

SEP 25 1990

File # 557



September 24, 1990

Mr. Chuck Schwer  
State of Vermont  
Department of Environmental Conservation  
Petroleum Sites Management Section  
103 South Main St.  
Waterbury, VT 05676

Dear Chuck:

Enclosed is the report on the investigation of subsurface petroleum contamination at Taylor Automotive, in Barton, Vermont. Please call me if you have any questions regarding this investigation.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Peter M. Murray', is written over the typed name.

Peter M. Murray  
Project Hydrogeologist

REPORT ON THE INVESTIGATION  
OF SUBSURFACE PETROLEUM CONTAMINATION  
TAYLOR AUTOMOTIVE  
BARTON, VERMONT

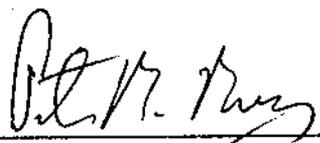
August, 1990

Prepared for:

Mr. and Mrs. Francis Taylor  
Barton, Vermont

Prepared by:

Griffin International  
2B Dorset Ln.  
Williston, Vermont



Peter M. Murray  
Project Hydrogeologist

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## 1.0 INTRODUCTION

This report details the investigation of subsurface petroleum contamination at Taylor Automotive, in Barton, Vermont. The investigation has been conducted by Griffin International, Inc. for Mr. and Mrs. Francis Taylor, the owners of Taylor Automotive. The petroleum contamination is likely the result of a leak in the underground gasoline storage system which was totally replaced during the week of August 6th, 1990. The system consisted of three underground storage tanks, associated piping and pumps.

## 2.0 SITE BACKGROUND

### 2.1 Site History

On August 6th, 1990, three underground gasoline storage tanks were excavated and removed from the premises of Taylor Automotive. Upon excavation of the tanks, a Vermont Department of Environmental Conservation, (D.E.C.) inspector, who was on site that day, detected significant petroleum contamination in the surrounding soils. The inspector then requested that the Taylor's hire a qualified consultant to perform a limited site assessment to determine the extent of the contamination and to identify any possible receptors.

On August 7th, Griffin International was hired to conduct the investigation.

### 2.2 Site Description

Taylor Automotive is a retail gasoline and automobile repair establishment. It is located slightly south of the center of the small village of Barton, on the west side of Route 5, near the outlet of Crystal Lake. The immediate area consists of a mixture of commercial and residential land uses. All homes and businesses in the area are served by the municipal water system.

In addition to Taylor Automotive, there are at least two other establishments in the immediate area that are believed to have underground storage tanks on the premises. These establishments are Bob's Variety and True Value. The locations of these establishments are illustrated on the Area Map, in Appendix A. All of these tanks have been abandoned for several years and are not believed to be contributing to the subsurface contamination

at Taylor Automotive.

### 3.0 INVESTIGATIVE PROCEDURES

#### 3.1 Soil Screening

On August 8th, the Griffin Hydrogeologist was on site to supervise the installation of three groundwater monitoring wells to serve as sampling points for the subsurface investigation. The wells were to be installed by Wyman's Meter and Tank Company using a track mounted hoe that was also being used to excavate the old tanks and install new ones.

Upon arrival to the site, the hydrogeologist discovered that the site was not yet prepared for the installation of the wells. The process of soil removal from the tank pit had been slowed by a shortage of dump trucks and confusion over which soils were to be considered contaminated and which soils were not. At the time of the hydrogeologist's arrival to the site, all soils were being trucked to a gravel pit in Hardwick, where they were being placed on plastic sheeting. This process was slowing down the process due to the amount of time required to drive to Hardwick. The Taylor's suggested that non-contaminated soils could be trucked to their home in Barton to be used as fill. This would result in a shorter amount of time for the soil removal because the dump trucks would not have to travel as far to dispose of the soils.

Mrs. Taylor contacted Cedric Sanborn, of the Vermont D.E.C., to inquire as to what constitutes contaminated soils. Mr. Sanborn indicated that soils which contained less than 1 ppm hydrocarbon vapors, as measured by a photoionizer, would be considered non-contaminated and, therefore, could be used at the Taylor's residence as clean fill. Subsequently, the Griffin hydrogeologist spent several hours that afternoon screening soils as they were excavated from the tank pit to determine which soils were contaminated and which were not. All soils that contained less than 1 ppm hydrocarbon vapors were trucked to the Taylor residence while all soils containing concentrations greater than 1 ppm were trucked to the Hardwick site.

