PHASE II REPORT ATEC
3/18/91 LOT ONE AVANTI

3-18-91

INITIAL PHASE II FINAL REPORT
LOT ONE STUDEBAKER CORRIDOR
SOUTH BEND, INDIANA
ATEC PROJECT NUMBERS 21-07458,
21-07460, AND 21-07461

MR. K.C. POCIUS
DEPARTMENT OF ECONOMIC DEVELOPMENT
COUNTY CITY BUILDING
SOUTH BEND, IN 46601

ATEC Environmental Consultants
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March 18, 1991

Mr. K.C. Pocius
Department of Economic Development
County City Building
South Bend, IN 46601

Re: Initial Phase II Environmental Site Assessment Final Report
Groundwater Monitoring, Underground Storage Tanks,
Soil Sampling and Testing, and Interior Inspection
Lot One Studebaker Corridor
Former Avanti Plant Site
South Bend, Indiana
ATEC Project Numbers 21-07458, 21-07460, and 21-07461

Dear Mr. Pocius:

ATEC Environmental Consultants (ATEC) has completed an initial groundwater and soil sampling and testing study, and a visual interior inspection at the subject property referenced above. The objective of this project was to determine if contamination or other environmental concerns may be present at the project site. ATEC report Number 21-17060 is included as Appendix F and includes analytical data from second round groundwater samples at Lot One. The following report provides information obtained as a result of work performed during this study.

We trust this submittal is responsive to your needs. If you have any questions or comments regarding this report, or if we can be of any further service to you in the future, please do not hesitate to contact us.

Very truly yours,
ATEC Associates, Inc.

Andrew D. Trowbridge /for
Kurtis H. Gilliam
Staff Environmental Scientist

Matthew C. Stokes
Matthew C. Stokes, C.H.M.M.
Project Manager/Environmental Scientist

MCS/ca

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EXECUTIVE SUMMARY

Upon review of groundwater analytical results as shown in Table 4, a total of three (3) monitoring well locations revealed VOC concentrations above detection limits for certain chlorinated hydrocarbons.

Groundwater sample MW-2 showed 37 ppb Trans-1,2-Dichloroethene (DCE), 10 ppb Tetrachloroethene (PCE), and detected Trichloroethene (TCE) below the quantitation limit of 5 ppb. The groundwater sample from MW-3 revealed 1,1,1-Trichloroethane (TCA) at 10 ppb and detected Trans-1,2-Dichloroethene below the quantitation limit of 5 ppb. Groundwater sample MW-4 showed only that Tetrachloroethene was detected below quantitation limits of 5 ppb.

In downgradient groundwater sample MW-2, PCE and vinyl chloride were detected above the action levels. The action levels are based on the Maximum Contaminant Level (MCL) for drinking water sources. Analytical results from both rounds of groundwater samples collected show similar results regarding the presence of low concentrations of volatile constituents. In each case, monitoring well location MW-2 revealed concentrations of volatile compounds above the MCLs for drinking water for certain contaminants. Verification of groundwater flow direction indicate this well is at a downgradient location with respect to Lot One.

ATEC recommends that this information be provided to Indiana Department of Environmental Management (IDEM) due to the Avanti site being listed as a CERCLIS site by the IDEM and the confirmed presence of low concentrations of contamination in the groundwater. ATEC's recommendation to the IDEM is to perform an initial risk assessment to determine possible impact of groundwater users in the area. The groundwater sources used as drinking water supplies may or may not be hydrogeologically interconnected with the aquifer sampled through these monitoring wells. Demonstration of low possible impact of downgradient receptors and further verification of possible off-site sources may act to decrease concerns that this site could be adversely affecting drinking water supplies. It should be noted that TCA and PCE were detected in groundwater samples collected at a location on Lot One through a study conducted by EIS Environmental Engineers, Inc. of South Bend, Indiana. The client provided ATEC data concerning this matter.

With regard to test results collected from soil borings B-1 through B-5, no concentrations of Total Petroleum Hydrocarbons (TPH) were detected. These borings were located near two (2) USTs at the west side of the Avanti building. Based on the lack of TPH detected in these borings, gross contamination was not discovered as a result of these USTs. It should be noted that one (1) UST is also located at the southeast corner of the Avanti building. The exact location of this UST could not be confirmed. Also, electrical overhead lines cross this immediate area. ATEC was unable to place any drill borings near this UST.

All three (3) USTs have been out of service for more than 12 months and have not been closed per industry standards based on information obtained to date, therefore exceed temporary closure requirements. As a result of this and based on the Code of Federal

Regulation (CFR) Part 280 for Underground Storage Tanks, the owner and operators of this property are required to permanently close each UST system per the regulatory standards. ATEC recommends that closure be performed to include complete removal of these USTs from the subsurface. Upon request, ATEC can provide you with a full description of closure activities and associated costs.

In general, debris, scrap material, machinery, and equipment do not present substantial environmental concerns requiring special action. It is recommended that these items be removed from the facility to prevent any contamination. For example, equipment and machinery should be removed in a manner to prevent leakage of hydraulic fluids or oils and gasoline.

Concerning liquid materials identified in drums or smaller containers, ATEC recommends that proper care be taken in choosing remedial procedures. Liquid chemicals should be removed and disposed of off-site in accordance with applicable regulations. Upon request, ATEC can provide you with a full description of removal, transportation and disposal procedures, and associated costs.

INITIAL PHASE II ENVIRONMENTAL SITE ASSESSMENT FINAL REPORT GROUNDWATER MONITORING, SOIL SAMPLING AND TESTING, AND INTERIOR INSPECTION

Lot One Studebaker Corridor
Former Avanti Plant Site
South Bend, Indiana
ATEC Project Numbers 21-07458, 21-04760, and 21-07461

1.0 INTRODUCTION

ATEC Environmental Consultants (ATEC) was retained by the South Bend Department of Economic Development (ATEC Proposal Number PE-90607, PE-90609A, and PE-90609B) to conduct a subsurface investigation at the above site as shown in Figure 1. The scope of this project included placement of four (4) monitoring wells, one (1) hydraulically upgradient and three (3) hydraulically downgradient. In addition, five (5) soil borings were advanced at locations within proximity of two (2) underground storage tanks (USTs).

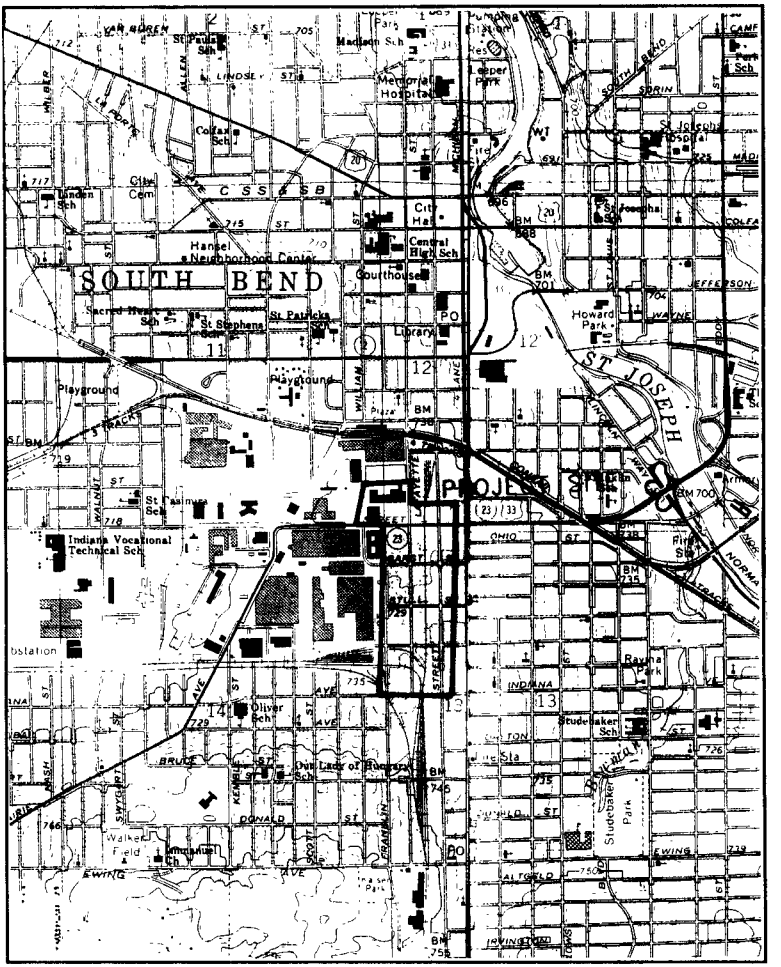
A total of five (5) water samples and nine (9) soil samples were collected, preserved, and transported to the ATEC laboratory in Indianapolis, Indiana for subsequent analysis. Also as part of this study for work conducted at the Avanti plant, an interior examination of the existing structure was made to inspect for possible environmental concerns.

2.0 SITE AND REGIONAL CHARACTERISTICS

2.1 Site History

The Avanti plant site is located at 765 South Lafayette Street on the northwest corner of Sample Street and South Lafayette Street, in Portage Township, South Bend, Indiana. The immediate area is primarily industrial and commercial with residential to the south. The project site boundary and associated buildings are illustrated in Figure 2.

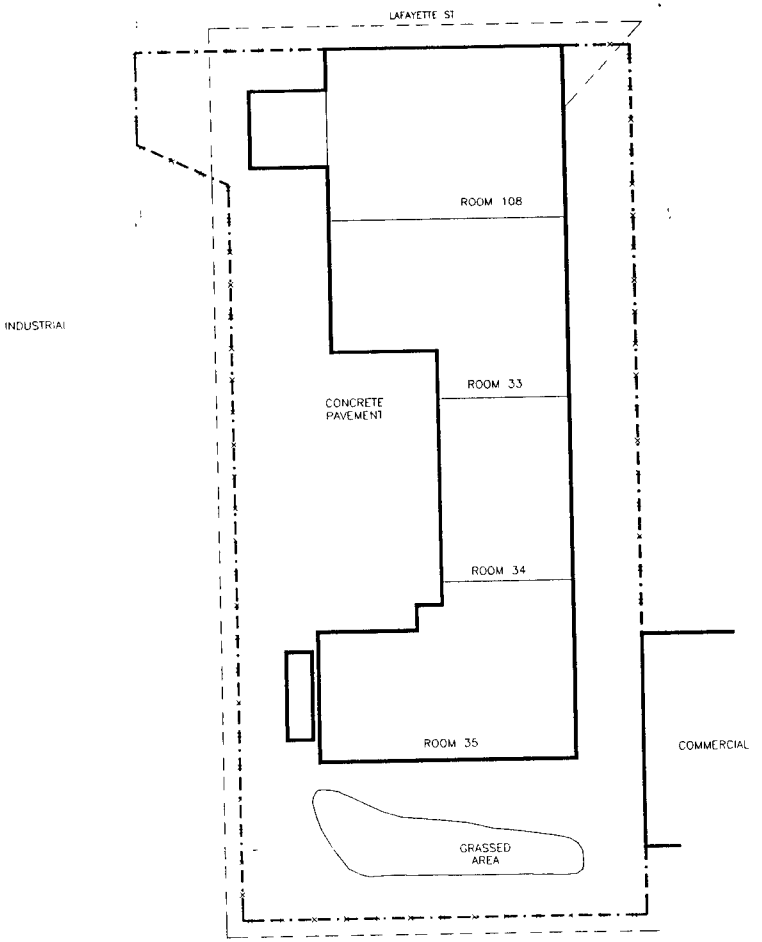
Review of written documents and maps, aerial photographs, and interviews with personnel associated with Studebaker history was conducted during the interim Phase I environmental site assessment (ATEC Project Number 21-07262). Based on this



VICINITY MAP
STUDEBAKER CORRIDOR PROJECT
SOUTH BEND , IN

PROJECT NO.	21-07458.61
SCALE	1" = 20
FIGURE NO.	1

ATEC



LEGEND

FENCE

OVERHEAD POWER

SITE BOUNDRY

SITE PLAN
STUDEBAKER CORRIDOR PROJECT
LOT #1
SOUTH BEND, IN

PROJECT NO
21-07458/61

SCALE
1" = 100'

FIGURE NO
2

ATEC

information, the study site was developed into a wagon manufacturing plant by two (2) Studebaker brothers from vacant land in the late 1800's. During the early 1900's the facility was converted to automotive manufacturing as part of the Studebaker complex located in South Bend, Indiana.

The facility continued to function as an automotive manufacturing facility through the mid 1900's with the addition of Room 108 shown in Figure 2 added in 1942. The Avanti automobile manufacturing initiated operations in the 1960's and continued until 1988. Operations of the Avanti manufacturing were sporadic between 1986 and 1988. No manufacturing operations were on-going at the time of this investigation, however Room 108 was used for storage of some automobiles and parts.

2.2 Physical Characteristics

The site has a level topography with an elevation of approximately 725 ft above mean sea level (MSL), based on information provided by the South Bend West, Indiana 7.5 Minute Quadrangle published by the U.S. Geological Survey in 1969 (Photo Revised in 1986). Regional topography slopes gently to the northeast toward the St. Joseph River.

Jefferson Avenue at the St. Joseph River has an elevation of 701 ft MSL. The river flows from southeast to southwest and is located approximately 3/4 mile northeast of the project site. Drainage at the site is controlled by infiltration in open and grassed areas and by gutters and curbing.

Construction, grading, and filling have altered the original surface soil characteristics at most of the study site. The U.S. Department of Agriculture Soil Survey for St. Joseph County, Indiana classifies the soil as Urban-land-fox complex. The boring logs compiled by the ATEC field geologists during the on-site drilling activities indicate the subsoil at the site is predominantly silty with fine to coarse sand throughout. A copy of each boring log is provided in Appendix A.

Groundwater depth in the monitoring wells ranged from 24.61 ft to 23.21 ft below ground surface. The boring logs in Appendix A provide the water level in each well. After completion of the monitoring well installation and sampling, the top of the casing from each monitoring well was surveyed to determine the direction of groundwater flow. Table 1 provides data on groundwater elevation for each well using an arbitrary benchmark of 100 ft MSL located at the site. Figure 3 illustrates monitoring well locations and the potentiometric surface of the groundwater based on data shown in Table 1. As shown, the groundwater elevation decreases across the site from southwest to northeast. This indicates that groundwater flow direction is generally to the northeast toward the St. Joseph River.

Table 1
Groundwater Elevations

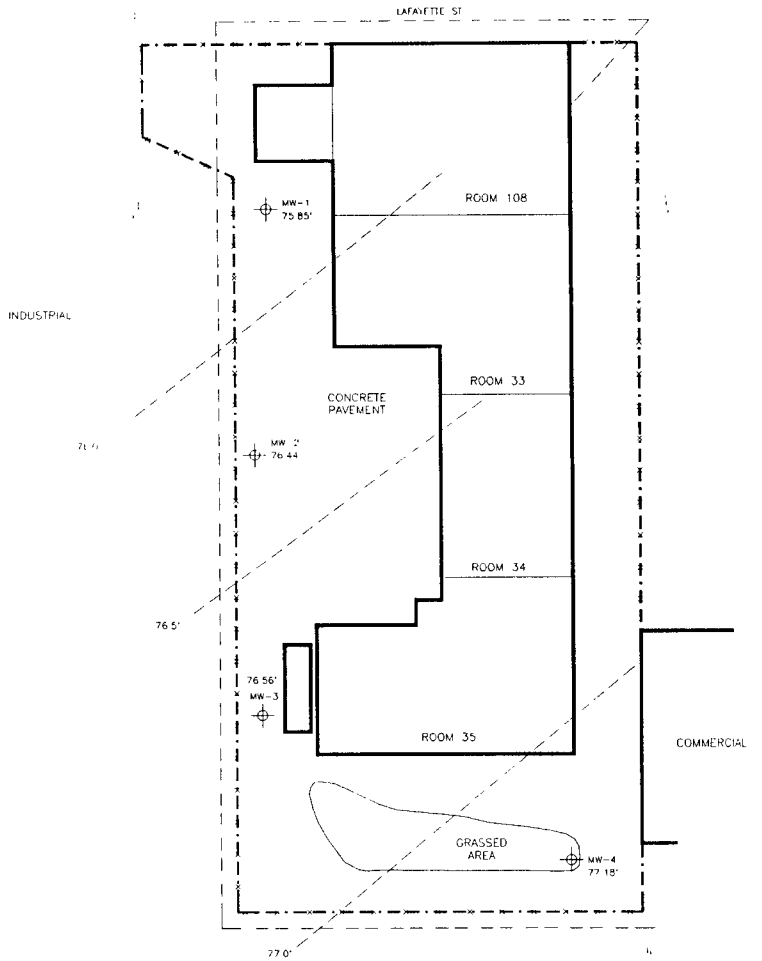
Monitoring Well Location	Elevation*
MW-1	75.85
MW-2	76.44
MW-3	76.56
MW-4	77.18

*Groundwater elevation in ft based on an arbitrary benchmark of 100 ft

2.3 Regulatory Review

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) was enacted to clean up orphan hazardous waste dump sites as well as attempting to cover compensation for environmental and public health damages and to assist in assessing liability.

