
B-1	3-4 feet	NR	0.0	NR	
	6-7 feet	NR	0.0	NR	
	10-12 feet	NR	0.0	NR	
B-2	3-4 feet	NR	0.0	NR	
	5-7 feet	NR	0.0	NR	
	9-12 feet	NR	0.0	NR	
B-3	4 feet	NR	0.0	NR	
	5-6 feet	0.2	0.0	0.2	
	8-10 feet	0.2	0.0	0.2	
	11-12 feet	NR	0.0	NR	
B-4	4 feet	NR	0.0	NR	
	5-7 feet	NR	0.0	NR	
	10-12 feet	NR	0.0	NR	
B-5	4 feet	NR	0.0	NR	
	6-7 feet	0.2	0.0	0.2	
	7-8 feet	NR	0.0	NR	

PID Instrument Used: HNu Calibration: Isobutylene

ID = Identification  
 DC = Depth Collected  
 TC = Time Collected  
 TT = Time Tested  
 BG = Background  
 ppm/v = parts per million / volume  
 NR = No Response

Table 2 Groundwater Analytical  
 36 Essex Road  
 Ipswich, Massachusetts

	MW1 4/05/02	MW2 4/05/02	MW3 5/20/02	RCGW2
Analytical Method TPH				
TPH ug/l	<80	NT	NT	1000
Oil and Grease mg/l	NT	0.5	NT	NA
Analytical Method VOC ug/l				
Bromodichloromethane	NT	8	10	50000
Chloroform	NT	26	89	400
Dibromochloromethane	NT	2	<1	50000

Table 3 Soil Analytical

	S1 5/20/02
Analytical Units mg/kg	
Pesticides	BDL
Herbicides	BDL

NT means Not Tested

Full suite of analysis was completed for VOC, if compound is not listed sample concentration was below Method Detection Limit

RCGW2 means Reportable Concentration for Groundwater 2

BDL means Below Detection Limits

NA means Not Applicable

## APPENDICES

## APPENDIX A

<b>R.E.W. Environmental Consultants, Inc.</b> 500 Maple Street Danvers, Massachusetts 01923 978-777-2055	<b>BORING LOG</b> Boring No.: 1 Date started: 4/5/02 Date end: 4/5/02	Project Type: Form Completed by DB Inspected by: DW Sheet 1 of 5
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Sampler: Truck-mounted GeoProbe using four foot long designated recovery sleeves.	Project Name: 36 Essex Road Address: 36 Essex Road City: Ipswich			
Groundwater Readings				
Date	Time	Water	Casing	Stabilization Time
4/18	-	2.83	2 ft	
Casing size:		Other:		

D E P T H	C B A L S O N W G S	Sample				Sample Description	HNu	Notes
		#	Pen./ Rec.	Depth (ft.)	Blows/ 6 inch			
0			3'			1' dk brown, damp, LOAM, tan to brown, damp, f/c SAND some f/c gravel		
				S-1			NR	3-4 feet
4			2.5'			1' Tan, saturated, f/c SAND 1.5' Gray, moist, CLAY, trace sand		Groundwater at 7 feet
				S-2			NR	6-7 feet
8			3'			Gray to olive green, damp, CLAY		
				S-3			NR	10-12 feet
12						Set well (MW1) at 12 feet 10 feet screen, 2 feet riser		No odor or sheen observed throughout boring