The soil screening was extremely helpful in determining the extent of the contamination. All soils removed from the southern and western sides of the tank pit were relatively free of contamination while the soils in the vicinity of the former pump island, which was on the eastern side of the pit, contained hydrocarbon vapor

concentrations of, up to, 110 ppm. Apparently, the leak or leaks in the former fuel storage system had occurred in the vicinity of the old pump island. A total of eight truck loads of contaminated soils were excavated from the pit on August 8th. On August 9th, four more truck loads of contaminated soils were removed from the vicinity of the former pump island and, on August 10th, two more truckloads of contaminated soils were removed from the site. In all, a total of fourteen truckloads or, one hundred and ninety six yards, of contaminated soils were removed to Hardwick. These soils are currently stockpiled on and covered with plastic sheeting to prevent contamination of the surrounding soils in the gravel pit. At this point, we are assuming that removal of the contaminated soils from Taylor Automotive has resulted in the removal of the bulk of the subsurface contamination at the site.

The soils in the tank pit consisted of fine to medium sand and silt, with some rounded gravel and cobbles, to a depth of twelve feet. From twelve feet to fifteen feet, the total depth of the excavation, the soils consisted of medium to coarse sand and fine gravel. The water table aquifer beneath Taylor Automotive is contained in this gravel layer. Groundwater that accumulated in the bottom of the tank pit contained no petroleum sheens or odors.

### 3.2 Monitoring Well Installation

Three groundwater monitoring wells were installed in the tank pit by Wyman's on August 9th. The PVC wells were placed in the bottom of the tank pit, which was then backfilled. The wells extend to a depth of fifteen feet below grade and are screened to a depth of two feet below grade. The wells were completed with eight inch diameter road boxes which were grouted in place for security and to provide an adequate seal to prevent downhole migration of surface contamination. The locations of the wells are illustrated on the Site Map, in Appendix A.

### 3.3 Groundwater Gradient and Flow Direction Determination

On August 15th, water table elevations, as well as the water level in the Crystal Lake outlet, were measured relative to mean sea level for the purpose of determining groundwater flow direction across the site. The Area Map, in Appendix A illustrates groundwater contours and flow direction which is to the north east. The groundwater gradient in the vicinity of Taylor Automotive is approximately 0.9%.

### 3.4 Groundwater Sampling and Analysis

Water samples were also collected on August 15th for analysis for BTEX and MTBE using EPA Method 602. Samples were collected from the three monitoring wells, from a point on the lake outlet which was assumed to be upgradient of the point at which the contamination was reaching the outlet and, one from downstream of that point. The laboratory results are listed in Appendix B.

The results indicate that detectable concentrations of BTEX and MTBE were found in only one of the three monitoring wells on that date. MW-3, which is located in the area where significant soil contamination was detected by the D.E.C inspector on August 7th, contained a total of 56.99 ppb BTEX and MTBE. Additionally, no BTEX or MTBE was detected in samples collected from the lake outlet.

### 4.0 CONCLUSIONS

1. There was a significant amount of subsurface petroleum contamination in the vicinity of the former underground fuel storage system at Taylor Automotive. The contamination consisted of gasoline in both the adsorbed and dissolved phases. No free floating product was detected on the site. The assumed source of the contamination, the former underground fuel storage system, has since been removed.
2. The removal of fourteen truckloads of contaminated soils from the tank pit has resulted in a significant decrease in contamination levels across the site. As of August 15th, dissolved petroleum contamination has been detected in only one of the three monitoring wells on site. No contamination was detected in the outlet of Crystal Lake. The contaminated well, MW-3, contained only 57 ppb dissolved BTEX and MTBE on that date.
3. The overburden deposits in the vicinity of Taylor Automotive consist of sand, silt and gravel. These deposits are assumed to have a relatively high permeability.
4. The groundwater gradient in the vicinity of Taylor Automotive is relatively slight, however, the high permeability likely results in a relatively high rate of groundwater migration across the site. This high groundwater flow rate likely results in the rapid dispersion and dilution of the contamination. If any of the

contamination is entering the outlet to Crystal Lake, it is in nondetectable concentrations.

