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REPORT OF SUBSURFACE INVESTIGATION 395 CLEANERS & LAUNDROMAT KENNEWICK PLAZA SHOPPING CENTER 128 SOUTH ELY STREET KENNEWICK, WASHINGTON 99336

FOR
JSH PROPERTIES, INC.
BY
ATC ASSOCIATES INC.
PROJECT NO. 76.18452.0201 TASK 6
MAY 5, 2000

ATC ASSOCIATES INC.

6347 Seaview Avenue Northwest
Seattle, Washington 98107
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May 5, 2000

Colleen D. Fitzgerald
Director of Retail Properties
JSH Properties, Inc.
14335 NE 24th Street, Suite 202
Bellevue, Washington 98007-3737

RE: SUBSURFACE INVESTIGATION
395 CLEANERS & LAUNDROMAT
KENNEWICK PLAZA SHOPPING CENTER
128 SOUTH ELY STREET
KENNEWICK, WASHINGTON
PROJECT NO. 76.18552.0201 TASK 6

Dear Ms. Fitzgerald:

Attached is the Subsurface Investigation report conducted at the above-referenced site. The report includes background information, findings, analytical results, and provides conclusions and recommendations.

ATC appreciates the opportunity to be of service to JSH Properties, Inc. Please contact us if you have any questions regarding this report or need additional information.

Sincerely,

ATC ASSOCIATES INC.

Neil R. Gilham, CHMM
Senior Project Manager

Daniel F. Krause
Operations Manager

Attachment

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Site Description

The site is a laundromat and dry cleaner drop-off facility known as 395 Cleaners & Laundromat located at 128 South Ely Street (U. S. Highway 395), City of Kennewick, County of Benton, State of Washington (project area). 395 Cleaners & Laundromat is a tenant in a shopping center known as Kennewick Plaza, located at the southwestern corner of West Kennewick Avenue and South Ely Street. Figure 1 depicts the location of the project area on a topographic map (*Kennewick, Wash.*, United States Geological Survey topographic map, 7.5-minute series, 1:24,000 scale, 1992). 395 Cleaners & Laundromat is located at the southeastern corner of the shopping center as depicted on Figure 2. The shopping center was initially developed in 1979. Before 1979, the site use was primarily agricultural. 395 Cleaners & Laundromat, under various names, has been in the shopping center since at least 1983. Dry cleaning operations were reportedly performed at 395 Cleaners & Laundromat until approximately 1997, when the dry cleaning machine was removed.

1.2 Purpose and Scope

The purpose of this Subsurface Investigation was to determine soil quality with respect to the suspected presence of halogenated volatile organic compounds (HVOCs) that may have been released to the subsurface as a result of past dry cleaning activities in the project area. Perchloroethylene (PCE), a HVOC, is a commonly used dry cleaning solvent and a common contaminant at dry cleaning facilities. In soil, PCE degrades to trichloroethylene (TCE), *cis*-1,2-dichloroethylene (*cis*-1,2-DCE), and vinyl chloride (VC) through a dehalogenation process. These degradation products are commonly found associated with releases of PCE.

The investigation was conducted in two phases. The initial phase involved a preliminary subsurface investigation that included the sampling of soil in and around the project area using truck-mounted direct-push probe and hand-auger sampling methods. The field work for this preliminary subsurface investigation phase was conducted during December 1999 and January 2000.

The scope of work for the preliminary subsurface investigation included the following:

- Advancement of two direct-push sampling probes (SP-1 and SP-2) at the southern exterior area of the project area;
- Drilling of two hand-auger borings (B-1 and B-2) inside the project area; and
- Collection of soil samples during drilling/probing and analysis of selected soil samples for the presence of HVOCs using EPA Method 8021B.

The findings of the preliminary subsurface investigation included the presence of PCE at concentrations less than applicable cleanup levels in shallow soil immediately underneath the concrete floor slab. Based on these findings and the limited extent of the preliminary subsurface investigation, an additional subsurface investigation was performed in March 2000.

The scope of work for the additional subsurface investigation included the following:

- Locating the sewer line that leaves the project area;

- Advancement of thirteen soil vapor sampling points in and around the project (VP-1 through VP-13 including seven outside points (VP-1 through VP-7) and six inside points (VP-8 through VP-13);
- Collection of soil vapor samples from the sampling points and analysis of the soil vapor samples for the presence of volatile organic compounds (VOCs) using EPA Method 8021B.
- Collection of a single soil sample from each of the six inside vapor collection points (VP-8 through VP-13);
- Advancement of a direct-push sampling probe (SP-3) adjacent to vapor point VP-1 to collect a soil sample from 12 feet bgs. The overall highest concentrations of VOCs in the soil vapor were collected from the 12 foot depth in VP-1. Therefore, soil probe SP-3 was advanced in this area to collect a soil sample from 12 feet bgs to determine if there was any impact to soil quality from VOCs;
- Advancement of a direct-push sampling probe (SP-4) adjacent to the located sewer at the location where the sewer line bends from the south towards the southwest. Soil samples were collected from the 4 to 6 foot, 6 to 8 foot, and 8 to 9 foot depth intervals. SP-4 is also identified as VP-7, when discussed in the context of soil vapor sampling; and
- Analysis of selected soil samples for the presence of HVOCs using EPA Method 8021B.

2.0 BACKGROUND

ATC performed a Phase I Environmental Site Assessment of Kennewick Plaza shopping center in November and December 1999. The following report describes this investigation:

> *Phase I Environmental Site Assessment – Kennewick Plaza – Kennewick, Washington,* ATC Associates Inc., December 13, 1999

The above-referenced report identified the 395 Cleaners & Laundromat tenant space as never having operated as a dry cleaner facility, only as a drop-off. There was considerable evidence to support this conclusion as referenced in the report. However, new evidence surfaced after the report was issued that indicated there had been a dry cleaning machine in the tenant space at one time. This information came from Ms. Jae Neale, the current owner of 395 Cleaners & Laundromat. Ms. Neale indicated that before her purchase of the business three years ago, the previous owner had operated a dry cleaning machine. She indicated the location of what she believed was the former location of the dry cleaning machine. She further indicated a circuit on the electrical panel marked as 'dry cleaner'. Based on this evidence, ATC recommended a subsurface investigation of this area.

ATC also located and contacted the previous owner of 395 Cleaners & Laundromat, Mr. Don Lehfeldt, by telephone on March 6, 2000. Mr. Lehfeldt confirmed the location of the dry cleaning machine as shown on Figure 3. Mr. Lehfeldt also confirmed that the dry cleaning machine was removed from the project area in approximately 1997.

The preliminary subsurface investigation performed in December 1999 and January 2000 was described in the following report:

> *Subsurface Investigation – 395 Cleaners & Laundromat - Kennewick Plaza Shopping Center – Kennewick, Washington,* ATC Associates Inc., February 2, 2000

The preliminary subsurface investigation as described in the above-referenced report and as the additional subsurface investigation performed in March 2000 are compiled together in this report.

3.0 PRELIMINARY SUBSURFACE INVESTIGATION - DECEMBER 1999 AND JANUARY 2000

3.1 Soil Investigation Methods

On December 28, 1999, two direct-push sampling probes (SP-1 and SP-2) were advanced on the western side of 395 Cleaners & Laundromat (Figure 3). Transglobal Environmental Geosciences Northwest, Inc. (TEG) using a truck-mounted Strataprobe™ direct-push probe apparatus advanced the soil probes. The two probes were both advanced to 12 feet below ground surface (bgs).

On January 11, 2000, two hand-auger borings (HA-1 and HA-2) were advanced by ATC using AMS hand-auger and sampling equipment. The two borings were advanced to a depth of 1.1 feet bgs in HA-1 and to 1.6 feet bgs in HA-2. HA-1 was located inside the dry cleaner facility in the approximate center of the tenant space and HA-2 was located inside the dry cleaner facility at the reported former location of the dry cleaner machine (Figure 3). Stewart's Locating Service, Inc cleared the boring locations of underground utilities. Twenty-four separate electrical conduits traversed beneath the floor slab from the electrical panels to the washers and dryers of the laundromat area. Sagebrush Concrete Sawing & Drilling cored the concrete floor slab to provide access to the underlying soil.

Soil samples from SP-1 and SP-2 were collected by driving a split-barrel sampler into undisturbed formation using the Strataprobe™ direct-push probe apparatus. Soil samples from HA-1 and HA-2 were collected using a stainless-steel scoop.

The soil samples were placed into laboratory-provided glass containers (one 4-ounce glass jar with a Teflon™-lined lid per sample). The collected soil samples were placed into a cooler chilled with "blue" ice and transported to the laboratory following chain-of-custody protocols.

The soil samples were sent to the laboratory of TEG in Lacey and Bellevue, Washington for analysis. Selected soil samples were analyzed for the presence of HVOCs using EPA Method 8021B.

3.2 Soil Conditions

The soil conditions encountered consisted of dark grayish brown sandy silt in the upper 3 feet. Below 3 feet to the total depth of 12 feet was brownish gray sandy gravel with cobbles. Boring logs are included in Appendix A.

Borings HA-1 and HA-2 encountered cobbles immediately beneath the concrete floor slab. Therefore, these borings could not be advanced beyond the total depth augered (1.1 and 1.6 feet bgs, respectively).

No groundwater was encountered during probing or hand augering. Groundwater is estimated to occur at a depth of 50 feet bgs or greater based on the findings of our Phase I Environmental Site Assessment (ATC, December 13, 1999). Based on a review of well logs obtained from Washington State Department of Ecology, wells outside subject property intercepted groundwater at depths ranging from 67 to 465 feet bgs. Groundwater zones appear to be primarily confined to gravel deposits (60 to 180 feet) and fractured basalt (greater than 180 feet)

3.3 Soil Quality

The laboratory analytical results for the soil samples are summarized in Table 1. The analytical reports and chain-of-custody documentation are included in Appendix B.

Ten soil samples (two to three from each boring) were analyzed for the presence of HVOCs using EPA Method 8021B.

The only HVOCs detected in the soil samples were PCE. PCE was detected only in the shallow soil samples collected directly underneath the concrete floor slab from HA-1 and HA-2. Deeper soil samples from these locations contained no detectable HVOCs. No HVOCs were detected in the soil samples from SP-1 and SP-2.

PCE was detected in a soil sample from HA-1 collected from a depth of 0.5 feet bgs (immediately beneath the concrete floor slab) at a concentration of 140 µg/kg. The samples collected from 0.8 and 1.1 feet bgs in HA-1 contained no detectable PCE or other HVOCs.