Descriptor for Distribution of Gravel, Sand, and Silt Size Particles by volume Principal >50%      'and' 35 to 50 %      'some' 20 to 35 % 'little' 10 to 20%      'trace' 0 to 10%	Remarks:																																																												
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">Granular Soils</th> <th colspan="2">Cohesive Soils</th> </tr> <tr> <th>Blows/Ft.</th> <th>Density</th> <th>Blows/Ft</th> <th>Density</th> </tr> <tr> <td>0 to 4</td> <td>Very Loose</td> <td>&lt;2</td> <td>Very Soft</td> </tr> <tr> <td>5 to 10</td> <td>Loose</td> <td>2 to 4</td> <td>Soft</td> </tr> <tr> <td>11 to 30</td> <td>Medium Dense</td> <td>4 to 8</td> <td>Medium Stiff</td> </tr> <tr> <td>31 to 50</td> <td>Dense</td> <td>8 to 15</td> <td>Stiff</td> </tr> <tr> <td>51+</td> <td>Very Dense</td> <td>15 to 30</td> <td>Very Stiff</td> </tr> <tr> <td></td> <td></td> <td>&gt;30</td> <td>Hard</td> </tr> </table>	Granular Soils		Cohesive Soils		Blows/Ft.	Density	Blows/Ft	Density	0 to 4	Very Loose	<2	Very Soft	5 to 10	Loose	2 to 4	Soft	11 to 30	Medium Dense	4 to 8	Medium Stiff	31 to 50	Dense	8 to 15	Stiff	51+	Very Dense	15 to 30	Very Stiff			>30	Hard	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Gravel:</td> <td style="width:33%;">(f) fine .18-.75 "</td> <td style="width:33%;">(m)med. .75-1."</td> <td style="width:33%;">coarse 1.-3.0"</td> </tr> <tr> <td colspan="4" style="text-align: center;">Moisture Content</td> </tr> <tr> <td>Dry:</td> <td colspan="3">Dry, absence of moisture, dry to touch</td> </tr> <tr> <td>Damp:</td> <td colspan="3">No visible water</td> </tr> <tr> <td>Moist:</td> <td colspan="3">Little visible water</td> </tr> <tr> <td>Wet:</td> <td colspan="3">Some free water visible</td> </tr> <tr> <td>Saturated:</td> <td colspan="3">Visible free water, should only be used if 100 % saturation is to be implied</td> </tr> </table>	Gravel:	(f) fine .18-.75 "	(m)med. .75-1."	coarse 1.-3.0"	Moisture Content				Dry:	Dry, absence of moisture, dry to touch			Damp:	No visible water			Moist:	Little visible water			Wet:	Some free water visible			Saturated:	Visible free water, should only be used if 100 % saturation is to be implied		
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<b>R.E.W. Environmental Consultants, Inc.</b> 500 Maple Street Danvers, Massachusetts 01923 978-777-2055	<b>BORING LOG</b> Boring No.: 3 Date started: 4/5/02 Date end: 4/5/02	Project Type: Form Completed by DB Inspected by: DW Sheet 3 of 5
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Sampler: Truck-mounted GeoProbe using four foot long designated recovery sleeves.	Project Name: 36 Essex Road Address: 36 Essex Road City: Ipswich			
<b>Groundwater Readings</b>				
Date	Time	Water	Casing	Stabilization Time
4/18	-	8.61	2	NA

D E P T H	C B A L S O N W G S	Sample				Sample Description	HNu	Notes
		#	Pen./ Rec.	Depth (ft.)	Blows/ 6 inch			
0			2.5'			6" Dk. Brown LOAM, tan to brown, damp, m/c SAND some f/c Gravel		
4			2.5'	S-1		1' Tan to brown, wet, m/c SAND some f/c Gravel, little silt, 1' tan, wet, m/c Sand and Gravel	NR	4 feet
				S-2			0.2	5-6 feet
								Groundwater at 7 feet
8			4'			3' Tan, wet, m/c SAND some f/c gravel, trace silt 1' tan, wet, f Sand and Silt	0.2	8-10
				S-3			NR	11-12 feet
				S-4				
12						Set well (MW2) at 12 feet 10 feet screen, 2 feet riser		No odor or sheen observed throughout boring