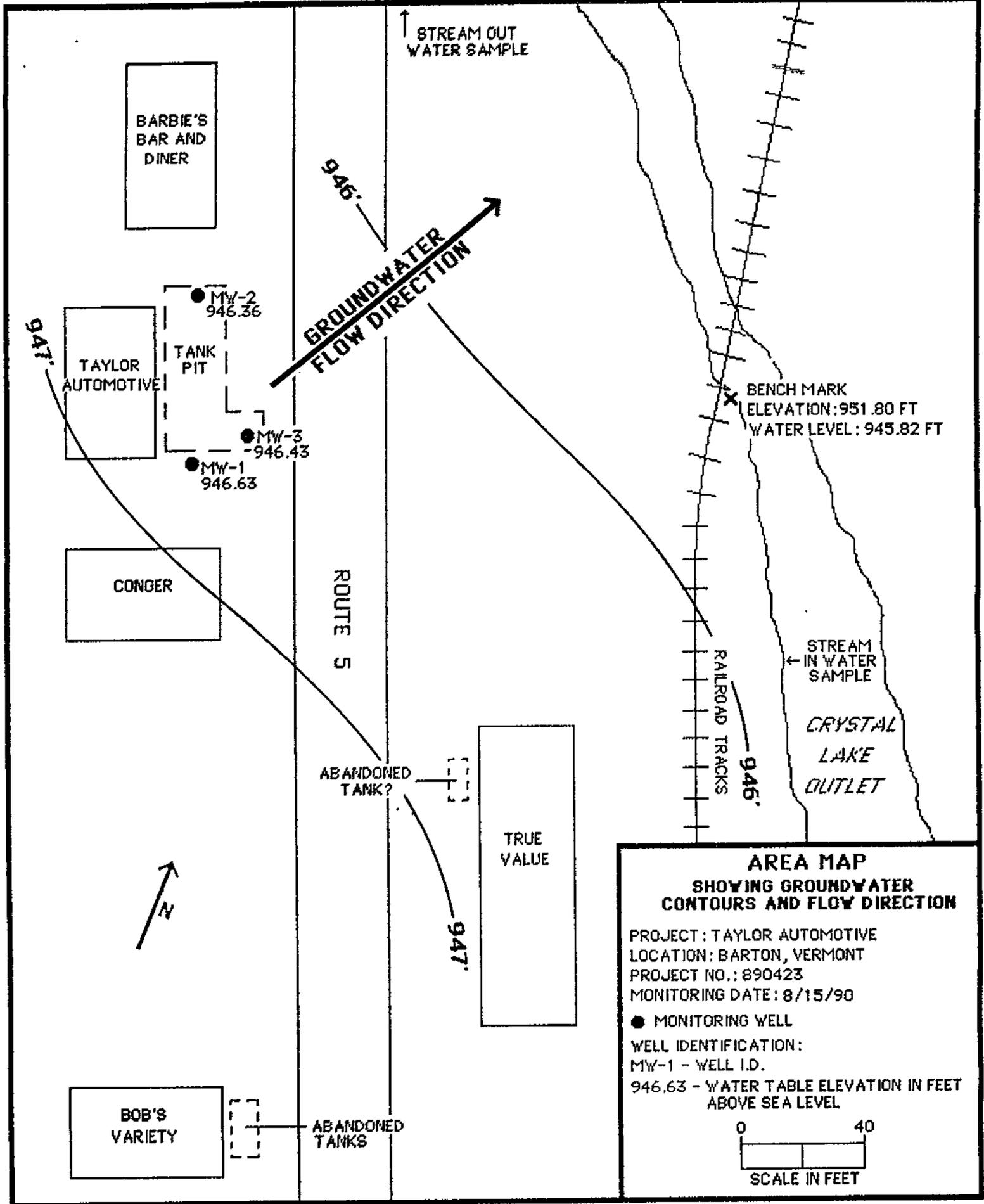
5. Aside from the outlet of Crystal Lake, there are no other likely receptors of the contamination at this point. All buildings in the area are served by the municipal water system and there are no buildings directly downgradient of the site.
6. Over time, the natural processes of dilution, dispersion and degradation of the contamination should result in the total elimination of adsorbed and dissolved hydrocarbons in the vicinity of the Taylor Automotive, assuming there are no further releases of petroleum to the subsurface.

## 5.0 RECOMMENDATIONS

1. Due to the lack of significant concentrations of dissolved petroleum contamination in the vicinity of Taylor Automotive, Griffin International recommends that no further investigation or monitoring of the site by consultants need be conducted. We do recommend, however, that to adequately monitor the natural reduction in contamination levels, water in the monitoring wells should be visually inspected on a regular basis for obvious contamination such as sheens, odors and free floating product. This monitoring can be performed by Taylor Automotive employees using a clear bailer. All observations should be recorded in a log which can be presented to the D.E.C. for verification.

APPENDIX A:

Area Map



**AREA MAP**  
**SHOWING GROUNDWATER**  
**CONTOURS AND FLOW DIRECTION**  
 PROJECT: TAYLOR AUTOMOTIVE  
 LOCATION: BARTON, VERMONT  
 PROJECT NO.: 890423  
 MONITORING DATE: 8/15/90  
 ● MONITORING WELL  
 WELL IDENTIFICATION:  
 MW-1 - WELL I.D.  
 946.63 - WATER TABLE ELEVATION IN FEET  
 ABOVE SEA LEVEL  
 0 40  
 SCALE IN FEET

APPENDIX B:  
Laboratory Results

RECEIVED AUG 28 1990



**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Taylor Automotive  
REPORT DATE: August 28, 1990 ANALYSIS DATE: August 27, 1990  
SAMPLER: Don Tourangeau STATION: MW-1  
DATE SAMPLED: August 15, 1990 REF.#: 13,899  
DATE RECEIVED: August 16, 1990 TIME SAMPLED: 14:39

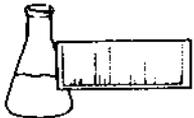
<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Sharon M. Grandage



**ENDYNE, INC.**

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32 James Brown Drive  
Williston, Vermont 05495  
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FAX 879-7103

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Taylor Automotive  
REPORT DATE: August 28, 1990      ANALYSIS DATE: August 27, 1990  
SAMPLER: Don Tourangeau      STATION: MW-2  
DATE SAMPLED: August 15, 1990      REF.#: 13,900  
DATE RECEIVED: August 16, 1990      TIME SAMPLED: 15:08

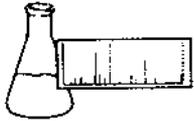
<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M. Henschel



**ENDYNE, INC.**

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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Taylor Automotive  
REPORT DATE: August 28, 1990      ANALYSIS DATE: August 27, 1990  
SAMPLER: Don Tourangeau              STATION: MW-3  
DATE SAMPLED: August 15, 1990      REF.#: 13,901  
DATE RECEIVED: August 16, 1990      TIME SAMPLED: 14:53

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	1.87
Xylenes	6.22
MTBE	48.9

NUMBER OF UNIDENTIFIED PEAKS FOUND: 6

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M. Hendrick



**ENDYNE, INC.**

Laboratory Services

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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Taylor Automotive  
REPORT DATE: August 28, 1990      ANALYSIS DATE: August 27, 1990  
SAMPLER: Don Tourangeau      STATION: Stream In  
DATE SAMPLED: August 15, 1990      REF.#: 13,902  
DATE RECEIVED: August 16, 1990      TIME SAMPLED: 15:24

<u>Parameter</u>	<u>Concentration (ug/L)</u> <sup>1</sup>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M. Hendrick



**ENDYNE, INC.**

Laboratory Services

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Williston, Vermont 05495  
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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Taylor Automotive  
REPORT DATE: August 28, 1990      ANALYSIS DATE: August 27, 1990  
SAMPLER: Don Tourangeau      STATION: Stream Out  
DATE SAMPLED: August 15, 1990      REF.#: 13,903  
DATE RECEIVED: August 16, 1990      TIME SAMPLED: 15:30

<u>Parameter</u>	<u>Concentration (ug/L)<sup>1</sup></u>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M. Hendole



**ENDYNE, INC.**

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Williston, Vermont 05495  
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FAX 879-7103

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Taylor Automotive  
REPORT DATE: August 28, 1990      ANALYSIS DATE: August 27, 1990  
SAMPLER: Don Tourangeau      STATION: Field Blank  
DATE SAMPLED: August 15, 1990      REF.#: 13,904  
DATE RECEIVED: August 16, 1990      TIME SAMPLED: 15:45

<u>Parameter</u>	<u>Concentration (ug/L)<sup>1</sup></u>
Benzene	ND <sup>2</sup>
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
MTBE	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

- 1 Method 602 detection limit is 1 ug/L
- 2 None detected

Reviewed by Suzanne M. Klencke