PCE was detected in a soil sample from HA-2 collected from a depth of 1.0 feet bgs (immediately beneath the concrete floor slab) at a concentration of 160 µg/kg. The samples collected from 1.4 and 1.6 feet bgs in HA-2 contained no detectable PCE or other HVOCs.

The concentrations of PCE detected were well below the 500 micrograms per kilogram (µg/kg) MTCA Method A cleanup level for PCE in soil (Model Toxics Control Act Cleanup Regulation, Chapter 173-340 WAC).

4.0 ADDITIONAL SUBSURFACE INVESTIGATION - MARCH 2000

4.1 Sewer Location

The sewer line leaving the facility was located by Stewart's Locating Service, Inc. on March 15, 2000. The location of the sewer was determined to exit from the south side of the facility and bend to the southwest to join the main sewer under West Second Avenue. The sewer location is depicted in Figure 3.

4.2 Soil Gas Survey

A soil gas survey was conducted inside and around the perimeter of the facility on March 15, 2000. The soil gas survey was performed by Transglobal Environmental Geosciences, Inc. (TEG). The soil vapor samples were collected by advancing direct-push probes into the subsurface and drawing a volume of soil vapor into pre-evacuated glass vials with a volume of 20 cubic centimeters. A TEG mobile laboratory was also present on-site and analyzed the collected soil vapor samples immediately after collection.

Thirteen soil vapor sampling points were advanced in and around the facility (VP-1 through VP-13). These sampling points included seven outside points (VP-1 through VP-7) and six inside points (VP-8 through VP-13).

In the seven outside points (VP-1 through VP-7), vapor samples were collected from 4, 8, and 12 foot depths, except in VP-7, where only a vapor sample from the 9-foot depth was collected. VP-7 is also

identified as SP-4, when discussed in the context of soil sampling in the following section. VP-7 (SP-4) was located at the point where the sewer line makes a bend (Figure 2).

In the six inside points (VP-8 through VP-13), vapor samples were collected from depths ranging from 2.5 to 3.5 feet bgs.

The collected vapor samples were submitted for analysis to a dedicated on-site mobile laboratory (TEG). The samples were analyzed for volatile organic compounds (VOCs) using EPA Method 8021B. The analytical results of the soil gas survey are presented in Table 2. The laboratory analytical reports are found in Appendix B.

4.3 Soil Sampling

Based on the findings of the soil gas survey, soil sampling was conducted in selected areas using direct-push probe equipment. The soil sampling was also conducted on March 15, 2000, concurrently with the soil gas survey. Soil sample locations are depicted on Figure 1. Soil sample locations included the following:

- A single soil sample was collected from each of the six inside vapor collection points (VP-8 through VP-13) at the 1 to 2 foot depth interval. After the soil samples were collected, the probes were advanced further (from 2.5 to 3 feet bgs) in order to collect a representative soil vapor sample.
- A single soil probe (SP-3) was advanced adjacent to vapor point VP-1 to collect a soil sample from 12 feet bgs. The overall highest concentrations of VOCs in the soil vapor were collected from the 12 foot depth in VP-1. Therefore, soil probe SP-3 was advanced in this area to collect a soil sample from 12 feet bgs to determine if there was any impact to soil quality from VOCs.
- A single soil probe (SP-4) was advanced adjacent to the located sewer at the location where the sewer line bends from the south towards the southwest. Soil samples were collected from the 4 to 6 foot, 6 to 8 foot, and 8 to 9 foot depth intervals. SP-4 is also identified as VP-7, when discussed in the context of preceding soil gas sampling section.

The collected soil samples were submitted for analysis to a dedicated on-site mobile laboratory (TEG). The samples were analyzed for VOCs using EPA Method 8021B. The analytical results are presented in Table 1. The laboratory analytical reports are found in Appendix B.

4.4 Soil Conditions

The soil conditions encountered during the additional subsurface investigation in March 2000 were the same as described in Section 3.2 of the report. Again, no groundwater was encountered.

4.5 Soil Quality

The laboratory analytical results for the soil samples are summarized in Table 1. The analytical reports and chain-of-custody documentation are included in Appendix B.

The findings for the additional subsurface investigation are summarized as follows:

- Concentrations of several VOCs were present in selected soil vapor samples including vinyl chloride, benzene, toluene, 1,1-dichloroethene, *trans*-1,2-dichloroethene, *cis*-1,2-dichloroethene, trichloroethene (TCE), and tetrachloroethene (PCE). These concentrations, in some cases, exceeded ambient air criteria per WAC 173-340-750.
- Concentrations of two VOCs, included TCE and PCE, were present in selected soil samples. These concentrations were all less than Method A cleanup levels per WAC 173-340-740.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Trace concentrations of several VOCs were present in selected soil vapor samples. These concentrations, in some cases, exceeded ambient air criteria per WAC 173-340-750. However, concentrations exceeding ambient air criteria are highly unlikely to be present in occupied areas. The presence of the concrete floor slab capping the soil and the air movement and air exchange within the facility would prevent any potential accumulation of VOCs within the building. The concentrations of various VOCs detected in the soil do not warrant any remedial actions or reporting to the Washington State Department of Ecology (Ecology). The VOC concentrations in the soil vapor are expected to decrease and dissipate with time since the dry cleaning operation has been removed.

The occurrence of PCE and TCE in soil appears to be limited in extent. The detected concentrations of PCE and TCE were all less than Method A cleanup levels per WAC 173-340-740.

Groundwater is relatively deep (greater than 50 feet bgs) and was not encountered during this investigation. Based on the depth to groundwater and on the detected concentrations of PCE and other VOCs, groundwater is not expected to be affected.

The concentrations of PCE and other VOCs detected in soil and soil vapor do not warrant any remedial actions or reporting to the Washington State Department of Ecology (Ecology). The presence of PCE and other VOCs in soil and soil vapor at the concentrations detected are not a threat to human health or the environment.

5.2 Recommendations

Based on the findings and conclusions of this Subsurface Investigation, there are no recommendations for any further investigation or remedial actions.

TABLE 1.
SOIL ANALYTICAL RESULTS

Boring No.	Depth (feet bgs)	Halogenated Volatile Organic Compounds (µg/kg)			
		PCE	TCE	VC	*cis*-1,2-DCE
SP-1	4 - 8	ND	ND	ND	ND
	8 - 12	ND	ND	ND	ND
SP-2	8 - 10	ND	ND	ND	ND
	10 - 12	ND	ND	ND	ND
SP-3	12	ND	ND	ND	ND
SP-4	4 - 6	ND	ND	ND	ND
	6 - 8	ND	ND	ND	ND
	8 - 9	70	ND	ND	ND
VP-8-S	1 - 2	ND	ND	ND	ND
VP-9-S	1 - 2	ND	ND	ND	ND
VP-10-S	1 - 2	ND	ND	ND	ND
VP-11-S	1 - 2	ND	90	ND	ND
VP-13-S	1.5 - 3	ND	ND	ND	ND
HA-1	0.5	140	ND	ND	ND
	0.8	ND	ND	ND	ND
	1.1	ND	ND	ND	ND
HA-2	1.0	160	ND	ND	ND
	1.4	ND	ND	ND	ND
	1.6	ND	ND	ND	ND
MTCA Cleanup Levels		**500 (A)**	**500 (A)**	**526 (B)**	**800,000 (B)**

Notes:

PCE and the other HVOCs are shown in this table because they are typically encountered at dry cleaner sites or sites where a release of PCE has occurred.

µg/kg = micrograms per kilogram or parts per billion

cis-1,2-DCE = *cis*-1,2-Dichloroethene
PCE = Tetrachloroethylene = Perchloroethylene
TCE = Trichloroethene
VC = Vinyl Chloride

ND = indicates sample was not detected above the laboratory analytical detection limit (laboratory analytical detection limits are equal to or less than the MTCA Method A or B cleanup levels for the target compounds listed in this table).

(A) = MTCA Method A Cleanup Level (Model Toxics Control Act Cleanup Regulation – Chapter 173-340 WAC)
(B) = MTCA Method B formula value (Model Toxics Control Act Cleanup Regulation – Chapter 173-340 WAC and Model Toxics Control Act Cleanup Levels and Risk Calculations – February 1996)