Descriptor for Distribution of Gravel, Sand, and Silt Size Particles by volume				Remarks:	
Principal >50%		'and' 35 to 50 %		'some' 20 to 35 %	
'little' 10 to 20%		'trace' 0 to 10%			
Granular Soils		Cohesive Soils		Gravel: (f) fine .18-.75 " (m) med. .75-1." coarse 1.-3.0"	
Blows/Ft.	Density	Blows/Ft.	Density	Moisture Content	
0 to 4	Very Loose	<2	Very Soft	Dry: Dry, absence of moisture, dry to touch	
5 to 10	Loose	2 to 4	Soft	Damp: No visible water	
11 to 30	Medium Dense	4 to 8	Medium Stiff	Moist: Little visible water	
31 to 50	Dense	8 to 15	Stiff	Wet: Some free water visible	
51+	Very Dense	15 to 30	Very Stiff	Saturated: Visible free water, should only be used if 100 % saturation is to be implied	
		>30	Hard		

<b>R.E.W. Environmental Consultants, Inc.</b>				<b>BORING LOG</b>				Project Type:			
500 Maple Street				Boring No.:	4			Form Completed by DB			
Danvers, Massachusetts 01923				Date started:	4/5/02			Inspected by: DW			
978-777-2055				Date end:	4/5/02			Sheet 4 of 5			
Sampler: Truck-mounted GeoProbe using four foot long designated recovery sleeves.						Project Name:		36 Essex Road			
						Address:		36 Essex Road			
						City:		Ipswich			
						Groundwater Readings					
		Date	Time	Water	Casing	Stabilization Time					
Casing size:						Other:					
D E P T H	C B A L S O N W G S	Sample				Sample Description	HNu	Notes			
		#	Pen./ Rec.	Depth (ft.)	Blows/ 6 inch						
		0	1.5'						Tan, moist, m/c SAND, some f/c Gravel, cobbles		
		4	2.5'	S-1					Tan, moist, m/c Sand and Gravel, cobbles	NR	4 feet
				S-2						NR	5-7 feet
											Groundwater at 7 feet
		8	3'						Tan, saturated, m/c Sand and Gravel, some cobbles		
				S-3						NR	10-12 feet
		12							End boring at 12 feet		No odor or sheen observed throughout boring
		Descriptor for Distribution of Gravel, Sand, and Silt Size Particles by volume							Remarks:		
Principal >50%		'and' 35 to 50 %		'some' 20 to 35 %							
'little' 10 to 20%		'trace' 0 to 10%									
Granular Soils				Cohesive Soils				Gravel: (f) fine .18-.75 " (m) med. .75-1." coarse 1.-3.0"			
Blows/Ft.		Density		Blows/Ft.		Density		Moisture Content			
0 to 4 Very Loose				<2 Very Soft				Dry: Dry, absence of moisture, dry to touch			
5 to 10 Loose				2 to 4 Soft				Damp: No visible water			
11 to 30 Medium Dense				4 to 8 Medium Stiff				Moist: Little visible water			
31 to 50 Dense				8 to 15 Stiff				Wet: Some free water visible			
51+ Very Dense				15 to 30 Very Stiff				Saturated: Visible free water, should only be used if 100 % saturation is to be implied			
				>30 Hard							



## **APPENDIX B**



**R.I. Analytical**

Specialists in Environmental Services

**CERTIFICATE OF ANALYSIS**

REW Environmental Consultants  
Attn: Mr. Dan Blanchette  
500 Maple Street  
Danvers, MA 01923

**Date Received:** 4/08/02  
**Date Reported:** 4/15/02  
**P.O. #:**  
**Work Order #:** 0204-04194

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**DESCRIPTION:** 36 ESSEX ROAD (TWO GROUNDWATER SAMPLES)

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Subject sample(s) has/have been analyzed by our laboratory with the attached results.