The Comprehensive Environmental Response, Compensation and Liability Inventory System (CERCLIS) is a list of sites to be investigated and assessed for possible inclusion on the National Priorities List (NPL) established by the Environmental Protection Agency (EPA) Superfund program. Once a site is placed on the CERCLIS List a series of investigations is conducted to determine the extent of contamination at the site. Once these investigations are complete, a score or rank is assigned to the



LEGEND

MONITORING WELL

GROUNDWATER ISOPLETH (FT)

FENCE

OVERHEAD POWER

SITE BOUNDRY

MONITORING WELL LOCATIONS
STUDEBAKER CORRIDOR PROJECT
LOT #1
SOUTH BEND, IN

PROJECT NO.
21-07458/61

SCALE
1" = 100'

FIGURE NO.
3

ATEC

site. The high ranking sites are subject to inclusion on the NPL. The low ranked sites or those deemed no immediate concern remain on the CERCLIS List.

ATEC has reviewed records located at the Indiana Department of Environmental Management (IDEM) in the Office of Solid and Hazardous Waste Management (OSHWM) concerning the regulatory status of the Avanti facility. The Avanti site is listed as a CERCLIS site based on an IDEM report dated March, 1990. At that time, an EPA identification number was not assigned to this facility.

Also, based on a report from the IDEM Commissioners Office dated December 10, 1990, the IDEM has re-evaluated many CERCLIS sites through the state of which the Avanti site was included. The IDEM generated a score of 27.6 based on the new CERCLIS site scoring methods and procedures. A copy of this procedure and a listing of the CERCLIS sites scored is found in Appendix B.

3.0 GROUNDWATER MONITORING PROGRAM

3.1 Work Performed

On November 26 and 28, 1990, ATEC personnel from the Indianapolis Drilling and Consulting Divisions performed a subsurface investigation consisting of the installation of four (4) monitoring wells. The purpose of the investigation was to collect samples to determine if previous activities at the site adversely impacted the quality of soil or groundwater. Photographic documentation of drilling activities can be found in Appendix C.

ATEC advanced all borings using a truck-mounted rotary drill rig equipped with 3-3/8 in. diameter hollow stem augers. Soil samples were collected at 2.5 ft intervals using a decontaminated carbon steel split-spoon sampler to the base of the wells. Each split-spoon sample was physically inspected by the field geologist for signs of contamination such as staining or hydrocarbon odors. The samples were also field screened for Total Flame-ionizable Vapors (TFVs) with a Porta FID II. The Porta FID detects TFVs emitted from the soil in parts per million (ppm). The operating procedures regarding the Porta FID are provided in Appendix D. All pertinent

information collected by the geologist for each boring including soil classification, physical observations, and TFV readings were recorded on the ATEC boring logs in Appendix A.

One (1) soil sample exhibiting the highest potential for contamination based on visual observations and field screening was collected from each monitoring well for Volatile Organic Compounds (VOCs) and total heavy metals analysis. ATEC considered MW-4 an upgradient well and therefore, the soil from this boring was assumed to be representative of background conditions. All four (4) soil samples were collected, preserved, and transported to ATEC's laboratory in Indianapolis, Indiana for analysis following all chain-of-custody procedures.

During the drilling of each boring, water was noted on the drilling rods at a depth between 22.5 ft and 25.0 ft. Each boring was advanced to 7.0 ft below groundwater for well installation. ATEC's standard well construction consists of a 7.0 ft length of 2 in. diameter PVC slot screen extending below the groundwater surface and 3.0 ft of screen above to allow for seasonal fluctuations in the water table. The boring annulus was filled by naturally occurring sand and by adding silica sand where needed. A bentonite seal was placed above the sand pack to prevent vertical migration of surface water into the well. The remaining annular space was grouted and the wells completed and secured with either a flush-mounted manhole cover or a protective cover stick-up. The wells were developed by over pumping to cleanse the well screen of fine-grained material and ensure good hydraulic conductivity with the surrounding aquifer. Complete well construction details are provided in Appendix A.

On November 30, 1990, groundwater samples were collected from the four (4) monitoring wells. Before obtaining the samples, each well was purged of a minimum of three (3) well volumes to ensure a representative groundwater sample. A Teflon bailer with polypropylene rope was utilized for purging and the collection of the samples. Between monitoring well samples, the bailer was decontaminated with an on-site tap water and Premier detergent wash, a tap water rinse, followed by a triple distilled water rinse. The groundwater samples collected were analyzed for VOCs and

total heavy metal. All four (4) groundwater samples were collected, preserved, and transported to the ATEC laboratory following appropriate chain-of-custody procedures.

On November 29, 1990, the four (4) monitoring wells were surveyed. The top of the casing of each well was surveyed into an arbitrary benchmark with an assigned elevation of 100.0 ft. The groundwater elevations collected on November 30, 1990, using a Solinist water level indicator, were used in conjunction with the survey data to determine water table elevations. A groundwater table map, including flow direction, is shown in Figure 3, as discussed in Section 2.2 of this report.

3.2 Analytical Results

A total of four (4) soil and four (4) groundwater samples were collected from the Avanti site and submitted to the ATEC laboratory for analysis. Each soil and groundwater sample submitted to the laboratory was tested for Total Heavy Metals (THMs) and Volatile Organic Compounds (VOCs). THM analysis includes testing for total arsenic, barium, cadmium, lead, mercury, selenium, and silver. Analysis for VOCs includes testing for a total of thirty-five (35) various organic compounds including certain petroleum constituents and several chlorinated hydrocarbons. Complete documentation of laboratory analytical reports is provided in Appendix E.

Soil metals were analyzed on a Perkin-Elmer 5100 Atomic Absorption Spectrophotometer according to the 7000 Series of the methods outlined in SW 846 and a Thermo Jarrell Ash ICAP-61 according to SW 846 Method 6010. Groundwater metals were analyzed on a Perkin-Elmer 5100 Atomic Absorption Spectrophotometer and a Thermo Jarrell Ash ICAP-61 according to EPA-600/4-79-020 Method 200.

The soil volatile samples were analyzed on a Finnigan 1020 OWA GC/MS/DS System, complete with Superincos Software, via SW 846 Method 8240 for Purgeable Organic Compounds. The groundwater volatile samples were analyzed on a Finnigan Incos 50 GC/MS/DS System, complete with Superincos Software, via U.S. EPA Method 624 for Purgeable Organic Compounds. Prior to soil or groundwater analysis,

the system was tuned against Bromofluorobenzene and calibrated with the appropriate standard.

3.2.1 Soil Analysis

Total heavy metals analysis of soils samples revealed three (3) metals (barium, chromium, and lead) detected at concentrations above quantitation limits. The quantitation limit is the minimum concentration in which the laboratory instrument can assign a value for each individual test performed. As shown below, Table 2 summarizes test results of soil samples collected from monitoring well (MW) locations and the depth from which each soil sample was collected.

Table 2
Total Heavy Metals (THMs) in Soils

Sample Location	Barium	Chromium	Lead	Depth (ft)
MW-1	6.1	4.1	3.5	23.5 - 25.0
MW-2	4.4	4.7	2.2	23.5 - 25.0
MW-3	6.7	5.2	2.6	23.5 - 25.0
MW-4	3.7	5.8	2.9	21.0 - 22.5
Quantitation Limit	2.0	2.0	2.0	
Evaluation Criteria	117	13	30	

All test results are reported as parts per million (ppm).
PPM is equivalent to milligrams per kilogram (mg/kg) in soils and milligram per liter (mg/L) in water

Volatile Organic Compounds (VOCs) analysis of soils detected VOC constituents at sample locations MW-2 and MW-4. A summary of these test results is provided in Table 3.

The client should note that methylene chloride is reported as being detected in many samples. Methylene chloride as well as acetone and toluene are used as laboratory extraction solvents for various organic analyses. Although the extraction and preparation processes are all performed by trained personnel in separate rooms under a vented fumehood, some vapors escape and are released into the laboratory

atmosphere. The release of these vapors into the laboratory atmosphere is basically a random process dependent upon daily usage and the care and diligence of laboratory personnel involved in handling the solvents. Once these compounds are released into the atmosphere they can contaminate any sample once it is removed from the sample container and exposed to the atmosphere. Given the extreme sensitivity of the analytical instrumentation, these compounds are often detected in low levels in environmental samples. The U.S. EPA[1] recognizes concentrations of these contaminants up to five (5) times the quantitation limit as laboratory artifacts. The quantitation limit for methylene chloride in these sample tests is 5 ppm. Therefore, ATEC believes these concentrations are a result of laboratory artifacts and not due to on-site activities. All VOCs detected in soils are shown in Table 3 with the exception of methylene chloride.

Table 3
Volatile Organic Compounds (VOCs) in Soils
Monitoring Well Sample Locations

Constituent	Sample Locations			
	MW-1	MW-2	MW-3	MW-4
1,1,1-Trichloroethane	ND	<5*	ND	<5*

ND = Constituent not detected
* = Constituent detected but concentration present is less than quantitation limit
All results reported in ppm

3.2.2 Groundwater Analysis

Analytical results for Total Heavy Metals show that one (1) constituent (barium) was detected above quantitation limits at three (3) sample locations. Sample Location MW-2 contained 0.059 ppm, MW-3 contained 0.055 ppm, and MW-4 contained 0.064 ppm of barium. The MW-1 soil sample did not show any concentrations for THMs above quantitation limits.

[1]Verbal statement made by the U.S. EPA to ATEC at a pre-bid conference, September, 1988.

The VOC analyses are summarized in Table 4 for groundwater samples. All VOCs detected are shown in Table 4 with the exception of methylene chloride. ATEC believes that this compound is introduced during laboratory analysis as explained in Section 3.2.1. Complete documentation of laboratory reports can be found in Appendix E.

Table 4
Volatile Organic Compounds in Groundwater
Monitoring Well Sample Locations

Constituent	Sample Locations				
	MW-1	MW-2	MW-3	MW-4	Evaluation Criteria
Trans-1,2-Dichloroethene	ND	37	<5*	ND	100**
1,1,1-Trichloroethane (TCA)	ND	ND	10	ND	200
Trichloroethene (TCE)	ND	<5*	ND	ND	5
Tetrachloroethene (PCE)	ND	10	ND	<5*	5

* = Constituent detected but concentration present is less than quantitation limit
** = Represents proposed Maximum Contaminant Level (MCL)
ND = Constituent not detected
All results reported in parts per billion (ppb)
This is equivalent to micrograms per liter (mg/L) in water

3.3 Evaluation Criteria

3.3.1 Soil

Total heavy metals occur naturally in soils and geologic formations. Acceptable background concentrations of total metals in soils are provided by the U.S. Geological Survey (USGS). The source used by ATEC for this project is the USGS professional paper 1270, by Shacklette and Boerngen. Acceptable concentrations are determined by using statistical methods on data from multiple sampling points. The acceptable background concentrations for various metals are calculated and provided in the USGS paper. The actual background concentrations are then calculated by adding the mean of the sample concentration to three (3) times the standard deviation of the sample concentrations. The calculated sample values and acceptable

concentrations are shown in Table 5. In each case, the sample values are below the acceptable concentrations. Therefore, it is assumed that actual total metals concentrations found in samples collected during this report are within acceptable background ranges.

Table 5
Total Metals Calculated Values and Evaluation Criteria for Soils

	Barium	Chromium	Lead
Sample Concentrations*	9.45	7.12	4.44
Acceptable Concentrations*	297.00	33.00	14.00

*Values calculated by adding mean to 3 times standard deviation

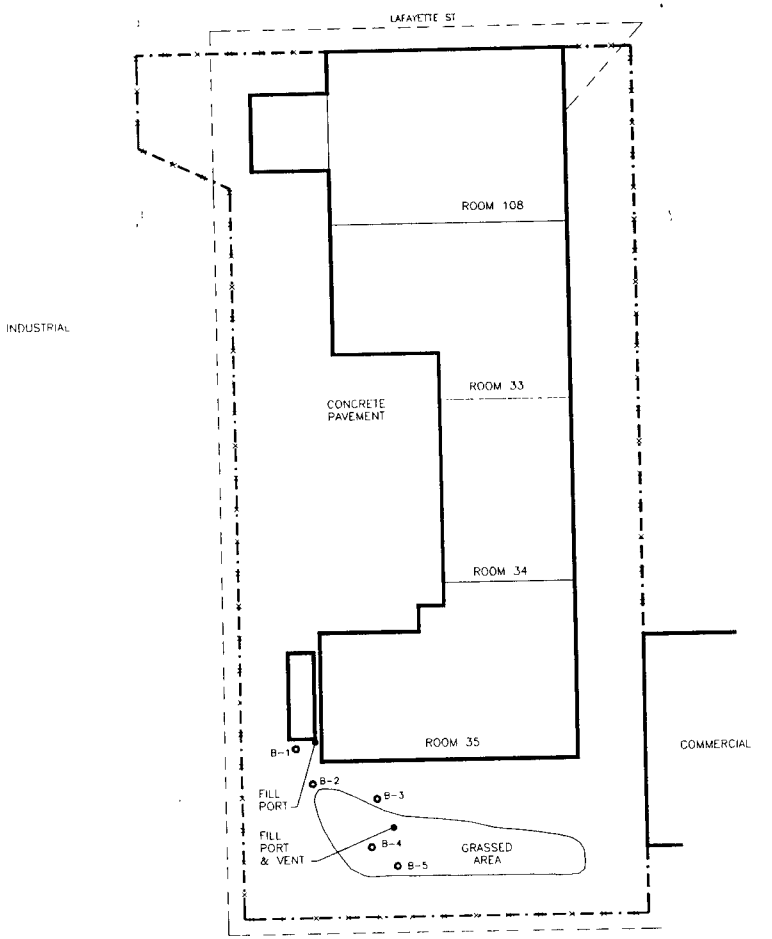
Soil VOC evaluation criteria used in this report are based on the proposed concentrations requiring corrective action at solid waste management units (Federal Register/Vol. 55, No. 145/Friday, July 27, 1990). As shown in Table 3, VOCs detected in soils are below both the quantitation and action levels.

3.3.2 Groundwater

The Maximum Contaminant Level (MCL) of a particular substance represents the maximum permissible level of a contaminant in the drinking water which is delivered to the consumers' tap and used by the general public for drinking. MCLs are legally enforceable and are used as the evaluation criteria of the groundwater analysis for this project. The MCLs for the VOCs detected in the groundwater are provided in Table 4. Only barium was detected above the quantitation limit in any groundwater sample. The MCL for barium is 5.0 mg/L.

4.0 SOILS SAMPLING AND TESTING

Soil borings were advanced at five (5) locations near two (2) underground storage tanks (USTs) as illustrated in Figure 4. The presence of these USTs was based on visual indications such as fill ports and vent pipe, however, the exact location of these USTs is unknown. The borings were placed as close to these USTs as possible to determine if gross contamination may have resulted from past use of these USTs.



LEGEND

BORING

FENCE

OVERHEAD POWER

SITE BOUNDRY

BORING PLAN
STUDEBAKER CORRIDOR PROJECT
LOT #1
SOUTH BEND, IN

PROJECT NO.
21-07458/61

SCALE
1" = 100'

FIGURE NO
4

ATEC

4.1 Work Performed

On November 29, 1990, ATEC personnel from the Environmental and Drilling Divisions arrived on-site to perform a subsurface investigation around the USTs on-site. The objective of the investigation was to determine if soil contamination was present as a result of former USTs located on the site. Photographic documentation of these drilling activities can be found in Appendix C.

ATEC utilized a truck-mounted rotary drill rig equipped with 3-3/8 in. I.D. hollow stem augers. Three (3) borings, designated B-1 through B-3, were advanced to a depth of 15.0 ft, and two (2) borings, designated B-4 and B-5, were advanced to a depth of 25.0 ft. Soil samples from borings B-1 through B-3 were collected at 2.5 ft intervals using a carbon steel split-spoon sampler. Soil samples from borings B-4 and B-5 were collected at 5.0 ft intervals to a depth of 18.5 ft and at 2.5 ft intervals to groundwater. The boring locations are shown in Figure 4.

During drilling operations, decontamination procedures were performed on the split-spoon samplers and the auger head (drill bit). Between each sample collection and each boring the split-spoon and auger head, respectively, were decontaminated using tap water and concentrated detergent. All visible soils adhering to the equipment were removed and a tap water and final distilled water rinse was performed.

The soil from each split-spoon sampler was visually inspected by an ATEC geologist for indications of contamination (i.e., staining and odor). The lithology of the soil in each boring was classified by the field geologist utilizing the Unified Soil Classification System (USCS). The samples from each interval were monitored for Total Flame-ionizable Vapors (TFVs) utilizing a Porta-FID II and readings were recorded in parts per million (ppm). A description of the Porta-FID and the procedures used in this investigation are provided in Appendix D. All information concerning the borings was recorded on an ATEC boring log. Complete boring logs are provided in Appendix A.

The soil sample exhibiting the highest TFV reading or most potential for contamination was placed into a sample jar for laboratory analysis. All appropriate chain-of-custody procedures were followed in the transportation of the samples to ATEC's laboratory in Indianapolis, Indiana.