TABLE 2.
SOIL VAPOR ANALYTICAL RESULTS

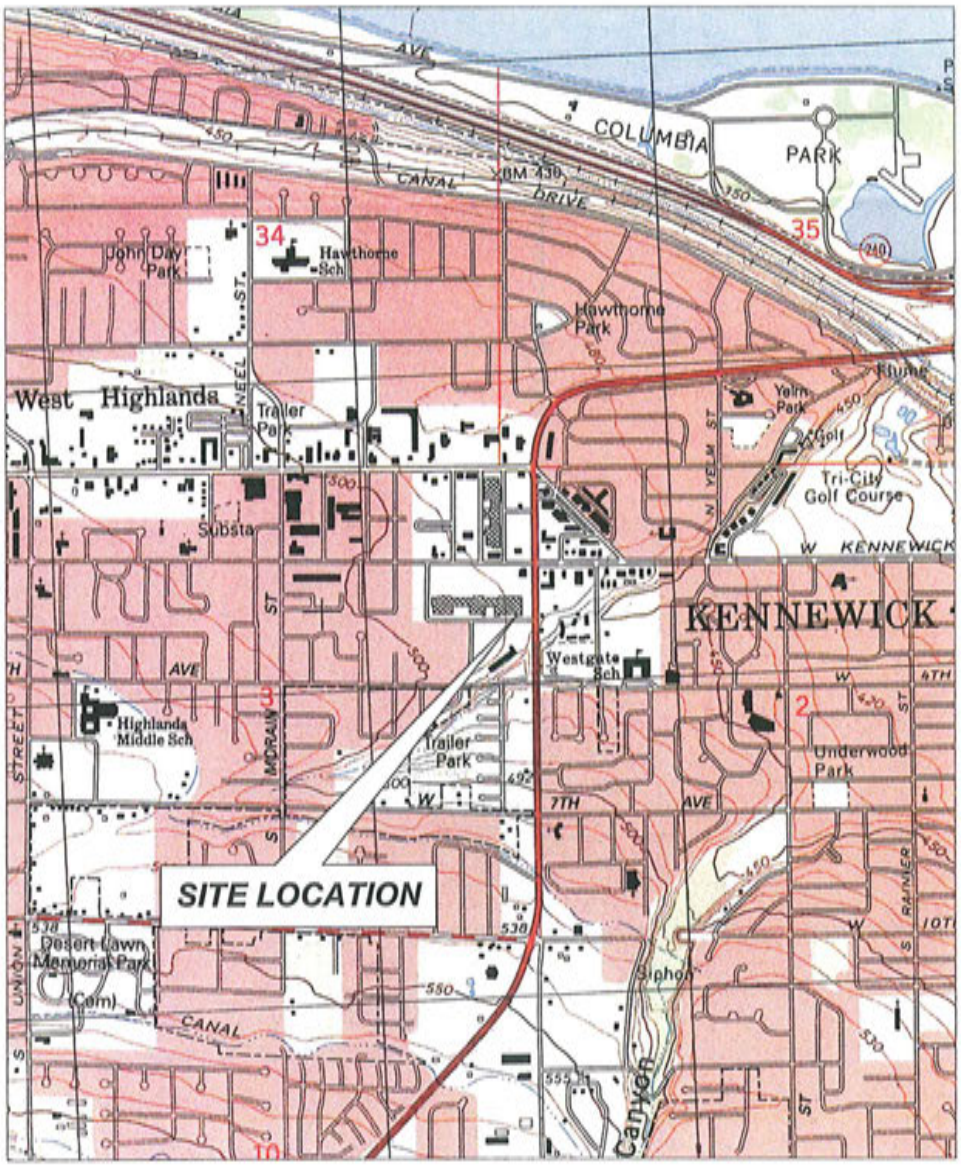
Boring No.	Depth (feet bgs)	Volatile Organic Compounds (mg/m³)							
		PCE	TCE	*Cis*-1,2-DCE	*Trans*-1,2-DCE	VC	1,1-DCE	Benzene	Toluene
VP-1	4	ND	ND	ND	ND	ND	ND	ND	ND
	8	ND	ND	ND	ND	ND	ND	ND	ND
	12	0.27	0.96	0.21	0.54	ND	ND	ND	ND
VP-2	4	ND	ND	ND	ND	ND	ND	ND	ND
	8	ND	ND	ND	0.24	ND	ND	ND	ND
	12	ND	ND	ND	0.24	ND	ND	ND	ND
VP-3	4	0.18	ND	ND	ND	ND	0.95	ND	ND
	8	ND	ND	ND	0.24	ND	ND	ND	ND
	12	ND	ND	ND	0.36	ND	ND	ND	ND
VP-4	4	ND	0.15	0.24	0.54	ND	ND	ND	ND
	8	ND	0.57	0.24	0.48	ND	ND	ND	ND
	12	0.27	ND	0.21	0.48	ND	ND	ND	ND
VP-5	4	0.30	ND	0.18	0.60	ND	0.39	0.24	0.33
	8	ND	ND	ND	0.36	ND	ND	ND	ND
	12	ND	ND	ND	0.18	ND	ND	ND	ND
VP-6	4	ND	ND	ND	ND	ND	ND	ND	ND
	8	ND	ND	ND	ND	ND	ND	ND	ND
	12	ND	ND	ND	ND	ND	ND	0.75	ND
VP-7	9	ND	ND	0.24	0.66	8.19	1.44	0.18	ND
VP-8	3	ND	0.69	0.24	0.36	ND	ND	ND	ND
VP-9	3	ND	ND	ND	ND	ND	ND	ND	0.45
VP-10	2.5	ND	ND	ND	ND	ND	ND	ND	0.87
VP-11	3	ND	ND	ND	ND	ND	0.33	ND	0.66
VP-12	2.5	0.39	ND	ND	ND	ND	ND	ND	ND
VP-13	3.5	ND	ND	ND	ND	ND	ND	ND	0.20
Ambient Air Criteria - Residential Method B		2.00	0.235	*	*	0.013	0.003	0.138	183
Ambient Air Criteria - Industrial Method C		43.8	5.15	*	*	0.292	0.073	3.017	400

Notes:

mg/m³ = milligrams per cubic meter
PCE = Tetrachloroethylene = Perchloroethylene
TCE = Trichloroethylene
cis-1,2-DCE = *cis*-1,2-Dichloroethylene
trans-1,2-DCE = *trans*-1,2-Dichloroethylene
VC = Vinyl Chloride
1,1-DCE = 1,1-Dichloroethylene
ND = indicates sample was not detected above the laboratory analytical detection limit
Ambient Air Criteria - calculated based on Chapter 173-340-750 WAC
* insufficient data available for calculating ambient air criteria

R 29 E.

T 8 N.



1/2 mile 0 1 mile

SOURCE: USGS 7.5-MINUTE TOPOGRAPHIC QUADRANGLE MAP
KENNEWICK, WASH.; 1992

VATC ASSOCIATES INC.
Solutions for Environmental Concerns

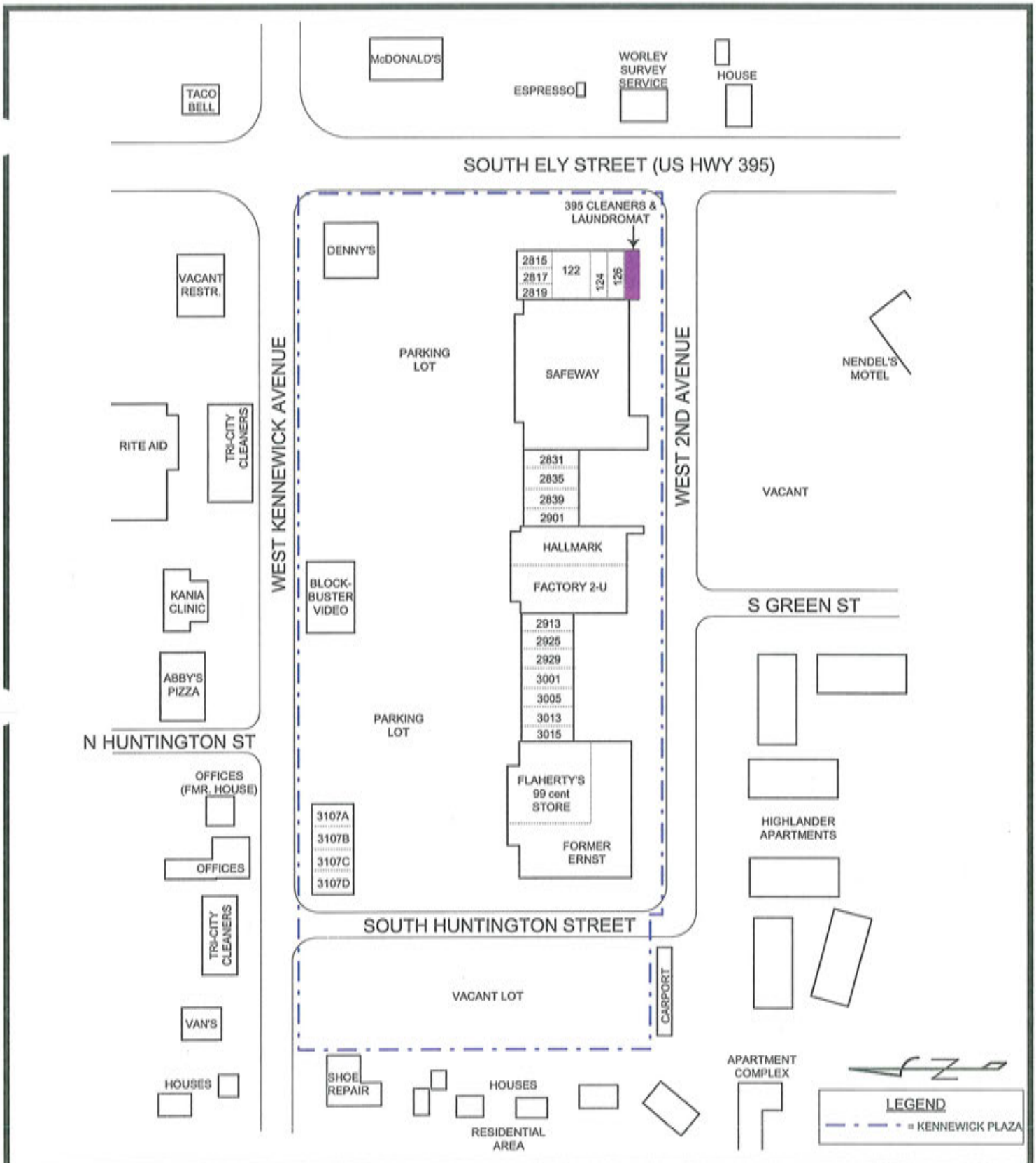
PROJECT NO.: 76.18452.0201 Task 6

DESIGNED BY: NRG	SCALE: 1:24,000	
DRAWN BY: NRG	DATE : 5/4/00	FILE: 0201task6-cleaners-topo Fig1.VSD