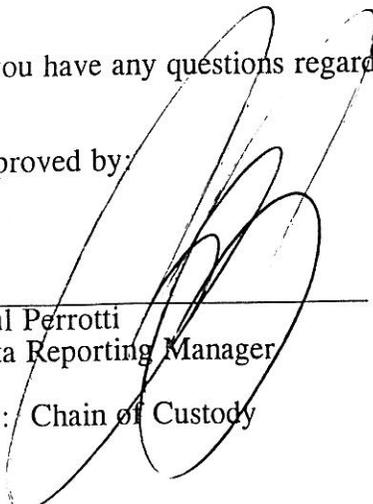
Reference: All parameters were analyzed by U.S. EPA approved methodologies. The specific methodologies are listed in the methods column of the Certificate Of Analysis.

Data qualifiers (if present) are explained in full at the end of a given sample's analytical results.

Certification #: RI-033, MA-RI015, CT-PH-0508, ME-RI015  
NH-253700 A & B, USDA S-41844, NY-11726

If you have any questions regarding this work, or if we may be of further assistance, please contact us.

Approved by:

  
\_\_\_\_\_  
Paul Perrotti  
Data Reporting Manager

enc: Chain of Custody

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

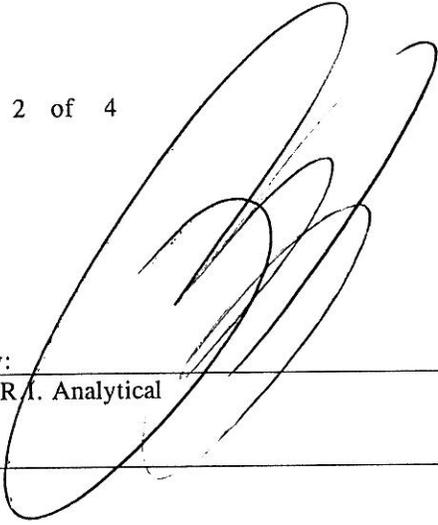
REW Environmental Consultants

Date Received: 4/08/02

Work Order # 0204-04194

Approved by: \_\_\_\_\_

R.I. Analytical



Sample #: 001

SAMPLE DESCRIPTION: MW-1 04/05/02

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
TPH GC/FID	<80	80	ug/l	SW846 8100M	4/12/02 18:32	TRA

R.I. Analytical Laboratories, Inc.

## CERTIFICATE OF ANALYSIS

REW Environmental Consultants

Date Received: 4/08/02

Work Order # 0204-04194

Approved by:

R.I. Analytical

Sample #: 002

SAMPLE DESCRIPTION: MW-2 04/05/02

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
OIL & GREASE IR	<0.5	0.5	mg/l	EPA 413.2	4/15/02 9:00	CCP
Volatile Organic Compounds						
Benzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Bromobenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Bromochloromethane	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Bromodichloromethane	8	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Bromoform	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Bromomethane	<2	2	ug/l	SW-846 8260	4/12/02 14:31	BML
n-Butylbenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
sec-Butylbenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
tert-Butylbenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Carbon Tetrachloride	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Chlorobenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Chloroethane	<5	5	ug/l	SW-846 8260	4/12/02 14:31	BML
Chloroform	26	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Chloromethane	<5	5	ug/l	SW-846 8260	4/12/02 14:31	BML
2-Chlorotoluene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
4-Chlorotoluene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Dibromochloromethane	2	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,2-Dibromo-3-Chloropropane	<2	2	ug/l	SW-846 8260	4/12/02 14:31	BML
1,2-Dibromoethane(EDB)	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Dibromomethane	<2	2	ug/l	SW-846 8260	4/12/02 14:31	BML
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Dichlorodifluoromethane	<5	5	ug/l	SW-846 8260	4/12/02 14:31	BML
1,1-Dichloroethane	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,2-Dichloroethane	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,1-Dichloroethene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
cis-1,2-Dichloroethene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
trans-1,2-Dichloroethene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,2-Dichloropropane	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,3-Dichloropropane	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
2,2-Dichloropropane	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,1-Dichloropropene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,3-Dichloropropene	<0.5	0.5	ug/l	SW-846 8260	4/12/02 14:31	BML
Ethylbenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Hexachlorobutadiene	<0.6	0.6	ug/l	SW-846 8260	4/12/02 14:31	BML
Isopropylbenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML

## R.I. Analytical Laboratories, Inc.

## CERTIFICATE OF ANALYSIS

REW Environmental Consultants

Date Received: 4/08/02

Work Order # 0204-04194

Approved by: \_\_\_\_\_

R.I. Analytical

Sample #: 002

MW-2 04/05/02

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
p-Isopropyltoluene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Methylene Chloride	<5	5	ug/l	SW-846 8260	4/12/02 14:31	BML
Naphthalene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
n-Propylbenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Styrene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,1,1,2-Tetrachloroethane	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Tetrachloroethene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Toluene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,2,3-Trichlorobenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,2,4-Trichlorobenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Trichloroethene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Trichlorofluoromethane	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,2,3-Trichloropropane	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,2,4-Trimethylbenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
1,3,5-Trimethylbenzene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
Vinyl Chloride	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
o-Xylene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
m&p-Xylene	<1	1	ug/l	SW-846 8260	4/12/02 14:31	BML
MTBE	<2	2	ug/l	SW-846 8260	4/12/02 14:31	BML
SURROGATES			RANGE	SW-846 8260	4/12/02 14:31	BML
Dibromofluoromethane	101		86-118%	SW-846 8260	4/12/02 14:31	BML
Toluene-d8	100		88-110%	SW-846 8260	4/12/02 14:31	BML
4-Bromofluorobenzene	102		86-115%	SW-846 8260	4/12/02 14:31	BML
1,2 Dichloroethane-d4	100		80-120%	SW-846 8260	4/12/02 14:31	BML

# R.I. Analytical Laboratories, Inc.

41 Illinois Avenue  
Warwick, RI 02888  
Phone: (401) 737-8500  
Fax: (401) 738-1970

950 Boylston Street, Unit 102  
Newton Highlands, MA 02461  
Phone: (617) 965-5133  
Fax: (617) 965-5624

## CHAIN OF CUSTODY RECORD

Page 1 of 1

**Container Type Codes:**  
P = Plastic  
G = Glass  
AG = Amber Glass  
O = Other (describe)

**Preservative Codes:**  
NP = Non preserved  
I = Cooled 4°C  
N = Nitric  
M = Methanol

**Matrix Codes:**  
GW = Groundwater  
WW = Wastewater  
DW = Potable Water  
O = Other (describe)

**S = Soil  
SI = Sludge  
A = Air  
B = Bulk/Solid**

Date Collected	Time Collected	Sample ID	Containers # + Code	G = Grab C = Comp.	Preservative Code	Matrix Code	Analyses Requested
4-5-02		MW-1	2AG	-	NP	GW	TPA 8100 <del>NON PRESERVED</del>
4-5-02		MW-2	1AG	-	NP-H	GW	0.18 <del>Preserved</del> <del>NON PRESERVED</del>
							413.2
							8260
							see A.F.
							of 4-9-02

### Client Information

**Company Name:** REW Environmental Consultants, Inc.  
**Address:** 500 Maple Street  
**City / State / Zip:** Danvers, MA 01923  
**Phone:** (978) 777-2055 **Fax:** (978) 777-6363  
**Contact:** Dan Blanchette

**Project Information**  
**Project Name / Location:** 36 Essex Rd  
**P.O. Number:** \_\_\_\_\_ **Project Number:** \_\_\_\_\_  
**Report To:** Dan Blanchette **Phone:** \_\_\_\_\_ **Fax:** \_\_\_\_\_  
**Sampled by:** DB  
**Reference Proposal:** \_\_\_\_\_

Relinquished by:	Date	Time	Received by:	Date	Time
<i>[Signature]</i>	4-8-02	12:45	<i>[Signature]</i>	4/8/02	1245
<i>[Signature]</i>	4/8/02	1700	<i>[Signature]</i>	4/8/02	1700
<i>[Signature]</i>	4/8/02	1815	<i>[Signature]</i>	4/8/02	1815