4.2 Analytical Results

A total of five (5) soil samples (identified B-1 through B-5) were collected from the Avanti site for analysis. Each of the five (5) soil samples were tested for Total Petroleum Hydrocarbons (TPH) based on the suspected contents and use of the USTs containing or having contained petroleum products. Complete documentation of laboratory analysis is provided in Appendix E.

Total hydrocarbons analyses were performed on a Perkin-Elmer 727B Infrared Spectrophotometer according to EPA-600/4-79-020 Method 418.1.

Soil samples from locations B-1, B-2, and B-3 were collected at a depth ranging from 13.5 to 15.0 ft. Sandy soils were encountered during drilling which indicates increased vertical movement of contaminants is possible. Based on this, soil samples from locations B-4 and B-5 were collected at a depth ranging from 21.0 to 22.5 ft.

Concerning analytical laboratory results obtained from each soil boring sample submitted for TPH, no sample revealed concentrations above the quantitation limit of 1.0 ppm. Based on this information, it is not believed that gross contamination has resulted from the past use of these USTs.

5.0 INTERIOR VISUAL INSPECTION

On November 27, 1990, a visual inspection and walk-through was conducted by Matt Stokes, Project Environmental Scientist and Chuck Cashman, ATEC Environmental Geologist. This inspection included an examination of the interior structure at the Avanti location.

The site consists of a former automobile manufacturing facility with one (1) structure on approximately 5 acres. The structure consists of a 4-story brick building with concrete floors on the main level and hardwood floors on each upper level. The structure was divided into four (4) rooms on the main level and three (3) rooms each on the upper levels. Room 108 at the east end of the structure was added on after original construction and only occupies the main level.

Generally, all rooms have been cleared of machinery, equipment, and debris sometime prior to this inspection with some exceptions. Lighting was very poor due to lack of interior lights and inclement weather. The majority of the visual inspection was made using hand-held flashlights and lighting from windows. Also during this interior inspection, heavy rains were on-going and due to apparent roof damage or deterioration, severe leaking was occurring through all three (3) upper levels to the main level. Wet floors and standing water were prevalent throughout the structure.

It should be noted that an asbestos sampling and testing program was performed and will be submitted to you by ATEC's Industrial Hygiene Division under separate cover.

5.1 Main Level

5.1.1 Room 108

This room is located at the east end of the structure and is currently used for storage of some automobiles and parts. The southeast portion of this room consisted of the office/showroom area. No visual signs of environmental concerns were noted in this area.

The north portion of this room was apparently used for automotive repair and painting. Three (3) below grade sumps were discovered in this area. One (1) small sump was 6.0 ft long by 6.0 ft wide with approximately 3.0 ft of waste oil at the base of the sump. The two (2) large sumps were 12.0 ft long by 12.0 ft wide with approximately 1.0 ft of an oil/water mixture. Photographic documentation of this area can be found in Appendix C.

A paint booth located immediately west of these large sumps had an associated sump or basin which was covered with wood and filled with plastic sheeting and some liquid. At this time, the contents and depth of this sump could not be determined. The size of this sump was approximately 6.0 ft by 4.0 ft long. Photographic documentation of these sumps is provided in Appendix C.

The west portion of this room consisted of a drive-through car wash booth. Immediately south of this, several automobiles were being stored. In general, some debris and a large sign was noted in this same area. Minor staining of floors was noted due to normal automotive leakage.

5.1.2 Room 33

Based on visual inspection, only debris such as scrap wood and boxes were remaining in this room on the main level. It should be noted that a capped metal riser approximately 3 in. in diameter is located along the north wall near the center of this room. The function of this riser is unknown based on visual inspection.

5.1.3 Room 34

Floors were extremely wet in this area with standing water at the time of the inspection. One (1) large paint booth is located along the south wall of this room near the center. Severe staining was not observed in this area. The north portion of this room consists of numerous partitioned rooms apparently used for painting. In general, this area had been cleaned and no obvious signs of environmental concerns were noted.

5.1.4 Room 35

Located in the center of this room is one (1) large paint booth and adjacent to this is another booth possibly used as a test chamber for parts.

The southeast corner of this room is occupied by an enclosed maintenance room which contained several feed lines possibly for transfer of bulk liquids. It is possible that aboveground storage tanks may have been located in this room at one time.

Along the west wall of Room 35 were approximately fifteen (15) lift trucks and several electrical generators. At the north center part of this room were entrance ways to the stairwell leading to upper levels and a freight elevator.

5.2 Second Level

5.2.1 Room 33

The only items noted in this area were metal racked shelving located at the north portion of this room. Only paper goods with some boxes were stored there. No visual evidence of environmental concerns were noted in this room.

5.2.2 Room 34

A paint booth is located at the north center area of this room. This paint area may have been for smaller parts based on the small entrance way into the paint booth.

5.2.3 Room 35

No visual indications of debris or scrap materials were observed in this room. No evidence of environmental concerns were noted.

5.3 Third Level

5.3.1 Room 33

No visual evidence of debris or scrap materials were observed in this room. No evidence of environmental concerns were noted.

5.3.2 Room 34

One (1) 55-gallon open top drum was located near the center portion of this room. This drum contained some paper scrap, however approximately 1.0 ft of an oily liquid was present in the bottom of the container. No other debris or scrap materials were noted in this area.

5.3.3 Room 35

One (1) 55-gallon open top drum was located toward the south end of this room. A very heavy oily substance along with some debris was observed present in the container.

One (1) large wood crate contained scrap metal parts near the southwest corner of this room. At the north end of this area were several large boxes storing various scrap parts. These boxes covered an area of approximately 20.0 ft by 30.0 ft.

5.4 Fourth Level

5.4.1 Room 33

This room was occupied by a large amount of scrap metals stored in boxes and various machinery located near the east center portion of this room. Most of this machinery and equipment was clean and did not appear to have oils or lubricants associated with them.

5.4.2 Room 34

No visual evidence of debris or scrap materials were observed in this room. No evidence of environmental concerns were noted.

5.4.3 Room 35

One (1) paint booth was noted in this area located at the north end. Various scrap equipment and machines were located throughout the center along the west wall. Also along the west wall were several mechanical hand lift trucks.

The entrance to the elevator shaft is located at the north end of this room near the center. The level at the upper part of the staircase to the elevator shaft contained several small containers of liquid chemicals as shown in the Photographic Documentation in Appendix C.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Groundwater Monitoring Program

Upon review of groundwater analytical results collected in November, 1990, as shown in Table 4, a total of three (3) monitoring well locations revealed VOC concentrations above detection limits for certain chlorinated hydrocarbons. The second round of analysis also showed low concentrations of volatiles in a fourth well at this site.

Groundwater sample MW-2 showed 37 ppb Trans-1,2-Dichloroethene (DCE), 10 ppb Tetrachloroethene (PCE), and detected Trichloroethene (TCE) below the quantitation limit of 5 ppb. The groundwater sample from MW-3 revealed 1,1,1-Trichloroethane (TCA) at 10 ppb and detected Trans-1,2-Dichloroethene below the quantitation limit of 5 ppb. Groundwater sample MW-4 showed only that Tetrachloroethene was detected below quantitation limits of 5 ppb.

The second round of testing showed MW-2 with 18 ppb DCE, 5 ppb PCE, and 33 ppb vinyl chloride. The groundwater sample from MW-3 showed similar concentrations in each sampling event for DCE and TCA with the detection of 1,1-Dichloroethane at less than the quantitation limit. MW-4 revealed the same results in both sampling events. The second round of sampling and testing, however, revealed 8 ppb DCE in the sample from MW-1.

The chlorinated hydrocarbons detected in these samples are not naturally occurring in the environment and are generally present due to manufacturing or other man-made operations. Many organic solvents are used in automotive and various machining industries as degreasers, paint solvents, and cleaners. The compounds TCA, TCE, and PCE are very common solvents used in heavy industry for degreasing and various cleaning operations. The DCE is a chemical degradation product of TCE and generally is found when concentrations of TCE are present. PCE has many uses in industry, one of which includes dry cleaning operations.

Downgradient monitoring well location MW-2 shows concentrations of these solvents at low levels, however the PCE and vinyl chloride is above the action levels of 5 ppb

and 2 ppb, respectively. Sample location MW-3 revealed that TCA was present with this the only sample showing any concentration of this compound. The concentration of TCA is below the action level.

Based on the proximity of monitoring well MW-4 and the groundwater flow direction to the northeast, this location is considered upgradient and contamination from this well might be considered from an off-site source. The detection of PCE at this location may indicate that concentrations in wells further downgradient are also due to off-site sources.

In order to make a preliminary assessment of groundwater conditions and based on economic reasons, the scope of this study was recommended. The groundwater monitoring study conducted during this investigation must be considered an initial assessment of groundwater conditions at this site. Analytical results from both rounds of groundwater samples collected show similar results regarding the presence of low concentrations of volatile constituents. In each case, monitoring well location MW-2 revealed concentrations of volatile compounds above the MCLs for drinking water for certain contaminants. Verification of groundwater flow direction indicate this well is at a downgradient location with respect to Lot One.

ATEC recommends that this information be provided to Indiana Department of Environmental Management (IDEM) due to the Avanti site being listed as a CERCLIS site by the IDEM and the confirmed presence of low concentrations of contamination in the groundwater. ATEC's recommendation to the IDEM is to perform an initial risk assessment to determine possible impact of groundwater users in the area. The groundwater sources used as drinking water supplies may or may not be hydrogeologically interconnected with the aquifer sampled through these monitoring wells. Demonstration of low possible impact of downgradient receptors and further verification of possible off-site sources may act to decrease concerns that this site could be adversely affecting drinking water supplies. It should be noted that TCA and PCE were detected in groundwater samples collected at a location on Lot One through a study conducted by EIS Environmental Engineers, Inc. of South Bend, Indiana. The client provided ATEC data concerning this matter.

6.2 Soil Sampling and Testing

With regard to test results collected from soil borings B-1 through B-5, no concentrations of Total Petroleum Hydrocarbons (TPH) were detected. These borings were located near two (2) USTs at the west side of the Avanti building. Based on the lack of TPH detected in these borings, gross contamination was not discovered as a result of these USTs. It should be noted that one (1) UST is also located at the southeast corner of the Avanti building. The exact location of this UST could not be confirmed. Also, electrical overhead lines cross this immediate area. ATEC was unable to place any drill borings near this UST.

All three (3) USTs have been out of service for more than 12 months and have not been closed per industry standards based on information obtained to date, therefore exceed temporary closure requirements. As a result of this and based on the Code of Federal Regulation (CFR) Part 280 for Underground Storage Tanks, the owner and operators of this property are required to permanently close each UST system per the regulatory standards. ATEC recommends that closure be performed to include complete removal of these USTs from the subsurface. Upon request, ATEC can provide you with a full description of closure activities and associated costs.

6.3 Interior Visual Inspection

In general, debris, scrap material, machinery, and equipment do not present substantial environmental concerns requiring special action. It is recommended that these items be removed from the facility to prevent any contamination. For example, equipment and machinery should be removed in a manner to prevent leakage of hydraulic fluids or oils and gasoline.

Concerning liquid materials identified in drums or smaller containers, ATEC recommends that proper care be taken in choosing remedial procedures. Liquid chemicals should be removed and disposed of off-site in accordance with applicable regulations. Upon request, ATEC can provide you with a full description of removal, transportation and disposal procedures, and associated costs.

Concerning oily liquids identified in three (3) sumps located in Room 108, ATEC recommends that complete chemical characterization of the samples be made to determine appropriate off-site disposal procedures.

Efforts concerning removal, transportation, and off-site disposal of containers of liquids and oily liquids is recommended to be coordinated through ATEC. ATEC will utilize a reputable waste disposal contractor to analyze and determine proper off-site disposal methods. Complete documentation of all activities would be provided. Upon request, ATEC can provide you with a complete description of activities required for off-site disposal and associated costs.

7.0 QUALIFICATIONS

Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with customary principles and practices in the fields of environmental science and engineering. This warranty is in lieu of all other warranties either express or implied. This company is not responsible for the independent conclusions, opinions or recommendations made by others based on the field exploration and laboratory test data presented in this report.

The work performed in conjunction with this assessment and the data developed, are intended as a description of available information at the dates and locations given. This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The present study included a limited number of borings across the entire project site. The conclusions drawn from the investigation are considered reliable, however, there may exist localized variations in subsurface conditions that have not been completely defined at this time. It should be noted that subsurface conditions may be better delineated with increased subsurface exploration including test pits, soil borings with sample collection and laboratory testing, and surface geophysical survey techniques.

APPENDICES

Appendix A: Boring Logs and Construction Diagrams

Appendix B: CERCLIS Score Procedures

Appendix C: Photographic Documentation

Appendix D: Screening Equipment

Appendix E: Analytical Results

Appendix F: ATEC Report Number 21-17060

APPENDIX A

BORING LOGS AND CONSTRUCTION DIAGRAMS

ATEC Associates, Inc.

Consulting Geotechnical, Materials and Environmental Engineers

LOG OF BORING NO. MW-1

CLIENT Department of Economic Development
PROJECT NAME Subsurface Investigation
PROJECT LOCATION Studebaker Corridor / South Bend, Indiana
BORING LOCATION Northeast corner of property
FOREMAN R. West
INSPECTOR C. Cashman

JOB NO. 21-07458
START DATE 11/26/90
BORING METHOD HSA
ROCK CORE DIA. ____ IN.
SHELBY TUBE DIA ____ IN.

SOIL/ROCK DESCRIPTION	STRATUM DEPTH ft.	DEPTH ft.	SAMPLE NO.	SPT (*)	REC %	TFV ppm (**)	REMARKS
Surface Elevation							
Brick and concrete (0.5')							
Dark brown slightly moist loose SILTY fine to coarse SAND (SM-SP)			1	6/3/3	50	ND	
		5	2	3/3/3	75	ND	
			3	4/3/3	100	ND	
Brown below 8.5'		10	4	2/4/4	75	ND	
			5	2/4/4	75	ND	
Trace Gravel below 13.5'		15	6	3/4/6	100	ND	
Medium dense below 16.0'			7	4/7/10	75	ND	
		20	8	5/5/7	75	ND	
			9	3/5/8	100	ND	
0.25' black stain @ 25.0'		25	10*	6/6/6	100	ND	
Wet below 25.0'			11	4/6/10	75	ND	
		30					*Sample obtained for laboratory analysis
Bottom of test boring @ 32.75'		35					
		40					

WATER LEVEL OBSERVATIONS
NOTED ON RODS 25.0 FT
AT COMPLETION ____ FT
AFTER ____ HRS. ____ FT

BORING METHODS
HSA-HOLLOW STEM AUGERS
CFA-CONT.FLIGHT AUGERS
HA-HAND AUGER

NOTES: (*) BLOWS/6 in., In Three 6 in. Increments
REC %: Sample Recovery %
(**) TFV-Total Vapors ppm (parts per million)

MW-1

DEPTH, FT

SOIL PROFILE

CONSTRUCTION DETAILS

MANHOLE AND LOCKING CAP

Brick and concrete

0.5'

Dark brown slightly moist loose SILTY fine to coarse SAND (SM-SP)

Brown below 8.5'

Trace Gravel below 13.5'

Medium dense below 16.0'

0.25' black stain @ 25.0'
Wet below 25.0'

RISER	0.2' - 22.6'
GROUT	0.44' - 15.4'
BENTONITE SEAL	15.4' - 19.0'
SAND PACK	---
SCREEN	22.6' - 32.6'
NATURAL PACK	19.0' - 32.75'

Bottom of Test Boring @ 32.75'

Construction Material:	Schedule 40 PVC
Well Diameter:	2 inches
Screen Length:	10.0 ft
Slot Size:	0.010
Development Method:	Rig pump
Development Duration:	30 minutes

Groundwater Level Observations

Date	Elev., ft
11/28/90	24.33
11/30/90	24.21

MONITORING WELL DETAILS

PROJECT NO. 21-07458

SCALE None

ATEC

ATEC Associates, Inc.

Consulting Geotechnical, Materials and Environmental Engineers

LOG OF BORING NO. MW-2

CLIENT	Department of Economic Development
PROJECT NAME	Subsurface Investigation
PROJECT LOCATION	Studebaker Corridor / South Bend, Indiana
BORING LOCATION	North of north side of building - in center
FOREMAN	R. West
INSPECTOR	C. Cashman

JOB NO.	21-07458
START DATE	11/28/90
BORING METHOD	HSA
ROCK CORE DIA.	IN.
SHELBY TUBE DIA	IN.