FIGURE 1

TOPOGRAPHIC MAP

SUBSURFACE INVESTIGATION
395 CLEANERS & LAUNDROMAT - KENNEWICK PLAZA
128 SOUTH ELY STREET
KENNEWICK, WASHINGTON



VATC ASSOCIATES INC.
Solutions for Environmental Concerns

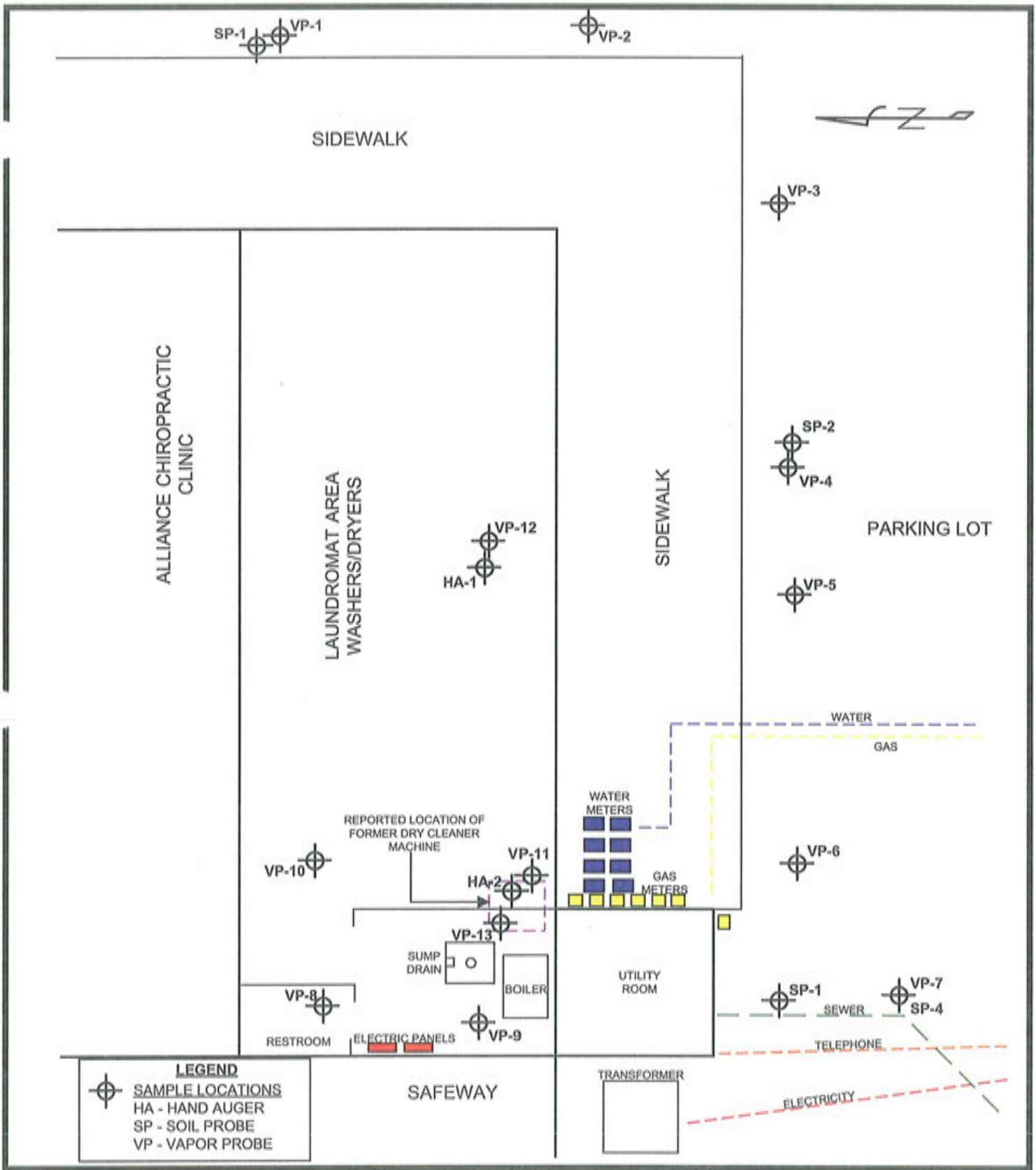
PROJECT NO.: 76.18452.0201 Task 6

DESIGNED BY: NRG	SCALE: ~ 1" = 200'	
DRAWN BY: NRG	DATE : 5/4/00	FILE: 0201task6-cleaners-sitemap Fig2.VSD

FIGURE 2

SITE PLAN

SUBSURFACE INVESTIGATION
395 CLEANERS & LAUNDROMAT - KENNEWICK PLAZA
128 SOUTH ELY STREET
KENNEWICK, WASHINGTON



ATC ASSOCIATES INC.
Solutions for Environmental Concerns

FIGURE 3

SAMPLE LOCATION PLAN

SUBSURFACE INVESTIGATION
395 CLEANERS & LAUNDROMAT - KENNEWICK PLAZA
128 SOUTH ELY STREET
KENNEWICK, WASHINGTON

PROJECT NO.: 76.18452.0201 Task 6		
DESIGNED BY: NRG	SCALE: ~ 1" = 10'	
DRAWN BY: NRG	DATE : 5/4/00	FILE: 0201task6-cleaners-sampleloc Fig3.VSD

ATC Environmental, Inc.

WELL LOG

BORING NO: SP-1

PROJECT NO: 76.18452.0201

PROJECT NAME: JSH Kennewick Plaza CLIENT:

PROJECT LOCATION: Kennewick, WA DRILLING CONTRACTOR: TEG

DRILLING MTHD: Strataprobe SAMPLE MTHD:

DATE STARTED: Dec 28, 1999 DATE FINISHED: Dec 28, 1999 DRILLER: INSPECTOR: Neil Gilham

SURFACE ELEVATION: NA

DEPTH (FT)	SAMPLE	SPT BLOWS PER 6"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	WELL CONST	REMARKS
0.0						Asphalt - 3 in.		
						Gravelly sandy silt, dark grayish brown, GM.		
	1					Silty gravelly sand with cobbles, grayish brown, GM.		SP-1 (0.0-4.0)
5.0								
	2							SP-1 (4.0-8.0)
10.0								
	3							SP-1 (8.0-12.0)
15.0								
20.0								
25.0								
30.0								

BOTTOM OF TEST BORING: 12.00'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

WELL CONSTRUCTION

WELL DIAM.:
CASING MATERIAL:
SCREEN MATERIAL:
SLOT SIZE:
METHOD:

OUTER CASING
GROUT
BENTONITE
SAND
SCREEN

ATC Environmental, Inc.

WELL LOG

BORING NO: SP-2
PROJECT NO: 76.18452.0201

PROJECT NAME: JSH Kennewick Plaza
CLIENT:
PROJECT LOCATION: Kennewick, WA
DRILLING CONTRACTOR: TEG
DRILLING MTHD: Strataprobe
SAMPLE MTHD:
DATE STARTED: Dec 28, 1999 DATE FINISHED: Dec 28, 1999 DRILLER:
INSPECTOR: Neil Gilham

SURFACE ELEVATION: NA

DEPTH (FT)	SAMPLE	SPT BLOWS PER 6"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	WELL CONST	REMARKS
0.0						Asphalt - 3 in.		
						Gravelly sandy silt, dark grayish brown, GM.		
	1					Silty gravelly sand with cobbles, grayish brown, GM.		SP-2 (0.0-4.0)
5.0								
	2							SP-2 (4.0-8.0)
								SP-2 (8.0-12.0)
	3							
10.0								SP-1 (11.0-12.0)
	4							
15.0								
20.0								
25.0								
30.0								

BOTTOM OF TEST BORING: 12.00'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

WELL CONSTRUCTION
WELL DIAM.:
CASING MATERIAL:
SCREEN MATERIAL:
SLOT SIZE:
METHOD:

OUTER CASING
GROUT
BENTONITE
SAND
SCREEN

ATC Environmental, Inc.

WELL LOG

BORING NO: HA-1

PROJECT NO: 76.18452.0201

PROJECT NAME: JSH Kennewick Plaza CLIENT: JSH Properties

PROJECT LOCATION: Kennewick, WA DRILLING CONTRACTOR: ATC

DRILLING MTHD: Hand Auger SAMPLE MTHD: Grab

DATE STARTED: Jan 11, 2000 DATE FINISHED: Jan 11, 2000 DRILLER: _____ INSPECTOR: Neil Gilham

SURFACE ELEVATION: NA

DEPTH (FT)	SAMPLE	SPT BLOWS PER 6"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	WELL CONST	REMARKS
0.0						Concrete - 6 in.		HA-1 (0.5)
						Silty gravelly sand with cobbles, dark grayish brown, GM.		HA-1 (0.8)
								HA-1 (1.1)
5.0								
10.0								
15.0								
20.0								
25.0								
30.0								

BOTTOM OF TEST BORING: 1.50'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

WELL CONSTRUCTION
WELL DIAM.:
CASING MATERIAL:
SCREEN MATERIAL:
SLOT SIZE:
METHOD:

OUTER CASING
GROUT
BENTONITE
SAND
SCREEN

ATC Environmental, Inc.

WELL LOG

BORING NO: HA-2

PROJECT NO: 76.18452.0201

PROJECT NAME: JSH Kennewick Plaza CLIENT: JSH Properties

PROJECT LOCATION: Kennewick, WA DRILLING CONTRACTOR: ATC

DRILLING MTHD: Hand Auger SAMPLE MTHD: Grab

DATE STARTED: Jan 11, 2000 DATE FINISHED: Jan 11, 2000 DRILLER: _____ INSPECTOR: Neil Gilham

SURFACE ELEVATION: NA

DEPTH (FT)	SAMPLE	SPT BLOWS PER 6"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	WELL CONST	REMARKS
0.0						Concrete - 6 in.		
						Silty gravelly sand with cobbles, dark grayish brown, GM.		HA-2 (1.0) HA-2 (1.4) HA-1 (1.6)
5.0								
10.0								
15.0								
20.0								
25.0								
30.0								

BOTTOM OF TEST BORING: 2.00'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

WELL CONSTRUCTION

WELL DIAM.:
CASING MATERIAL:
SCREEN MATERIAL:
SLOT SIZE:
METHOD:

OUTER CASING
GROUT
BENTONITE
SAND
SCREEN

ATC Associates Inc.

BORING LOG

BORING NO: SP-3

PROJECT NO: 76.87676.0201

PROJECT NAME: JSH-Kennewick Plaza CLIENT: JSH Properties Inc.

PROJECT LOCATION: Kennewick, WA DRILLING CONTRACTOR: TEG

DRILLING MTHD: Strataprobe SAMPLE MTHD: Split-barrel sampler

DATE STARTED: Mar 15, 2000 DATE FINISHED: Mar 15, 2000 DRILLER: _____ INSPECTOR: Neil Gilham

SURFACE ELEVATION: 490'

DEPTH (FT)	SAMPLE	SPT BLOWS PER 6"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	REMARKS
0.0						Asphalt - 3 in.	
						(GM): silty sandy GRAVEL with cobbles, grayish brown, damp	
5.0							
10.0							
	1		50				SP-3 (12)
15.0							
20.0							
25.0							
30.0							

BOTTOM OF TEST BORING: 12.00'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

ATC Associates Inc.

BORING LOG

BORING NO: SP-4 / VP-7
PROJECT NO: 76.87676.0201

PROJECT NAME: JSH-Kennewick Plaza
CLIENT: JSH Properties Inc.
PROJECT LOCATION: Kennewick, WA
DRILLING CONTRACTOR: TEG
DRILLING MTHD: Strataprobe
SAMPLE MTHD: Split-barrel sampler
DATE STARTED: Mar 15, 2000 DATE FINISHED: Mar 15, 2000 DRILLER:
INSPECTOR: Neil Gilham

SURFACE ELEVATION: 490'

DEPTH (FT)	SAMPLE	SPT BLOWS PER 6"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	REMARKS
0.0						Asphalt - 3 in.	
						(GM): silty sandy GRAVEL with cobbles, grayish brown, damp	
5.0	1		50				
	2		50				SP-4 (4-6)
	3		30				SP-4 (6-8)
10.0							SP-4 (8-9) VP-7 (vapor)
15.0							
20.0							
25.0							
30.0							

BOTTOM OF TEST BORING: 9.00'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

ATC Associates Inc.

BORING LOG

BORING NO: VP-1

PROJECT NO: 76.87676.0201

PROJECT NAME: JSH-Kennewick Plaza

CLIENT: JSH Properties Inc.