**Project Comments:**

**LIST SPECIAL MDL REQUIREMENTS:** SOIL SAMPLES: 5-1 WATER SAMPLES: GW-1

**RIAL USE ONLY:**  
 Pick-Up Only  
 RIAL Sampled  
 Shipped on Ice  
 RIAL W.O. # 0204-04194

**Turn Around Time:**  
 Normal  
 5-business days  
 Surcharges may apply  
 Rush (business days)



**R.I. Analytical**

Specialists in Environmental Services

**CERTIFICATE OF ANALYSIS**

REW Environmental Consultants  
Attn: Mr. Dan Blanchette  
500 Maple Street  
Danvers, MA 01923

**Date Received:** 5/20/02  
**Date Reported:** 5/28/02  
**P.O. #:**  
**Work Order #:** 0205-06242

---

**DESCRIPTION:** 36 ESSEX RD (IPSVICH) ONE SOIL AND ONE GROUNDWATER SAMPLE

---

Subject sample(s) has/have been analyzed by our laboratory with the attached results.

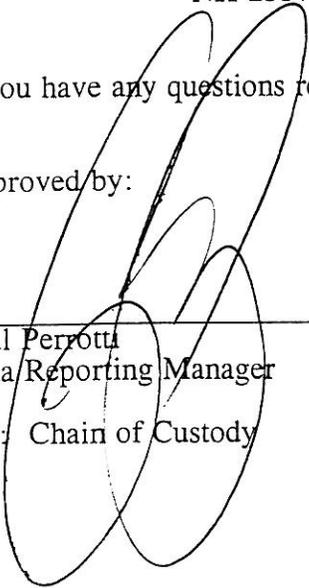
Reference: All parameters were analyzed by U.S. EPA approved methodologies. The specific methodologies are listed in the methods column of the Certificate Of Analysis.

Data qualifiers (if present) are explained in full at the end of a given sample's analytical results.

Certification #: RI-033, MA-RI015, CT-PH-0508, ME-RI015  
NH-253700 A & B, USDA S-41844, NY-11726

If you have any questions regarding this work, or if we may be of further assistance, please contact us.

Approved by:

  
\_\_\_\_\_  
Paul Perrotti  
Data Reporting Manager

enc: Chain of Custody

R.I. Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

REW Environmental Consultants  
Date Received: 5/20/02  
Work Order # 0205-06242

Approved by: \_\_\_\_\_  
R.I. Analytical

Sample #: 001  
SAMPLE DESCRIPTION: S-1 05/20/02

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
<b>HERBICIDES</b>						
2,4 -D	<0.1	0.1	mg/kg dry	SW-846 8150	5/28/02 11:40	RML
2,4,5 -TP (SILVEX)	<0.01	0.01	mg/kg dry	SW-846 8150	5/28/02 11:40	RML
2,4,5 -T	<0.01	0.01	mg/kg dry	SW-846 8150	5/28/02 11:40	RML
Dalapon	<0.01	0.01	mg/kg dry	SW-846 8150	5/28/02 11:40	RML
Dicamba	<0.01	0.01	mg/kg dry	SW-846 8150	5/28/02 11:40	RML
Dichloroprop	<0.01	0.01	mg/kg dry	SW-846 8150	5/28/02 11:40	RML
Dinoseb	<0.01	0.01	mg/kg dry	SW-846 8150	5/28/02 11:40	RML
<b>PESTICIDES</b>						
Aldrin	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Alpha-BHC	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Beta-BHC	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Delta-BHC	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Gamma-BHC	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Chlordane	<0.05	0.05	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
4-4'-DDD	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
4-4'-DDE	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
4-4'-DDT	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Dieldrin	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Endosulfan I	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Endosulfan II	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Endosulfan Sulfate	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Endrin	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Endrin Aldehyde	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Heptachlor	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Heptachlor epoxide	<0.01	0.01	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Methoxychlor	<0.05	0.05	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
Toxaphene	<0.5	0.5	mg/kg dry	SW-846 8080	5/24/02 23:16	RML
SURROGATE			RANGE	SW-846 8080	5/24/02 23:16	RML
Decachlorobiphenyl	126		60-140 %	SW-846 8080	5/24/02 23:16	RML

R.I. Analytical Laboratories, Inc.