SOIL/ROCK DESCRIPTION	STRATUM DEPTH ft.	DEPTH ft.	SAMPLE NO.	SPT (*)	REC %	TFV ppm (**)	REMARKS
Surface Elevation							
7" concrete Coarse Gravel, brick, cinder, debris fill			1	5/5/6	67	ND	
		5	2	2/3/5	10	ND	
	6.5						
Brown moist loose SILTY fine to coarse SAND (SM-SP) with trace fine Gravel			3	3/3/3	75	ND	
		10	4	2/2/3	67	ND	
Medium dense increasing Gravel below 13.5'			5	3/4/5	25	ND	
		15	6	8/6/7	75	ND	
			7	6/10/11	90	ND	
		20	8	6/9/11	100	ND	
			9	3/5/7	100	ND	
Wet below 24.0'		25	10*	6/6/10	100	ND	
					"		*Sample obtained for laboratory analysis
		30					
Bottom of test boring @ 32.0'							
		35					
		40					

WATER LEVEL OBSERVATIONS
NOTED ON RODS 24.0 FT
AT COMPLETION ____ FT
AFTER ____ HRS. ____ FT

BORING METHODS
HSA-HOLLOW STEM AUGERS
CFA-CONT.FLIGHT AUGERS
HA-HAND AUGER

NOTES: (*)BLOWS/6 in., In Three 6 in. Increments
REC %: Sample Recovery %
(**)TFV-Total F apors ppm (parts per million)

MW-2

DEPTH, FT | SOIL PROFILE

CONSTRUCTION DETAILS

MANHOLE AND LOCKING CAP

7" concrete
Coarse Gravel, brick, cinder, debris fill

6.5'

Brown moist loose SILTY fine to coarse SAND (SM-SP) with trace fine Gravel

Medium dense increasing Gravel below 13.5'

Wet below 24.0'

RISER	0.55' - 22.0'
GROUT	0.7' - 16.5'
BENTONITE SEAL	16.5' - 18.5'
SAND PACK	18.5' - 23.0'
SCREEN	22.0' - 32.0'
NATURAL PACK	23.0' - 32.0'

Bottom of Test Boring @ 32.0'

Construction Material:	Schedule 40 PVC
Well Diameter:	2 inches
Screen Length:	10.0 ft
Slot Size:	0.010
Development Method:	Rig pump
Development Duration:	30 minutes

Groundwater Level Observations

Date	Elev., ft
11/28/90	23.31
11/30/90	23.21

MONITORING WELL DETAILS

PROJECT NO. 21-07458

SCALE None

ATEC

ATEC Associates, Inc.

Consulting Geotechnical, Materials and Environmental Engineers

LOG OF BORING NO. MW-3

CLIENT	Department of Economic Development
PROJECT NAME	Subsurface Investigation
PROJECT LOCATION	Studebaker Corridor / South Bend, Indiana
BORING LOCATION	North of northwest corner of building
FOREMAN	R. West
INSPECTOR	C. Cashman

JOB NO.	21-07458
START DATE	11/28/90
BORING METHOD	HSA
ROCK CORE DIA.	IN.
SHELBY TUBE DIA	IN.

SOIL/ROCK DESCRIPTION	STRATUM DEPTH ft.	DEPTH ft.	SAMPLE NO.	SPT (*)	REC %	TFV ppm (**)	REMARKS
Surface Elevation							
0.1' Asphalt; 0.5' concrete (0.6')							
Sand and Gravel and concrete debris fill	3.5						
Brown moist loose SILTY fine to coarse SAND (SM-SP) with trace fine Gravel		5	1	10/7/3	100	ND	
			2	3/4/4	100	ND	
		10	3	3/4/4	100	ND	
Light brown below 13.5'			4	3/3/4	100	ND	
		15	5	3/5/5	75	ND	
			6	2/2/3	67	ND	
Medium dense below 21.0'		20	7	4/4/3	67	ND	
			8	5/8/9	100	ND	
Wet below 24.0'		25	9*	5/7/7	100	ND	
		30			"		*Sample obtained for laboratory analysis
Bottom of test boring @ 32.0'		35					
		40					

WATER LEVEL OBSERVATIONS
NOTED ON RODS 24.0 FT
AT COMPLETION FT
AFTER HRS. FT

BORING METHODS
HSA-HOLLOW STEM AUGERS
CFA-CONT.FLIGHT AUGERS
HA-HAND AUGER

NOTES: (*)BLOWS/6 in., In Three 6 in. Increments
REC %: Sample Recovery, %
(**)TFV-Total Vapors
ppm (parts per million)

MW-3

DEPTH, FT

SOIL PROFILE

CONSTRUCTION DETAILS

MANHOLE AND LOCKING CAP

0.1' Asphalt;
0.6' 0.5' Concrete
Sand and Gravel and concrete debris fill

3.5'
Brown moist loose SILTY fine to coarse SAND (SM-SP) with trace fine Gravel

Light brown below 13.5'

Medium dense below 21.0'

Wet below 24.0'

RISER	0.51' - 21.9'
GROUT	0.6' - 16.5'
BENTONITE SEAL	16.5' - 18.2'
SAND PACK	18.2' - 21.1'
SCREEN	21.9' - 31.9'
NATURAL PACK	21.1' - 32.0'

Bottom of Test Boring @ 32.0'

Construction Material:	Schedule 40 PVC
Well Diameter:	2 inches
Screen Length:	10.0 ft
Slot Size:	0.010
Development Method:	Rig pump
Development Duration:	30 minutes

Groundwater Level Observations

Date	Elev., ft
11/28/90	23.30
11/30/90	23.32

MONITORING WELL DETAILS

PROJECT NO. 21-07458

SCALE None

ATEC

ATEC Associates, Inc.

Consulting Geotechnical, Materials and Environmental Engineers

LOG OF BORING NO. MW-4

CLIENT Department of Economic Development
PROJECT NAME Subsurface Investigation
PROJECT LOCATION Studebaker Corridor / South Bend, Indiana
BORING LOCATION West of southwest corner of building
FOREMAN R. West
INSPECTOR C. Cashman

JOB NO. 21-07458
START DATE 11/28/90
BORING METHOD HSA
ROCK CORE DIA. ____ IN.
SHELBY TUBE DIA ____ IN.

SOIL/ROCK DESCRIPTION	STRATUM DEPTH ft.	DEPTH ft.	SAMPLE NO.	SPT (*)	TFV REC %	TFV ppm (**)	REMARKS
Surface Elevation							
Black slightly moist loose Sand and Gravel fill	3.0		1	6/4/5	100	ND	
Brown slightly moist loose SILTY fine to course SAND (SM-SP) with trace Gravel		5	2	4/4/5	100	ND	
			3	3/5/3	100	ND	
Light brown medium dense below 11.0'		10	4	2/2/2	100	ND	
			5	5/7/7	67	ND	
		15	6	3/7/9	75	ND	
			7	3/5/6	100	ND	
		20	8	3/5/7	100	ND	
Wet below 22.5'			9*	3/5/8	100	1	
		25	10	3/3/7	50	ND	
		30					
Bottom of test boring @ 29.0'							*Sample obtained for laboratory analysis
		35					
		40					

WATER LEVEL OBSERVATIONS
NOTED ON RODS 22.5 FT
AT COMPLETION ____ FT
AFTER ____ HRS. ____ FT

BORING METHODS
HSA-HOLLOW STEM AUGERS
CFA-CONT.FLIGHT AUGERS
HA-HAND AUGER

NOTES: (*)BLOWS/6 in., In Three 6 in. Increments
REC %: Sample Recovery, %
(**)TFV-Total Vapors ppm (par...

ATEC Associates, Inc.

Consulting Geotechnical, Materials and Environmental Engineers

LOG OF BORING NO. MW-4A

CLIENT Department of Economic Development
PROJECT NAME Subsurface Investigation
PROJECT LOCATION Studebaker Corridor / South Bend, Indiana
BORING LOCATION West of Avanti building
FOREMAN R. West
INSPECTOR C. Cashman

JOB NO. 21-07458
START DATE 11/28/90
BORING METHOD HSA
ROCK CORE DIA. IN.
SHELBY TUBE DIA IN.

SOIL/ROCK DESCRIPTION	STRATUM DEPTH ft.	DEPTH ft.	SAMPLE NO.	SPT (*)	REC %	TFV ppm (**)	REMARKS
Surface Elevation							
Asphalt/concrete, brick and Sand fill			1	5/6/75	100		
Auger refusal @ 4.0'		5	2	50/0	0		
		10					

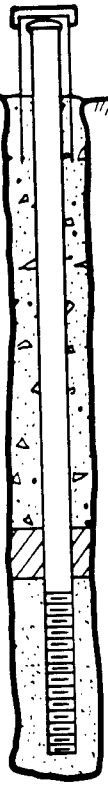
WATER LEVEL OBSERVATIONS
NOTED ON RODS FT
AT COMPLETION FT
AFTER HRS. FT

BORING METHODS
HSA-HOLLOW STEM AUGERS
CFA-CONT.FLIGHT AUGERS
HA-HAND AUGER

NOTES: (*)BLOWS/6 in., In Three 6 in. Increments
REC %: Sample Recovery, %
(**)TFV-Total Vapors ppm (part...

MW-4

DEPTH, FT	SOIL PROFILE
	Black slightly moist loose Sand and Gravel fill
3.0'	Brown slightly moist loose SILTY fine to coarse SAND (SM-SP) with trace Gravel
	Light brown medium dense below 11.0'
	Wet below 22.5'
	Bottom of Test Boring @ 29.0'



CONSTRUCTION DETAILS

PROTECTIVE COVER

RISER	+2.5' - 19.0'
GROUT	0.0' - 15.0'
BENTONITE SEAL	15.0' - 16.9'
SAND PACK	---
SCREEN	19.0' - 29.0'
NATURAL PACK	16.9' - 29.0'

Construction Material:	Schedule 40 PVC
Well Diameter:	2 inches
Screen Length:	10.0 ft
Slot Size:	0.010
Development Method:	Rig pump
Development Duration:	30 minutes

Groundwater Level Observations

Date	Elev., ft
11/30/90	24.61

MONITORING WELL DETAILS

PROJECT NO. 21-07458

SCALE None

ATEC

ATEC Associates, Inc.

Consulting Geotechnical, Materials and Environmental Engineers

LOG OF BORING NO. MW-4B

CLIENT Department of Economic Development
PROJECT NAME Subsurface Investigation
PROJECT LOCATION Studebaker Corridor / South Bend, Indiana
BORING LOCATION West of Avanti building
FOREMAN R. West
INSPECTOR C. Cashman

JOB NO. 21-07458
START DATE 11/28/90
BORING METHOD HSA
ROCK CORE DIA. IN.
SHELBY TUBE DIA IN.

SOIL/ROCK DESCRIPTION	STRATUM DEPTH ft.	DEPTH ft.	SAMPLE NO.	SPT (*)	REC %	TFV ppm (**)	REMARKS
Surface Elevation							
Asphalt/concrete, cobble stone and Sand fill							
		5					
Auger refusal @ 3.5'							

WATER LEVEL OBSERVATIONS
NOTED ON RODS FT
AT COMPLETION FT
AFTER HRS. FT

BORING METHODS
HSA-HOLLOW STEM AUGERS
CFA-CONT.FLIGHT AUGERS
HA-HAND AUGER

NOTES: (*) BLOWS/6 in., In Three 6 in. Increments
REC %: Sample Recovery
(**) TFV-Tota e Vapors
ppm (parts per million)

ATEC Associates, Inc.

Consulting Geotechnical, Materials and Environmental Engineers

LOG OF BORING NO. B-1

CLIENT Department of Economic Development
PROJECT NAME Studebaker Corridor Project
PROJECT LOCATION South Bend, Indiana
BORING LOCATION Northwest corner of building
FOREMAN R. West
INSPECTOR C. Cashman

JOB NO. 21-07461
START DATE 11/29/90
BORING METHOD HSA
ROCK CORE DIA. ____ IN.
SHELBY TUBE DIA ____ IN.

SOIL/ROCK DESCRIPTION	STRATUM DEPTH ft.	DEPTH ft.	SAMPLE NO.	SPT (*)	REC %	TFV ppm (**)	REMARKS
Surface Elevation							
Asphalt, concrete, brick and Gravel fill	3.0						
Brown slightly moist loose SILTY fine to coarse SAND (SM-SP) with trace Gravel		5	1	2/2/2	67	ND	
			2	3/4/4	75	ND	
		10	3	3/5/5	67	ND	
			4	3/5/4	100	ND	
		15	5*	3/4/7	67	ND	
Bottom of test boring @ 15.0'		20					*Sample obtained for laboratory analysis Boring backfilled with auger cuttings and capped upon completion

WATER LEVEL OBSERVATIONS
NOTED ON RODS ____ FT
AT COMPLETION ____ FT
AFTER ____ HRS. ____ FT

BORING METHODS
HSA-HOLLOW STEM AUGERS
CFA-CONT.FLIGHT AUGERS
HA-HAND AUGER

NOTES: (*)BLOWS/6 in., In Three 6 in. Increments
REC %: Sample Recovery, %
(**)TFV-Total Vapors ppm (parts per million)

ATEC Associates, Inc.

Consulting Geotechnical, Materials and Environmental Engineers

LOG OF BORING NO. B-2

CLIENT Department of Economic Development
PROJECT NAME Studebaker Corridor Project
PROJECT LOCATION South Bend, Indiana
BORING LOCATION Northwest of corner of building
FOREMAN R. West
INSPECTOR C. Cashman

JOB NO. 21-07461
START DATE 11/29/90
BORING METHOD HSA
ROCK CORE DIA. IN.
SHELBY TUBE DIA IN.

SOIL/ROCK DESCRIPTION	STRATUM DEPTH ft.	DEPTH ft.	SAMPLE NO.	SPT (*)	REC %	TFV ppm (**)	REMARKS
Surface Elevation							
Asphalt and road base	1.0						
Black slightly moist medium dense SILTY fine to coarse SAND (SM-SP) with trace Gravel			1	5/8/6	100	ND	
Brown below 4.0'		5	2	4/5/5	100	ND	
			3	4/5/5	100	ND	
		10	4	3/4/5	67	ND	
			5	2/2/3	100	ND	
		15	6*	4/7/10	100	ND	
Bottom of test boring @ 15.0'							
		20					*Sample obtained for laboratory analysis Boring backfilled with auger cuttings and capped upon completion

WATER LEVEL OBSERVATIONS
NOTED ON RODS FT
AT COMPLETION FT
AFTER HRS. FT

BORING METHODS
HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
HA-HAND AUGER

NOTES: (*)BLOWS/6 in., In Three 6 in. Increments
REC %: Sample Recovery, %
(**)TFV-Total Flame Ionizable Vapors ppm (p

ATEC Associates, Inc.

Consulting Geotechnical, Materials and Environmental Engineers

LOG OF BORING NO. B-3

CLIENT Department of Economic Development
PROJECT NAME Studebaker Corridor Project
PROJECT LOCATION South Bend, Indiana
BORING LOCATION West of building through concrete
FOREMAN R. West
INSPECTOR C. Cashman

JOB NO. 21-07461
START DATE 11/29/90
BORING METHOD HSA
ROCK CORE DIA. ___ IN.
SHELBY TUBE DIA ___ IN.

SOIL/ROCK DESCRIPTION	STRATUM DEPTH ft.	DEPTH ft.	SAMPLE NO.	SPT (*)	REC %	TFV ppm (**)	REMARKS
Surface Elevation							
Concrete (0.5')							
Gravel and brick fill	3.5		1	6/20/9	100	ND	
Brown slightly moist loose SILTY fine to coarse SAND (SM-SP) with trace fine to medium Gravel		5	2	2/1/1	100	ND	
			3	3/4/3	100	ND	
Increasing Gravel below 11.0'		10	4	2/5/5	67	ND	
			5	7/6/5	67	ND	
		15	6*	2/4/6	100	ND	
Bottom of test boring @ 15.0'							
		20					

*Sample obtained for laboratory analysis

Boring backfilled with auger cuttings and capped upon completion

WATER LEVEL OBSERVATIONS
NOTED ON RODS ___ FT
AT COMPLETION ___ FT
AFTER ___ HRS. ___ FT

BORING METHODS
HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
HA-HAND AUGER

NOTES: (*) BLOWS/6 in., In Three 6 in. Increments
REC %: Sample Recovery, %
(**) TFV-Tota[illegible] e Vapors ppm ([illegible])

ATEC Associates, Inc.

Consulting Geotechnical, Materials and Environmental Engineers

LOG OF BORING NO. B-4

CLIENT Department of Economic Development
PROJECT NAME Studebaker Corridor Project
PROJECT LOCATION South Bend, Indiana
BORING LOCATION West of building in grass - north boring
FOREMAN R. West
INSPECTOR C. Cashman

JOB NO. 21-07461
START DATE 11/29/90
BORING METHOD HSA
ROCK CORE DIA. ____ IN.
SHELBY TUBE DIA ____ IN.

SOIL/ROCK DESCRIPTION	STRATUM DEPTH ft.	DEPTH ft.	SAMPLE NO.	SPT (*)	REC %	TFV ppm (**)	REMARKS
Surface Elevation							
Black moist loose SILTY fine to coarse SAND (SM-SP) with trace Gravel							
Brown below 4.0'		5	1	2/3/4	67	ND	
		10	2	2/2/4	50	ND	
		15	3	3/4/5	100	ND	
		20	4	4/8/10	100	2	
Wet below 22.5'			5*	8/7/7	50	7	
		25	6	4/7/9	100	ND	*Sample obtained for laboratory analysis
Bottom of test boring @ 25.0'							Boring backfilled with auger cuttings and capped upon completion
		30					

WATER LEVEL OBSERVATIONS
NOTED ON RODS 22.5 FT
AT COMPLETION ____ FT
AFTER ____ HRS. ____ FT

BORING METHODS
HSA-HOLLOW STEM AUGERS
CFA-CONT.FLIGHT AUGERS
HA-HAND AUGER

NOTES: (*) BLOWS/6 in., In Three 6 in. Increments
REC %: Sample Recovery, %
(**) TFV-Total Flame Ionizable Vapors ppm (pa

ATEC Associates, Inc.