PROJECT LOCATION: Kennewick, WA

DRILLING CONTRACTOR: TEG

DRILLING MTHD: Strataprobe

SAMPLE MTHD: Split-barrel sampler

DATE STARTED: Mar 15, 2000 DATE FINISHED: Mar 15, 2000 DRILLER:

INSPECTOR: Neil Gilham

SURFACE ELEVATION: 490'

DEPTH (FT)	SAMPLE	SPT BLOWS PER 6"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	REMARKS
0.0						Asphalt - 3 in.	
						(GM): silty sandy GRAVEL with cobbles, grayish brown, damp	
	1						VP-1 (9)
5.0							
	2						VP-1 (8)
10.0							
	3						VP-1 (12)
15.0							
20.0							
25.0							
30.0							

BOTTOM OF TEST BORING: 12.00'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

ATC Associates Inc.

BORING LOG

BORING NO: VP-2

PROJECT NO: 76.87676.0201

PROJECT NAME: JSH-Kennewick Plaza CLIENT: JSH Properties Inc.

PROJECT LOCATION: Kennewick, WA DRILLING CONTRACTOR: TEG

DRILLING MTHD: Stratoprobe SAMPLE MTHD: Split-barrel sampler

DATE STARTED: Mar 15, 2000 DATE FINISHED: Mar 15, 2000 DRILLER: _____ INSPECTOR: Neil Gilham

SURFACE ELEVATION: 490'

DEPTH (FT)	SAMPLE	SPT BLOWS PER 6"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	REMARKS
0.0						Asphalt - 3 in.	
						(GM): silty sandy GRAVEL with cobbles, grayish brown, damp	
	1						VP-2 (4)
5.0							
	2						VP-2 (8)
10.0							
	3						VP-2 (12)
15.0							
20.0							
25.0							
30.0							

BOTTOM OF TEST BORING: 12.00'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

ATC Associates Inc.

BORING LOG

BORING NO: VP-3

PROJECT NO: 76.87676.0201

PROJECT NAME: JSH-Kennewick Plaza CLIENT: JSH Properties Inc.

PROJECT LOCATION: Kennewick, WA DRILLING CONTRACTOR: TEG

DRILLING MTHD: Strataprobe SAMPLE MTHD: Split-barrel sampler.

DATE STARTED: Mar 15, 2000 DATE FINISHED: Mar 15, 2000 DRILLER: _____ INSPECTOR: Neil Gilham

SURFACE ELEVATION: 490'

DEPTH (FT)	SAMPLE	SPT BLOWS PER 6"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	REMARKS
0.0						Asphalt - 3 in.	
						(GM): silty sandy GRAVEL with cobbles, grayish brown, damp	
	1						VP-3 (4)
5.0							
	2						VP-3 (8)
10.0							
	3						VP-3 (12)
15.0							
20.0							
25.0							
30.0							

BOTTOM OF TEST BORING: 12.00'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

ATC Associates Inc.

BORING LOG

BORING NO: VP-4

PROJECT NO: 76.87676.0201

PROJECT NAME: JSH-Kennewick Plaza CLIENT: JSH Properties Inc.

PROJECT LOCATION: Kennewick, WA DRILLING CONTRACTOR: TEG

DRILLING MTHD: Strataprobe SAMPLE MTHD: Split-barrel sampler

DATE STARTED: Mar 15, 2000 DATE FINISHED: Mar 15, 2000 DRILLER: _____ INSPECTOR: Neil Gilham

SURFACE ELEVATION: 490'

DEPTH (FT)	SAMPLE	SPT BLOWS PER 6"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	REMARKS
0.0						Asphalt - 3 in.	
						(GM): silty sandy GRAVEL with cobbles, grayish brown, damp	
	1						VP-4 (4)
5.0							
	2						VP-4 (8)
10.0							
	3						VP-4 (12)
15.0							
20.0							
25.0							
30.0							

BOTTOM OF TEST BORING: 12.00'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

ATC Associates Inc.

BORING LOG

BORING NO: VP-5
PROJECT NO: 76.87676.0201

PROJECT NAME: JSH-Kennewick Plaza
CLIENT: JSH Properties Inc.
PROJECT LOCATION: Kennewick, WA
DRILLING CONTRACTOR: TEG
DRILLING MTHD: Strataprobe
SAMPLE MTHD: Split-barrel sampler
DATE STARTED: Mar 15, 2000 DATE FINISHED: Mar 15, 2000 DRILLER: _____ INSPECTOR: Neil Gilham

SURFACE ELEVATION: 490'

DEPTH (FT)	SAMPLE	SPT BLOWS PER 6"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	REMARKS
0.0						Asphalt - 3 in.	
						(GM): silty sandy GRAVEL with cobbles, grayish brown, damp	
	1						VP-5 (4)
5.0							
	2						VP-5 (8)
10.0							
	3						VP-5 (12)
15.0							
20.0							
25.0							
30.0							

BOTTOM OF TEST BORING: 12.00'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

ATC Associates Inc.

BORING LOG

BORING NO: VP-6

PROJECT NO: 76.87676.0201

PROJECT NAME: JSH-Kennewick Plaza CLIENT: JSH Properties Inc.

PROJECT LOCATION: Kennewick, WA DRILLING CONTRACTOR: TEG

DRILLING MTHD: Strataprobe SAMPLE MTHD: Split-barrel sampler

DATE STARTED: Mar 15, 2000 DATE FINISHED: Mar 15, 2000 DRILLER: INSPECTOR: Neil Gilham

SURFACE ELEVATION: 490'

DEPTH (FT)	SAMPLE	SPT BLOWS PER 6"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	REMARKS
0.0						Asphalt - 3 in.	
						(GM): silty sandy GRAVEL with cobbles, grayish brown, damp	
	1						VP-6 (4)
5.0							
	2						VP-6 (8)
10.0							
	3						VP-6 (12)
15.0							
20.0							
25.0							
30.0							

BOTTOM OF TEST BORING: 12.00'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

ATC Associates Inc.

BORING LOG

BORING NO: VP-8

PROJECT NO: 76.87676.0201

PROJECT NAME: JSH-Kennewick Plaza CLIENT: JSH Properties Inc.

PROJECT LOCATION: Kennewick, WA DRILLING CONTRACTOR: TEG

DRILLING MTHD: Strataprobe SAMPLE MTHD: Split-barrel sampler

DATE STARTED: Mar 15, 2000 DATE FINISHED: Mar 15, 2000 DRILLER: _____ INSPECTOR: Neil Gilham

SURFACE ELEVATION: 490'

DEPTH (FT)	SAMPLE	SPT BLOWS PER 12"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	REMARKS
0.0						Concrete - 6 in.	
	1					(GM): silty sandy GRAVEL with cobbles, grayish brown, damp	VP-8-S (1-2 VP-8 (3)
5.0							
10.0							
15.0							
20.0							
25.0							
30.0							

BOTTOM OF TEST BORING: 3.00'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

ATC Associates Inc.

BORING LOG

BORING NO: VP-9

PROJECT NO: 76.87676.0201

PROJECT NAME: JSH-Kennewick Plaza CLIENT: JSH Properties Inc.

PROJECT LOCATION: Kennewick, WA DRILLING CONTRACTOR: TEG

DRILLING MTHD: Strataprobe SAMPLE MTHD: Split-barrel sampler

DATE STARTED: Mar 15, 2000 DATE FINISHED: Mar 15, 2000 DRILLER: _____ INSPECTOR: Neil Gilham

SURFACE ELEVATION: 490'

DEPTH (FT)	SAMPLE	SPT BLOWS PER 12"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	REMARKS
0.0						Concrete - 6 in.	
	1					(GM): silty sandy GRAVEL with cobbles, grayish brown, damp	VP-9-S (1-2)
							VP-9 (3)
5.0							
10.0							
15.0							
20.0							
25.0							
30.0							

BOTTOM OF TEST BORING: 3.00'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

ATC Associates Inc.

BORING LOG

BORING NO: VP-10

PROJECT NO: 76.87676.0201

PROJECT NAME: JSH-Kennewick Plaza CLIENT: JSH Properties Inc.

PROJECT LOCATION: Kennewick, WA DRILLING CONTRACTOR: TEG

DRILLING MTHD: Strataprobe SAMPLE MTHD: Split-barrel sampler

DATE STARTED: Mar 15, 2000 DATE FINISHED: Mar 15, 2000 DRILLER: _____ INSPECTOR: Neil Gilham

SURFACE ELEVATION: 490'

DEPTH (FT)	SAMPLE	SPT BLOWS PER 12"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	REMARKS
0.0						Concrete - 6 in.	
	1					(GM): silty sandy GRAVEL with cobbles, grayish brown, damp.	VP-10-S (1-2) VP-10 (3)
5.0							
10.0							
15.0							
20.0							
25.0							
30.0							

BOTTOM OF TEST BORING: 2.50'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

ATC Associates Inc.

BORING LOG

BORING NO: VP-11

PROJECT NO: 76.87676.0201

PROJECT NAME: JSH-Kennewick Plaza CLIENT: JSH Properties Inc.

PROJECT LOCATION: Kennewick, WA DRILLING CONTRACTOR: TEG

DRILLING MTHD: Strataprobe SAMPLE MTHD: Split-barrel sampler

DATE STARTED: Mar 15, 2000 DATE FINISHED: Mar 15, 2000 DRILLER: _____ INSPECTOR: Neil Gilhom

SURFACE ELEVATION: 490'

DEPTH (FT)	SAMPLE	SPT BLOWS PER 12"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	REMARKS
0.0						Concrete - 6 in.	
	1					(GM): silty sandy GRAVEL with cobbles, grayish brown, damp	VP-11-S (1-2) VP-11 (3)
5.0							
10.0							
15.0							
20.0							
25.0							
30.0							

BOTTOM OF TEST BORING: 3.00'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

ATC Associates Inc.

BORING LOG

BORING NO: VP-12

PROJECT NO: 76.87676.0201

PROJECT NAME: JSH-Kennewick Plaza CLIENT: JSH Properties Inc.

PROJECT LOCATION: Kennewick, WA DRILLING CONTRACTOR: TEG

DRILLING MTHD: Strataprobe SAMPLE MTHD: Split-barrel sampler

DATE STARTED: Mar 15, 2000 DATE FINISHED: Mar 15, 2000 DRILLER: _____ INSPECTOR: Neil Gilham

DEPTH (FT)	SAMPLE	SPT BLOWS PER 6"	REC (%)	(ppm)	PROFILE	SURFACE ELEVATION: 490' LITHOLOGIC DESCRIPTION	REMARKS
0.0						Concrete - 6 in.	
						(GM): silty sandy GRAVEL with cobbles, grayish brown, damp	VP-12 (3)
5.0							
10.0							
15.0							
20.0							
25.0							
30.0							

BOTTOM OF TEST BORING: 2.50'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

ATC Associates Inc.