## CERTIFICATE OF ANALYSIS

REW Environmental Consultants

Date Received: 5/20/02

Work Order # 0205-06242

Approved by: \_\_\_\_\_

R.I. Analytical

Sample #: 002

SAMPLE DESCRIPTION: MW-3 05/20/02

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Volatile Organic Compounds						
Benzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Bromobenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Bromochloromethane	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Bromodichloromethane	10	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Bromoform	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Bromomethane	<10	10	ug/l	SW-846 8260	5/24/02 13:22	BML
n-Butylbenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
sec-Butylbenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
tert-Butylbenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Carbon Tetrachloride	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Chlorobenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Chloroethane	<5	5	ug/l	SW-846 8260	5/24/02 13:22	BML
Chloroform	89	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Chloromethane	<5	5	ug/l	SW-846 8260	5/24/02 13:22	BML
2-Chlorotoluene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
4-Chlorotoluene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Dibromochloromethane	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,2-Dibromo-3-Chloropropane	<2	2	ug/l	SW-846 8260	5/24/02 13:22	BML
1,2-Dibromoethane(EDB)	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Dibromomethane	<2	2	ug/l	SW-846 8260	5/24/02 13:22	BML
1,2-Dichlorobenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,3-Dichlorobenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,4-Dichlorobenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Dichlorodifluoromethane	<5	5	ug/l	SW-846 8260	5/24/02 13:22	BML
1,1-Dichloroethane	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,2-Dichloroethane	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,1-Dichloroethene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
cis-1,2-Dichloroethene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
trans-1,2-Dichloroethene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,2-Dichloropropane	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,3-Dichloropropane	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
2,2-Dichloropropane	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,1-Dichloropropene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Ethylbenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Hexachlorobutadiene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Isopropylbenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
p-Isopropyltoluene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Methylene Chloride	<5	5	ug/l	SW-846 8260	5/24/02 13:22	BML

## R.I. Analytical Laboratories, Inc.

## CERTIFICATE OF ANALYSIS

REW Environmental Consultants

Date Received: 5/20/02

Work Order # 0205-06242

Approved by:

R.I. Analytical

Sample #: 002

MW-3 05/20/02

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	ANALYZED DATE/TIME	ANALYST
Naphthalene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
n-Propylbenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Styrene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,1,1,2-Tetrachloroethane	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,1,1,2,2-Tetrachloroethane	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Tetrachloroethene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Toluene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,2,3-Trichlorobenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,2,4-Trichlorobenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,1,1-Trichloroethane	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,1,2-Trichloroethane	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Trichloroethene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Trichlorofluoromethane	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,2,3-Trichloropropane	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,2,4-Trimethylbenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
1,3,5-Trimethylbenzene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
Vinyl Chloride	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
o-Xylene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
m&p-Xylene	<1	1	ug/l	SW-846 8260	5/24/02 13:22	BML
MTBE	<2	2	ug/l	SW-846 8260	5/24/02 13:22	BML
SURROGATES			RANGE	SW-846 8260	5/24/02 13:22	BML
Dibromofluoromethane	98		86-118 %	SW-846 8260	5/24/02 13:22	BML
Toluene-d8	108		88-110 %	SW-846 8260	5/24/02 13:22	BML
4-Bromofluorobenzene	94		86-115 %	SW-846 8260	5/24/02 13:22	BML
1,2 Dichloroethane-d4	101		80-120 %	SW-846 8260	5/24/02 13:22	BML