Consulting Geotechnical, Materials and Environmental Engineers

LOG OF BORING NO. B-5

CLIENT	Department of Economic Development
PROJECT NAME	Studebaker Corridor Project
PROJECT LOCATION	South Bend, Indiana
BORING LOCATION	West of building - south boring
FOREMAN	R. West
INSPECTOR	C. Cashman

JOB NO.	21-07461
START DATE	11/29/90
BORING METHOD	HSA
ROCK CORE DIA.	IN.
SHELBY TUBE DIA	IN.

SOIL/ROCK DESCRIPTION Surface Elevation	STRATUM DEPTH ft.	DEPTH ft.	SAMPLE NO.	SPT (*)	REC %	TFV ppm (**)	REMARKS
Black moist loose SILTY fine to coarse SAND (SM-SP)							
Brown below 4.0'		5	1	2/4/6	100	ND	
		10	2	4/5/3	50	ND	
		15	3	2/3/5	50	ND	
		20	4	3/4/5	100	ND	
Wet below 22.5'			5*	4/7/11	100	2	
		25	6	5/6/7	67	ND	*Sample obtained for laboratory analysis
Bottom of test boring @ 25.0'							Boring backfilled with auger cuttings and capped upon completion
		30					

WATER LEVEL OBSERVATIONS
NOTED ON RODS 22.5 FT
AT COMPLETION FT
AFTER HRS. FT

BORING METHODS
HSA-HOLLOW STEM AUGERS
CFA-CONT.FLIGHT AUGERS
HA-HAND AUGER

NOTES:(*)BLOWS/6 in., In Three 6 in. Increments
REC %: Sample Recovery, %
(**)TFV-Total Flame Ionizable Vapors ppm (parts per million)

APPENDIX B

CERCLIS SCORE PROCEDURES

Department of Environmental Management
Commissioner's Bulletin No. 1

Date: December 10, 1990

Subject: Scoring of hazardous substances response sites utilizing the Indiana Scoring Model (ISM).

Authority: Title 329 IAC 7-2-3 sets forth guidelines for publishing sites that have been scored utilizing the ISM.

File Repository: The public may inquire at the Department of Environmental Management, 105 South Meridian Street, Indianapolis, Indiana 46201, Room 901, to review and/or obtain specific information regarding a particular site's scoring package. For further details contact the Office of Environmental Response - Site Investigation Section - also located at the aforementioned address.

Introduction: The Indiana Scoring Model (ISM) is a method of prioritizing, for state response actions, those hazardous substances response sites which are not on the National Priorities List (NPL). The ISM serves as the Commissioner's management tool to address those sites which pose the most significant threat to human health and the environment in addition to assuring the departments resources are allocated accordingly.

Hazardous substances response sites that are evaluated utilizing the ISM are assigned a numerical score. Site scoring will be a dynamic process and scores may be subject to change based on significant changes in site circumstances, receipt of additional site information, or other relevant factors.

The ISM combines three (3) scores assigned to a hazardous substance response site as follows:

(1) S_M reflects the potential for harm to humans or the environment from the migration of a hazardous substance away from the facility by routes involving groundwater, surface water, or air. It is a composite of separate scores for each of the three (3) routes.

(2) S_{FE} reflects the potential for harm from substances that can explode or cause fires.

(3) S_{DC} reflects the potential for harm from direct contact with hazardous substances at the facility, i.e., no migration need be involved.

The score for each hazard mode (migration, fire and explosion, and direct contact) or route is obtained by considering a set of factors that characterize the potential of the facility to cause harm. Each factor is assigned a numerical value (on a scale of zero (0) to three (3), five (5), or eight (8) according to prescribed guidelines. This value is then multiplied by a weighting factor yielding the factor score. The factor scores are then combined and scores within a factor category are multiplied together to develop a score for groundwater, surface water, air, fire and explosion, and direct contact.

In computing an individual migration route score, the product of its factor category scores is divided by the maximum possible score, and the resulting ratio is multiplied by one hundred (100). The last step puts all S_{FE} or S_{DC} mode scores on a scale of zero (0) to ten (10).

S_M is a composite of the scores for the three (3) possible migration routes:

$$S_M = \frac{1}{1.73} \sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$$

Where: S_{gw} = groundwater route score
S_{sw} = surface water route score
S_a = air route score

The effect of this means of combining the route scores is to emphasize the primary (highest scoring) route in aggregating route scores while giving some additional consideration to the secondary or tertiary routes if they score high. The factor 1/1.73 is used simply for the purpose of reducing S_M scores to a one hundred (100) point scale.

The ISM does not quantify the probability of harm from a facility or the magnitude of the harm that could result, although the factors have been selected in order to approximate both those elements of risk. It is a procedure for ranking facilities in terms of the potential threat they pose by describing:

Huntington Terminals	Huntington/Huntington	28.90	12-10-90
Monon Well Field	Monon/White	28.40	12-10-90
Davenport Dump	Monrovia/Morgan	28.20	12-10-90
Albany Sludge Pit	Albany/Delaware	27.70	12-10-90
Avanti	South Bend/St. Joseph	27.60	12-10-90
Clayton Wells	Clayton/Hendricks	27.00	12-10-90
Texas Eastern	Reddington/Jackson	26.26	12-10-90
Stout Storage Battery	Muncie/Delaware	26.22	12-10-90
Albany Battery Case Dump	Albany/Delaware	25.87	12-10-90
Universal Adhesives	Middlebury/Elkhart	25.00	12-10-90
Dugger Electric	Dugger/Sullivan	20.07	12-10-90
Energy Cooperative, Inc.	East Chicago/Lake	19.87	12-10-90
Alcoa	Lafayette/Tippecanoe	19.44	12-10-90
Mud Lake Site	Steuben County	18.30	12-10-90
Calumet Containers	Hammond/Lake	16.07	12-10-90
Schreiber Oil Company	Cedar Lake/Lake	13.48	12-10-90
Midwest Plating	Kokomo/Howard	12.10	12-10-90
Beal St. Disposal	Hammond/Lake	1.55	12-10-90
East Thompson Rd.	Indianapolis/Marion	0.00	12-10-90

APPENDIX C

PHOTOGRAPHIC DOCUMENTATION

Lot #1 Studebaker Corridor
South Bend, Indiana

A-1 Drilling MW-3 facing east

A-2 Drilling MW-4 facing east

B-1 Developing MW-4

B-2 Completed well MW-4

C-1 Drilling boring B-3 east of UST in grassy area

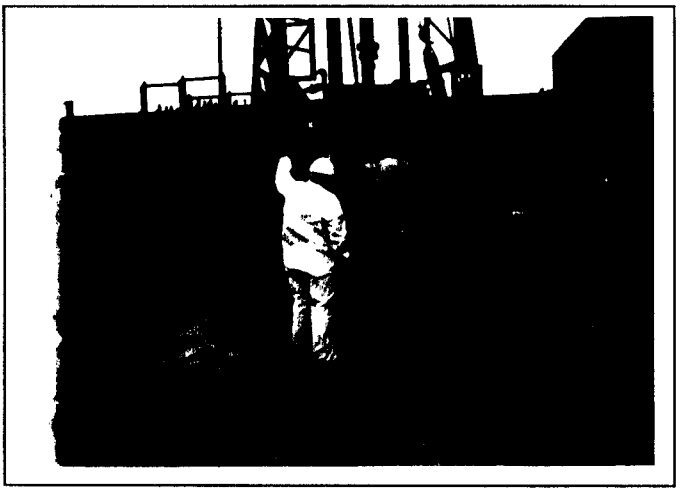
C-2 Drilling boring B-4 near UST in grassy area

D-1 Main level, below grade oil pit

D-2 Main level, one (1) of two (2) large below grade sumps

E-1 Third level, 55-gallon drum containing oil and garbage

E-2 Elevator tower storage containers



A-1

A-2

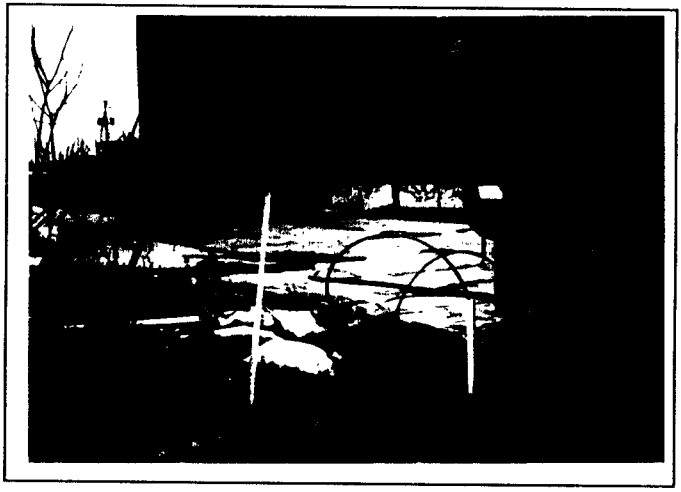
SITE PHOTO LOG
STUDEBAKER CORRIDOR PROJECT
LOT #1
SOUTH BEND, IN

PROJECT NO.
21-07458/61

SCALE
NONE

FIGURE NO
A

ATEC



B-1

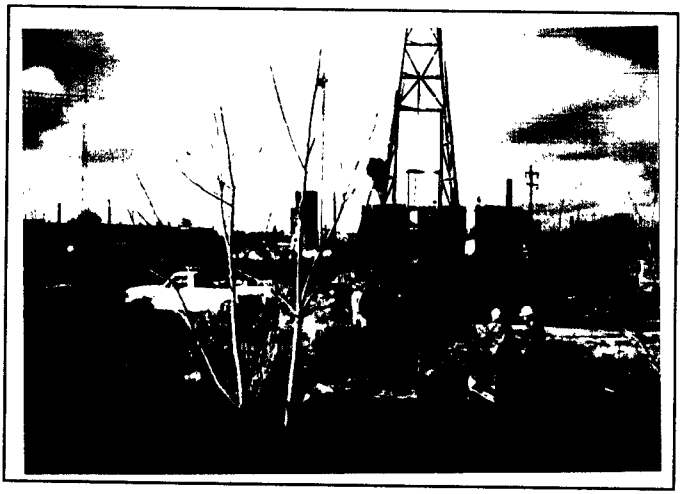
B-2

SITE PHOTO LOG
STUDEBAKER CORRIDOR PROJECT
LOT #1
SOUTH BEND, IN

PROJECT NO.	21-07458/61
SCALE	NONE
FIGURE NO	B

ATEC

C-1

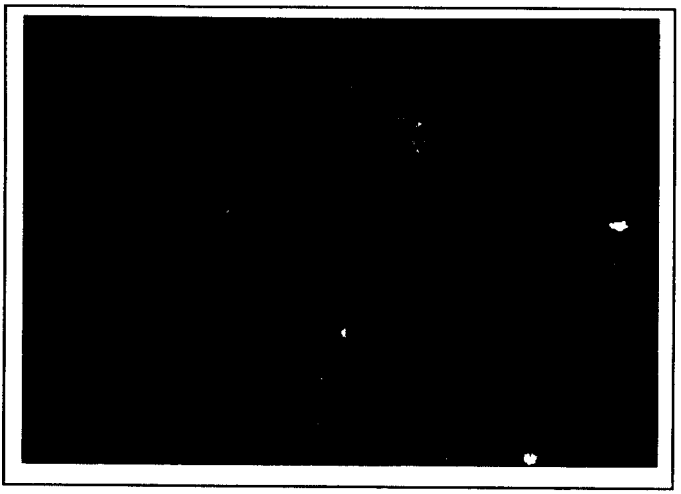


C-2

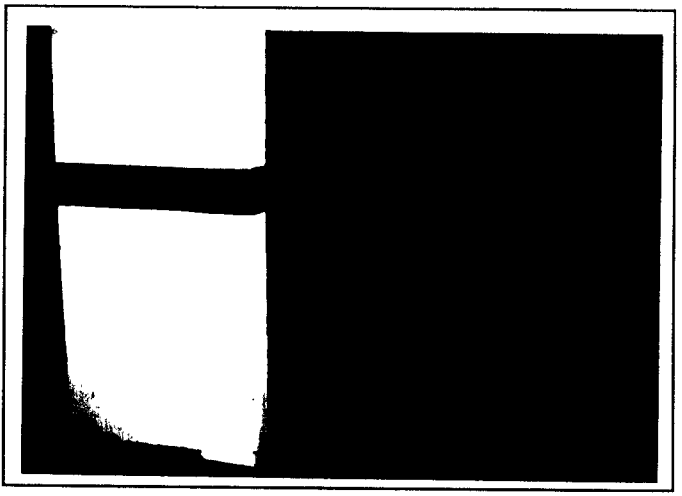
SITE PHOTO LOG
STUDEBAKER CORRIDOR PROJECT
LOT #1
SOUTH BEND, IN

PROJECT NO	21-07458/61
SCALE	NONE
FIGURE NO	C

ATEC



D-1



D-2

SITE PHOTO LOG
STUDEBAKER CORRIDOR PROJECT
LOT #1
SOUTH BEND, IN

PROJECT NO.
21-07458/61

SCALE
NONE

FIGURE NO
D

ATEC

E-1

E-2

SITE PHOTO LOG
STUDEBAKER CORRIDOR PROJECT
LOT #1
SOUTH BEND, IN

PROJECT NO.
21-07458/61

SCALE
NONE

FIGURE NO
E

ATEC

APPENDIX D

SCREENING EQUIPMENT

H-Nu

ATEC used a portable instrument called an H-Nu to measure TPVs emitted from the soil samples. The H-Nu is equipped with a small pump which continuously draws air samples into an ionization chamber which is flooded with ultra-violet light. Ionization of the vapors within this chamber results in the generation of an electric current which relates to the concentration of vapors below this energy. Most of the light permanent gases (such as those in ambient air) have ionization potentials at 12 eV or more while many organic chemicals (benzene, xylene, toluene, etc.) have ionization potentials below 10.5 eV.

For the purposes of this investigation, the H-Nu was used as a screening tool for the presence of photo-ionizable contaminants. Following extrusion the sample was placed in a plastic sample bag and the pump inlet for the H-Nu was placed in the bag for measurement. The highest value recorded during this procedure was recorded on the boring logs. For screening purposes, ATEC relies on the calibration performed on the instrument at the factory. The factory calibrates the instrument to 100 ppm benzene, therefore, values reported on the boring logs represent ppm as benzene. In screening applications the actual numerical values recorded are of secondary importance, especially since there are no established United States Environmental Protection Agency (U.S. EPA) and the Indiana Department of Environmental Management (IDEM) standards for TPVs. The relative magnitude of the values between sampling sites is considered to be of primary importance in screening for the presence of contaminated samples. In general, background levels of TPVs at an undeveloped site would be 25 ppm or less while background values at an industrial site or, in this case, a gasoline station would be 50 to 100 ppm.

VAPOR SCREENING EQUIPMENT

The Porta-FID utilizes the principle of hydrogen flame ionization for detection and measurement of total flame-ionizable vapors (TFVs). The instrument measures organic vapor concentration by producing a response to an unknown sample, which can be related to a gas of known composition to which the instrument has previously been calibrated. During normal survey mode operation, a continuous sample is drawn into the probe and transmitted to the detector chamber by an internal pumping system.

The sample stream is metered and passed through particle filters before reaching the detector chamber. Inside the detector chamber, the sample is exposed to a hydrogen flame which ionizes the organic vapors. When most organic vapors burn, they leave positively charged carbon-containing ions. An electric field drives the ions to a collecting electrode. As the positive ions are collected, a current corresponding to the collection rate is generated. This current is measured with a linear electrometer preamplifier which has an output signal proportional to the ionization current. A signal conditioning amplifier is used to amplify the signal from the preamp and to condition it for subsequent meter or external recorder display. The display is an integral part of the Probe/Readout Assembly and has 270° scale deflection.

In general, the hydrogen flame ionization detector is more sensitive for hydrocarbons than any other class of organic compounds. The response of the Porta-FID varies from compound to compound, but gives repeatable results with all types of hydrocarbons; i.e., saturated hydrocarbons (alkanes), unsaturated hydrocarbons (alkenes and alkynes) and aromatic hydrocarbons.