BORING LOG

BORING NO: VP-13

PROJECT NO: 76.87676.0201

PROJECT NAME: JSH-Kennewick Plaza CLIENT: JSH Properties Inc.

PROJECT LOCATION: Kennewick, WA DRILLING CONTRACTOR: TEG

DRILLING MTHD: Strataprobe SAMPLE MTHD: Split-barrel sampler

DATE STARTED: Mar 15, 2000 DATE FINISHED: Mar 15, 2000 DRILLER: _____ INSPECTOR: Neil Gilham

SURFACE ELEVATION: 490'

DEPTH (FT)	SAMPLE	SPT BLOWS PER 18"	REC (%)	PID (ppm)	PROFILE	LITHOLOGIC DESCRIPTION	REMARKS
0.0						Concrete - 18 in.	
	1					(GM): silty sandy GRAVEL with cobbles, grayish brown, damp	VP-13-8 (1.5-3) VP-13 (3.5)
5.0							
10.0							
15.0							
20.0							
25.0							
30.0							

BOTTOM OF TEST BORING: 3.50'

SPT = STANDARD PENETRATION TEST
REC = SAMPLE RECOVERY
ND = NON-DETECTABLE
FID = FLAME IONIZATION DETECTOR
PID = PHOTO-IONIZATION DETECTOR

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

800 Sleater-Kinney SE, PMB #262
Lacey, Washington 98503-1127

Mobile Environmental Laboratories
Environmental Sampling Services

Telephone: 360-459-4670
Fax: 360-459-3432

December 30, 1999

Neil Gilham
ATC Associates
6347 Seaview Ave. NW
Seattle, WA 98107

Dear Mr. Gilham:

Please find enclosed the analytical data report for the Kennewick Project in Kennewick, Washington. StrataProbe services were conducted on December 28, 1999. Soil samples were analyzed for Gasoline by NWTPH-Gx, Diesel and Oil by NWTPH-Dx/Dx Extended, and Specific Halogenated Hydrocarbons and BTEX by Method 8021B on December 29, 1999.

The results of these analyses are summarized in the attached table. All soil values are reported on a dry weight basis. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

TEG Northwest appreciates the opportunity to have provided analytical services to ATC Associates for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A. Korosec
President

QA/QC FOR ANALYTICAL METHODS

GENERAL

The TEG Northwest Laboratory quality assurance and quality control (QA/QC) procedures are conducted following the guidelines and objectives which meet or exceed certification/-accreditation requirements of California DOHS, Washington DOE, and Oregon DEQ. The Quality Control Program is a consistent set of procedures which assures data quality through the use of appropriate blanks, replicate analyses, surrogate spikes, and matrix spikes, and with the use of reference standards that meet or exceed EPA standards.

When analyses are taking place on-site with the mobile lab, the need for Field Blanks or Travel/Trip Blanks is eliminated. If there is going to be a delay before sample preparation for analysis, the sample is stored at 4^{O} C.

ANALYTICAL METHODS

TEG Northwest Labs use analytical methodologies which are in conformity with U. S. Environmental Protection Agency (EPA), Washington DOE, and Oregon DEQ methodologies. When necessary and appropriate due to the nature or composition of the sample, TEG may use variations of the methods which are consistent with recognized standards or variations used by the industry and government laboratories.

TPH-Gasoline, TPH-Diesel
(Gasoline and/or Diesel, Modified EPA 8015, NWTPH-Gx and NWTPH-Dx)

A check standard is run at the beginning of the day. 1) A close standard is run at the end of the day. 2) Both open and close standards must be within 15% of the continuing calibration curve value. All samples are prepared with a surrogate spike, and the recovery must be between 65% and 135% unless high sample concentrations interfere with the determination of the recovery percentage. A duplicate sample is run at a rate of 1 per 10 samples. At least 1 method blank is run per 20 samples analyzed.

Purgeable Volatile Halocarbons
(Chlorinated Hydrocarbons, EPA 601/8021B)

A calibration standard is run at the beginning of the day. The standard must be within 15% of the continuing calibration curve value. The standard is rerun at the end of the day. All samples are prepared with a surrogate spike, and the recovery must be between 65% and 135%. At least 1 method blank is run per day.

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

KENNEWICK PROJECT
Kennewick, Washington
ATC Associates, Inc.
Client Project #76.18452.0202

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

Sample Description		Method Blank	Sp 1 (4-8)	Sp 1 (8-12)	Sp 1 (8-12) Dup	Sp 2 (8-10)	Sp 2 (10-12)
Date Sampled		--	12/29/99	12/29/99	12/29/99	12/29/99	12/29/99
Date Analyzed		12/29/99	12/29/99	12/29/99	12/29/99	12/29/99	12/29/99
	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Vinyl chloride	0.25	nd	nd	nd	nd	nd	nd
Benzene	0.05	nd	nd	nd	nd	nd	nd
Toluene	0.05	nd	nd	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd	nd	nd
Total Xylenes	0.05	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd	nd
Methylene chloride	0.05	nd	nd	nd	nd	nd	nd
trans -1,2-Dichloroethene	0.05	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd
cis -1,2-Dichloroethene	0.05	nd	nd	nd	nd	nd	nd
Chloroform	0.05	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.05	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	0.05	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	0.05	nd	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.05	nd	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.05	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	0.05	nd	nd	nd	nd	nd	nd
Surrogate Recovery (%)		100	101	101	96	110	103

"nd" Indicates not detected at listed detection limit.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Michael Dee
DATA REVIEWED BY: Michael Korosec

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

KENNEWICK PROJECT
Kennewick, Washington
ATC Associates, Inc.
Client Project #76.18452.0202

QA/QC Data - EPA 8021B Analyses

	Sample Description: Stockpile-4						
	Matrix Spike			Matrix Spike Duplicate			RPD
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	(%)
Benzene	1.00	0.84	84	1.00	0.87	87	3.51
Toluene	1.00	0.88	88	1.00	0.96	96	8.70
1,1-Dichloroethene	1.00	0.90	90	1.00	0.81	81	10.53
Trichloroethene (TCE)	1.00	1.13	113	1.00	1.12	112	0.89
Surrogate Spike			110			106	3.70

	Laboratory Control Sample		
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Benzene	1.00	0.81	81
Toluene	1.00	0.83	83
1,1-Dichloroethene	1.00	0.97	97
Trichloroethene (TCE)	1.00	0.96	96
Surrogate Spike			99

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 80%-120%
ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Michael Dee
DATA REVIEWED BY: Michael Korosec

TEG ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: ..IC ASSOCIATES INC

ADDRESS: 6347 SEAVIEW AVE NW, SEATTLE, WA 98107

PHONE: 206.781.1449 FAX: 206.781.1543

CLIENT PROJECT #: 76.10452.0202 PROJECT MANAGER: NEIL GILHAM

DATE: 12/28/99 PAGE 1 OF 1

PROJECT NAME: KENNEWICK

LOCATION:

COLLECTOR: NEIL GILHAM DATE OF COLLECTION: 12/28/99

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	NWTPH-Dx ext	NWTPH-Gx				HVLP	NOTES	Total Number of Containers	Laboratory Note Number
1. SW-EAST-1 (10)		1130	SOIL	4oz JAR																			✓			
2. SW-EAST-1 (12)		1150																✓	✓							
3. SW-WEST-1 (12)		1145																✓	✓							
4. SW-NORTH-1 (12)		1210																✓	✓							
5. SW-SOUTH-1 (12)		1215																✓	✓							
6. BOTTOM-1 (15)		1225																✓	✓							
7. SP-1 0-4		1130																					✓			
8. SP-1 4-8		1135			✓																					
9. SP-1 8-12		1040			✓																					
10. SP-2 0-4		1130																					✓			
11. SP-2 4-8		1135																					✓			
12. SP-2 8-10		1140			✓																					
13. SP-2 10-12		1145			✓																					
14.																										
15.																										
16.																										
17.																										
18.																										

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
[signature]	12/28/99 1430	[signature]	12/28/99 1430
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time:

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

800 Sleater-Kinney SE, PMB #262
Lacey, Washington 98503-1127

Mobile Environmental Laboratories **Telephone: 360-459-4670**
Environmental Sampling Services **Fax: 360-459-3432**

January 18, 2000

Neil Gilham
ATC Associates
6347 Seaview Ave. NW
Seattle, WA 98107

Dear Mr. Gilham:

Please find enclosed the analytical data report for the Kennewick Project in Kennewick, Washington. Soil samples were analyzed for Specific Halogenated Hydrocarbons and BTEX by Method 8021B on January 13 & 14, 2000.

The results of these analyses are summarized in the attached table. All soil values are reported on a dry weight basis. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

TEG Northwest appreciates the opportunity to have provided analytical services to ATC Associates for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A Korosec

Michael A. Korosec
President

QA/QC FOR ANALYTICAL METHODS

GENERAL

The TEG Northwest Laboratory quality assurance and quality control (QA/QC) procedures are conducted following the guidelines and objectives which meet or exceed certification/-accreditation requirements of California DOHS, Washington DOE, and Oregon DEQ. The Quality Control Program is a consistent set of procedures which assures data quality through the use of appropriate blanks, replicate analyses, surrogate spikes, and matrix spikes, and with the use of reference standards that meet or exceed EPA standards.

When analyses are taking place on-site with the mobile lab, the need for Field Blanks or Travel/Trip Blanks is eliminated. If there is going to be a delay before sample preparation for analysis, the sample is stored at 4^{o} C.

ANALYTICAL METHODS

TEG Northwest Labs use analytical methodologies which are in conformity with U. S. Environmental Protection Agency (EPA), Washington DOE, and Oregon DEQ methodologies. When necessary and appropriate due to the nature or composition of the sample, TEG may use variations of the methods which are consistent with recognized standards or variations used by the industry and government laboratories.

Purgeable Volatile Halocarbons
(Chlorinated Hydrocarbons, EPA 601/8021B)

A calibration standard is run at the beginning of the day. The standard must be within 15% of the continuing calibration curve value. The standard is rerun at the end of the day. All samples are prepared with a surrogate spike, and the recovery must be between 65% and 135%. At least 1 method blank is run per day.