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APPENDIX E

ANALYTICAL RESULTS

ATEC Environmental Consultants
Division of ATEC Associates, Inc.
5150 East 65th Street
Indianapolis, Indiana 46220-4871
[317] 849-4990, FAX # [317] 849-4278

December 11, 1990

Mr. Matthew Stokes
ATEC Environmental Construction Div.
5150 East 65th Street
Indianapolis, IN 46220

Re: Four Soil/Four Water VOA
Four Soil/Five Water RCRA Metals
SW 846 Method 8240, 7000 Series, 6010
US EPA Method 624
EPA-600/4-79-020 Method 200 Series
Department of Economical Development
City of South Bend
ATEC Project Number 21-07458

Dear Mr. Stokes:

Enclosed are the results of the Chemical Analyses for the five water and four soil samples which were submitted to the ATEC Environmental/Analytical Testing Division on November 30, 1990, on behalf of the City of South Bend. The volatile samples were analyzed on a Finnigan Incos 50 GC/MS/DS system, complete with Superincos Software, via SW 846 Method 8240 and US EPA Method 624 for Purgeable Organic Compounds. Prior to analysis the system was tuned against Bromofluorobenzene and calibrated with the appropriate standard. Metals were analyzed on a Perkin-Elmer 5100 Atomic Absorption Spectrophotometer according to the 7000 Series of the methods outlined in SW 846 and a Thermo Jarrell Ash ICAP-61 according to SW 846 Method 6010 and EPA-600/4-79-020 Method 200 Series.

All associated Quality Control information will be maintained in the Testing Division files, a copy of which can be forwarded to you upon request. After a thirty-day period, a fee will be assessed for this additional information.

It has been a pleasure serving you and, as always, if there are any questions concerning these results or the ATEC Policies, please feel free to contact me.

Respectfully submitted,
ATEC Associates, Inc.

Keith S. Kline
Environmental/Analytical
Testing Division

KSK/mw

REPORT OF TEST RESULTS

ATEC Project Number 21-07458

Date: December 13, 1990

Client: S.B. Redevelopment Commission
Dept. of Economic Development
County City Building
South Bend, IN 46601

Sample Identification: Studebaker Corridor Project
Sample Matrix: Water
Sample Taken By: ATEC
Date Sampled: November 26 to 30, 1990
Date Received: November 30, 1990
Date Analyzed: December 3 to 12, 1990
Analyst: EVS, MAV, KEB
Verified By: KEB
ATEC Lab Number: 9011356

Parameter (units in mg/L unless noted)	Sample I.D. Number MW-1	MW-2	MW-3	MW-4	Blank	Quantitation Limit (mg/L)	Method No. (EPA 600/ 4-79-020)
Total Metals							
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	206.2
Barium	<0.05	0.059	0.055	0.064	<0.05	0.05	200.7
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	200.7
Chromium	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	200.7
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	200.7
Mercury	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.002	245.1
Selenium	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	270.2
Silver	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	200.7

Respectfully submitted,
ATEC Associates, Inc.

John D Dunger
Environmental/Analytical Testing Divison

REPORT OF TEST RESULTS

ATEC Project Number 21-07458

Date: December 13, 1990

Client: S.B. Redevelopment Commission
Dept. of Economic Development
County City Building
South Bend, IN 46601

Sample Identification: Studebaker Corridor Project
Sample Matrix: Soil
Sample Taken By: ATEC
Date Sampled: November 26 to 30, 1990
Date Received: November 30, 1990
Date Analyzed: December 3 to 12, 1990
Analyst: EVS, MAV, KEB
Verified By: KEB, JDD
ATEC Lab Number: 9011356

Parameter (units in mg/kg unless noted)	Sample I.D. Number (23.5-25') MW-1	(23.5-25') MW-2	(23.5-25') MW-3	(21-22.5') MW-4	Quantitation Limit (mg/kg)	SW 846 Analytical Method No.
Total Metals						
Arsenic	<2.0	<2.0	<2.0	<2.0	2.0	7060
Barium	6.1	4.4	6.7	3.7	2.0	6010
Cadmium	<2.0	<2.0	<2.0	<2.0	2.0	6010
Chromium	4.1	4.7	5.2	5.8	2.0	6010
Lead	3.5	2.2	2.6	2.9	2.0	6010
Mercury	<1.0	<1.0	<1.0	<1.0	1.0	7470
Selenium	<2.0	<2.0	<2.0	<2.0	2.0	7740
Silver	<2.0	<2.0	<2.0	<2.0	2.0	6010

Respectfully submitted,
ATEC Associates, Inc.

Environmental/Analytical Testing Divison

Client: S.B. Redevelopment Commission
Client Address: Department of Economic Development
County City Building
South Bend, IN 46601

Client Project Number: 21-07458
Client Sample Identification: MW-1 (23.5-25)
Sample Matrix: Soil
Date Sample Collected: November 26, 1990
Date Sample Received: November 30, 1990
Date Sample Analyzed: December 4, 1990
Analytical Equipment: Incos BV

VOLATILE COMPOUNDS
ANALYTICAL RESULTS

ATEC Lab No. 9011356-1

Analyte	CAS Number	Concentration (ug/kg)	Quantitation Limit (ug/kg)
Chloromethane	74-87-3	<10	10
Bromomethane	74-83-9	<10	10
Vinyl Chloride	75-01-4	<10	10
Chloroethane	75-00-3	<10	10
Methylene Chloride	75-09-2	7	5
Acetone	67-64-1	<10	10
Carbon Disulfide	75-15-0	< 5	5
1,1-Dichloroethene	75-35-4	< 5	5
1,1-Dichloroethane	75-35-3	< 5	5
Trans-1,2-Dichloroethene	156-60-5	< 5	5
Chloroform	67-66-3	< 5	5
1,2-Dichloroethane	107-06-2	< 5	5
2-Butanone	78-93-3	<10	10
1,1,1-Trichloroethane	71-55-6	< 5	5
Carbon Tetrachloride	56-23-5	< 5	5
Vinyl Acetate	108-05-4	<10	10
Bromodichloromethane	75-27-4	< 5	5
1,2-Dichloropropane	78-87-5	< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

ANALYTICAL RESULTS

ATEC Lab No. 9011356-1

Analyte	CAS Number	Concentration (ug/kg)	Quantitation Limit (ug/kg)
Trans-1, 3-Dichloropropene	10061-02-6	< 5	5
Trichloroethene	79-01-6	< 5	5
Dibromochloromethane	124-48-1	< 5	5
1,1,2-Trichloroethane	79-00-5	< 5	5
Benzene	71-43-2	< 5	5
cis-1,3-Dichloropropene	10061-01-5	< 5	5
2-Chloroethylvinylether	110-75-8	<10	10
Bromoform	75-25-2	< 5	5
4-Methyl-2-Pentanone	108-10-1	<10	10
2-Hexanone	591-78-6	<10	10
Tetrachloroethene	127-18-4	< 5	5
1,1,2,2-Tetrachloroethane	79-34-5	< 5	5
Toluene	108-88-3	< 5	5
Chlorobenzene	108-90-7	< 5	5
Ethylbenzene	100-41-4	< 5	5
Styrene	100-42-5	< 5	5
Total Xylenes		< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

Analytical Method: SW 846 Method 8240

Analyst: T. Harrison
Verified: M. McGill
Date Reported: December 5, 1990

Respectfully submitted,

Kevin S. Kline

Environmental/Analytical Testing Division

Client: S.B. Redevelopment Commission
Client Address: Department of Economic Development
County City Building
South Bend, IN 46601

Client Project Number: 21-07458
Client Sample Identification: MW-2 (23.5-25)
Sample Matrix: Soil
Date Sample Collected: November 28, 1990
Date Sample Received: November 30, 1990
Date Sample Analyzed: December 4, 1990
Analytical Equipment: Incos BV

VOLATILE COMPOUNDS
ANALYTICAL RESULTS

ATEC Lab No. 9011356-2

Analyte	CAS Number	Concentration (ug/kg)	Quantitation Limit (ug/kg)
Chloromethane	74-87-3	<10	10
Bromomethane	74-83-9	<10	10
Vinyl Chloride	75-01-4	<10	10
Chloroethane	75-00-3	<10	10
Methylene Chloride	75-09-2	5	5
Acetone	67-64-1	<10	10
Carbon Disulfide	75-15-0	< 5	5
1,1-Dichloroethene	75-35-4	< 5	5
1,1-Dichloroethane	75-35-3	< 5	5
Trans-1,2-Dichloroethene	156-60-5	< 5	5
Chloroform	67-66-3	< 5	5
1,2-Dichloroethane	107-06-2	< 5	5
2-Butanone	78-93-3	<10	10
1,1,1-Trichloroethane	71-55-6	< 5*	5
Carbon Tetrachloride	56-23-5	< 5	5
Vinyl Acetate	108-05-4	<10	10
Bromodichloromethane	75-27-4	< 5	5
1,2-Dichloropropane	78-87-5	< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

ANALYTICAL RESULTS

ATEC Lab No. 9011356-2

Analyte	CAS Number	Concentration (ug/kg)	Quantitation Limit (ug/kg)
Trans-1, 3-Dichloropropene	10061-02-6	< 5	5
Trichloroethene	79-01-6	< 5	5
Dibromochloromethane	124-48-1	< 5	5
1,1,2-Trichloroethane	79-00-5	< 5	5
Benzene	71-43-2	< 5	5
cis-1,3-Dichloropropene	10061-01-5	< 5	5
2-Chloroethylvinylether	110-75-8	<10	10
Bromoform	75-25-2	< 5	5
4-Methyl-2-Pentanone	108-10-1	<10	10
2-Hexanone	591-78-6	<10	10
Tetrachloroethene	127-18-4	< 5	5
1,1,2,2-Tetrachloroethane	79-34-5	< 5	5
Toluene	108-88-3	< 5	5
Chlorobenzene	108-90-7	< 5	5
Ethylbenzene	100-41-4	< 5	5
Styrene	100-42-5	< 5	5
Total Xylenes		< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

Analytical Method: SW 846 Method 8240

Analyst: T. Harrison
Verified: M. McGill
Date Reported: December 5, 1990

Respectfully submitted,

Keith S. Kline

Environmental/Analytical Testing Division

Client: S.B. Redevelopment Commission
Client Address: Department of Economic Development
County City Building
South Bend, IN 46601

Client Project Number: 21-07458
Client Sample Identification: MW-3 (23.5-25)
Sample Matrix: Soil
Date Sample Collected: November 28, 1990
Date Sample Received: November 30, 1990
Date Sample Analyzed: December 4, 1990
Analytical Equipment: Incos BV

VOLATILE COMPOUNDS
ANALYTICAL RESULTS

ATEC Lab No. 9011356-3

Analyte	CAS Number	Concentration (ug/kg)	Quantitation Limit (ug/kg)
Chloromethane	74-87-3	<10	10
Bromomethane	74-83-9	<10	10
Vinyl Chloride	75-01-4	<10	10
Chloroethane	75-00-3	<10	10
Methylene Chloride	75-09-2	6	5
Acetone	67-64-1	<10	10
Carbon Disulfide	75-15-0	< 5	5
1,1-Dichloroethene	75-35-4	< 5	5
1,1-Dichloroethane	75-35-3	< 5	5
Trans-1,2-Dichloroethene	156-60-5	< 5	5
Chloroform	67-66-3	< 5	5
1,2-Dichloroethane	107-06-2	< 5	5
2-Butanone	78-93-3	<10	10
1,1,1-Trichloroethane	71-55-6	< 5	5
Carbon Tetrachloride	56-23-5	< 5	5
Vinyl Acetate	108-05-4	<10	10
Bromodichloromethane	75-27-4	< 5	5
1,2-Dichloropropane	78-87-5	< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

ANALYTICAL RESULTS

ATEC Lab No. 9011356-3

Analyte	CAS Number	Concentration (ug/kg)	Quantitation Limit (ug/kg)
Trans-1, 3-Dichloropropene	10061-02-6	< 5	5
Trichloroethene	79-01-6	< 5	5
Dibromochloromethane	124-48-1	< 5	5
1,1,2-Trichloroethane	79-00-5	< 5	5
Benzene	71-43-2	< 5	5
cis-1,3-Dichloropropene	10061-01-5	< 5	5
2-Chloroethylvinylether	110-75-8	<10	10
Bromoform	75-25-2	< 5	5
4-Methyl-2-Pentanone	108-10-1	<10	10
2-Hexanone	591-78-6	<10	10
Tetrachloroethene	127-18-4	< 5	5
1,1,2,2-Tetrachloroethane	79-34-5	< 5	5
Toluene	108-88-3	< 5	5
Chlorobenzene	108-90-7	< 5	5
Ethylbenzene	100-41-4	< 5	5
Styrene	100-42-5	< 5	5
Total Xylenes		< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

Analytical Method: SW 846 Method 8240

Analyst: T. Harrison
Verified: M. McGill
Date Reported: December 5, 1990

Respectfully submitted,

Keith S. Kline

Environmental/Analytical Testing Division

Client: S.B. Redevelopment Commission
Client Address: Department of Economic Development
County City Building
South Bend, IN 46601

Client Project Number: 21-07458
Client Sample Identification: MW-4 (21-22.5)
Sample Matrix: Soil
Date Sample Collected: November 28, 1990
Date Sample Received: November 30, 1990
Date Sample Analyzed: December 4, 1990
Analytical Equipment: Incos BV

VOLATILE COMPOUNDS
ANALYTICAL RESULTS

ATEC Lab No. 9011356-4

Analyte	CAS Number	Concentration (ug/kg)	Quantitation Limit (ug/kg)
Chloromethane	74-87-3	<10	10
Bromomethane	74-83-9	<10	10
Vinyl Chloride	75-01-4	<10	10
Chloroethane	75-00-3	<10	10
Methylene Chloride	75-09-2	6	5
Acetone	67-64-1	<10	10
Carbon Disulfide	75-15-0	< 5	5
1,1-Dichloroethene	75-35-4	< 5	5
1,1-Dichloroethane	75-35-3	< 5	5
Trans-1,2-Dichloroethene	156-60-5	< 5	5
Chloroform	67-66-3	< 5	5
1,2-Dichloroethane	107-06-2	< 5	5
2-Butanone	78-93-3	<10	10
1,1,1-Trichloroethane	71-55-6	< 5*	5
Carbon Tetrachloride	56-23-5	< 5	5
Vinyl Acetate	108-05-4	<10	10
Bromodichloromethane	75-27-4	< 5	5
1,2-Dichloropropane	78-87-5	< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

ANALYTICAL RESULTS

ATEC Lab No. 9011356-4

Analyte	CAS Number	Concentration (ug/kg)	Quantitation Limit (ug/kg)
Trans-1, 3-Dichloropropene	10061-02-6	< 5	5
Trichloroethene	79-01-6	< 5	5
Dibromochloromethane	124-48-1	< 5	5
1,1,2-Trichloroethane	79-00-5	< 5	5
Benzene	71-43-2	< 5	5
cis-1,3-Dichloropropene	10061-01-5	< 5	5
2-Chloroethylvinylether	110-75-8	<10	10
Bromoform	75-25-2	< 5	5
4-Methyl-2-Pentanone	108-10-1	<10	10
2-Hexanone	591-78-6	<10	10
Tetrachloroethene	127-18-4	< 5	5
1,1,2,2-Tetrachloroethane	79-34-5	< 5	5
Toluene	108-88-3	< 5*	5
Chlorobenzene	108-90-7	< 5	5
Ethylbenzene	100-41-4	< 5	5
Styrene	100-42-5	< 5	5
Total Xylenes		< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

Analytical Method: SW 846 Method 8240

Analyst: T. Harrison
Verified: M. McGill
Date Reported: December 5, 1990

Respectfully submitted,

Kevin S. Kline

Environmental/Analytical Testing Division

Client: S.B. Redevelopment Commission
Client Address: Department of Economic Development
County City Building
South Bend, IN 46601

Client Project Number: 21-07458
Client Sample Identification: MW-1
Sample Matrix: Water
Date Sample Collected: November 30, 1990
Date Sample Received: November 30, 1990
Date Sample Analyzed: December 4, 1990
Analytical Equipment: Incos BV

VOLATILE COMPOUNDS
ANALYTICAL RESULTS

ATEC Lab No. 9011356-5

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Chloromethane	74-87-3	<10	10
Bromomethane	74-83-9	<10	10
Vinyl Chloride	75-01-4	<10	10
Chloroethane	75-00-3	<10	10
Methylene Chloride	75-09-2	< 5*	5
Acetone	67-64-1	<10	10
Carbon Disulfide	75-15-0	< 5	5
1,1-Dichloroethene	75-35-4	< 5	5
1,1-Dichloroethane	75-35-3	< 5	5
Trans-1,2-Dichloroethene	156-60-5	< 5	5
Chloroform	67-66-3	< 5	5
1,2-Dichloroethane	107-06-2	< 5	5
2-Butanone	78-93-3	<10	10
1,1,1-Trichloroethane	71-55-6	< 5	5
Carbon Tetrachloride	56-23-5	< 5	5
Vinyl Acetate	108-05-4	<10	10
Bromodichloromethane	75-27-4	< 5	5
1,2-Dichloropropane	78-87-5	< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