TEG NW SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

TEG Job Number: S00112-4
Client: ATC
Client Job Name: Kennewick
Client Job Number: 18452.0201 Task 4

Analytical Results

8021B, µg/kg		MTH BLK	LCS	HA-1 (0.5)	HA-1 (0.8)	HA-1 (1.1)	HA-2 (1.0)	HA-2 (1.4)
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	01/13/00	01/13/00	01/13/00	01/13/00	01/13/00	01/13/00	01/13/00
Date analyzed	Limits	01/13/00	01/13/00	01/13/00	01/13/00	01/13/00	01/13/00	01/13/00
Moisture, %				12%	10%	8%	12%	11%
Chloromethane	250	nd		nd	nd	nd	nd	nd
Bromomethane	250	nd		nd	nd	nd	nd	nd
Vinyl chloride	250	nd		nd	nd	nd	nd	nd
Chloroethane	250	nd		nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	250	nd		nd	nd	nd	nd	nd
1,1-Dichloroethene	250	nd	114%	nd	nd	nd	nd	nd
Methylene Chloride	250	nd		nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	250	nd		nd	nd	nd	nd	nd
1,1-Dichloroethane	250	nd		nd	nd	nd	nd	nd
Chloroform	50	nd		nd	nd	nd	nd	nd
1,1,1-Trichloroethane	50	nd		nd	nd	nd	nd	nd
Carbontetrachloride	50	nd		nd	nd	nd	nd	nd
1,2-Dichloroethane	250	nd		nd	nd	nd	nd	nd
Trichloroethene	50	nd	109%	nd	nd	nd	nd	nd
1,2-Dichloropropane	250	nd		nd	nd	nd	nd	nd
Bromodichloromethane	250	nd		nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	250	nd		nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	250	nd		nd	nd	nd	nd	nd
Chlorobenzene	250	nd	112%	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	50	nd		nd	nd	nd	nd	nd
Tetrachloroethene	50	nd		140	nd	nd	160	nd
Dibromochloromethane	250	nd		nd	nd	nd	nd	nd
Bromoform	250	nd		nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	250	nd		nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	250	nd		nd	nd	nd	nd	nd
Bromobenzene	250	nd		nd	nd	nd	nd	nd
1,2,3-Trichloropropane	250	nd		nd	nd	nd	nd	nd
Dibromomethane	250	nd		nd	nd	nd	nd	nd
m-Dichlorobenzene	50	nd		nd	nd	nd	nd	nd
p-Dichlorobenzene	50	nd		nd	nd	nd	nd	nd
o-Dichlorobenzene	50	nd		nd	nd	nd	nd	nd
Surrogate recoveries:								
Bromochloromethane		101%	99%	100%	114%	106%	114%	106%
1,4-Dichlorobutane		92%	87%	91%	95%	94%	97%	96%
Bromochloropropane		113%	107%	119%	122%	118%	122%	114%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
na - not analyzed
C - coelution with sample peaks
M - matrix interference
J - estimated value
Results reported on dry-weight basis
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

TEG NW SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

TEG Job Number:	S00112-4
Client:	ATC
Client Job Name:	Kennewick
Client Job Number:	18452.0201 Tas

Analytical Results

8021B, µg/kg		HA-2 (1.6)
Matrix	Soil	Soil
Date extracted	Reporting	01/13/00
Date analyzed	Limits	01/13/00
Moisture, %		7%
Chloromethane	250	nd
Bromomethane	250	nd
Vinyl chloride	250	nd
Chloroethane	250	nd
cis-1,2-Dichloroethene	250	nd
1,1-Dichloroethene	250	nd
Methylene Chloride	250	nd
trans-1,2-Dichloroethene	250	nd
1,1-Dichloroethane	250	nd
Chloroform	50	nd
1,1,1-Trichloroethane	50	nd
Carbontetrachloride	50	nd
1,2-Dichloroethane	250	nd
Trichloroethene	50	nd
1,2-Dichloropropane	250	nd
Bromodichloromethane	250	nd
cis-1,3-Dichloropropene	250	nd
trans-1,3-Dichloropropene	250	nd
Chlorobenzene	250	nd
1,1,2-Trichloroethane	50	nd
Tetrachloroethene	50	nd
Dibromochloromethane	250	nd
Bromoform	250	nd
1,1,2,2-Tetrachloroethane	250	nd
1,1,1,2-Tetrachloroethane	250	nd
Bromobenzene	250	nd
1,2,3-Trichloropropane	250	nd
Dibromomethane	250	nd
m-Dichlorobenzene	50	nd
p-Dichlorobenzene	50	nd
o-Dichlorobenzene	50	nd

Surrogate recoveries:	
Bromochloromethane	113%
1,4-Dichlorobutane	100%
Bromochloropropane	124%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
na - not analyzed
C - coelution with sample peaks
M - matrix interference
J - estimated value
Results reported on dry-weight basis
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

500112-4

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: ATC ASSOCIATES INC.

ADDRESS: 6347 SEAVIEW AVE NW, SEATTLE, WA 98107

PHONE: 206 · 781.1449 FAX: 206.781.1543

CLIENT PROJECT #: 18452.0201 TASK 4 PROJECT MANAGER: NEIL GIKHAM

DATE: 1/12/00 PAGE 1 OF 1

PROJECT NAME: KENNEWICK

LOCATION:

COLLECTOR: NEIL GIKHAM DATE OF COLLECTION 1/11/00

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B Halog	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	NOTES	Total Number of Containers	Laboratory Note Number
1. HA-1 (0.5)		0700	SOIL	4oz JAR	✓														1	
2. HA-1 (0.6)		0705	"	"	✓														1	
3. HA-1 (1.1)		0710	"	"	✓														1	
4. HA-2 (1.0)		0730	"	"	✓														1	
5. HA-2 (1.4)		0735	"	"	✓														1	
6. HA-2 (1.6)		0740	"	"	✓														1	
7.																				
8.																				
9.																				
10.																				
11.																				
12.																				
13.																				
14.																				
15.																				
16.																				
17.																				
18.																				

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
[signature]	1/12/00 1600	[signature]	01/12/00 1600
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☑ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

RUSH

Turn Around Time: 24 HR.

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

800 Sleater-Kinney SE, PMB #262
Lacey, Washington 98503-1127

Mobile Environmental Laboratories **Telephone: 360-459-4670**
Environmental Sampling Services **Fax: 360-459-3432**

March 23, 2000

Neil Gilham
ATC Associates
6347 Seaview Ave. NW
Seattle, WA 98107

Dear Mr. Gilham:

Please find enclosed the analytical data report for the Kennewick Project in Kennewick, Washington. StrataProbe and Mobile Laboratory services were conducted on March 15 & 16, 2000. Soil and soil vapor samples were analyzed on and off – site for Specific Halogenated Hydrocarbons and BTEX by Method 8021B.

The results of these analyses are summarized in the attached table. All soil values are reported on a dry weight basis. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

TEG Northwest appreciates the opportunity to have provided analytical services to ATC Associates for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A Korosec

Michael A. Korosec
President

QA/QC FOR ANALYTICAL METHODS

GENERAL

The TEG Northwest Laboratory quality assurance and quality control (QA/QC) procedures are conducted following the guidelines and objectives which meet or exceed certification/-accreditation requirements of California DOHS, Washington DOE, and Oregon DEQ. The Quality Control Program is a consistent set of procedures which assures data quality through the use of appropriate blanks, replicate analyses, surrogate spikes, and matrix spikes, and with the use of reference standards that meet or exceed EPA standards.

When analyses are taking place on-site with the mobile lab, the need for Field Blanks or Travel/Trip Blanks is eliminated. If there is going to be a delay before sample preparation for analysis, the sample is stored at 4^{O} C.

ANALYTICAL METHODS

TEG Northwest Labs use analytical methodologies which are in conformity with U. S. Environmental Protection Agency (EPA), Washington DOE, and Oregon DEQ methodologies. When necessary and appropriate due to the nature or composition of the sample, TEG may use variations of the methods which are consistent with recognized standards or variations used by the industry and government laboratories.

Purgeable Volatile Halocarbons
(Chlorinated Hydrocarbons, EPA 601/8021B)

A calibration standard is run at the beginning of the day. The standard must be within 15% of the continuing calibration curve value. The standard is rerun at the end of the day. All samples are prepared with a surrogate spike, and the recovery must be between 65% and 135%. At least 1 method blank is run per day.

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

KENNEWICK PROJECT
Kennewick, Washington
ATC Asscoiates, Inc.
Client Project #18452,0201 Task 6

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil Vapor

SAMPLE DESCRIPTION		Method Blank	VP-1 (4)	VP-1 (4) Dup.	VP-1 (8)	VP-1 (8) Dup,	VP-1 (12)	VP-2 (4)	VP-2 (8)	VP-2 (12)
	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3
DATE SAMPLED	MDL	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00
DATE ANALYZED		3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00
Vinyl chloride	0.75	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	0.15	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	0.15	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	0.15	nd	nd	nd	nd	nd	nd	nd	nd	nd
Total Xylenes	0.15	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.15	nd	nd	nd	nd	nd	nd	0.39	nd	nd
Trans-1,2-dichlorethene	0.15	nd	nd	nd	nd	nd	0.54	nd	0.24	0.24
Cis-1,2-dichloroethene	0.15	nd	nd	nd	nd	nd	0.21	nd	nd	nd
Trichloroethene (TCE)	0.15	nd	nd	nd	nd	nd	0.96	nd	nd	nd
Tetrachloroethene (PCE)	0.15	nd	nd	nd	nd	nd	0.27	nd	nd	nd

ANALYSES PERFORMED BY: Tim McCall
DATA REVIEWED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

KENNEWICK PROJECT
Kennewick, Washington
ATC Asscoiates, Inc.
Client Project #18452,0201 Task 6

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil Vapor

SAMPLE DESCRIPTION		VP-3 (4)	VP-3 (8)	VP-3 (12)	VP-4 (4)	VP-4 (8)	VP-4 (12)	VP-5 (4)	VP-5 (8)	VP-5 (12)
	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3
DATE SAMPLED	MDL	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00
DATE ANALYZED		3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00
Vinyl chloride	0.75	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	0.15	0.18	nd	nd	nd	nd	nd	0.24	nd	nd
Toluene	0.15	nd	nd	nd	nd	nd	0.30	0.33	nd	nd
Ethylbenzene	0.15	nd	nd	nd	nd	nd	nd	nd	nd	nd
Total Xylenes	0.15	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.15	0.95	nd	nd	nd	nd	nd	0.39	nd	nd
Trans-1,2-dichlorethene	0.15	nd	0.24	0.36	0.54	0.48	0.48	0.60	0.36	0.18
Cis-1,2-dichloroethene	0.15	nd	nd	nd	0.24	0.24	0.21	0.18	nd	nd
Trichloroethene (TCE)	0.15	nd	nd	nd	0.15	0.57	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.15	nd	nd	nd	nd	nd	0.27	0.30	nd	nd