ANALYTICAL RESULTS

ATEC Lab No. 9011356-5

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Trans-1, 3-Dichloropropene	10061-02-6	< 5	5
Trichloroethene	79-01-6	< 5	5
Dibromochloromethane	124-48-1	< 5	5
1,1,2-Trichloroethane	79-00-5	< 5	5
Benzene	71-43-2	< 5	5
cis-1,3-Dichloropropene	10061-01-5	< 5	5
2-Chloroethylvinylether	110-75-8	<10	10
Bromoform	75-25-2	< 5	5
4-Methyl-2-Pentanone	108-10-1	<10	10
2-Hexanone	591-78-6	<10	10
Tetrachloroethene	127-18-4	< 5	5
1,1,2,2-Tetrachloroethane	79-34-5	< 5	5
Toluene	108-88-3	< 5	5
Chlorobenzene	108-90-7	< 5	5
Ethylbenzene	100-41-4	< 5	5
Styrene	100-42-5	< 5	5
Total Xylenes		< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

Analytical Method: U.S. EPA Method 624

Analyst: T. Harrison
Verified: M. McGill
Date Reported: December 5, 1990

Respectfully submitted,

Kevin S. Kline

Environmental/Analytical Testing Division

Client: S.B. Redevelopment Commission
Client Address: Department of Economic Development
County City Building
South Bend, IN 46601

Client Project Number: 21-07458
Client Sample Identification: MW-2
Sample Matrix: Water
Date Sample Collected: November 30, 1990
Date Sample Received: November 30, 1990
Date Sample Analyzed: December 4, 1990
Analytical Equipment: Incos BV

VOLATILE COMPOUNDS
ANALYTICAL RESULTS

ATEC Lab No. 9011356-6

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Chloromethane	74-87-3	<10	10
Bromomethane	74-83-9	<10	10
Vinyl Chloride	75-01-4	<10	10
Chloroethane	75-00-3	<10	10
Methylene Chloride	75-09-2	12	5
Acetone	67-64-1	<10	10
Carbon Disulfide	75-15-0	< 5	5
1,1-Dichloroethene	75-35-4	< 5	5
1,1-Dichloroethane	75-35-3	< 5	5
Trans-1,2-Dichloroethene	156-60-5	37	5
Chloroform	67-66-3	< 5	5
1,2-Dichloroethane	107-06-2	< 5	5
2-Butanone	78-93-3	<10	10
1,1,1-Trichloroethane	71-55-6	< 5	5
Carbon Tetrachloride	56-23-5	< 5	5
Vinyl Acetate	108-05-4	<10	10
Bromodichloromethane	75-27-4	< 5	5
1,2-Dichloropropane	78-87-5	< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

ANALYTICAL RESULTS

ATEC Lab No. 9011356-6

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Trans-1, 3-Dichloropropene	10061-02-6	< 5	5
Trichloroethene	79-01-6	< 5*	5
Dibromochloromethane	124-48-1	< 5	5
1,1,2-Trichloroethane	79-00-5	< 5	5
Benzene	71-43-2	< 5	5
cis-1,3-Dichloropropene	10061-01-5	< 5	5
2-Chloroethylvinylether	110-75-8	<10	10
Bromoform	75-25-2	< 5	5
4-Methyl-2-Pentanone	108-10-1	<10	10
2-Hexanone	591-78-6	<10	10
Tetrachloroethene	127-18-4	10	5
1,1,2,2-Tetrachloroethane	79-34-5	< 5	5
Toluene	108-88-3	< 5	5
Chlorobenzene	108-90-7	< 5	5
Ethylbenzene	100-41-4	< 5	5
Styrene	100-42-5	< 5	5
Total Xylenes		< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

Analytical Method: U.S. EPA Method 624

Analyst: T. Harrison
Verified: M. McGill
Date Reported: December 5, 1990

Respectfully submitted,

Keith S Kline

Environmental/Analytical Testing Division

Client: S.B. Redevelopment Commission
Client Address: Department of Economic Development
County City Building
South Bend, IN 46601

Client Project Number: 21-07458
Client Sample Identification: MW-3
Sample Matrix: Water
Date Sample Collected: November 30, 1990
Date Sample Received: November 30, 1990
Date Sample Analyzed: December 4, 1990
Analytical Equipment: Incos BV

VOLATILE COMPOUNDS
ANALYTICAL RESULTS

ATEC Lab No. 9011356-7

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Chloromethane	74-87-3	<10	10
Bromomethane	74-83-9	<10	10
Vinyl Chloride	75-01-4	<10	10
Chloroethane	75-00-3	<10	10
Methylene Chloride	75-09-2	14	5
Acetone	67-64-1	<10	10
Carbon Disulfide	75-15-0	< 5	5
1,1-Dichloroethene	75-35-4	< 5	5
1,1-Dichloroethane	75-35-3	< 5	5
Trans-1,2-Dichloroethene	156-60-5	< 5*	5
Chloroform	67-66-3	< 5	5
1,2-Dichloroethane	107-06-2	< 5	5
2-Butanone	78-93-3	<10	10
1,1,1-Trichloroethane	71-55-6	10	5
Carbon Tetrachloride	56-23-5	< 5	5
Vinyl Acetate	108-05-4	<10	10
Bromodichloromethane	75-27-4	< 5	5
1,2-Dichloropropane	78-87-5	< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

ANALYTICAL RESULTS

ATEC Lab No. 9011356-7

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Trans-1, 3-Dichloropropene	10061-02-6	< 5	5
Trichloroethene	79-01-6	< 5	5
Dibromochloromethane	124-48-1	< 5	5
1,1,2-Trichloroethane	79-00-5	< 5	5
Benzene	71-43-2	< 5	5
cis-1,3-Dichloropropene	10061-01-5	< 5	5
2-Chloroethylvinylether	110-75-8	<10	10
Bromoform	75-25-2	< 5	5
4-Methyl-2-Pentanone	108-10-1	<10	10
2-Hexanone	591-78-6	<10	10
Tetrachloroethene	127-18-4	< 5	5
1,1,2,2-Tetrachloroethane	79-34-5	< 5	5
Toluene	108-88-3	< 5	5
Chlorobenzene	108-90-7	< 5	5
Ethylbenzene	100-41-4	< 5	5
Styrene	100-42-5	< 5	5
Total Xylenes		< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

Analytical Method: U.S. EPA Method 624

Analyst: T. Harrison
Verified: M. McGill
Date Reported: December 5, 1990

Respectfully submitted,

Kevin S. Kline

Environmental/Analytical Testing Division

Client: S.B. Redevelopment Commission
Client Address: Department of Economic Development
County City Building
South Bend, IN 46601

Client Project Number: 21-07458
Client Sample Identification: MW-4
Sample Matrix: Water
Date Sample Collected: November 30, 1990
Date Sample Received: November 30, 1990
Date Sample Analyzed: December 4, 1990
Analytical Equipment: Incos BV

VOLATILE COMPOUNDS
ANALYTICAL RESULTS

ATEC Lab No. 9011356-8

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Chloromethane	74-87-3	<10	10
Bromomethane	74-83-9	<10	10
Vinyl Chloride	75-01-4	<10	10
Chloroethane	75-00-3	<10	10
Methylene Chloride	75-09-2	13	5
Acetone	67-64-1	<10	10
Carbon Disulfide	75-15-0	< 5	5
1,1-Dichloroethene	75-35-4	< 5	5
1,1-Dichloroethane	75-35-3	< 5	5
Trans-1,2-Dichloroethene	156-60-5	< 5	5
Chloroform	67-66-3	< 5	5
1,2-Dichloroethane	107-06-2	< 5	5
2-Butanone	78-93-3	<10	10
1,1,1-Trichloroethane	71-55-6	< 5	5
Carbon Tetrachloride	56-23-5	< 5	5
Vinyl Acetate	108-05-4	<10	10
Bromodichloromethane	75-27-4	< 5	5
1,2-Dichloropropane	78-87-5	< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

ANALYTICAL RESULTS

ATEC Lab No. 9011356-8

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Trans-1, 3-Dichloropropene	10061-02-6	< 5	5
Trichloroethene	79-01-6	< 5	5
Dibromochloromethane	124-48-1	< 5	5
1,1,2-Trichloroethane	79-00-5	< 5	5
Benzene	71-43-2	< 5	5
cis-1,3-Dichloropropene	10061-01-5	< 5	5
2-Chloroethylvinylether	110-75-8	<10	10
Bromoform	75-25-2	< 5	5
4-Methyl-2-Pentanone	108-10-1	<10	10
2-Hexanone	591-78-6	<10	10
Tetrachloroethene	127-18-4	< 5*	5
1,1,2,2-Tetrachloroethane	79-34-5	< 5	5
Toluene	108-88-3	< 5	5
Chlorobenzene	108-90-7	< 5	5
Ethylbenzene	100-41-4	< 5	5
Styrene	100-42-5	< 5	5
Total Xylenes		< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

Analytical Method: U.S. EPA Method 624

Analyst: T. Harrison
Verified: M. McGill
Date Reported: December 5, 1990

Respectfully submitted,

Keith S. Kline

Environmental/Analytical Testing Division

CHAIN OF CUSTODY RECORD

PROJ. NO. 21-07458

PROJECT NAME STUDEBAKER CORRIDOR PROJECT

CLIENT DEPARTMENT OF ECONOMICAL DEVELOPMENT - CITY OF SOUTH BEND

LAB PROJ. NO. 901356

SAMPLERS: (Signature) Charles D. Cashman

SAMPLING METHOD OSHA-soil-split spoon/H2O-teflon bailer

LABORATORY ANALYSIS

SAMPLE I.D NO.	DATE	TIME	COMPOSITE	GRAB	WATER	SOIL		FILTERED	ACIDIFIED	ICED		NUMBER OF CONTAINERS	LAB I.D. NUMBER	VOLATILE ORGANICS	BTX & E	TOTAL HYDROCARBONS	PCB'S	E.P. TOXIC METALS	TOTAL METALS (8)	IGNITABILITY			SAMPLE LOCATION / REMARKS
MW-1 (23.5-25')	11-26-90	4:00pm		X		X				X		2	-1	X				X					
MW-2 (23.5-25')	11-28-90	9:15am		X		X				X		2	-2	X				X					
MW-3 (23.5-25')	11-28-90	11:30am		X		X				X		2	-3	X				X					
MW-4 (21-22.5')	11-28-90	1:45pm		X		X				X		2	-4	X				X					
MW-1	11-30-90	11:10am		X	X			X	X	X		3	-5	X				X					
MW-2	11-30-90	10:45am		X	X			X	X	X		3	-6	X				X					
MW-3	11-30-90	10:15am		X	X			X	X	X		3	-7	X				X					
MW-4	11-30-90	9:40am		X	X			X	X	X		3	-8	X				X					
BLANK	11-30-90	11:00am		X	X			X	X	X		1	-9					X					

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Charles D. Cashman	11-30-90 3:35pm				

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Project Manager / Phone #:
		B. Hudson	11/30/90 3:40	MATT STOKES x1720

ATEC Environmental Consultants
Division of ATEC Associates, Inc.
5150 East 65th Street
Indianapolis, Indiana 46220-4871
(317) 849-4990, FAX # (317) 849-4278

ATEC Environmental Consultants
Division of ATEC Associates, Inc.
5150 East 65th Street
Indianapolis, Indiana 46220-4871
[317] 849-4990, FAX # [317] 849-4278

December 13, 1990

Mr. Matthew Stokes
ATEC Environmental Services
5150 East 65th Street
Indianapolis, IN 46220

Re: Five Soil TPH
SW 846 Method 8015 California Modified
City of South Bend
Studebaker Corridor Project
ATEC Project Number 21-07461

Dear Mr. Stokes:

Enclosed are the results of the Organic Analyses for the five soil samples which were submitted to the ATEC Environmental/Analytical Testing Division on November 30, 1990, on behalf of City of South Bend. Total Petroleum Hydrocarbon analyses were performed on a Varian 3700 Gas Chromatograph using Flame Ionization Detection via SW 846 Method 8015 California Modified.

All associated Quality Control information will be maintained in the Testing Division files, a copy of which can be forwarded to you upon request. After a thirty-day period, a fee will be assessed for this additional information.

It has been a pleasure serving you and, as always, if there are any questions concerning these results or the ATEC Policies, please feel free to contact me.

Respectfully submitted,
ATEC Associates, Inc.

Donna S. Spyker

Donna S. Spyker
Environmental/Analytical
Testing Division

DSS/mw

REPORT OF TEST RESULTS

ATEC Project Number 21-07461

Date: December 10, 1990

Client: City of South Bend
South Bend Redevelopment Commission
1200 County City Building
South Bend, IN 46601

Analysis Information: Total Petroleum Hydrocarbon Analysis
SW 846 Method 8015 California Modified

Sample Taken By:	ATEC (CC)
Sample Matrix:	Soil
Date Sampled:	November 29, 1990
Date Received:	November 30, 1990
Date Analyzed:	December 7, 1990
Analyst:	LAA
Verified By:	DSS
ATEC Lab Number:	9011355

Sample Identification	Total Petroleum Hydrocarbon	Quantitation Limit
B-1 (13.5-15)	<1.0 ppm	1.0 ppm
B-2 (13.5-15)	<1.0 ppm	1.0 ppm
B-3 (13.5-15)	<1.0 ppm	1.0 ppm
B-4 (21-22.5)	<1.0 ppm	1.0 ppm
B-5 (21-22.5)	<1.0 ppm	1.0 ppm

Respectfully submitted,
ATEC Associates, Inc.

Environmental/Analytical Testing Division

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME	LAB PROJ. NO.
21-07461	STATE BAKER CORRIDOR PROJECT	901135
	CLIENT CITY OF SOUTH BEND - DEPART OF ECON DVLPMT	

SAMPLERS (Signature): Charles D. Cashman

SAMPLING METHOD: HSA split spoon

SAMPLE I.D. NO.	DATE	TIME	COMPOSITE	GRAB	WATER	SOIL	FILTERED	ACIDIFIED	ICED	NUMBER OF CONTAINERS	LAB I.D. NUMBER
B-1 (13.5-15')	11-29-90	8:30am		X		X			X	1	-1
B-2 (13.5-15')	11-29-90	9:30am		X		X			X	1	-2
B-3 (13.5-15')	11-29-90	10:15am		X		X			X	1	-3
B-4 (21-22.5')	11-29-90	11:00am		X		X			X	1	-4
B-5 (21-22.5')	11-29-90	11:45am		X		X			X	1	-5

LABORATORY ANALYSIS

VOLATILE ORGANICS	BTX & E	TOTAL HYDROCARBONS	PCB'S	EP. TOXIC METALS	TOTAL METALS (8)	IGNITABILITY	SAMPLE LOCATION / REMARKS
	X						
	X						
	X						
	X						
	X						

ATEC Environmental Consultants
Division of ATEC Associates, Inc.
5150 East 65th Street
Indianapolis, Indiana 46220-4871
(317) 849-4990, FAX # (317) 849-4278

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Project Manager / Phone #:
Charles D. Cashman	11-30-90 3:35p	B Henderson	11/30/90 3:39	MATT STOKES x1720

CHAIN OF CUSTODY RECORD

PROJ NO. 21-07458

PROJECT NAME STUDEBAKER CORRIDOR PROJECT

CLIENT DEPARTMENT OF ECONOMICAL DEVELOPMENT - CITY OF SOUTH BEND

LAB PROJ. NO. 90 11356

SAMPLERS: (Signature) Charles D. Cashman

SAMPLING METHOD: HSA - soil - split spoon / H2O - teflon bailer

LABORATORY ANALYSIS

SAMPLE I.D. NO.	DATE	TIME	COMPOSITE	GRAB	WATER	SOIL		FILTERED	ACIDIFIED	ICED		NUMBER OF CONTAINERS	LAB I.D. NUMBER	VOLATILE ORGANICS	BTX & E	TOTAL HYDROCARBONS	PCB'S	E.P. TOXIC METALS	TOTAL METALS (8)	IGNITABILITY		SAMPLE LOCATION / REMARKS
MW-1 (23.5-25')	11-26-90	4:00pm		X		X				X		2	-1	X					X			
MW-2 (23.5-25')	11-28-90	9:15am		X		X				X		2	-2	X					X			
MW-3 (23.5-25')	11-28-90	11:30am		X		X				X		2	-3	X					X			
MW-4 (21-22.5')	11-28-90	1:45pm		X		X				X		2	-4	X					X			
MW-1	11-30-90	11:10am		X	X			X	X	X		3	-5	X					X			
MW-2	11-30-90	10:45am		X	X			X	X	X		3	-6	X					X			
MW-3	11-30-90	10:15am		X	X			X	X	X		3	-7	X					X			
MW-4	11-30-90	1:40pm		X	X			X	X	X		3	-8	X					X			
BLANK	11-30-90	11:00pm		X	X			X	X	X		1	-9						X			

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Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Project Manager / Phone #:
Charles D. Cashman	11-30-90 3:35pm	YB. Hudson	11/30/90 3:40	MATT STOKES x1720

APPENDIX F

ATEC REPORT NUMBER 21-17060

March 18, 1991

Mr. K.C. Pocius
Department of Economic Development
County City Building
South Bend, IN 46601

Re: Groundwater Monitoring Program
Lot One
Studebaker Corridor
Former Avanti Plant Site
South Bend, Indiana
ATEC Project Number 21-17060

Dear Mr. Pocius:

ATEC Environmental Consultants (ATEC) has performed a second round of sampling and testing groundwater from four (4) monitoring wells located at the above-referenced facility. This work was recommended based on findings made during the initial Phase II environmental site assessment of this property. Upon approval from the client to continue this project ATEC proceeded.

On February 21, 1991, ATEC personnel collected groundwater samples from four (4) monitoring wells at this site. Before obtaining the samples, each well was purged of a minimum of three (3) well volumes to ensure a representative groundwater sample. A Teflon bailer with polypropylene rope was utilized for purging and the collection of the samples. Between monitoring well samples, the bailer was decontaminated with an on-site tap water and Premier detergent wash, a tap water rinse, followed by a triple distilled water rinse. The groundwater samples collected were analyzed for VOCs. All four (4) groundwater samples were collected, preserved, and transported to the ATEC laboratory following appropriate chain-of-custody procedures.

On November 29, 1990, the four (4) monitoring wells were surveyed. The top of the casing of each well was surveyed into an arbitrary benchmark with an assigned elevation of 100.0 ft. Groundwater elevations

were also collected on February 21, 1991, using a Solinist water level indicator, were used in conjunction with the survey data to verify water table elevations.

Groundwater depth in the monitoring wells ranged from 24.19 ft to 22.75 ft below ground surface. Based on calculations of groundwater elevations using these recent groundwater depths, groundwater flow direction to the northeast is confirmed by this data.

Findings

The second round of groundwater analyses are shown in Table 1 along with the first round of analyses.

Table 1
Volatile Organic Compounds in Groundwater Monitoring Well Sample Locations

	Sample Locations								
	MW-1		MW-2		MW-3		MW-4		Evaluation Criteria
Constituent	11/90	2/91	11/90	2/91	11/90	2/91	11/90	2/91	
Trans-1,2-Dichloroethene	ND	8	37	18	<5*	<5*	ND	ND	100**
1,1,1-Trichloroethane	ND	ND	ND	ND	10	13	ND	ND	200
Trichloroethene	ND	ND	<5*	ND	ND	ND	ND	ND	5
Tetrachloroethene	ND	ND	10	5	ND	ND	<5*	<5*	5
Vinyl Chloride	ND	ND	ND	33	ND	ND	ND	ND	2
1,1-Dichloroethane	ND	ND	ND	ND	ND	<5*	ND	ND	5

* = Constituent detected but concentration present is less than quantitation limit
** = Represents proposed Maximum Contaminant Level (MCL)
ND = Constituent not detected
All results reported in parts per billion (ppb)
This is equivalent to micrograms per liter (mg/L) in water

Based on the groundwater test results from the second round of sampling, downgradient well MW-2 remains the only well tested which showed concentrations of Volatile Compounds above the maximum levels established by the EPA for Contaminant Levels (MCLs) for drinking water. The groundwater sample collected from MW-2 shows Tetrachloroethene (PCE) at the MCL for this compound and vinyl chloride above the MCL. Vinyl chloride was not shown in the first round of testing at this well location. Volatile constituents were also detected in downgradient locations MW-1 and MW-3 however concentrations are below MCLs for drinking water.

Also, test results from the second round of sampling confirm the presence of PCE in upgradient well MW-4.

Conclusions

Analytical results from both rounds of groundwater samples collected show similar results regarding the presence of low concentrations of volatile constituents. In each case, monitoring well location MW-2 revealed concentrations of volatile compounds above the MCLs for drinking water for certain contaminants. Verification of groundwater flow direction indicate this well is at a downgradient location with respect to Lot One.

ATEC recommends that this information be provided to Indiana Department of Environmental Management (IDEM) due to the Avanti site being listed as a CERCLIS site by the IDEM and the confirmed presence of low concentrations of contamination in the groundwater. ATEC's recommendation to the IDEM is to perform an initial risk assessment to determine possible impact of groundwater users in the area. The groundwater sources used as drinking water supplies may or may not be hydrogeologically interconnected with the aquifer sampled through these monitoring wells. Demonstration of low possible impact of downgradient receptors and further verification of possible off-site sources may act to decrease concerns that this site could be adversely affecting drinking water supplies.

Very truly yours,

ATEC Associates, Inc.

Andrew D Trowbridge /for
Kurtis H. Gilliam
Staff Environmental Scientist

Matthew C Stokes
Matthew C. Stokes, C.H.M.M.
Project Manager/Environmental Scientist

MCS/ca

ATEC Environmental Consultants
Division of ATEC Associates, Inc.
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March 5, 1991

Mr. Matthew Stokes
ATEC Environmental Consultants
5150 East 65th Street
Indianapolis, IN 46220

Re: Four Water VOA
U.S. EPA Method 624
City of South Bend
Department of Economic Development
ATEC Project Number 21-17060

Dear Mr. Stokes:

Enclosed are the results of the Organic Analyses for the four water samples which were submitted to the ATEC Environmental/Analytical Testing Division on February 22, 1991, on behalf of the City of South Bend. The volatile samples were analyzed on a Finnigan 1020 OWA GC/MS/DS system, complete with Superincos Software, via U.S. EPA Method 624 for Purgeable Organic Compounds. Prior to analysis the system was tuned against Bromofluorobenzene and calibrated with the appropriate standard.

All associated Quality Control information will be maintained in the Testing Division files, a copy of which can be forwarded to you upon request. After a thirty-day period, a fee will be assessed for this additional information.

It has been a pleasure serving you and, as always, if there are any questions concerning these results or the ATEC policies, please feel free to contact me.

Respectfully submitted,
ATEC Associates, Inc.

Keith S. Kline

Keith S. Kline
Environmental/Analytical
Testing Division

KSK/sdv

Client: City of South Bend
Client Address: City County Building
South Bend, IN 46601

Client Project Number: 21-17060
Client Sample Identification: MW-1
Sample Matrix: Water
Date Sample Collected: February 21, 1991
Date Sample Received: February 22, 1991
Date Sample Analyzed: February 28, 1991
Analytical Equipment: 1020B

VOLATILE COMPOUNDS
ANALYTICAL RESULTS

ATEC Lab No. 9102254-1

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Chloromethane	74-87-3	<10	10
Bromomethane	74-83-9	<10	10
Vinyl Chloride	75-01-4	24	10
Chloroethane	75-00-3	<10	10
Methylene Chloride	75-09-2	7	5
Acetone	67-64-1	<10	10
Carbon Disulfide	75-15-0	< 5	5
1,1-Dichloroethene	75-35-4	< 5	5
1,1-Dichloroethane	75-35-3	< 5	5
Trans-1,2-Dichloroethene	156-60-5	8	5
Chloroform	67-66-3	< 5	5
1,2-Dichloroethane	107-06-2	< 5	5
2-Butanone	78-93-3	<10	10
1,1,1-Trichloroethane	71-55-6	< 5	5
Carbon Tetrachloride	56-23-5	< 5	5
Vinyl Acetate	108-05-4	<10	10
Bromodichloromethane	75-27-4	< 5	5
1,2-Dichloropropane	78-87-5	< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

ANALYTICAL RESULTS

ATEC Lab No. 9102254-1

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Trans-1, 3-Dichloropropene	10061-02-6	< 5	5
Trichloroethene	79-01-6	< 5	5
Dibromochloromethane	124-48-1	< 5	5
1,1,2-Trichloroethane	79-00-5	< 5	5
Benzene	71-43-2	< 5	5
cis-1,3-Dichloropropene	10061-01-5	< 5	5
2-Chloroethylvinylether	110-75-8	<10	10
Bromoform	75-25-2	< 5	5
4-Methyl-2-Pentanone	108-10-1	<10	10
2-Hexanone	591-78-6	<10	10
Tetrachloroethene	127-18-4	< 5	5
1,1,2,2-Tetrachloroethane	79-34-5	< 5	5
Toluene	108-88-3	< 5	5
Chlorobenzene	108-90-7	< 5	5
Ethylbenzene	100-41-4	< 5	5
Styrene	100-42-5	< 5	5
Total Xylenes		< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

Analytical Method: U.S. EPA Method 624

Analyst: M. McGill
Verified: B. Keller
Date Verified: March 4, 1991

Respectfully submitted,

Keith S. Kline

Environmental/Analytical Testing Division

Client: City of South Bend
Client Address: City County Building
South Bend, IN 46601

Client Project Number: 21-17060
Client Sample Identification: MW-2
Sample Matrix: Water
Date Sample Collected: February 21, 1991
Date Sample Received: February 22, 1991
Date Sample Analyzed: February 28, 1991
Analytical Equipment: 1020B

VOLATILE COMPOUNDS
ANALYTICAL RESULTS

ATEC Lab No. 9102254-2

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Chloromethane	74-87-3	<10	10
Bromomethane	74-83-9	<10	10
Vinyl Chloride	75-01-4	33	10
Chloroethane	75-00-3	<10	10
Methylene Chloride	75-09-2	< 5	5
Acetone	67-64-1	<10	10
Carbon Disulfide	75-15-0	< 5	5
1,1-Dichloroethene	75-35-4	< 5	5
1,1-Dichloroethane	75-35-3	< 5	5
Trans-1,2-Dichloroethene	156-60-5	18	5
Chloroform	67-66-3	< 5	5
1,2-Dichloroethane	107-06-2	< 5	5
2-Butanone	78-93-3	<10	10
1,1,1-Trichloroethane	71-55-6	< 5	5
Carbon Tetrachloride	56-23-5	< 5	5
Vinyl Acetate	108-05-4	<10	10
Bromodichloromethane	75-27-4	< 5	5
1,2-Dichloropropane	78-87-5	< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

ANALYTICAL RESULTS

ATEC Lab No. 9102254-2

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Trans-1, 3-Dichloropropene	10061-02-6	< 5	5
Trichloroethene	79-01-6	< 5	5
Dibromochloromethane	124-48-1	< 5	5
1,1,2-Trichloroethane	79-00-5	< 5	5
Benzene	71-43-2	< 5	5
cis-1,3-Dichloropropene	10061-01-5	< 5	5
2-Chloroethylvinylether	110-75-8	<10	10
Bromoform	75-25-2	< 5	5
4-Methyl-2-Pentanone	108-10-1	<10	10
2-Hexanone	591-78-6	<10	10
Tetrachloroethene	127-18-4	5	5
1,1,2,2-Tetrachloroethane	79-34-5	< 5	5
Toluene	108-88-3	< 5	5
Chlorobenzene	108-90-7	< 5	5
Ethylbenzene	100-41-4	< 5	5
Styrene	100-42-5	< 5	5
Total Xylenes		< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

Analytical Method: U.S. EPA Method 624

Analyst: M. McGill
Verified: B. Keller
Date Verified: March 4, 1991

Respectfully submitted,

Keith S. Kline

Environmental/Analytical Testing Division

Client: City of South Bend
Client Address: City County Building
South Bend, IN 46601

Client Project Number: 21-17060
Client Sample Identification: MW-3
Sample Matrix: Water
Date Sample Collected: February 21, 1991
Date Sample Received: February 22, 1991
Date Sample Analyzed: February 28, 1991
Analytical Equipment: 1020B

VOLATILE COMPOUNDS
ANALYTICAL RESULTS

ATEC Lab No. 9102254-3

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Chloromethane	74-87-3	<10	10
Bromomethane	74-83-9	<10	10
Vinyl Chloride	75-01-4	<10	10
Chloroethane	75-00-3	<10	10
Methylene Chloride	75-09-2	< 5*	5
Acetone	67-64-1	<10*	10
Carbon Disulfide	75-15-0	< 5	5
1,1-Dichloroethene	75-35-4	< 5	5
1,1-Dichloroethane	75-35-3	< 5*	5
Trans-1,2-Dichloroethene	156-60-5	< 5*	5
Chloroform	67-66-3	< 5	5
1,2-Dichloroethane	107-06-2	< 5	5
2-Butanone	78-93-3	<10	10
1,1,1-Trichloroethane	71-55-6	13	5
Carbon Tetrachloride	56-23-5	< 5	5
Vinyl Acetate	108-05-4	<10	10
Bromodichloromethane	75-27-4	< 5	5
1,2-Dichloropropane	78-87-5	< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

ANALYTICAL RESULTS

ATEC Lab No. 9102254-3

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Trans-1, 3-Dichloropropene	10061-02-6	< 5	5
Trichloroethene	79-01-6	< 5	5
Dibromochloromethane	124-48-1	< 5	5
1,1,2-Trichloroethane	79-00-5	< 5	5
Benzene	71-43-2	< 5	5
cis-1,3-Dichloropropene	10061-01-5	< 5	5
2-Chloroethylvinylether	110-75-8	<10	10
Bromoform	75-25-2	< 5	5
4-Methyl-2-Pentanone	108-10-1	<10	10
2-Hexanone	591-78-6	<10	10
Tetrachloroethene	127-18-4	< 5	5
1,1,2,2-Tetrachloroethane	79-34-5	< 5	5
Toluene	108-88-3	< 5	5
Chlorobenzene	108-90-7	< 5	5
Ethylbenzene	100-41-4	< 5	5
Styrene	100-42-5	< 5	5
Total Xylenes		< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

Analytical Method: U.S. EPA Method 624

Analyst: M. McGill
Verified: B. Keller
Date Verified: March 4, 1991

Respectfully submitted,

Keith S. Kline

Environmental/Analytical Testing Division

Client: City of South Bend
Client Address: City County Building
South Bend, IN 46601

Client Project Number: 21-17060
Client Sample Identification: MW-4
Sample Matrix: Water
Date Sample Collected: February 21, 1991
Date Sample Received: February 22, 1991
Date Sample Analyzed: February 28, 1991
Analytical Equipment: 1020B

VOLATILE COMPOUNDS
ANALYTICAL RESULTS

ATEC Lab No. 9102254-4

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Chloromethane	74-87-3	<10	10
Bromomethane	74-83-9	<10	10
Vinyl Chloride	75-01-4	<10	10
Chloroethane	75-00-3	<10	10
Methylene Chloride	75-09-2	5	5
Acetone	67-64-1	<10	10
Carbon Disulfide	75-15-0	< 5	5
1,1-Dichloroethene	75-35-4	< 5	5
1,1-Dichloroethane	75-35-3	< 5	5
Trans-1,2-Dichloroethene	156-60-5	< 5	5
Chloroform	67-66-3	< 5	5
1,2-Dichloroethane	107-06-2	< 5	5
2-Butanone	78-93-3	<10	10
1,1,1-Trichloroethane	71-55-6	< 5	5
Carbon Tetrachloride	56-23-5	< 5	5
Vinyl Acetate	108-05-4	<10	10
Bromodichloromethane	75-27-4	< 5	5
1,2-Dichloropropane	78-87-5	< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

ANALYTICAL RESULTS

ATEC Lab No. 9102254-4

Analyte	CAS Number	Concentration (ug/L)	Quantitation Limit (ug/L)
Trans-1, 3-Dichloropropene	10061-02-6	< 5	5
Trichloroethene	79-01-6	< 5	5
Dibromochloromethane	124-48-1	< 5	5
1,1,2-Trichloroethane	79-00-5	< 5	5
Benzene	71-43-2	< 5	5
cis-1,3-Dichloropropene	10061-01-5	< 5	5
2-Chloroethylvinylether	110-75-8	<10	10
Bromoform	75-25-2	< 5	5
4-Methyl-2-Pentanone	108-10-1	<10	10
2-Hexanone	591-78-6	<10	10
Tetrachloroethene	127-18-4	< 5*	5
1,1,2,2-Tetrachloroethane	79-34-5	< 5	5
Toluene	108-88-3	< 5	5
Chlorobenzene	108-90-7	< 5	5
Ethylbenzene	100-41-4	< 5	5
Styrene	100-42-5	< 5	5
Total Xylenes		< 5	5

* Analyte detected but amount present is less than the Quantitation Limit.

Analytical Method: U.S. EPA Method 624

Analyst: M. McGill
Verified: B. Keller
Date Verified: March 4, 1991

Respectfully submitted,

Keith S. Kline

Environmental/Analytical Testing Division

CHAIN OF CUSTODY RECORD

PROJ. NO. 21-17060

PROJECT NAME GROUNDWATER WELLS/SAMPLING AND TESTING

CLIENT DEPARTMENT OF ECONOMIC DEVELOPEMENT, SOUTH BEND

LAB PROJ. NO. 9102254

SAMPLERS: (Signature) D. Ben Chandler, Jr.

SAMPLING METHOD BAILER

LABORATORY ANALYSIS

SAMPLE I.D. NO.	DATE	TIME	COMPOSITE	GRAB	WATER	SOIL		FILTERED	ACIDIFIED	ICED		NUMBER OF CONTAINERS	LAB I.D. NUMBER	VOLATILE ORGANICS	BTX & E	TOTAL HYDROCARBONS	PCB'S	E.P. TOXIC METALS	TOTAL METALS (8)	IGNITABILITY		SAMPLE LOCATION / REMARKS
MW-1	2/21/91			✓	✓					✓		2	-1	✓								
MW-2	2/21/91			✓	✓					✓		2	-2	✓								
MW-3	2/21/91			✓	✓					✓		2	-3	✓								
MW-4	2/21/91			✓	✓					✓		2	-4	✓								

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
D. Ben Chandler, Jr.	2/22/91 8:40a				

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Project Manager / Phone #:
		Reed Barga	2-22-91 8:40a	

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