ANALYSES PERFORMED BY: Tim McCall
DATA REVIEWED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

KENNEWICK PROJECT
Kennewick, Washington
ATC Asscoiates, Inc.
Client Project #18452,0201 Task 6

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil Vapor

SAMPLE DESCRIPTION		VP-6 (4)	VP-6 (8)	VP-6 (12)
	mg/m3	mg/m3	mg/m3	mg/m3
DATE SAMPLED	MDL	3/15/00	3/15/00	3/15/00
DATE ANALYZED		3/15/00	3/15/00	3/15/00
Vinyl chloride	0.75	nd	nd	nd
Benzene	0.15	nd	nd	0.75
Toluene	0.15	nd	nd	nd
Ethylbenzene	0.15	nd	nd	nd
Total Xylenes	0.15	nd	nd	nd
1,1-Dichloroethene	0.15	nd	nd	nd
Trans-1,2-dichlorethene	0.15	nd	nd	nd
Cis-1,2-dichloroethene	0.15	nd	nd	nd
Trichloroethene (TCE)	0.15	nd	nd	nd
Tetrachloroethene (PCE)	0.15	nd	nd	nd

ANALYSES PERFORMED BY: Tim McCall
DATA REVIEWED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

KENNEWICK PROJECT
Kennewick, Washington
ATC Asscoiates, Inc.
Client Project #18452,0201 Task 6

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil Vapor

SAMPLE DESCRIPTION		Method Blank	VP-7(9)	VP-8(3)	VP-9(3)	VP-9(3) Dup.	VP-10(2.5)	VP-11(3)	VP-12 (2.5)	VP-13(3.5)
	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3
DATE SAMPLED	MDL		3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00
DATE ANALYZED		3/16/00	3/16/00	3/16/00	3/16/00	3/16/00	3/16/00	3/16/00	3/16/00	3/16/00
Vinyl chloride	0.75	nd	8.19	nd	nd	nd	nd	nd	nd	nd
Benzene	0.15	nd	0.18	nd	nd	nd	nd	nd	nd	nd
Toluene	0.15	nd	nd	nd	0.45	0.27	0.87	0.66	nd	0.20
Ethylbenzene	0.15	nd	nd	nd	nd	nd	nd	nd	nd	nd
Total Xylenes	0.15	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.15	nd	1.44	nd	nd	nd	nd	0.33	nd	nd
Trans-1,2-dichlorethene	0.15	nd	0.66	0.36	nd	nd	0.36	nd	nd	nd
Cis-1,2-dichloroethene	0.15	nd	0.24	0.24	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.15	nd	nd	0.69	nd	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.15	nd	nd	nd	nd	nd	nd	nd	0.39	nd

ANALYSES PERFORMED BY: Tim McCall
DATA REVIEWED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

KENNEWICK PROJECT
Kennewick, Washington
ATC Asscoiates, Inc.
Client Project #18452,0201 Task 6

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

SAMPLE DESCRIPTION		Method Blank	SP4 (4-6)	SP4 (4-6) Dup.	SP4 (6-8)	SP4 (8-9)	VP-8-5(1-2)	VP-9-5(1-2)	VP-10-5(1-2)	VP-11-5(1-2)	VP-13-5(1.5-3)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DATE SAMPLED	MDL		3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00	3/15/00
DATE ANALYZED		3/16/00	3/16/00	3/16/00	3/16/00	3/16/00	3/16/00	3/16/00	3/16/00	3/16/00	3/16/00
Vinyl chloride	0.25	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Total Xylenes	0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trans-1,2-dichlorethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Cis-1,2-dichloroethene	0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.05	nd	nd	nd	nd	nd	nd	nd	nd	0.09	nd
Tetrachloroethene (PCE)	0.05	nd	nd	nd	nd	0.07	nd	nd	nd	nd	nd
SURROGATE RECOVERY (%)		79	76	115	90	76	97	87	83	97	95

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Tim McCall
DATA REVIEWED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

KENNEWICK PROJECT
Kennewick, Washington
ATC Asscoiates, Inc.
Client Project #18452,0201 Task 6

QA/QC DATA - EPA 8021B ANALYSES

Sample No.: SP4 (6-8)	Matrix Spike			Matrix Spike Duplicate			
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	RPD (%)
BENZENE	1.00	1.05	105	1.00	0.96	96	8.96
TRICHLOROETHENE (TCE)	1.00	1.07	107	1.00	0.80	80	28.88
TETRACHLOROETHENE (PCE)	1.00	0.98	98	1.00	0.99	99	1.02

	LCS		
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
BENZENE	1.00	1.02	102
TRICHLOROETHENE (TCE)	1.00	0.80	80
TETRACHLOROETHENE (PCE)	1.00	0.81	81

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%
ACCEPTABLE MATRIX SPIKE: 80%-120%
ACCEPTABLE RPD: 35%

ANALYSES PERFORMED BY: Tim McCall
DATA REVIEWED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

KENNEWICK PROJECT
Kennewick, Washington
ATC Associates, Inc.
Client Project #18452,0201 Task 6

Specific Halogenated and Aromatic Hydrocarbons (EPA 8021B) in Soil

Sample Description		Method Blank	SP-3(12)	SP-3(12) Dup.
Date Sampled		3/15/00	3/15/00	3/15/00
Date Analyzed		3/22/00	3/22/00	3/22/00
	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Vinyl chloride	0.75	nd	nd	nd
Benzene	0.15	nd	nd	nd
Toluene	0.15	nd	nd	nd
Ethylbenzene	0.15	nd	nd	nd
Total Xylenes	0.15	nd	nd	nd
1,1-Dichloroethene	0.15	nd	nd	nd
trans-1,2-Dichloroethene	0.15	nd	nd	nd
cis-1,2-Dichloroethene	0.15	nd	nd	nd
Trichloroethene (TCE)	0.15	nd	nd	nd
1,1,2-Trichloroethane	0.15	nd	nd	nd
Tetrachloroethene (PCE)	0.15	nd	nd	nd
Surrogate Recovery (%)		97	98	92

"nd" Indicates not detected at listed detection limit.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65%- 135%

ANALYSES PERFORMED BY: Tim McCall
DATA REVIEWED BY: Sherry Chilcutt

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: ATC ASSOCIATES INC.

ADDRESS: 6347 SEAVIEW AVE NW, SEATTLE, WA 98107

PHONE: 206.781.1449 FAX: 206.781.1543

CLIENT PROJECT #: 18452.0201 Task 6 PROJECT MANAGER: NEIL GICHAM

DATE: 3/15/00 PAGE 1 OF

PROJECT NAME: Kennewick

LOCATION:

COLLECTOR: NEIL GICHAM/TEG DATE OF COLLECTION 3/15/00

Sample Number	FT. Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	NOTES	Total Number of Containers	Laboratory Note Number
1. VP-1(4)	4'		VAPOR	Vapor	✓															
2. VP-1 (8)	8				✓															
3. VP-1 (12)	12				✓															
4. VP-2 (4)	4				✓															
5. VP-2 (8)	8				✓															
6. VP-2 (12)	12				✓															
7. VP 5 (4)	4				✓															
8. VP 5 (8)	8				✓															
9. VP-5 - (12)	12				✓															
10. VP 4 (4)	4				✓															
11. VP 4 (8)	8				✓															
12. VP 4 (12)	12				✓															
13. VP 3 (4)	4				✓															
14. VP 3 (8)	8				✓															
15. VP 3 (12)	12				✓															
16. VP 6 (4)	4				✓															
17. VP 6 (8)	8				✓															
18. VP 6 (12)	12				✓															

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
	3/15/00	Jim McCall	0800 3/15/00
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time:

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: ATC ASSOCIATES INC.

ADDRESS: 6347 SEAVIEW AVE NW, SEATTLE, WA 98107

PHONE: 206.781.1449 FAX: 206.781.1543

CLIENT PROJECT #: 18452.0201 Task 6 PROJECT MANAGER: NEIL GILHAM

DATE: 3/15/00 PAGE 1 OF

PROJECT NAME: Kennewick

LOCATION:

COLLECTOR: NEIL GILHAM DATE OF COLLECTION 3/15/00

Sample Number	Ft. Depth	Time	Sample Type	Container Type	VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (B & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	NOTES	Total Number of Containers	Laboratory Note Number
15 1. SP-4 (4-6)	4-6	1745	SOIL	4oz JAR	✓														1	
2. SP-4 (6-8)	6-8	1800	"	"	✓														1	
3. SP-4 (8-9)	8-9	1815	"	"	✓														1	
4. VP-7 (9)	9	1815	VAPOR	VIAL	✓														2	
5. VP-8 (3)	3	2130	"	"	✓														2	
6. VP-8-S (1-2)	1-2	2140	SOIL	4oz JAR	✓														1	
7. VP-9 (3)	3	2215	VAPOR	VIAL	✓														2	
8. VP-9-S (1-2)	1-2	2220	SOIL	4oz JAR	✓														1	
9. VP-10 (2.5)	2.5	2250	VAPOR	VIAL	✓														2	
10. VP-10-S (1-2)	1-2	2240	SOIL	4oz JAR	✓														1	
11. VP-11-S (1-2)	1-2	2310	SOIL	"	✓														1	
12. VP-11 (3)	3	2340	VAPOR	VIAL	✓														2	
13. VP-12 (2.5)	2.5	2400	"	"	✓														2	
16 14. VP-13-S (1.5-3)	1.5-3	0030	SOIL	4oz JAR	✓														1	
15. VP-13 (3.5)	3.5	0035	VAPOR	VIAL	✓														2	
16.																				
17.																				
18.																				

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
[signature]	3/16/00 0115	[signature]	3/16/00 0115
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time:

teg TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: ATC ASSOCIATES INC.

ADDRESS: 6347 SEAVIEW AVE NW, SEATTLE, WA 98107

PHONE: 206.781.1449 FAX: 206.781.1543

CLIENT PROJECT #: 18452.0201 Task6 PROJECT MANAGER: NEIL GILHAM

DATE: 3/15/00 PAGE 2 OF

PROJECT NAME: Kennewick

LOCATION:

COLLECTOR: NEIL GILHAM DATE OF COLLECTION 3/15/00

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	NOTES	Total Number of Containers	Laboratory Note Number
1. SP-3 (12)	12	1545	SOIL	4oz. JAR	✓														1	
2.																				
3.																				
4.																				
5.																				
6.																				
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[signature]	3/15/00	[signature]	400 3/15/00
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time: