

SITE CHARACTERIZATION REPORT
Version 1.0

SHOPPERS FORUM MALL CHLORINATED SOLVENT INVESTIGATION

Work Order No.
DEC File No. 102.38.100
DEC Hazard No.: 3682

Prepared for

CITY OF FAIRBANKS
800 Cushman Street
Fairbanks, Alaska 99701



Prepared by

TRAVIS/PETERSON ENVIRONMENTAL CONSULTING, INC.
329 2nd Street
Fairbanks, Alaska 99701

Qualified Person	Printed Name	Signature
Sample Collection Data Interpretation Data Reporting	Ryan Peterson Staff Scientist	

Project Number: 1531-04

January 2020

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
1.1	Site Information	1
1.2	Potentially Responsible Party	1
1.3	Project Area Background.....	1
1.4	Contaminants of Potential Concern	2
1.5	Project Objectives	2
2.0	FIELD ACTIVITIES.....	2
2.1	Installation of Passive Soil gas Samplers.....	3
2.2	Retrieval of Passive Soil Gas Samplers	3
2.3	Field Modifications or Deviations from Approved Work Plan	3
3.0	RESULTS OF SCREENING	3
3.1	Disposal of Contaminated Media.....	4
3.1.1	Disposal of Investigative Derived Waste	4
3.2	Sampling and Analysis Deviations or Modifications to the Approved Work Plan	4
4.0	CONCEPTUAL SITE MODEL	4
5.0	PROPOSED CLEANUP LEVELS.....	4
6.0	PROPOSED CLEANUP TECHNIQUES.....	5
7.0	QUALITY ASSURANCE SUMMARY	5
7.1	Precision.....	6
7.1.1	Field Duplicates.....	6
7.1.2	Laboratory Control Sample Duplicates and/or Matrix Spike Duplicates	6
7.2	Accuracy	6
7.3	Representativeness	6
7.4	Comparability	6
7.4.1	Comparability of Laboratory Data to Field Screening Data	6
7.4.2	Comparability of Data Between Laboratories.....	7
7.5	Completeness	7
7.6	Sensitivity	7
8.0	CONCLUSIONS	7
9.0	REFERENCES.....	8

LIST OF TABLES

Table 1: Proposed Cleanup Levels for Soil and Groundwater COPCs. 5

LIST OF APPENDICES

Appendix A Figures
Appendix B Chlorinated Solvent Screening Maps
Appendix C Petroleum Hydrocarbon Screening Maps
Appendix D Field Screening Procedures
Appendix E Field Screening Summary Table
Appendix F Field Notes
Appendix G Laboratory Report of Analysis
Appendix H Conceptual Site Model

LIST OF ACRONYMS

AAC	Alaska Administrative Code
AS/SVE	Air Sparging/Soil Vapor Extraction
BTEX	Benzene, Toluene, Ethylbenze, Xylenes by EPA Method 8021 or 8260
bgs	below ground surface
COPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
DEC	Alaska Department of Environmental Conservation
EDB	Ethylene Dibromide
ft ²	square feet
GRO	Gasoline Range Organic Hydrocarbons by Alaska Method 101
DRO	Diesel Range Organic Hydrocarbons by Alaska Method 102
IDW	Investigative Derived Waste
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
lf	linear feet
MCL	Maximum Contaminant Level
mil	A unit of measurement equal to 1/1000 of an inch.
mg/Kg	Milligram per Kilogram
mg/L	milligrams per Litre
MS	Matrix Spike
MSDs	Matrix spike Duplicate
PAH	Polyaromatic Hydrocarbons
PCB	Polychlorinated Biphenyl's
PID	Photo Ionization Detector
POLs	Petroleum, Oils, and Lubricants
PPM	Parts Per Million
PQL	Practical Quantification Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
RRO	Residual Range Organic Hydrocarbons by Alaska Method 103
SCR	Site Characterization Report
SVOC	Semi-volatile Organic Compound
TPECI	Travis/Peterson Environmental Consulting, Inc.
UST	Underground Storage Tank
VOC	Volatile Organic Compound
yd ³	Cubic Yards
cis 1,2-DCE	cis 1,2-DCE
trans 1,2-DCE	trans 1,2-DCE
1,1-DCE	1,1-DCE

EXECUTIVE SUMMARY

PROJECT OBJECTIVES

The investigations detailed in this Site Characterization Report (SCR) were prompted by the discovery of PCE and TCE at the property downgradient of the subject property have shown that there are also concentrations of PCE and TCE in the soil and groundwater on the subject property. This contamination is likely a product of dry cleaning businesses that were previously present on the subject property (QAPP Worksheet #10).

This work for the Shoppers Forum Mall project consisted of activities necessary to:

- Install a series of soil vapor monitoring devices;
- Allow them to remain in place undisturbed for a a period of time as specified by the manufacturer; and
- Remove soil vapor monitoring devices for analysis.

The project required the installation of soil vapor monitoring devices in order to determine the horizontal extent of potential chlorinated solvent soil contamination across the property.

A total of 66 passive soil gas samplers were installed and successfully retrieved from around the subject property as shown in Figure 2.

CONTAMINANTS OF POTENTIAL CONCERN

The Shoppers Forum Mall is located within the boundaries of a contaminated site mapped as Shoppers Forum (DEC File # 102.38.100). The City of Fairbanks has been advised to anticipate tetrachloroethylene (PCE) and trichloroethylene (TCE) contamination within the project work area. The list of COPCs for the project (QAPP Worksheet #10) is listed below:

- Tetrachloroethylene (PCE);
- trichloroethylene (TCE);
- Cis,1-2 dichloroethene (cis 1,2-DCE);
- Trans-1,2 dichloroethene (trans 1,2-DCE);
- 1,1-dichloroethene (1,1-DCE); and
- Vinyl chloride.

FIELD ACTIVITIES

Field activities were performed by TPECI qualified personnel Dr. Edmond C. Packee, Jr and Ryan Peterson. on October 12, 18, 22, and 28, 2019. Field activities performed included:

- Installation and retrieval of 66 passive soil gas samplers.

Each of the above activities is described in the following sections.

RESULTS

Soil screening and results confirm that the presence of contamination centered around three locations on the subject property including north of the main mall structure, north, south, and west of the Annex structure, and in the parking lot centered around grid coordinate D3.

RECOMMENDATIONS

The maps generated from screening data collected during this investigation should be used to choose new groundwater well locations around the subject property. Specifically, a groundwater well should be installed in the parking lot around grid coordinate D3.

1.0 INTRODUCTION

The following Site Characterization Report (SCR) presents details of field screening and analytical sampling completed by Travis/Peterson Environmental Consulting, Inc. (TPECI) personnel pursuant to the Alaska Department of Environmental Conservation (DEC) approved *Shoppers Forum Mall Chlorinated Solvent Investigation Sampling and Analysis Plan, August, 2018* (approved work plan).

This SCR was prepared to comply with the requirements of 18 AAC 75.335 (c) which requires the submission of:

- Information obtained from activities performed in accordance with the approved work plan;
- Results of sampling and analysis performed pursuant to the approved work plan;
- A demonstration that inspections, sampling and, analyses performed adequately characterize the extent of hazardous substance contamination; and
- Recommended cleanup techniques applicable to the site if contamination remains onsite.

1.1 SITE INFORMATION

The work described in this FSP will be conducted at the Shoppers Forum Mall located in Fairbanks, Alaska (Figure 1). Access to the site is via Airport Way or Cowles Street. The project site is located at latitude 64.836016° north, longitude -147.741176° west.

The property is located on alluvial sand and gravels deposited by the Tanana and Chena rivers. Based on the apparent water surface elevation of existing wells, groundwater is believed to be between 15 and 20 feet below ground surface. Currently, the site is fully developed. There are two structures currently located on the subject property as well as a paved parking area.

The subject property is owned by the Gavora, Inc. and is managed by Gavora, Inc. TPECI was contracted by the City of Fairbanks to perform the activities described in this FSP.

1.2 POTENTIALLY RESPONSIBLE PARTY

The potentially responsible party pursuant to 18 AAC 75 is the City of Fairbanks and Gavora, Inc.

1.3 PROJECT AREA BACKGROUND

The investigations documented in this SCR were prompted by the discovery of tetrachloroethylene (PCE) and trichloroethylene (TCE) at the property downgradient of the subject property have shown that there are also concentrations of PCE and TCE in the soil and groundwater on the subject property. This contamination is likely a product of dry cleaning businesses that were previously present on the subject property (QAPP Worksheet #10).

This work for the Shoppers Forum Mall project consisted of activities necessary to:

- Install a series of soil vapor monitoring devices;
- Allow them to remain in place undisturbed for a period of time as specified by the manufacturer; and

- Remove soil vapor monitoring devices for analysis.

The project required the installation of soil vapor monitoring devices in order to determine the horizontal extent of potential chlorinated solvent soil contamination across the property.

A total of 66 passive soil gas samplers were installed and successfully retrieved from pre-determined locations around the subject property as shown in Figure 2.

1.4 CONTAMINANTS OF POTENTIAL CONCERN

The Shoppers Forum Mall is located within the boundaries of a contaminated site mapped as Shoppers Forum (DEC File # 102.38.100). The City of Fairbanks has been advised to anticipate PCE and TCE contamination within the project work area. The list of COPCs for the project (QAPP Worksheet #10) is listed below:

- PCE;
- TCE;
- Cis,1-2 dichloroethene (cis 1,2-DCE);
- Trans-1,2 dichloroethene (trans 1,2-DCE);
- 1,1-dichloroethene (1,1-DCE); and
- Vinyl chloride.

1.5 PROJECT OBJECTIVES

Field activities described in this SCR were intended to provide data to meet the following project objectives:

Objective 1: Verify the presence of contaminants on the subject property

Objective 2: Delineate the size and extent of contamination present on the subject property

Objective 3: Determine the concentration of contaminants on the subject property

Sections 2 through 5 detail the methods used to meet the project objectives described in this section.

The information obtained during the course of work outlined in this SCR was used to map the contaminant plume on the subject property. This information will then be used to better plan future site work including choosing locations of future monitoring wells. 75.330.

2.0 FIELD ACTIVITIES

Field activities were performed by TPECI qualified personnel Dr. Edmond C. Packee, Jr and Ryan Peterson. on October 12, 18, 22, and 28, 2019. Field activities performed included:

- Installation and retrieval of 66 passive soil gas samplers.

Each of the above activities is described in the following sections.

2.1 INSTALLATION OF PASSIVE SOIL GAS SAMPLERS

On October 12, 2019 a total of 62 passive soil gas samplers were installed by TPECI employees Ryan Peterson and Dr. Edmond C. Packee Jr. 10 Additional passive soil gas samplers were installed on October 22, 2019. Some of the additional 10 replaced samplers that were unable to be retrieved after the initial installation on October 12.

Sample installation was performed using an electric hammer drill with a 1.5” bit and a push rod to install samplers approximately 2.5 feet below ground surface. Once installed samplers were left in place for six days. The GPS coordinates of each sample were collected prior to retrieval.

2.2 RETRIEVAL OF PASSIVE SOIL GAS SAMPLERS

Passive Soil Gas Samplers were retrieved on October 18 and 28, 2019. Samplers were pulled from their install depths and placed back into their numbered sample vials and returned to the lab for analysis.

2.3 FIELD MODIFICATIONS OR DEVIATIONS FROM APPROVED WORK PLAN

The following deviations from the approved work plan were noted during field activities for this project:

3.0 RESULTS OF SCREENING

Screening results indicated the presence of PCE, TCE, and several chemical constituents of common dry cleaning related solvents in three primary locations around the Shoppers Forum Mall. Additionally unanticipated petroleum contamination and benzene were detected in two locations on the subject property. Screening results are presented in map view in Appendix A. Screening results are presented in table view in Appendix E.

PCE and TCE were both detected north of the main mall structure and within the DOT right of way (highest concentrations between grid location A1 and A4).

PCE and TCE were both detected north, west, and south of the mall annex structure (highest concentrations to the south between grid locations J6 and J9).

PCE, TCE, and cis-1,2-DCE were detected in the parking lot centered around grid location D3. This area is most likely the oldest chlorinated solvent related contamination on the property due to the presence of cis-1,2-DCE which was not detected at the main mall or annex structures.

Unanticipated total petroleum hydrocarbon (TPH) contamination was detected in several areas around the property. The highest results were around grid space E2 (near the main mall entrance), grid space G4 in the parking lot, grid coordinate K1 in the southeast corner of the property, and grid location B1 in the northwest corner of the property.

Unanticipated benzene contamination was detected in several areas around the property. The highest results were between grid coordinates D1 and B1 and at grid location E1 and K1 west of the main mall structure and in the parking lot around grid coordinates D3, E3-E4, G3, and H3.

See Appendix B for chlorinated solvent screening maps. See Appendix C for petroleum hydrocarbon screening maps.

3.1 DISPOSAL OF CONTAMINATED MEDIA

The following sections described the final disposal of contaminated media and investigative derived waste generated during the course of field activities.

3.1.1 Disposal of Investigative Derived Waste

Solid investigative derived waste (IDW) was collected and disposed of as trash at the Fairbanks North Star Borough Landfill. No liquid IDW was generated during the field activities described in this SCR.

3.2 SAMPLING AND ANALYSIS DEVIATIONS OR MODIFICATIONS TO THE APPROVED WORK PLAN

The following deviations from the approved work plan during sampling and analysis included:

- The samplers installed in locations I4 and G5 were irretrievable either due to being lost or destroyed at some point while they were installed.

4.0 CONCEPTUAL SITE MODEL

The conceptual site model (Appendix H) indicates that the following pathways are complete and require further evaluation:

- 2.a.1. – Incidental soil ingestion;
- 2.b.1 – Ingestion of groundwater;
- 2.c.1 – Inhalation of outdoor air;
- 3 Additional Exposure Pathway – Dermal exposure to contaminants in groundwater.

The conceptual site model also identified pathway 2.c.2 – Inhalation of indoor air as complete, however inhalation of indoor air has been studied in the past resulting in the installation of a sub slab depressurization system, therefore this pathway requires no further evaluation.

5.0 PROPOSED CLEANUP LEVELS

Analytical sample results indicated the following chemical constituents were present on site:

- PCE;
- TCE;
- Cis,1-2 dichloroethene (cis 1,2-DCE); and
- Benzene.

Table 1: Proposed Cleanup Levels for Soil and Groundwater COPCs.

Contaminant of Potential Concern	DEC Cleanup Level	
	Soil	Groundwater
PCE	0.19 mg/kg	41 ug/L
TCE	0.011 mg/kg	2.8 ug/L
Cis,1-2 dichloroethene	0.12 mg/kg	36 ug/L
Benzene	0.022 mg/kg	4.6 ug/L
Notes: Cleanup levels are from Table B1 of 18 AAC 75.341 mg/kg – milligrams per kilogram ug/L – micrograms per Liter		

6.0 PROPOSED CLEANUP TECHNIQUES

Due to the fact that contamination associated with this property has been detected in groundwater, additional groundwater wells are recommended to more accurately monitor long term sub surface conditions.

7.0 QUALITY ASSURANCE SUMMARY

This quality assurance summary is included pursuant to the DEC, Division of Spill Prevention and Response, Contaminated Sites Technical Memorandum, March 2009 (DEC, 2009b). The quality assurance summary, at a minimum, must describe the following six parameters for all analytical results with respect to the impact that any discrepancies have on the quality and usability of the data. For additional detailed quality assurance information see the DEC laboratory data review checklist, Appendix E.

- **Precision** - measures the reproducibility of repetitive measurements. It is measured by calculating the relative percent difference (RPD) between duplicate samples. Field duplicate samples, matrix spike (MS) and matrix spike duplicate (MSD) pairs, and laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) pairs were used to measure precision for this project.
- **Accuracy** - measures the correctness, or the closeness, between the true value and the quantity detected. It is measured by calculating the percentage recovery of known concentrations of spiked compounds that were introduced into the appropriate sample matrix. Surrogate and LCS/LCSD and/or MS/MSD sample recoveries were used to measure accuracy for this project.
- **Representativeness** - describes the degree to which data accurately and precisely represents site characteristics.
- **Comparability** (if applicable) - describes whether two data sets can be considered equivalent with respect to the project goal.
- **Completeness** - describes the amount of valid data obtained from the sampling event(s). It is calculated as the percentage of valid measurements compared to the total number of measurements. The completeness goal for this project was set at 85 percent.

- **Sensitivity** - describes the lowest concentration that the analytical method can reliably quantitate, and is evaluated by verifying that the detected results and/or PQLs meet the applicable cleanup levels listed in the DEC Title 18 AAC 75.341, Tables B1 and B2

7.1 PRECISION

Pursuant to the DEC (DEC, 2009b), precision of measurements must be evaluated for both field duplicates, LCSDs, and/or MSDs. Precision of field and laboratory data for this project is presented in the following sections.

7.1.1 Field Duplicates

Duplicates were required for the site characterization portion of this project. Each passive sampler contains two separate samples. Duplicates were chosen by the laboratory and used to verify the accuracy of the test. Samples J1, J2, E4, and E6 were analyzed as duplicates.

The field duplicate sample results were comparable (≤ 50 RPD) to all project sample results, with the exception of TPH on J1/J1D (63.25%).

7.1.2 Laboratory Control Sample Duplicates and/or Matrix Spike Duplicates

LCS/LCSD and MS/MSD were not used in this project.

7.2 ACCURACY

LCS/LCSD, MS/MSD, and surrogates were not used during this project.

7.3 REPRESENTATIVENESS

Pursuant to the DEC(DEC, 2009b), the representativeness of the data collected must be evaluated in terms of the degree to which data characterizes the actual site conditions and the consistency with the conceptual site model (CSM) and data quality objectives in the approved work plan. Within the work area for this project the collected data is characteristic of the site and consistent with data quality objectives.

The data collected during the course of field activities described in this SCR indicate were used to develop the CSM for this project (Section 4.0 and Appendix J). Therefore, the data are representative of the CSM.

7.4 COMPARABILITY

Pursuant to the DEC (DEC, 2009b), the comparability of the data collected must be evaluated in terms of the degree to which data are comparable to field screening methods (if applicable) and the standard methods, procedures, quantitation units, and reporting formats between lab reports and between laboratories, if more than one laboratory is used. An evaluation of data comparability for this project is appropriate because field screening methods was used to protect worker health and safety and guide excavation activities.

7.4.1 Comparability of Laboratory Data to Field Screening Data

The data collected during this project is entirely comprised of screening data.

7.4.2 Comparability of Data Between Laboratories

Amplified Geochemical Imaging, LLC. was the contract laboratory for this project. There was no overlap of analysis between the laboratories and comparability of methods, procedures quantitation limits, and reporting formats was not applicable.

7.5 COMPLETENESS

Pursuant to the DEC (DEC, 2009b), the completeness of the data collected must be evaluated in terms of number of valid samples collected. A total of 66 field samples were submitted for analysis. All samples were valid screening samples for all detected analytes.

7.6 SENSITIVITY

Pursuant to the DEC (DEC 2009b), the sensitivity of the data collected must be evaluated in terms of PQLs relative to regulatory cleanup standards. Trip blank results were not evaluated in terms of the PQL because the data collected during this project is screening data, and not intended to show the site is clean from a regulatory standpoint. All trip blank results were non-detect.

8.0 CONCLUSIONS

Screening results indicated the presence of PCE, TCE, and several chemical constituents of common dry cleaning related solvents in three primary locations around the Shoppers Forum Mall. Additionally unanticipated petroleum contamination and benzene were detected in two locations on the subject property. Screening results are presented in map view in Appendix A. Screening results are presented in table view in Appendix C.

PCE and TCE were both detected north of the main mall structure and within the DOT right of way (highest concentrations between grid location A1 and A4). Groundwater wells currently exist in this area and should continue to be sampled.

PCE and TCE were both detected north, west, and south of the mall annex structure (highest concentrations to the south between grid locations J6 and J9). Additional groundwater well coverage in this area is recommended.

PCE, TCE, and cis-1,2-DCE were detected in the parking lot centered around grid location D3. This area is most likely the oldest chlorinated solvent related contamination on the property due to the presence of cis-1,2-DCE which was not detected at the main mall or annex structures. Additional groundwater well coverage in this area is recommended.

Unanticipated total petroleum hydrocarbon (TPH) contamination was detected in several areas around the property. The highest results were around grid space E2 (near the main mall entrance), grid space G4 in the parking lot, grid coordinate K1 in the southeast corner of the property, and grid location B1 in the northwest corner of the property. Investigation of these areas including soil borings is recommended.

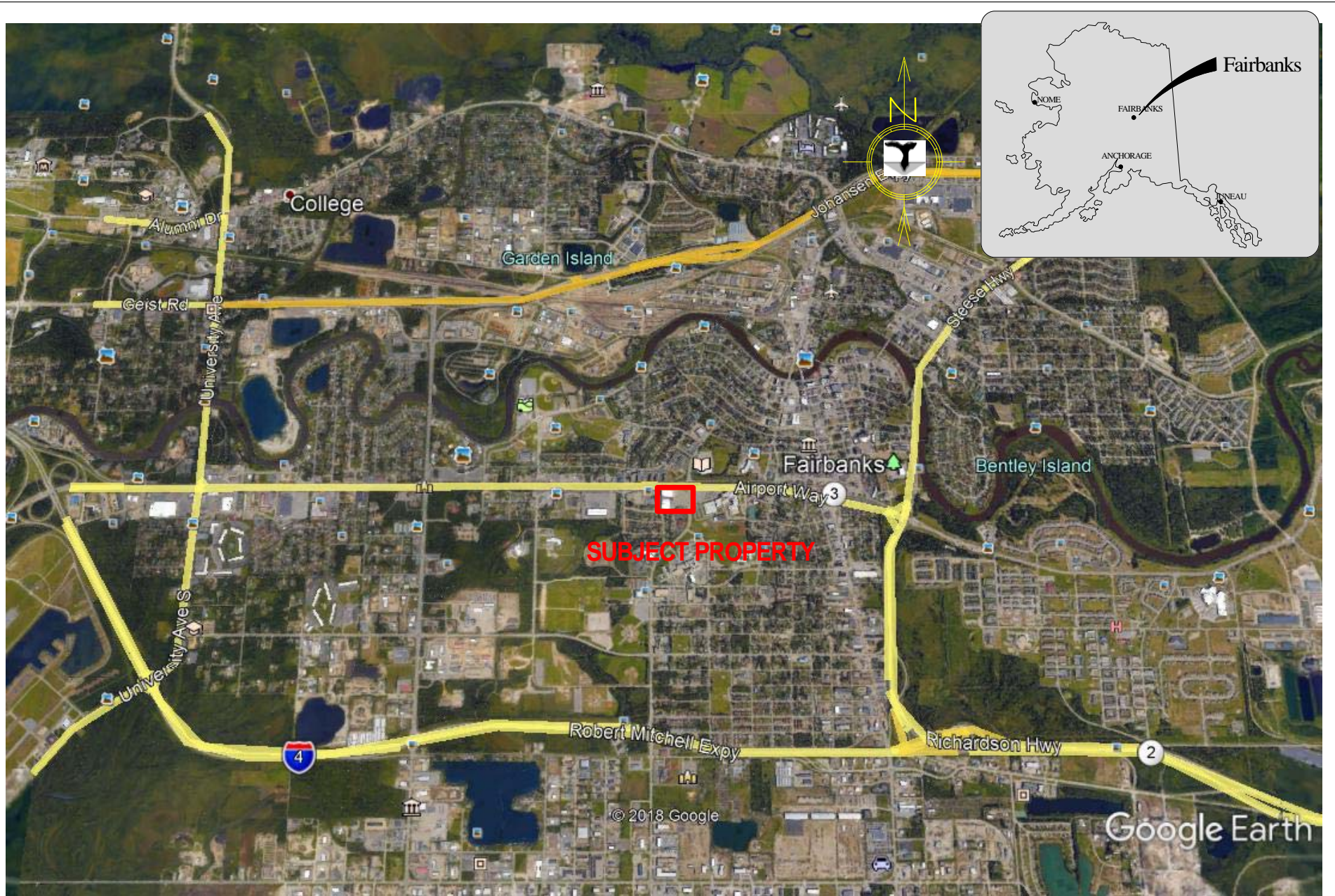
Unanticipated benzene contamination was detected in several areas around the property. The highest results were between grid coordinates D1 and B1 and at grid location E1 and K1 west of the main mall structure and in the parking lot around grid coordinates D3, E3-E4, G3, and H3. Investigation of these areas including soil borings is recommended.

9.0 REFERENCES

- DEC, 2009a. *Technical Memorandum: Arsenic in Soil*. Division of Spill Prevention and Response, Contaminated Sites Technical Memorandum. Alaska Department of Environmental Conservation. March 2009.
- DEC, 2009b. *Environmental Laboratory Data and Quality Assurance Requirements*. Division of Spill Prevention and Response, Contaminated Sites Technical Memorandum. Alaska Department of Environmental Conservation. March 2009.
- DEC, 2010. *Draft Field Sampling Guide*. Division of Spill Prevention and Response, Contaminated Sites Program. May 2010.
- DEC, 2015. *Oil and Hazardous Substances Pollution Control Regulations - Discharge Reporting, Cleanup, and Disposal of Oil and Other Hazardous Substances and General Provisions*. Alaska Department of Environmental Conservation. 18 AAC 75 as revised as of June 17, 2015.

APPENDIX A

FIGURES



TRAVIS/PETERSON ENVIRONMENTAL CONSULTING, INC.
 329 2ND STREET
 FAIRBANKS, ALASKA 99701

SHOPPERS FORUM MALL CHLORINATED SOLVENT INVESTIGATION
 CITY OF FAIRBANKS

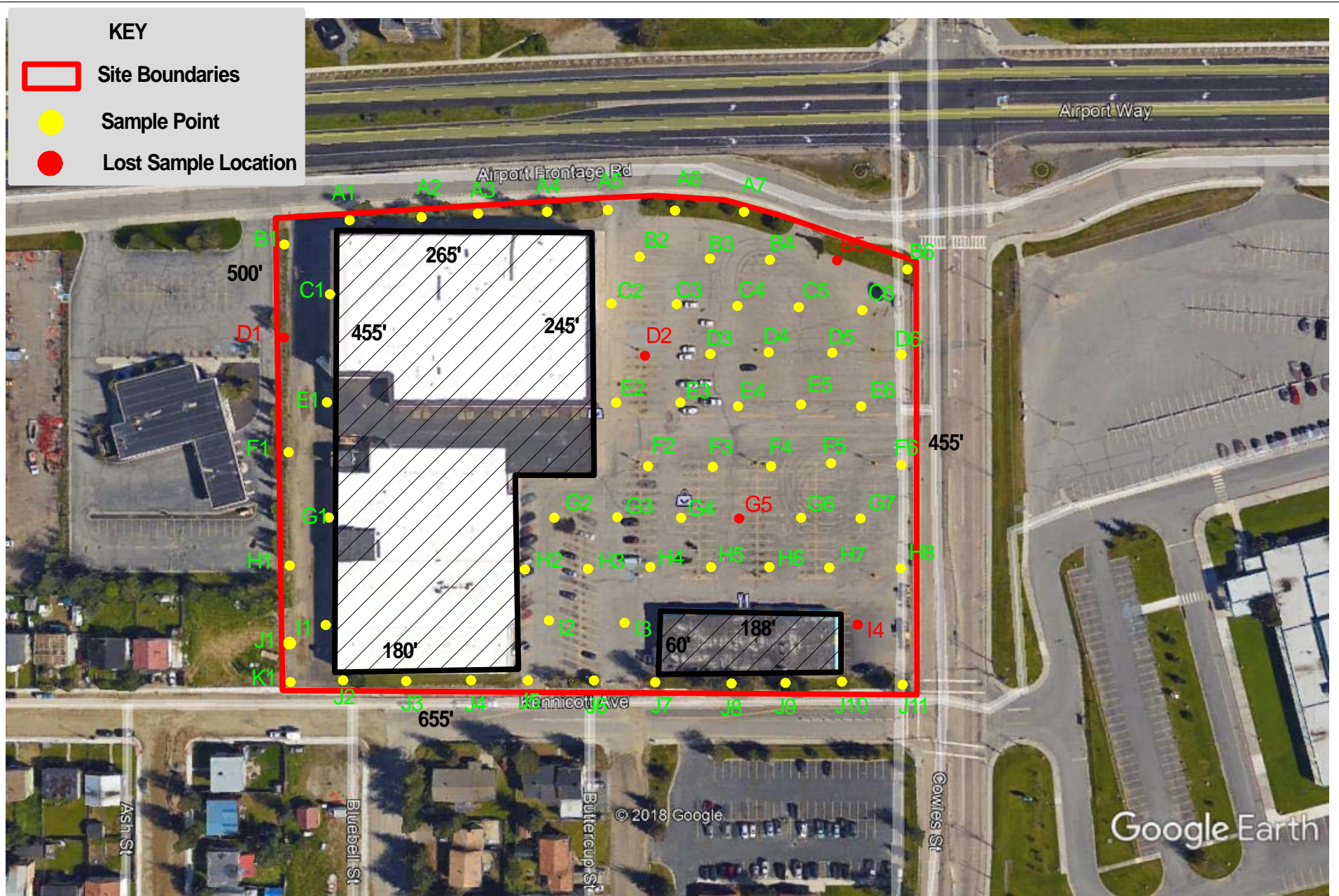
FIGURE 1
 LOCATION & VICINITY

PROJECT No: 1531-04

FILE: 1531/04/Figures/Figure 1.skf

DATE: 3/18

SCALE: NO SCALE



TRAVIS/PETERSON ENVIRONMENTAL CONSULTING, INC.
 329 2ND STREET
 FAIRBANKS, ALASKA 99701

SHOPPERS FORUM MALL CHLORINATED SOLVENT INVESTIGATION
 CITY OF FAIRBANKS

FIGURE 2
 SITE PLAN

PROJECT No: 1535-04

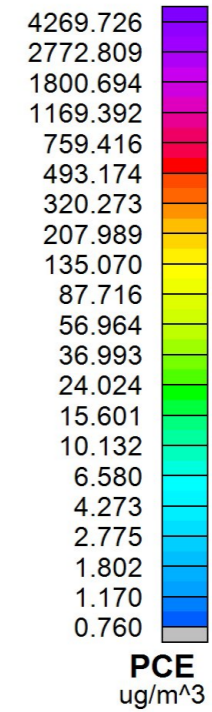
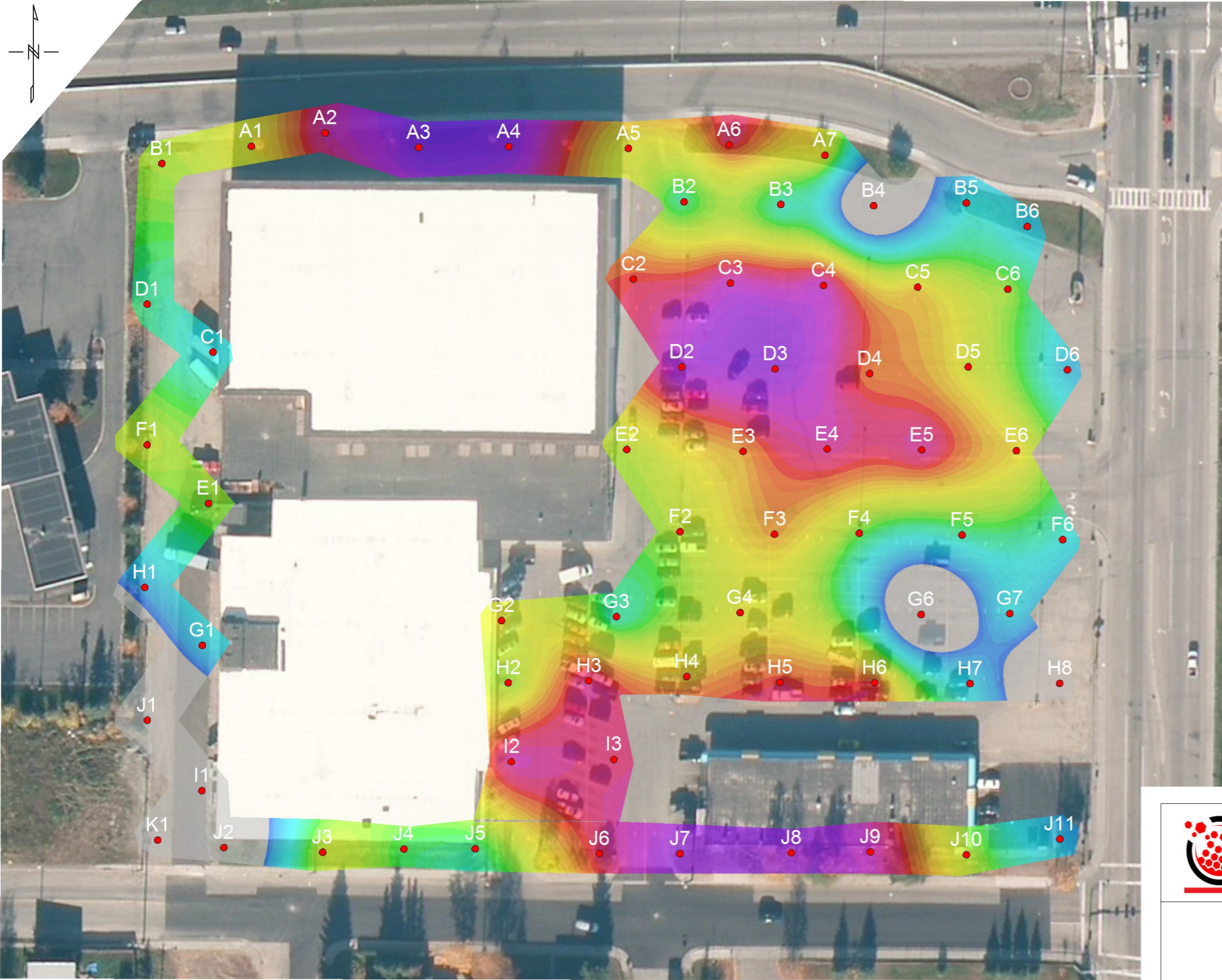
FILE: 1531/04/Figures/Figure 2.skf

DATE: 2/28/18

SCALE: NO SCALE

APPENDIX B

CHLORINATED SOLVENT SCREENING MAPS

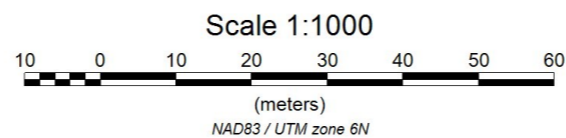


**AMPLIFIED
GEOCHEMICAL
IMAGING, LLC**

210 EXECUTIVE DRIVE, SUITE 1
NEWARK, DELAWARE 19702-3335 USA
PHONE: +1-302-266-2428
FAX: +1-302-266-2429
WWW.AGISURVEYS.NET

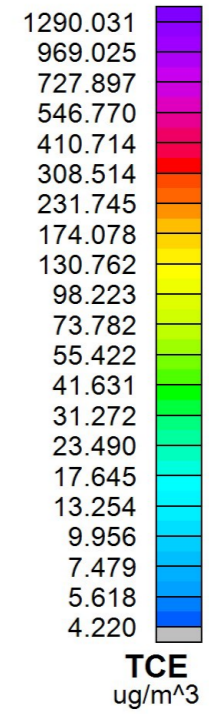
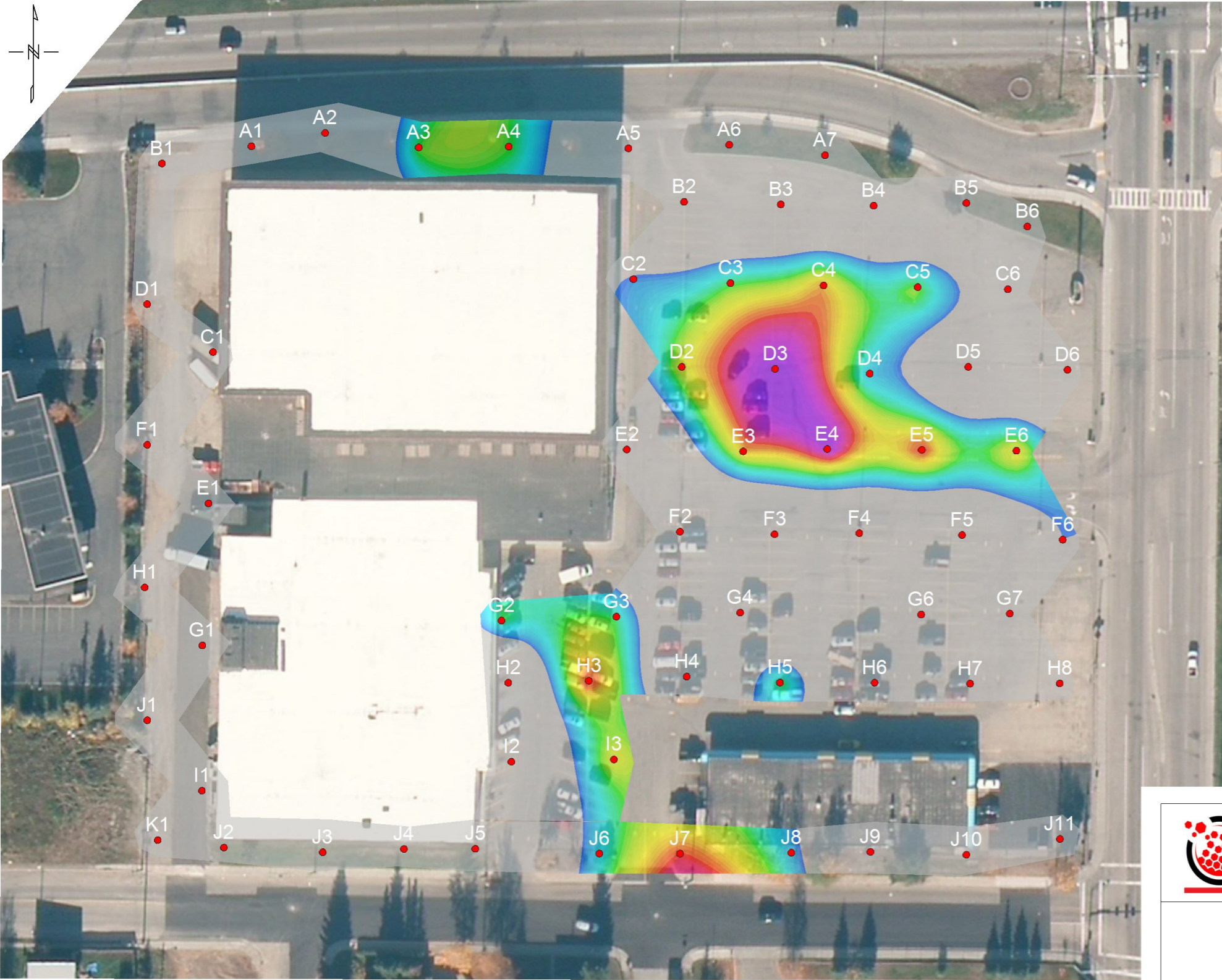


**Travis/Peterson Environmental Consultants
Gavora Mall
Tetrachloroethene**



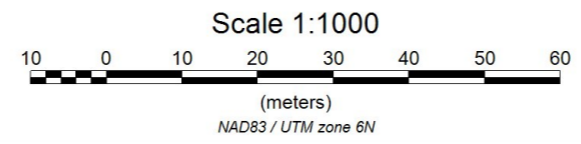
THIS DRAWING AND ANY OF ITS ATTACHMENTS HAVE BEEN PRODUCED FOR THE SOLE USE OF THE RECIPIENT IDENTIFIED HEREIN AND MUST NOT BE USED, REPRODUCED OR MODIFIED IN ANY WAY WITHOUT THE PRIOR WRITTEN CONSENT OF AMPLIFIED GEOCHEMICAL IMAGING, LLC. UNAUTHORIZED USE IS STRICTLY PROHIBITED PURSUANT TO COPYRIGHT, TRADEMARK AND OTHER APPLICABLE LAWS.

DATE DRAWN: Dec 16, 2019	DRAWN BY: RF	ORIG. CAD: coords only	SITE CODE:
REV. DATE: Jan 8, 2020	REV. #: 1	PROJECT NUMBER: 02138	



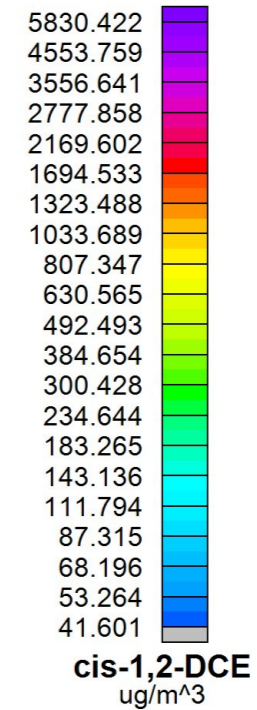
210 EXECUTIVE DRIVE, SUITE 1
 NEWARK, DELAWARE 19702-3335 USA
 PHONE: +1-302-266-2428
 FAX: +1-302-266-2429
 WWW.AGISURVEYS.NET

Travis/Peterson Environmental Consultants
 Gavora Mall
 Trichloroethene



THIS DRAWING AND ANY OF ITS ATTACHMENTS HAVE BEEN PRODUCED FOR THE SOLE USE OF THE RECIPIENT IDENTIFIED HEREIN AND MUST NOT BE USED, REPRODUCED OR MODIFIED IN ANY WAY WITHOUT THE PRIOR WRITTEN CONSENT OF AMPLIFIED GEOCHEMICAL IMAGING, LLC. UNAUTHORIZED USE IS STRICTLY PROHIBITED PURSUANT TO COPYRIGHT, TRADEMARK AND OTHER APPLICABLE LAWS.

DATE DRAWN: Dec 16, 2019	DRAWN BY: RF	ORIG. CAD: coords only	SITE CODE:
REV. DATE: Jan 8, 2020	REV. #: 1	PROJECT NUMBER: 02138	

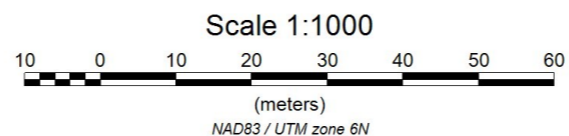


**AMPLIFIED
GEOCHEMICAL
IMAGING, LLC**

210 EXECUTIVE DRIVE, SUITE 1
NEWARK, DELAWARE 19702-3335 USA
PHONE: +1-302-266-2428
FAX: +1-302-266-2429
WWW.AGISURVEYS.NET



**Travis/Peterson Environmental Consultants
Gavora Mall
cis-1,2-Dichloroethene**

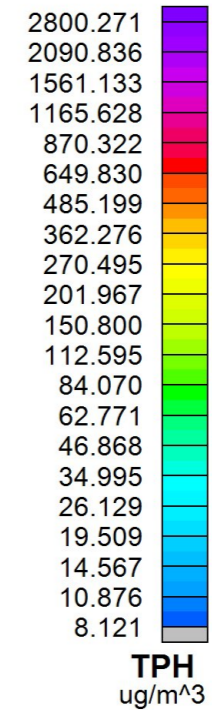
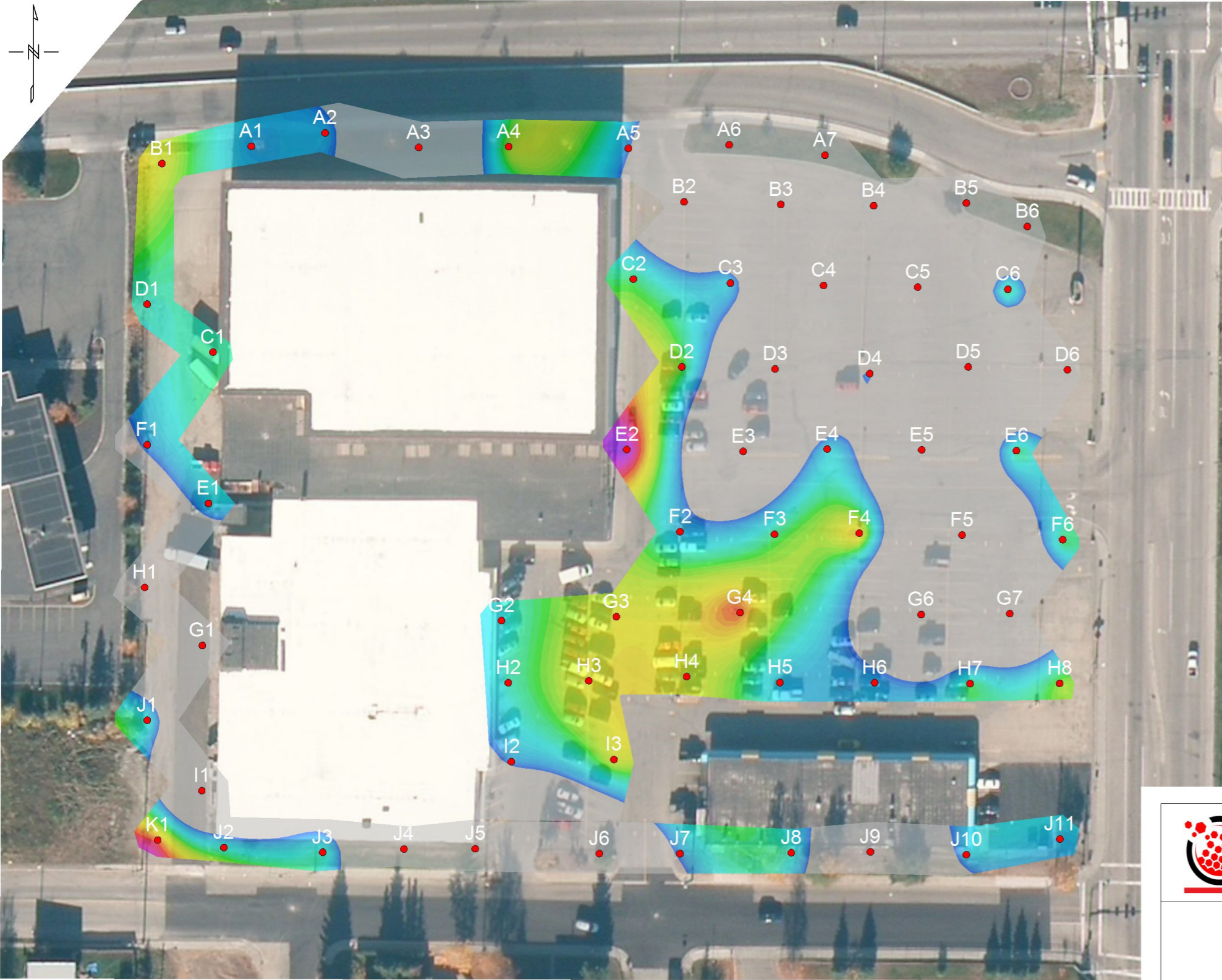


THIS DRAWING AND ANY OF ITS ATTACHMENTS HAVE BEEN PRODUCED FOR THE SOLE USE OF THE RECIPIENT IDENTIFIED HEREIN AND MUST NOT BE USED, REPRODUCED OR MODIFIED IN ANY WAY WITHOUT THE PRIOR WRITTEN CONSENT OF AMPLIFIED GEOCHEMICAL IMAGING, LLC. UNAUTHORIZED USE IS STRICTLY PROHIBITED PURSUANT TO COPYRIGHT, TRADEMARK AND OTHER APPLICABLE LAWS.

DATE DRAWN: Dec 16, 2019	DRAWN BY: RF	ORIG. CAD: coords only	SITE CODE:
REV. DATE: Jan 8, 2020	REV. #: 1	PROJECT NUMBER: 02138	

APPENDIX C

PETROLEUM HYDROCARBON SCREENING MAPS

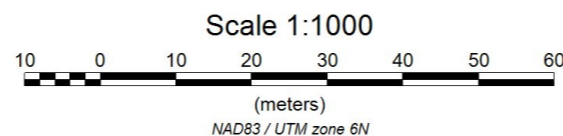


**AMPLIFIED
GEOCHEMICAL
IMAGING, LLC**

210 EXECUTIVE DRIVE, SUITE 1
NEWARK, DELAWARE 19702-3335 USA
PHONE: +1-302-266-2428
FAX: +1-302-266-2429
WWW.AGISURVEYS.NET

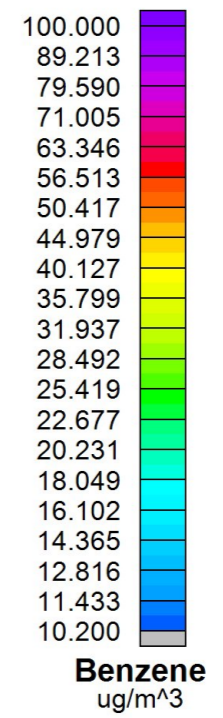
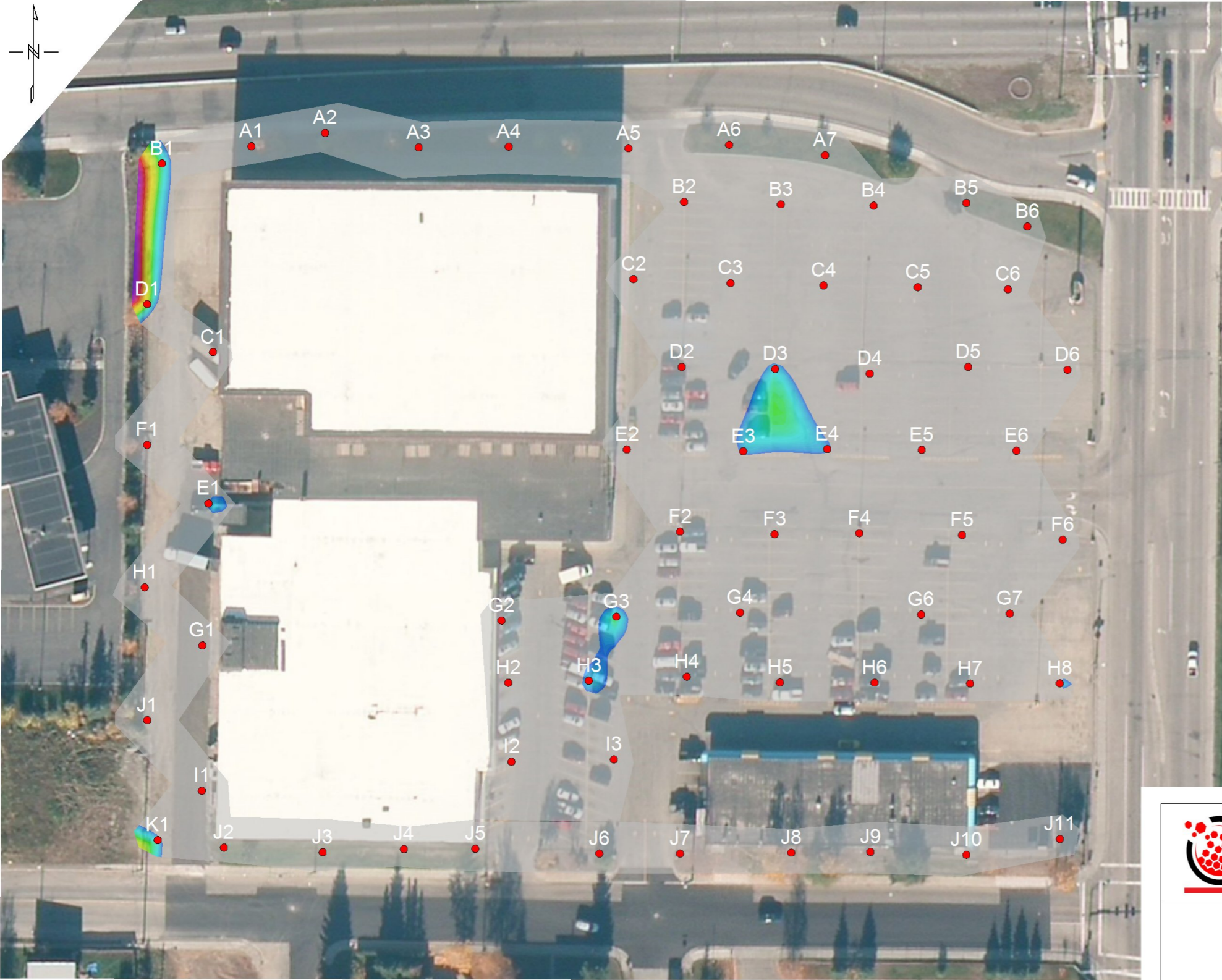


**Travis/Peterson Environmental Consultants
Gavora Mall
Total Petroleum Hydrocarbons**



THIS DRAWING AND ANY OF ITS ATTACHMENTS HAVE BEEN PRODUCED FOR THE SOLE USE OF THE RECIPIENT IDENTIFIED HEREIN AND MUST NOT BE USED, REPRODUCED OR MODIFIED IN ANY WAY WITHOUT THE PRIOR WRITTEN CONSENT OF AMPLIFIED GEOCHEMICAL IMAGING, LLC. UNAUTHORIZED USE IS STRICTLY PROHIBITED PURSUANT TO COPYRIGHT, TRADEMARK AND OTHER APPLICABLE LAWS.

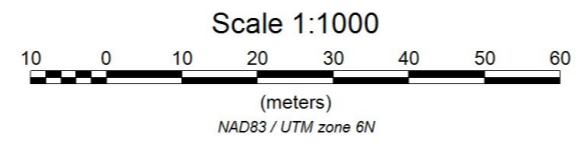
DATE DRAWN: Dec 16, 2019	DRAWN BY: RF	ORIG. CAD: coords only	SITE CODE:
REV. DATE: Jan 8, 2020	REV. #: 1	PROJECT NUMBER: 02138	



210 EXECUTIVE DRIVE, SUITE 1
NEWARK, DELAWARE 19702-3335 USA
PHONE: +1-302-266-2428
FAX: +1-302-266-2429
WWW.AGISURVEYS.NET



Travis/Peterson Environmental Consultants
Gavora Mall
Benzene

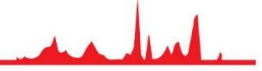


THIS DRAWING AND ANY OF ITS ATTACHMENTS HAVE BEEN PRODUCED FOR THE SOLE USE OF THE RECIPIENT IDENTIFIED HEREIN AND MUST NOT BE USED, REPRODUCED OR MODIFIED IN ANY WAY WITHOUT THE PRIOR WRITTEN CONSENT OF AMPLIFIED GEOCHEMICAL IMAGING, LLC. UNAUTHORIZED USE IS STRICTLY PROHIBITED PURSUANT TO COPYRIGHT, TRADEMARK AND OTHER APPLICABLE LAWS.

DATE DRAWN: Dec 16, 2019	DRAWN BY: RF	ORIG. CAD: coords only	SITE CODE:
REV. DATE: Jan 8, 2020	REV. #: 1	PROJECT NUMBER: 02138	

APPENDIX D

FIELD SCREENING PROCEDURES



Guidelines for Soil Gas and Sub-Slab Sampling Using the AGI Universal Sampler

Tools and Supplies Provided by AGI



AGI Environmental Sampling Kit



AGI Universal Sampler



Numbered Vials



Corks



String



Insertion Rods

Also Included:

Chain of custody and installation and retrieval e-Log

Not Included in Kit:

- Scissors
- Pen or Pencil
- Gloves
- Watch
- Hammer drill or slide hammer and tile probe (other tools for creating hole)
- Rubber Mallet (for sub-slab installation)

Preparation for Installation



Site map & field notebook necessary to record sampling information



Locate and mark buried utilities and other obstacles



Lay out sampling grid prior to drilling holes

Guidelines for Soil Gas and Sub-Slab Sampling Using the AGI Universal Sampler

Advancing Installation Holes

Choose the best method for soil conditions



Slide hammer and tile probe



Rotary hammer drill with 36 inch long x 0.5 inch diameter carbide tipped bit



Hammer and 36 inch long, narrow diameter steel rod.



Hard surfaces - use a rotary hammer drill. Open ground - use rotary hammer drill, slam bar & tile probe, or hammer and steel rod



Make 0.5 to 1 inch hole 36 inches (1m) deep

Note: Augers, direct push equipment, etc. can also be used, but sealing holes will require something other than provided corks

Installing Samplers



Cut 72 inch length of string and tie ends together to create loop.



Loop string through eyelet of cork.



Remove sampler from vial.

Guidelines for Soil Gas and Sub-Slab Sampling Using the AGI Universal Sampler

Installing Samplers (Continued)



Match serial number of sampler with number on vial.



Loop string through looped end of sampler and secure.



Place insertion rod into pocket of sampler.



Insert rod and sampler into hole.



Push rod and sampler to depth in hole.



Push rod to the side and twist to detach sampler



Insert cork to seal hole. (Rubber mallet may be necessary in sub-slab installations)



Record installation date and time on log.



Record serial number on site map.

Guidelines for Soil Gas and Sub-Slab Sampling Using the AGI Universal Sampler

Retrieving Samplers



Remove cork by hand or with screwdriver



Pull string to remove sampler from hole



Compare serial number to map location



Compare serial number to vial number



Cut and discard string and cork



Wipe sampler clean.



Return sampler to vial. Clean top of vial and threads and secure vial with cap.



Attach tamper seal across cap and vial.



Record retrieval time and data on log.



Return vial to box.

Guidelines for Soil Gas and Sub-Slab Sampling Using the AGI Universal Sampler

Storing and Shipping Samplers

STORAGE

AGI Samplers are carefully cleaned, sealed, and stored after manufacturing. They must remain sealed in their vials in the shipping boxes until deployment and after retrieval. DO NOT store near potential sources of organic vapors such as petroleum fuels and exhaust, solvents, adhesives, paints, etc.

TRIP BLANKS

An additional number (specified) of AGI Samplers are included as trip blanks. The customer selects which samplers to be used/treated as trip blanks, and notes this on the Chain of Custody and Installation/Retrieval Log. These samplers remain unopened, and travel to and from the site during installation and retrieval, while in storage away from AGI's facility, and in transit to/from AGI's facility.

PACKAGING FOR RETURN

- Place boxes with samplers back into outer shipping container using appropriate packing materials to protect fragile contents.
- **Do not** use Styrofoam “peanuts” as packing material. Bubble packing is acceptable.
- Label box to indicate fragile contents.
- There is no need to return the shipment in coolers with ice.
- **Return the AGI Samplers, insertion rod and paperwork (preferably by overnight courier) to:**

**AGI Laboratory
210 Executive Drive, Suite 1
Newark, DE 19702-3335
Phone: (302) 266-2428
Attn: NOTIFY LAB IMMEDIATELY UPON DELIVERY!!**

IMPORTANT: Samples should not be shipped for weekend or holiday delivery.

For questions concerning installation, retrieval, storage, or return of samplers contact:

**Don D'Apolito, Kelly Stringham or Brenda Dudley
(302) 266-2428**

APPENDIX E

FIELD SCREENING SUMMARY TABLE

APPENDIX F
FIELD NOTES

2 10/12/19

8:30am - began prepping for field work	
9:00am - arrived onsite @ Shepers	
Furn. moved to instand	
Soil gas samples	SR
City of FBes	
- onsite - Ryan Peterson	REP
- Eddie Packee	REP
- weather - n 3/0 E, cloudy	
- wind n 5 mph SW	
B1 - 00804458	- 9:22 AM
A1 - 00804459	- 9:28 AM
D1 - 00804460	- 9:35 AM
F1 - 00804461	- 00804462 - 9:46 AM
E1 - 00804463	- 9:52 AM
H1 - 00804464	- 10:05 AM
G1/E1 - 00804465	- 10:10 AM
J1 - 00804466	- 10:30 AM
I1 - 00804468	- 10:35 AM
C1 - 00804467	- 10:37 AM
K1 - 00804469	- 10:40 AM
J2 - 00804470	- 10:45 AM
J3 - 00804471	- 10:50 AM

10/12/19 3

J4 - 00804472	- 10:55 AM
J5 - 00804473	- 10:57 AM
J6 - 00804474	- 11:05 AM
J7 - 00804475	- 11:10 AM - I3*
J7 - 00804476	- 11:13 AM
J8 - 00804477	- 11:17 AM
J9 - 00804478	- 11:23 AM
J10 - 00804479	- 11:25 AM
J11 - 00804480	- 11:28 AM
I4 - 00804481	- 11:35 AM
H8 - 00804482	- 11:40 AM
G7 - 00804483	- 11:45 AM
G6 - 00804484	- 11:52 AM
G5 - 00804485	- 11:58 AM 12:25 PM
H7 - 00804486	- 12:05 PM
F6 - 00804487	- 12:12 PM
F5 - 00804488	- 12:17 PM
F4 - 00804489	- 12:22 PM
H6 - 00804490	- 12:28 PM
H5 - 00804491	- 12:33 PM
G4	
G3 - 00804492	- 12:47 PM
H2 - 00804493	- 12:51 PM - I2*
G2 - 00804494	- 1:03 PM
H3 - 00804495	- 1:10 PM

Return on 10/12/19

4 10/12/19

H2 - 00804496 - 1:18pm
 H4 - 00804497 - 1:22pm
 G4 - 00804498 - 1:32pm
 F3 - 00804499 - 1:38pm
 F2 - 00804500 - 1:48pm
 E6 - 00804501 - 1:50pm
 E5 - 00804502 - 1:51pm
 E4 - 00804503 - ~~1:53pm~~ 2:16pm
 E3 - 00804504 - 1:56pm
 E2 - 00804505 - 2:00pm
 D2 - 00804506 - 2:18pm
 D3 - 00804507 - 2:22pm
 D4 - 00804508 - 2:31pm
 D5 - 00804509 - 2:37pm
 D6 - 00804510 - 2:43pm
 C6 - 00804511 - 2:47pm
 C5 - 00804512 - 2:49pm
 C4 - 00804513 - 2:51pm
 C3 - 00804514 - 2:53pm
 C2 - 00804515 - 2:56pm
 B2 - 00804516 - 2:58pm
 B3 - 00804517 - 3:00pm
 B4 - 00804518 - 3:02pm
 B5A - 00804519 - 3:05pm
 B5B - 00804520 - 3:07pm

5

3:10pm - field work completed.
 offsite headed to
 offsite

Return on the Rain

6 10/18/14

12:55pm - covered onsite began

prepping for field work

1:15pm - arrived onsite Ca

Shoppers Forum Mall

to retrieve passive

samples

- sample I4 missing ✓ 4481

- sample D2 missing - 4506

- sample B5 alb missing 4519/20

- sample D1 missing - 4460

- sample G5 missing - 4485

4:40pm work completed - onsite
needed to office

8 10/19/19

12:30pm - arrived onsite Ca Shoppers
Forum Mall to retrieve

sample GZ which
was not able to be
recovered on 10/18/19
due to a vehicle parked
on top of it

12:10pm retrieval completed
offsite headed to
office

Ret on the Rain

10 10/24/19

12:30pm - began prepping for field work

1:15pm - arrived outside Co

Shoppers Forum to

collect GPS coords of installed Samplers

- weather - in 31°F, mostly cloudy

- wind in 1 mph SW

11

Plot in the Rain

10/22/19

- 12:15pm - began preparing for field work
- 12:45pm arrived onsite to install soil gas samplers for City of Fairbanks on Shoppers Forum Mall

- weather - v. cloudy, 70°F
 - wind - 2 mph E

A2 - 00750581 - 12:52pm
 A3 - 750580 - 12:57pm
 A4 - 750579 - 1:01pm
 A5 - 750584 - 1:27pm
 A6 - 750578 - 1:06pm
 A7 - 750577 - 1:10pm
 B5 - 750576 - 1:14pm
 B6 - 750582 - 1:17pm
 D2 - 750583 - 1:21pm
 D1 - 750585 - 1:30pm

- collected GPS coords

1:55pm - work completed ~ 0.66 side needed to 0.66 side

14 10/20/19

12:45pm - began prepping for field work

1:20pm - arrived onsite to retrieve samples for City of Fairbanks
City Shoppers Forum

- Ryan Peterson (GEP) onsite

- weather - 47°F - cloudy
- wind 1 mph E

1:55pm - work completed - offsite needed to offsite

Return site later

APPENDIX G
LABORATORY REPORT



AMPLIFIED
GEOCHEMICAL
IMAGING, LLC

Laboratory Report

Site: Gavora Mall

Prepared for:

Travis/Peterson Environmental Consultants
32 2nd Street
airbanks, AK 701
USA

Prepared on:
December 3, 201

Project Summary and Objective

Amplified Geochemical Imaging, LLC (AGI) provided the AGI Environmental Survey used at:

Gavora Mall

The service provided by AGI included delivery of the required quantity of AGI Universal Samplers, analysis by the method described below for the requested organic compounds, reporting of the data, and contour mapping (as needed).

This report includes results for only the samples noted under the Laboratory Sample Report section. If contour maps are part of the project deliverable, the maps will be prepared and issued under a separate report cover, upon receipt of a usable sitemap (electronic) and compound choices for contouring.

Written/submitted by:

Ray Fenstermacher, P.G.

Project Manager

Reviewed/approved by:

Ian McMullen

Chemist

Analytical data approved by:

Ian McMullen

Chemist

Quality Assurance Statement

The AGI Laboratory, at Amplified Geochemical Imaging's facility in Newark, DE USA, operates under the guidelines of its ISO Standard 17025 DoD ELAP accreditation, and its Quality Assurance Manual, Operating Procedures, and Methods (SOP-QA-0462).

For this project, the analytical method, results, and observations reported do [] do not [✓] fall within the scope of AGI's ISO 17025 accreditation.

Screening/Concentration Method

The AGI Universal Samplers are analyzed at AGI's fixed laboratory using thermal desorption-gas chromatography/mass spectrometry (TD-GC/MS) instrumentation following modified U.S. EPA Method 8260 (SPG-WI-0292) which includes the following:

- **BFB Tuning Frequency:** A BFB tune is analyzed at the start of each analytical run and after every 30 samples.
- **Initial Calibration:** A minimum of a five point calibration curve is analyzed prior to the analysis of samples.
- **Initial Calibration Verification (ICV):** Following the calibration a second-source reference standard is analyzed to verify the accuracy of the calibration. Acceptance criteria for the ICV is +/- 30%.
- **Linearity of Target Compounds:** If the RSD of any target analyte is less than or equal to 25% then average response factor can be used for quantitation. If the RSD exceeds 25% for a target compound a regression equation can be used for quantitation.
- **Continuing Calibration Verification:** After every 10 samples, and at the end of each analytical batch, a mid-level second-source Reference Standard is analyzed. The acceptance criteria for all target analytes in the reference standards are +/- 50% of the true value.
- **Method Blank:** Analyzed prior to the analysis of field samples and every 30 samples.

Note: Analyte levels reported for the field-deployed AGI Universal Samplers that exceed trip and method blank levels, and/or the reporting limit, are more likely to have originated from on-site sources.

Media Sampled:	SOIL GAS
Chemist - sample analysis:	atima Nia i
Chemist - data processor:	atima Nia i
Chemist - data review:	Ian McMullen

Method deviations: None

Please note that data file names ending with R are rerun samples using the second pair of sorbers, in which the original results were not reported. Data file names ending in D are duplicate analysis results for the second set of sorbers from the same sampler, and are reported.

Additional Report Information

- Comments
- Laboratory Sample Report
- Chain of Custody
- Installation and Retrieval Log
- Data Table(s) and Key
- Concentration Calculation Method Summary
- Total Ion Chromatograms

Project Specific Comments

The samples used for this survey were shipped in two separate shipments: one of 63 samples and a second shipment of 11 samples.

Seven samples were lost in the field, and 1 sample was declared to be a trip blank. The remaining 66 samples were deployed in the field. All samples returned were also analyzed.

Survey period ¹	One set of samples were installed on October 12, 2011 and retrieved on October 18, 2011. Another set of samples were installed on October 22, 2011 and retrieved on October 28, 2011. The exposure for these samples was six (6) days.
Tamper seal intact:	Yes
Date received:	11/1/11 11:00 am By: Scott Kirlin
COC returned:	Yes, two COC's were received one for each of the out-going shipments.
Comments:	None

¹ - Installation start to end of retrieval, as reported. See installation and retrieval log for individual deployment and retrieval dates and times (i.e., sampler exposure time).

General Comments

Analytical QA/QC

Laboratory instrumentation consists of gas chromatographs equipped with mass selective detectors, coupled with automated thermal desorption units. Sample preparation involves cutting the tip off the bottom of the AGI Universal Sampler, and transferring one or more "sorbents" to a thermal desorption tube for analysis. The insertion/retrieval cord prevents soil, water and other interferences from coming in contact with the adsorbent. No further sample preparation is required. Any replicate sorbents not consumed in the initial analysis will be discarded fifteen (15) days from the date of the laboratory report.

Data are archived and stored in a secure manner as per AGI's Quality Assurance program (SOP-QA-0462).

Total petroleum hydrocarbons (TPH), gasoline-range petroleum hydrocarbons (GRPH), and/or diesel range petroleum hydrocarbons (DRPH), when reported, are calculated using the area under the peaks observed in m/z 55 and 57 selected ion chromatograms. Quantitation of the mass values was performed using the response factor for a specific alkane (present in the calibration standards). TPH values include the entire chromatogram and provide estimates for aliphatic hydrocarbon ranges of C4 to C20. GRPH and DRPH include only the relevant regions of the chromatograms and provide estimates for C4 to C10 and C10 to C20 aliphatic hydrocarbons, respectively.

Trip blanks were provided to document potential exposures that were not part of the signal of interest (e.g., impact during sampler shipment, installation and/or retrieval, and storage). The trip blanks are identically manufactured and packaged AGI Universal Samplers to those samplers deployed in the field. The trip blanks remain unopened during all phases of the project. Levels reported on the trip blanks may indicate potential impact to the samplers other than the contaminant source of interest.

Unresolved peak envelopes (UPEs) are represented as a series of compound peaks clustered together around a central gas chromatograph elution time in the total ion chromatogram. UPEs may be indicative of complex fluid mixtures. UPEs observed early in the chromatograms are considered to indicate presence of more volatile fluids, while UPEs observed later in the chromatogram may indicate the presence of less volatile fluids. Multiple UPEs may indicate the presence of multiple complex fluids.

Total ion chromatograms (TICs) are included in the Attachments. The eight-digit serial number of each sampler is incorporated in the TIC identification (e.g., 12345678.D represents AGI Universal Sampler 12345678).

General Comments

Soil Gas Sampling

For soil gas sampling, the AGI Environmental Survey reports mass levels migrating through the open pore spaces of the soil and diffusing through the sampler membrane for sorption by the engineered, hydrophobic adsorbents, housed within the membrane tube. During the migration of the soil gas away from the source to the AGI Universal Sampler, the vapors are subject to a variety of attenuation factors. The soil gas masses reported on the samplers compare favorably with the concentrations reported in the soil or groundwater (e.g., where soil gas levels are reported at greater levels to other sampled locations on the site, the matrix data should reveal the same pattern, and vice versa). However, due to a variety of factors, a perfect comparison between matrix data and soil gas levels can rarely be achieved.

Soil gas concentrations ($\mu\text{g}/\text{m}^3$) are calculated following the method described in the Additional Report Information section.

Soil gas signals reported by this method cannot be correlated specifically to soil adsorbed, groundwater, and /or free-phase contamination. The soil gas signal reported from each AGI Universal Sampler can evolve from all of these sources. Differentiation between soil and groundwater contamination can only be achieved with prior knowledge of the site history (i.e., the site is known to have groundwater contamination only).

Air Sampling

For indoor, outdoor, and crawlspace air sampling, the AGI Environmental Survey reports mass levels present in the air and diffusing through the sampler membrane for sorption by the engineered adsorbents housed within the membrane tube.

Air concentrations ($\mu\text{g}/\text{m}^3$) are calculated following the method described in the Additional Report Information section.

Groundwater and Sediment Porewater Sampling

For groundwater and sediment porewater sampling, the AGI Environmental Survey reports the mass levels of compounds present in the water which, when coming in contact with the sampler membrane, partitions out of solution, and diffuses through the sampler membrane for sorption by the engineered adsorbents.

Water concentrations ($\mu\text{g}/\text{L}$) are calculated using the quantified mass, exposure period and the compound specific uptake rate. The rates were measured under controlled experimental conditions. The uptake rates are corrected for water pressure (depth of the AGI Universal Sampler below the water table), water temperature and the aquifer flow rate. For sediment porewater, the uptake rate is corrected for the reduced volume of water in the sediment, by multiplying the uptake rate by the pore water fraction.

Laboratory Sample Report

<u>AGI Sample ID</u>	<u>Field ID</u>	<u>Sample Type</u>
750576	B5	FIELD_SAMPLE
750577	A7	FIELD_SAMPLE
750578	A6	FIELD_SAMPLE
750579	A4	FIELD_SAMPLE
750580	A3	FIELD_SAMPLE
750581	A2	FIELD_SAMPLE
750582	B6	FIELD_SAMPLE
750583	D2	FIELD_SAMPLE
750584	A5	FIELD_SAMPLE
750585	D1	FIELD_SAMPLE
750586	Trip Blank	Trip Blank
804458	B1	FIELD_SAMPLE
804459	A1	FIELD_SAMPLE
804460	D1	LOST
804461	Sampler Destroyed During installation	LOST
804462	F1	FIELD_SAMPLE
804463	E1	FIELD_SAMPLE
804464	H1	FIELD_SAMPLE
804465	G1	FIELD_SAMPLE
804466	J1	FIELD_SAMPLE
804467	C1	FIELD_SAMPLE
804468	I1	FIELD_SAMPLE
804469	K1	FIELD_SAMPLE
804470	J2	FIELD_SAMPLE
804471	J3	FIELD_SAMPLE
804472	J4	FIELD_SAMPLE
804473	J5	FIELD_SAMPLE
804474	J6	FIELD_SAMPLE
804475	I3	FIELD_SAMPLE
804476	J7	FIELD_SAMPLE
804477	J8	FIELD_SAMPLE
804478	J9	FIELD_SAMPLE
804479	J10	FIELD_SAMPLE
804480	J11	FIELD_SAMPLE
804481	Sampler Lost	LOST
804482	H8	FIELD_SAMPLE
804483	G7	FIELD_SAMPLE
804484	G6	FIELD_SAMPLE
804485	Sampler Lost	LOST
804486	H7	FIELD_SAMPLE
804487	F6	FIELD_SAMPLE
804488	F5	FIELD_SAMPLE

Laboratory Sample Report

<u>AGI Sample ID</u>	<u>Field ID</u>	<u>Sample Type</u>
804489	F4	FIELD_SAMPLE
804490	H6	FIELD_SAMPLE
804491	H5	FIELD_SAMPLE
804492	G3	FIELD_SAMPLE
804493	I2	FIELD_SAMPLE
804494	G2	FIELD_SAMPLE
804495	H3	FIELD_SAMPLE
804496	H2	FIELD_SAMPLE
804497	H4	FIELD_SAMPLE
804498	G4	FIELD_SAMPLE
804499	F3	FIELD_SAMPLE
804500	F2	FIELD_SAMPLE
804501	E6	FIELD_SAMPLE
804502	E5	FIELD_SAMPLE
804503	E4	FIELD_SAMPLE
804504	E3	FIELD_SAMPLE
804505	E2	FIELD_SAMPLE
804506	Sampler Lost	LOST
804507	D3	FIELD_SAMPLE
804508	D4	FIELD_SAMPLE
804509	D5	FIELD_SAMPLE
804510	D6	FIELD_SAMPLE
804511	C6	FIELD_SAMPLE
804512	C5	FIELD_SAMPLE
804513	C4	FIELD_SAMPLE
804514	C3	FIELD_SAMPLE
804515	C2	FIELD_SAMPLE
804516	B2	FIELD_SAMPLE
804517	B3	FIELD_SAMPLE
804518	B4	FIELD_SAMPLE
804519	Sampler Lost	LOST
804520	Sampler Lost	LOST

Total # Field Samples: 66

Total # Trip Blanks: 1

Total # Unused: 0

Total # Lost: 7



**AGI Universal Passive Sampler Chain of Custody
Soil gas and/or Air Sampling**

Production Order #: ENV 02138

Customer Name: Travis/Peterson Environmental Consultants

Site Name: Gavora Mall

Address: 329 2nd Street
Fairbanks, AK 99701
USA

Site Address:

Project Manager:

Serial # of Samplers Shipped 00804458	-	00804520	# of Samplers for Installation	60	# of Trip Blanks	3
			Total Samplers Shipped	63	Pieces	
			Total Samplers Received	_____	Pieces	
			Total Samplers Installed	_____	Pieces	

Serial # of Trip Blanks (Client Decides)

Insertion Rods

Tips Shipped: 2

Rod Bodies Shipped 8

--	--	--

Prepared By: [Signature]
Verified By: [Signature]

Installation Method: (Circle those that apply)
Slide Hammer Hammer Drill Auger
Other

Installation Performed By:
Name: Ryan Peterson
Company: TPECI

Retrieval Performed By:
Name: Ryan Peterson
Company: TPECI

Installation Start Date / Time: 10/12/19 / 9:00am
Installation Complete Date / Time: 10/12/19 / 3:10pm

Retrieval Start Date / Time: 10/18/19 / 1:15pm
Retrieval Complete Date / Time: 10/18/19 / 4:00pm

Total Samplers Retrieved: 57
Total Samplers Lost In Field: 6
Total Unused Samplers Returned: 0

Insertion Rod Sections Returned: 2

Relinquished By: [Signature] Date/Time 8/15/19
Company: AGI 11:30AM

Received By: [Signature] Date/Time _____
Company: TPECI

Relinquished By: [Signature] Date/Time 10/29/19
Company: TPECI 4:00pm

Received By: [Signature] Date/Time 11/1/19
Company: AGI 11:00AM



210 Executive Drive
 Newark, Delaware 19702 USA
 ph: +1-302-266-2428
 www.agisurveys.net

**AGI Universal Passive Sampler Chain of Custody
 Soil gas and/or Air Sampling**

Production Order #: ENV 02138-2

Customer Name: Travis/Peterson Environmental Consultants

Site Name: Gavora Mall Extra Samplers

Address: 329 2nd Street
 Fairbanks, AK 99701
 USA

Site Address:

Project Manager:

Serial # of Samplers Shipped

00750576 - 00750586

of Samplers for Installation 8

Total Samplers Shipped 11

Total Samplers Received _____

Total Samplers Installed _____

of Trip Blanks 3

Pieces

Pieces

Pieces

Serial # of Trip Blanks (Client Decides)

Insertion Rods

Tips Shipped: 0

Rod Bodies Shipped 0

00750586

Prepared By: [Signature]

Verified By: [Signature]

Installation Method: (Circle those that apply)

Slide Hammer Hammer Drill Auger

Other

Installation Performed By:

Name: Ryan Peterson

Company: TPECI

Retrieval Performed By:

Name: Ryan Peterson

Company: TPECI

Installation Start Date / Time: 10/22/19 / 12:52pm

Installation Complete Date / Time: 10/22/19 / 1:30pm

Retrieval Start Date / Time: 10/28/19 / 1:20pm

Retrieval Complete Date / Time: 10/28/19 / 1:50pm

Total Samplers Retrieved: 10

Total Samplers Lost In Field: 0

Total Unused Samplers Returned: 1

Insertion Rod Sections Returned: 0

Relinquished By: [Signature] Date/Time 10/11/19

Company: AGI 3:00PM

Received By: [Signature] Date/Time

Company: TPECI

Relinquished By: [Signature] Date/Time 10/22/19

Company: TPECI 4:00pm

Received By: [Signature] Date/Time 11/1/19

Company: AGI 11:00AM



210 Executive Drive, Suite 1
Newark, DE USA 19702-3335
ph: 302-266-2428

AGI Project No. ENV 02138
Site Name: Gavora Mall
Site Location:

**AGI Soil Gas Sampling
Installation & Retrieval Log**

Company Name: Travis/Peterson Evironmental Consulting
Location:
Samples collected by:

* Optional or as needed

SAMPLER SERIAL NO.	FIELD ID* (e.g., arbitrary, US EPA)	SAMPLE TYPE (Field Sample, Trip Blank, Field Blank, etc.)	INSTALLATION DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/27/2000 13:00		RETRIEVAL DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/30/2000 13:00		OBSERVATIONS/COMMENT S* (e.g., sample depth, location description, missing, pulled from hole, etc. - as needed)	SAMPLE ENVIRONMENT* (e.g., grass, bare soil, through slab)	YES / NO			SOIL TYPE AT MODULE DEPTH (clay, loamy sand etc.)
									EVIDENCE OF LIQUID PETROLEUM HYDROCARBONS?	ODOR ?	WATER IN INSTALLATION HOLE?	
00804458	B1	FIELD SAMPLE	10/12/2019	9:22Am	10/18/2019	1:18PM			No	No	No	SAND
00804459	A1	FIELD SAMPLE	10/12/2019	9:28Am	10/18/2019	1:21PM			No	No	No	SAND
00804460	D1	FIELD SAMPLE	10/12/2019	9:35AM	10/18/2019				No	No	No	SAND
00804461	Sampler Destroyed During installation	FIELD SAMPLE							No	No	No	SAND
00804462	F1	FIELD SAMPLE	10/12/2019	9:48AM	10/18/2019	1:30PM			No	No	No	SAND
00804463	E1	FIELD SAMPLE	10/12/2019	9:58AM	10/18/2019	1:33PM			No	No	No	SAND
00804464	H1	FIELD SAMPLE	10/12/2019	10:05AM	10/18/2019	1:36PM			No	No	No	SAND
00804465	G1	FIELD SAMPLE	10/12/2019	10:10AM	10/18/2019	1:39PM			No	No	No	SAND
00804466	J1	FIELD SAMPLE	10/12/2019	10:30AM	10/18/2019	1:42PM			No	No	No	SAND
00804467	C1	FIELD SAMPLE	10/12/2019	10:37AM	10/18/2019	1:45PM			No	No	No	SAND
00804468	I1	FIELD SAMPLE	10/12/2019	10:35AM	10/18/2019	1:50PM			No	No	No	SAND
00804469	K1	FIELD SAMPLE	10/12/2019	10:40AM	10/18/2019	1:53PM			No	No	No	SAND
00804470	J2	FIELD SAMPLE	10/12/2019	10:45AM	10/18/2019	1:56PM			No	No	No	SAND
00804471	J3	FIELD SAMPLE	10/12/2019	10:50AM	10/18/2019	2:00PM			No	No	No	SAND
00804472	J4	FIELD SAMPLE	10/12/2019	10:55AM	10/18/2019	2:05PM			No	No	No	SAND
00804473	J5	FIELD SAMPLE	10/12/2019	10:57AM	10/18/2019	2:08PM			No	No	No	SAND
00804474	J6	FIELD SAMPLE	10/12/2019	11:05AM	10/18/2019	2:11PM			No	No	No	SAND
00804475	I3	FIELD SAMPLE	10/12/2019	11:10AM	10/18/2019	2:15PM			No	No	No	SAND
00804476	J7	FIELD SAMPLE	10/12/2019	11:13AM	10/18/2019	2:18PM			No	No	No	SAND
00804477	J8	FIELD SAMPLE	10/12/2019	11:17Am	10/18/2019	2:21PM			No	No	No	SAND
00804478	J9	FIELD SAMPLE	10/12/2019	11:23AM	10/18/2019	2:24PM			No	No	No	SAND
00804479	J10	FIELD SAMPLE	10/12/2019	11:25Am	10/18/2019	2:27PM			No	No	No	SAND
00804480	J11	FIELD SAMPLE	10/12/2019	11:28Am	10/18/2019	2:30PM			No	No	No	SAND
00804481	Sampler Lost]	FIELD SAMPLE	10/12/2019	11:33AM	10/18/2019				No	No	No	SAND
00804482	H8	FIELD SAMPLE	10/12/2019	11:40AM	10/18/2019	2:38PM			No	No	No	SAND
00804483	G7	FIELD SAMPLE	10/12/2019	11:45AM	10/18/2019	2:41PM			No	No	No	SAND
00804484	G6	FIELD SAMPLE	10/12/2019	11:52AM	10/18/2019	2:45PM			No	No	No	SAND
00804485	Sampler Lost	FIELD SAMPLE	10/12/2019	12:25PM	10/18/2019				No	No	No	SAND
00804486	H7	FIELD SAMPLE	10/12/2019	12:05PM	10/18/2019	2:53PM			No	No	No	SAND
00804487	F6	FIELD SAMPLE	10/12/2019	12:12PM	10/18/2019	2:56PM			No	No	No	SAND
00804488	F5	FIELD SAMPLE	10/12/2019	12:17PM	10/18/2019	2:59PM			No	No	No	SAND
00804489	F4	FIELD SAMPLE	10/12/2019	12:22PM	10/18/2019	3:02PM			No	No	No	SAND
00804490	H6	FIELD SAMPLE	10/12/2019	12:28PM	10/18/2019	3:05PM			No	No	No	SAND
00804491	H5	FIELD SAMPLE	10/12/2019	12:33PM	10/18/2019	3:08PM			No	No	No	SAND
00804492	G3	FIELD SAMPLE	10/12/2019	12:47PM	10/18/2019	3:12PM			No	No	No	SAND
00804493	I2	FIELD SAMPLE	10/12/2019	12:51PM	10/18/2019	3:15PM			No	No	No	SAND
00804494	G2	FIELD SAMPLE	10/12/2019	1:03PM	10/19/2019	12:05PM			No	No	No	SAND
00804495	H3	FIELD SAMPLE	10/12/2019	1:10PM	10/18/2019	3:20PM			No	No	No	SAND
00804496	H2	FIELD SAMPLE	10/12/2019	1:18PM	10/18/2019	3:25PM			No	No	No	SAND
00804497	H4	FIELD SAMPLE	10/12/2019	1:22PM	10/18/2019	3:28PM			No	No	No	SAND
00804498	G4	FIELD SAMPLE	10/12/2019	1:32PM	10/18/2019	3:31PM			No	No	No	SAND
00804499	F3	FIELD SAMPLE	10/12/2019	1:38PM	10/18/2019	3:35PM			No	No	No	SAND
00804500	F2	FIELD SAMPLE	10/12/2019	1:45PM	10/18/2019	3:38PM			No	No	No	SAND
00804501	E6	FIELD SAMPLE	10/12/2019	1:50PM	10/18/2019	3:41PM			No	No	No	SAND
00804502	E5	FIELD SAMPLE	10/12/2019	1:51PM	10/18/2019	3:44PM			No	No	No	SAND



210 Executive Drive, Suite 1
Newark, DE USA 19702-3335
ph: 302-266-2428

AGI Project No. ENV 02138
Site Name: Gavora Mall
Site Location:

**AGI Soil Gas Sampling
Installation & Retrieval Log**

Company Name: Travis/Peterson Evironmental Consulting
Location:
Samples collected by:

* Optional or as needed

SAMPLER SERIAL NO.	FIELD ID* (e.g., arbitrary, US EPA)	SAMPLE TYPE (Field Sample, Trip Blank, Field Blank, etc.)	INSTALLATION DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/27/2000 13:00		RETRIEVAL DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/30/2000 13:00		OBSERVATIONS/COMMENT S* (e.g., sample depth, location description, missing, pulled from hole, etc. - as needed)	SAMPLE ENVIRONMENT* (e.g., grass, bare soil, through slab)	YES / NO			SOIL TYPE AT MODULE DEPTH (clay, loamy sand etc.)
			EVIDENCE OF LIQUID PETROLEUM HYDROCARBONS?	ODOR ?	WATER IN INSTALLATION HOLE?							
00804503	E4	FIELD_SAMPLE	10/12/2019	2:26PM	10/18/2019	3:47PM			No	No	No	SAND
00804504	E3	FIELD_SAMPLE	10/12/2019	1:56PM	10/18/2019	3:50PM			No	No	No	SAND
00804505	E2	FIELD_SAMPLE	10/12/2019	2:00PM	10/18/2019	3:53PM			No	No	No	SAND
00804506	Sampler Lost	FIELD_SAMPLE	10/12/2019	2:18PM	10/18/2019				No	No	No	SAND
00804507	D3	FIELD_SAMPLE	10/12/2019	2:22PM	10/18/2019	4:02PM			No	No	No	SAND
00804508	D4	FIELD_SAMPLE	10/12/2019	2:31PM	10/18/2019	4:05PM			No	No	No	SAND
00804509	D5	FIELD_SAMPLE	10/12/2019	2:37PM	10/18/2019	4:08PM			No	No	No	SAND
00804510	D6	FIELD_SAMPLE	10/12/2019	2:43PM	10/18/2019	4:11PM			No	No	No	SAND
00804511	C6	FIELD_SAMPLE	10/12/2019	2:47PM	10/18/2019	4:15PM			No	No	No	SAND
00804512	C5	FIELD_SAMPLE	10/12/2019	2:49PM	10/18/2019	4:18PM			No	No	No	SAND
00804513	C4	FIELD_SAMPLE	10/12/2019	2:51PM	10/18/2019	4:21PM			No	No	No	SAND
00804514	C3	FIELD_SAMPLE	10/12/2019	2:53PM	10/18/2019	4:25PM			No	No	No	SAND
00804515	C2	FIELD_SAMPLE	10/12/2019	2:56PM	10/18/2019	4:28PM			No	No	No	SAND
00804516	B2	FIELD_SAMPLE	10/12/2019	2:58PM	10/18/2019	4:30PM			No	No	No	SAND
00804517	B3	FIELD_SAMPLE	10/12/2019	3:00PM	10/18/2019	4:33PM			No	No	No	SAND
00804518	B4	FIELD_SAMPLE	10/12/2019	3:02PM	10/18/2019	4:36PM			No	No	No	SAND
00804519	Sampler Lost	FIELD_SAMPLE							No	No	No	SAND
00804520	Sampler Lost	FIELD_SAMPLE							No	No	No	SAND
750581	A2	FIELD_SAMPLE	10/22/2019	12:52PM	10/28/2019	1:25PM			No	No	No	SAND
750580	A3	FIELD_SAMPLE	10/22/2019	12:57PM	10/28/2019	1:28PM			No	No	No	SAND
750579	A4	FIELD_SAMPLE	10/22/2019	1:01PM	10/28/2019	1:31PM			No	No	No	SAND
750584	A5	FIELD_SAMPLE	10/22/2019	1:23PM	10/28/2019	1:34PM			No	No	No	SAND
750578	A6	FIELD_SAMPLE	10/22/2019	1:06PM	10/28/2019	1:37PM			No	No	No	SAND
750577	A7	FIELD_SAMPLE	10/22/2019	1:10PM	10/28/2019	1:40PM			No	No	No	SAND
750576	B5	FIELD_SAMPLE	10/22/2019	1:14PM	10/28/2019	1:42PM			No	No	No	SAND
750582	B6	FIELD_SAMPLE	10/22/2019	1:17PM	10/28/2019	1:45PM			No	No	No	SAND
750583	D2	FIELD_SAMPLE	10/22/2019	1:21PM	10/28/2019	1:48PM			No	No	No	SAND
750585	D1	FIELD_SAMPLE	10/22/2019	1:30PM	10/28/2019	1:52PM			No	No	No	SAND
750586	Trip Blank	Trip Blank							No	No	No	SAND



AGI Soil Gas Sampling
Installation & Retrieval Log

* Optional or as needed

AT MINIMUM PROVIDE SOIL TYPE						
SAMPLER SERIAL NO.	TOTAL SOIL POROSITY AT MODULE DEPTH* (total volume of pores/total volume)	WATER FILLED SOIL POROSITY AT MODULE DEPTH* (volume of water/volume of pores)	PROJECTED COORDINATES X (EASTING)	PROJECTED COORDINATES Y (NORTHING)	COORDINATE SYSTEM* (e.g., UTM Zone, Stateplane, etc.)	COORDINATE DATUM* (e.g., WGS 84)
00804458	0.375	0.144	147°44'36.73233"W	64°50'11.83201"N		WGS 84
00804459	0.375	0.144	147°44'35.28397"W	64°50'11.95796"N		WGS 84
00804460	0.375	0.144	147°44'36.94560"W	64°50'10.85867"N		WGS 84
00804461	0.375	0.144				WGS 84
00804462	0.375	0.144	147°44'36.91839"W	64°50'09.88642"N		WGS 84
00804463	0.375	0.144	147°44'35.91061"W	64°50'09.48707"N		WGS 84
00804464	0.375	0.144	147°44'36.93124"W	64°50'08.90066"N		WGS 84
00804465	0.375	0.144	147°44'35.98401"W	64°50'08.50419"N		WGS 84
00804466	0.375	0.144	147°44'36.86456"W	64°50'07.98372"N		WGS 84
00804467	0.375	0.144	147°44'35.86816"W	64°50'10.53267"N		WGS 84
00804468	0.375	0.144	147°44'35.96353"W	64°50'07.50105"N		WGS 84
00804469	0.375	0.144	147°44'36.67070"W	64°50'07.15568"N		WGS 84
00804470	0.375	0.144	147°44'35.59528"W	64°50'07.10931"N		WGS 84
00804471	0.375	0.144	147°44'33.99164"W	64°50'07.08495"N		WGS 84
00804472	0.375	0.144	147°44'32.67402"W	64°50'07.11410"N		WGS 84
00804473	0.375	0.144	147°44'31.51541"W	64°50'07.12137"N		WGS 84
00804474	0.375	0.144	147°44'29.50302"W	64°50'07.09847"N		WGS 84
00804475	0.375	0.144	147°44'29.28448"W	64°50'07.74975"N		WGS 84
00804476	0.375	0.144	147°44'28.19233"W	64°50'07.10467"N		WGS 84
00804477	0.375	0.144	147°44'26.38820"W	64°50'07.11865"N		WGS 84
00804478	0.375	0.144	147°44'25.10265"W	64°50'07.13216"N		WGS 84
00804479	0.375	0.144	147°44'23.54485"W	64°50'07.11951"N		WGS 84
00804480	0.375	0.144	147°44'22.03017"W	64°50'07.23655"N		WGS 84
00804481	0.375	0.144				WGS 84
00804482	0.375	0.144	147°44'22.06206"W	64°50'08.31177"N		WGS 84
00804483	0.375	0.144	147°44'22.88621"W	64°50'08.79036"N		WGS 84
00804484	0.375	0.144	147°44'24.32465"W	64°50'08.77610"N		WGS 84
00804485	0.375	0.144				WGS 84
00804486	0.375	0.144	147°44'23.51709"W	64°50'08.30294"N		WGS 84
00804487	0.375	0.144	147°44'22.04156"W	64°50'09.30520"N		WGS 84
00804488	0.375	0.144	147°44'23.67568"W	64°50'09.32903"N		WGS 84
00804489	0.375	0.144	147°44'25.34481"W	64°50'09.33378"N		WGS 84
00804490	0.375	0.144	147°44'25.06847"W	64°50'08.30145"N		WGS 84
00804491	0.375	0.144	147°44'26.60363"W	64°50'08.29472"N		WGS 84
00804492	0.375	0.144	147°44'29.27018"W	64°50'08.73647"N		WGS 84
00804493	0.375	0.144	147°44'30.94603"W	64°50'07.72566"N		WGS 84
00804494	0.375	0.144	147°44'31.13416"W	64°50'08.70072"N		WGS 84
00804495	0.375	0.144	147°44'29.70674"W	64°50'08.29190"N		WGS 84
00804496	0.375	0.144	147°44'31.01291"W	64°50'08.27132"N		WGS 84
00804497	0.375	0.144	147°44'28.11773"W	64°50'08.32824"N		WGS 84
00804498	0.375	0.144	147°44'27.26268"W	64°50'08.77517"N		WGS 84
00804499	0.375	0.144	147°44'26.71946"W	64°50'09.31916"N		WGS 84
00804500	0.375	0.144	147°44'28.25464"W	64°50'09.32943"N		WGS 84
00804501	0.375	0.144	147°44'22.80924"W	64°50'09.91597"N		WGS 84
00804502	0.375	0.144	147°44'24.34786"W	64°50'09.91439"N		WGS 84



AGI Soil Gas Sampling
Installation & Retrieval Log

* Optional or as needed

AT MINIMUM PROVIDE SOIL TYPE						
SAMPLER SERIAL NO.	TOTAL SOIL POROSITY AT MODULE DEPTH* (total volume of pores/total volume)	WATER FILLED SOIL POROSITY AT MODULE DEPTH* (volume of water/volume of pores)	PROJECTED COORDINATES X (EASTING)	PROJECTED COORDINATES Y (NORTHING)	COORDINATE SYSTEM* (e.g., UTM Zone, Stateplane, etc.)	COORDINATE DATUM* (e.g., WGS 84)
00804503	0.375	0.144	147°44'25.88140"W	64°50'09.91239"N		WGS 84
00804504	0.375	0.144	147°44'27.24439"W	64°50'09.88997"N		WGS 84
00804505	0.375	0.144	147°44'29.13334"W	64°50'09.89285"N		WGS 84
00804506	0.375	0.144				WGS 84
00804507	0.375	0.144	147°44'26.74256"W	64°50'10.46186"N		WGS 84
00804508	0.375	0.144	147°44'25.20517"W	64°50'10.43746"N		WGS 84
00804509	0.375	0.144	147°44'23.60859"W	64°50'10.49178"N		WGS 84
00804510	0.375	0.144	147°44'21.99602"W	64°50'10.47922"N		WGS 84
00804511	0.375	0.144	147°44'22.97905"W	64°50'11.03098"N		WGS 84
00804512	0.375	0.144	147°44'24.44337"W	64°50'11.03830"N		WGS 84
00804513	0.375	0.144	147°44'25.97094"W	64°50'11.04261"N		WGS 84
00804514	0.375	0.144	147°44'27.48213"W	64°50'11.05127"N		WGS 84
00804515	0.375	0.144	147°44'29.05850"W	64°50'11.07079"N		WGS 84
00804516	0.375	0.144	147°44'28.25073"W	64°50'11.60930"N		WGS 84
00804517	0.375	0.144	147°44'26.68075"W	64°50'11.59922"N		WGS 84
00804518	0.375	0.144	147°44'25.17307"W	64°50'11.59803"N		WGS 84
00804519	0.375	0.144				WGS 84
00804520	0.375	0.144				WGS 84
750581	0.375	0.144	147°44'34.09039"W	64°50'12.05612"N		WGS 84
750580	0.375	0.144	147°44'32.56800"W	64°50'11.96386"N		WGS 84
750579	0.375	0.144	147°44'31.10748"W	64°50'11.97548"N		WGS 84
750584	0.375	0.144	147°44'29.16571"W	64°50'11.97511"N		WGS 84
750578	0.375	0.144	147°44'27.52894"W	64°50'12.00717"N		WGS 84
750577	0.375	0.144	147°44'25.97171"W	64°50'11.94276"N		WGS 84
750576	0.375	0.144	147°44'23.66902"W	64°50'11.62411"N		WGS 84
750582	0.375	0.144	147°44'22.67503"W	64°50'11.46645"N		WGS 84
750583	0.375	0.144	147°44'28.25674"W	64°50'10.46830"N		WGS 84
750585	0.375	0.144	147°44'36.94560"W	64°50'10.85867"N		WGS 84
750586	0.375	0.144				

AMPLIFIED GEOCHEMICAL IMAGING, LLC
 210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE 19702
 TRAVIS/PETERSON ENVIRONMENTAL CONSULTANTS, AK
 STANDARD TARGET VOCs/SVOCs
 GAVORA MALL
 ORDER # 02138

DATAFILE	FIELD	DATE/ TIME												
NAME	ID	ANALYZED	DF	TPH, ug	MTBE, ug	t12DCE, ug	11DCA, ug	c12DCE, ug	CHCl3, ug	111TCA, ug	12DCA, ug	BENZ, ug	CCl4, ug	TCE, ug
RL =				0.50	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
00750576	B5	11/13/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750577	A7	11/14/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750578	A6	11/13/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750579	A4	11/13/2019	1	14.4	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.32
00750580	A3	11/12/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.34
00750581	A2	11/13/2019	1	0.97	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750582	B6	11/13/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750583	D2	11/13/2019	1	7.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.76
00750584	A5	11/13/2019	1	0.61	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02
00750585	D1	11/13/2019	1	2.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.09	<0.02	<0.02
00804458	B1	11/14/2019	1	14.3	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02
00804459	A1	11/12/2019	1	0.74	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804462	F1	11/13/2019	1	0.78	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804463	E1	11/13/2019	1	1.73	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02
00804464	H1	11/13/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804465	G1	11/12/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804466	J1	11/12/2019	1	2.54	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804466D	J1	11/25/2019	1	1.28	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804467	C1	11/14/2019	1	3.64	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804468	I1	11/13/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804469	K1	11/13/2019	1	47.3	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02
00804470	J2	11/13/2019	1	2.36	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804470D	J2	11/25/2019	1	2.36	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804471	J3	11/13/2019	1	2.72	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804472	J4	11/13/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02
00804473	J5	11/12/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804474	J6	11/12/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
00804475	I3	11/12/2019	1	13.4	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.84
00804475D	I3	11/25/2019	1	15.9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.80
00804476	J7	11/13/2019	1	0.72	<0.02	<0.02	<0.02	0.10	0.03	0.02	<0.02	<0.02	<0.02	2.87
00804477	J8	11/13/2019	1	2.69	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04
00804478	J9	11/12/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804479R	J10	11/14/2019	1	1.41	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804480	J11	11/13/2019	1	0.95	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804482	H8	11/13/2019	1	7.98	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02
00804483	G7	11/13/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804484	G6	11/12/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804486	H7	11/13/2019	1	4.85	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804487	F6	11/13/2019	1	5.55	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03

AMPLIFIED GEOCHEMICAL IMAGING, LLC
 210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE 19702
 TRAVIS/PETERSON ENVIRONMENTAL CONSULTANTS, AK
 STANDARD TARGET VOCs/SVOCs
 GAVORA MALL
 ORDER # 02138

DATAFILE	FIELD	DATE/ TIME												
NAME	ID	ANALYZED	DF	TPH, ug	MTBE, ug	t12DCE, ug	11DCA, ug	c12DCE, ug	CHCl3, ug	111TCA, ug	12DCA, ug	BENZ, ug	CCl4, ug	TCE, ug
00804487D	F6	11/25/2019	1	5.36	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03
00804488	F5	11/12/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804489	F4	11/14/2019	1	29.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804490	H6	11/13/2019	1	0.91	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02
00804491	H5	11/13/2019	1	0.92	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.35
00804492	G3	11/13/2019	1	16.5	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	0.19
00804493	I2	11/12/2019	1	0.74	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804494	G2	11/13/2019	1	1.92	<0.02	<0.02	<0.02	<0.02	0.11	<0.02	<0.02	<0.02	<0.02	0.27
00804495	H3	11/13/2019	1	16.7	<0.02	<0.02	<0.02	0.13	<0.02	<0.02	<0.02	0.04	<0.02	4.77
00804496	H2	11/13/2019	1	2.75	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02
00804497	H4	11/13/2019	1	13.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804498	G4	11/13/2019	1	58.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804499	F3	11/12/2019	1	3.88	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804500	F2	11/13/2019	1	0.93	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804501	E6	11/12/2019	1	4.20	<0.02	0.02	<0.02	1.18	<0.02	<0.02	<0.02	<0.02	<0.02	1.03
00804501D	E6	11/25/2019	1	3.61	<0.02	<0.02	<0.02	1.08	<0.02	<0.02	<0.02	<0.02	<0.02	1.05
00804502	E5	11/12/2019	1	<0.50	<0.02	<0.02	<0.02	0.19	<0.02	<0.02	<0.02	<0.02	<0.02	4.04
00804503	E4	11/13/2019	1	1.77	<0.02	0.13	<0.02	1.34	<0.02	<0.02	<0.02	0.03	<0.02	13.2
00804503D	E4	11/25/2019	1	1.48	<0.02	0.12	<0.02	1.25	<0.02	<0.02	<0.02	0.03	<0.02	11.7
00804504	E3	11/12/2019	1	<0.50	<0.02	0.44	<0.02	18.4	<0.02	<0.02	<0.02	0.03	<0.02	1.52
00804505	E2	11/13/2019	1	217	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02
00804507	D3	11/13/2019	1	<0.50	<0.02	0.62	<0.02	1.72	0.03	<0.02	<0.02	0.05	<0.02	13.1
00804508	D4	11/12/2019	1	0.78	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04
00804509	D5	11/12/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804510	D6	11/13/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02
00804511	C6	11/13/2019	1	6.20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02
00804512	C5	11/13/2019	1	<0.50	<0.02	<0.02	<0.02	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	0.47
00804513	C4	11/14/2019	1	<0.50	<0.02	0.12	<0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	2.23
00804514	C3	11/14/2019	1	1.60	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.22
00804515	C2	11/14/2019	1	4.51	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	0.03
00804516	B2	11/12/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02
00804517	B3	11/13/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804518	B4	11/12/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750586	Trip Blank	11/13/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
BLK-1	Method Blank	11/12/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
BLK-2	Method Blank	11/13/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
BLK-3	Method Blank	11/13/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
BLK-6	Method Blank	11/22/2019	1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

AMPLIFIED GEOCHEMICAL IMAGING, LLC
 210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE 19702
 TRAVIS/PETERSON ENVIRONMENTAL CONSULTANTS, AK
 STANDARD TARGET VOCs/SVOCs
 GAVORA MALL
 ORDER # 02138

DATAFILE													
NAME	112TCA, ug	TOL, ug	OCT, ug	PCE, ug	CIBENZ, ug	1112TetCA, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug	1122TetCA, ug	135TMB, ug	124TMB, ug	13DCB, ug
RL =	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
00750576	<0.02	<0.02	<0.02	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750577	<0.02	<0.02	<0.02	3.97	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750578	<0.02	<0.02	<0.02	24.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750579	<0.02	<0.02	<0.02	96.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750580	<0.02	<0.02	<0.02	120	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750581	<0.02	<0.02	<0.02	30.5	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750582	<0.02	<0.02	<0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750583	<0.02	0.11	<0.02	78.6	<0.02	<0.02	<0.02	0.22	0.16	<0.02	0.45	0.45	<0.02
00750584	<0.02	<0.02	<0.02	2.59	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750585	<0.02	0.13	<0.02	0.30	<0.02	<0.02	0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02
00804458	<0.02	0.11	0.04	1.11	<0.02	<0.02	0.04	0.13	0.07	<0.02	0.04	0.15	<0.02
00804459	<0.02	<0.02	<0.02	3.73	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804462	<0.02	<0.02	<0.02	1.68	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804463	<0.02	0.26	0.03	1.03	<0.02	<0.02	0.04	0.13	0.05	<0.02	<0.02	0.02	<0.02
00804464	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804465	<0.02	<0.02	<0.02	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804466	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804466D	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804467	<0.02	<0.02	<0.02	0.11	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804468	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804469	<0.02	0.07	0.08	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	0.02	<0.02
00804470	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804470D	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804471	<0.02	0.11	<0.02	1.84	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02
00804472	<0.02	<0.02	<0.02	0.44	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804473	<0.02	<0.02	<0.02	0.33	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804474	<0.02	<0.02	<0.02	20.9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804475	<0.02	0.06	0.07	20.3	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02
00804475D	<0.02	0.06	0.08	16.9	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02
00804476	<0.02	<0.02	<0.02	121	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804477	<0.02	0.07	<0.02	88.9	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804478	<0.02	<0.02	<0.02	47.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804479R	<0.02	<0.02	<0.02	1.50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804480	<0.02	0.05	<0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804482	<0.02	0.07	0.15	<0.02	<0.02	<0.02	0.02	0.07	0.04	<0.02	<0.02	0.02	<0.02
00804483	<0.02	0.04	<0.02	0.15	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804484	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804486	<0.02	0.45	0.05	0.10	<0.02	<0.02	0.28	1.57	0.68	<0.02	0.30	0.55	<0.02
00804487	<0.02	<0.02	0.06	0.16	<0.02	<0.02	<0.02	0.03	0.02	<0.02	<0.02	<0.02	<0.02

AMPLIFIED GEOCHEMICAL IMAGING, LLC
 210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE 19702
 TRAVIS/PETERSON ENVIRONMENTAL CONSULTANTS, AK
 STANDARD TARGET VOCs/SVOCs
 GAVORA MALL
 ORDER # 02138

DATAFILE	112TCA, ug	TOL, ug	OCT, ug	PCE, ug	CIBENZ, ug	1112TetCA, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug	1122TetCA, ug	135TMB, ug	124TMB, ug	13DCB, ug
00804487D	<0.02	<0.02	0.07	0.18	<0.02	<0.02	<0.02	0.03	0.02	<0.02	<0.02	<0.02	<0.02
00804488	<0.02	<0.02	<0.02	0.32	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804489	<0.02	0.06	0.03	0.64	<0.02	<0.02	0.05	0.29	0.23	<0.02	0.09	0.19	<0.02
00804490	<0.02	0.08	<0.02	18.9	<0.02	<0.02	0.03	0.15	0.08	<0.02	0.05	0.09	<0.02
00804491	<0.02	0.02	<0.02	18.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804492	<0.02	0.13	0.06	0.22	<0.02	<0.02	0.02	0.06	0.03	<0.02	<0.02	<0.02	<0.02
00804493	<0.02	<0.02	<0.02	41.5	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804494	<0.02	0.04	<0.02	3.72	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804495	<0.02	0.15	2.30	32.0	<0.02	<0.02	0.07	0.19	0.09	<0.02	<0.02	0.03	<0.02
00804496	<0.02	0.03	<0.02	0.79	<0.02	<0.02	<0.02	0.07	0.06	<0.02	0.05	0.11	<0.02
00804497	<0.02	0.02	0.07	6.03	<0.02	<0.02	<0.02	0.09	0.09	<0.02	0.03	0.07	<0.02
00804498	10.7	0.58	9.23	2.57	<0.02	<0.02	1.00	3.66	2.01	<0.02	0.18	0.36	<0.02
00804499	<0.02	0.14	0.07	8.20	<0.02	<0.02	0.02	0.09	0.06	<0.02	<0.02	0.03	<0.02
00804500	<0.02	<0.02	<0.02	1.46	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804501	<0.02	0.02	0.03	4.28	<0.02	<0.02	<0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02
00804501D	<0.02	0.02	0.02	4.21	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804502	<0.02	<0.02	0.04	35.5	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804503	<0.02	<0.02	<0.02	31.8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804503D	<0.02	<0.02	<0.02	29.7	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804504	<0.02	0.02	<0.02	7.21	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804505	<0.02	0.04	<0.02	1.26	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804507	<0.02	<0.02	<0.02	105	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804508	<0.02	<0.02	<0.02	9.91	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804509	<0.02	<0.02	<0.02	2.23	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804510	<0.02	0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804511	<0.02	<0.02	<0.02	1.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804512	<0.02	<0.02	<0.02	5.68	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804513	<0.02	0.04	<0.02	59.6	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804514	<0.02	<0.02	<0.02	52.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804515	<0.02	0.03	<0.02	16.8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02
00804516	<0.02	0.02	<0.02	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804517	<0.02	<0.02	<0.02	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00804518	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00750586	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
BLK-1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
BLK-2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
BLK-3	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
BLK-6	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

AMPLIFIED GEOCHEMICAL IMAGING, LLC
 210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE 19702
 TRAVIS/PETERSON ENVIRONMENTAL CONSULTANTS, AK
 STANDARD TARGET VOCs/SVOCs
 GAVORA MALL
 ORDER # 02138

DATAFILE	14DCB, ug	12DCB, ug	UNDEC, ug	NAPH, ug	TRIDEC, ug	2MeNAPH, ug	Acenaphthylene, ug	PENTADEC, ug	Acenaphthene, ug	Fluorene, ug
NAME	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
RL =	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
00750576	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00750577	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00750578	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00750579	<0.02	<0.02	<0.05	<0.05	0.20	<0.05	<0.05	0.15	<0.05	<0.05
00750580	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00750581	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00750582	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00750583	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00750584	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00750585	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804458	<0.02	<0.02	0.28	0.10	0.39	0.28	<0.05	0.16	<0.05	<0.05
00804459	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804462	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804463	<0.02	<0.02	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05
00804464	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804466	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804466D	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804467	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804468	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804469	<0.02	<0.02	0.06	0.05	0.22	<0.05	<0.05	<0.05	<0.05	<0.05
00804470	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804470D	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804471	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804472	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804473	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804474	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804475	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804475D	<0.02	<0.02	<0.05	<0.05	0.08	<0.05	<0.05	0.06	<0.05	<0.05
00804476	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804477	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804478	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804479R	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804480	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804482	<0.02	<0.02	0.08	<0.05	0.09	<0.05	<0.05	<0.05	<0.05	<0.05
00804483	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804484	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804486	<0.02	<0.02	<0.05	<0.05	0.09	<0.05	<0.05	<0.05	<0.05	<0.05
00804487	<0.02	<0.02	<0.05	<0.05	0.12	<0.05	<0.05	0.10	<0.05	<0.05

AMPLIFIED GEOCHEMICAL IMAGING, LLC
 210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE 19702
 TRAVIS/PETERSON ENVIRONMENTAL CONSULTANTS, AK
 STANDARD TARGET VOCs/SVOCs
 GAVORA MALL
 ORDER # 02138

DATAFILE	14DCB, ug	12DCB, ug	UNDEC, ug	NAPH, ug	TRIDEC, ug	2MeNAPH, ug	Acenaphthylene, ug	PENTADEC, ug	Acenaphthene, ug	Fluorene, ug
00804487D	<0.02	<0.02	<0.05	<0.05	0.10	<0.05	<0.05	0.06	<0.05	<0.05
00804488	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804489	<0.02	<0.02	0.28	0.11	0.70	0.16	<0.05	0.32	<0.05	<0.05
00804490	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804491	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804492	<0.02	<0.02	<0.05	<0.05	0.46	<0.05	<0.05	0.65	<0.05	<0.05
00804493	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804494	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804495	<0.02	<0.02	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05
00804496	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804497	<0.02	<0.02	0.10	<0.05	0.34	<0.05	<0.05	0.20	<0.05	<0.05
00804498	<0.02	<0.02	0.12	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05
00804499	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804500	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804501	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804501D	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804502	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804503	<0.02	<0.02	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804503D	<0.02	<0.02	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05
00804504	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804505	<0.02	<0.02	2.52	<0.05	2.53	<0.05	<0.05	0.26	<0.05	<0.05
00804507	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804508	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804509	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804510	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804511	<0.02	<0.02	0.21	<0.05	0.16	<0.05	<0.05	<0.05	<0.05	<0.05
00804512	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804513	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804514	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804515	<0.02	<0.02	0.11	<0.05	0.15	<0.05	<0.05	0.05	<0.05	<0.05
00804516	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804517	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00804518	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00750586	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BLK-1	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BLK-2	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BLK-3	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BLK-6	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

AMPLIFIED GEOCHEMICAL IMAGING, LLC
 210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE 19702
 TRAVIS/PETERSON ENVIRONMENTAL CONSULTANTS, AK
 STANDARD TARGET VOCs/SVOCs
 ESTIMATED SOIL GAS CONCENTRATIONS
 GAVORA MALL
 ORDER # 02138

DATAFILE	FIELD	DATE/ TIME	DATE/ TIME	DATE/ TIME	DATE/ TIME		estimated									
NAME	ID	INSTALLED	RETRIEVED	RECEIVED	ANALYZED	DF	TPH, ug/m^3	MTBE, ug/m^3	t12DCE, ug/m^3	11DCA, ug/m^3	c12DCE, ug/m^3	CHCl3, ug/m^3	111TCA, ug/m^3	12DCA, ug/m^3	BENZ, ug/m^3	
00804502	E5	10/12/19 13:51	10/18/19 15:44	11/1/19 11:00	11/12/19 13:32	1	<8.13	<60.7	<132	<44.1	215	<22.2	<12.6	<10.4	<10.2	
00804503	E4	10/12/19 14:26	10/18/19 15:47	11/1/19 11:00	11/13/19 14:31	1	27.6	<60.8	438	<44.1	874	<22.2	<12.7	<10.4	15.7	
00804503D	E4	10/12/19 14:26	10/18/19 15:47	11/1/19 11:00	11/25/19 9:19	1	23.2	<60.8	409	<44.1	833	<22.2	<12.7	<10.4	15.3	
00804504	E3	10/12/19 13:56	10/18/19 15:50	11/1/19 11:00	11/12/19 14:00	1	<8.13	<60.7	921	<44.1	5830	<22.2	<12.6	<10.4	13.8	
00804505	E2	10/12/19 14:00	10/18/19 15:53	11/1/19 11:00	11/13/19 8:14	1	2800 E	<60.7	<132	<44.1	<41.6	<22.2	<12.6	<10.4	11.9	
00804507	D3	10/12/19 14:22	10/18/19 16:02	11/1/19 11:00	11/13/19 15:57	1	<8.14	<60.8	1150	<44.1	1050	34.5	<12.7	<10.4	21.3	
00804508	D4	10/12/19 14:31	10/18/19 16:05	11/1/19 11:00	11/12/19 15:27	1	12.6	<60.8	<132	<44.1	<41.6	<22.2	<12.7	<10.4	<10.3	
00804509	D5	10/12/19 14:37	10/18/19 16:08	11/1/19 11:00	11/12/19 16:25	1	<8.15	<60.8	<132	<44.1	<41.6	<22.2	<12.7	<10.4	<10.3	
00804510	D6	10/12/19 14:43	10/18/19 16:11	11/1/19 11:00	11/13/19 12:34	1	<8.15	<60.8	<132	<44.1	<41.6	<22.2	<12.7	<10.4	10.3	
00804511	C6	10/12/19 14:47	10/18/19 16:15	11/1/19 11:00	11/13/19 12:05	1	91.9	<60.8	<132	<44.1	<41.6	<22.2	<12.7	<10.4	<10.3	
00804512	C5	10/12/19 14:49	10/18/19 16:18	11/1/19 11:00	11/13/19 22:10	1	<8.15	<60.8	<132	<44.1	116	<22.2	<12.7	<10.4	<10.3	
00804513	C4	10/12/19 14:51	10/18/19 16:21	11/1/19 11:00	11/14/19 3:55	1	<8.15	<60.8	415	<44.1	98.9	<22.2	<12.7	<10.4	<10.3	
00804514	C3	10/12/19 14:53	10/18/19 16:25	11/1/19 11:00	11/14/19 3:26	1	24.9	<60.8	<132	<44.1	<41.6	<22.2	<12.7	<10.4	<10.3	
00804515	C2	10/12/19 14:56	10/18/19 16:28	11/1/19 11:00	11/14/19 1:32	1	67.6	<60.8	<132	<44.1	<41.6	41.2	<12.7	<10.4	<10.3	
00804516	B2	10/12/19 14:58	10/18/19 16:30	11/1/19 11:00	11/12/19 14:29	1	<8.15	<60.8	<132	<44.1	<41.6	<22.2	<12.7	<10.4	13.8	
00804517	B3	10/12/19 15:00	10/18/19 16:33	11/1/19 11:00	11/13/19 14:59	1	<8.15	<60.8	<132	<44.1	<41.6	<22.2	<12.7	<10.4	<10.3	
00804518	B4	10/12/19 15:02	10/18/19 16:36	11/1/19 11:00	11/12/19 19:47	1	<8.15	<60.8	<132	<44.1	<41.6	<22.2	<12.7	<10.4	<10.3	
00750586	Trip Blank	10/13/19 21:53	10/20/19 0:04	11/1/19 11:00	11/13/19 2:00	1	<8.12	<60.7	<132	<44.1	<41.6	<22.1	<12.6	<10.4	<10.2	
BLK-1	Method Blank	10/13/19 21:53	10/20/19 0:04		11/12/19 11:42	1	<8.12	<60.7	<132	<44.1	<41.6	<22.1	<12.6	<10.4	<10.2	
BLK-2	Method Blank	10/13/19 21:53	10/20/19 0:04		11/13/19 5:21	1	<8.12	<60.7	<132	<44.1	<41.6	<22.1	<12.6	<10.4	<10.2	
BLK-3	Method Blank	10/13/19 21:53	10/20/19 0:04		11/13/19 23:37	1	<8.12	<60.7	<132	<44.1	<41.6	<22.1	<12.6	<10.4	<10.2	
BLK-6	Method Blank	10/13/19 21:53	10/20/19 0:04		11/22/19 23:40	1	<8.12	<60.7	<132	<44.1	<41.6	<22.1	<12.6	<10.4	<10.2	

AMPLIFIED GEOCHEMICAL IMAGING, LLC
 210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE 19702
 TRAVIS/PETERSON ENVIRONMENTAL CONSULTANTS, AK
 STANDARD TARGET VOCs/SVOCs
 ESTIMATED SOIL GAS CONCENTRATIONS
 GAVORA MALL
 ORDER # 02138

DATAFILE					estimated			estimated							
NAME	CCl4, ug/m^3	TCE, ug/m^3	112TCA, ug/m^3	TOL, ug/m^3	OCT, ug/m^3	PCE, ug/m^3	CIBENZ, ug/m^3	1112TetCA, ug/m^3	ETBENZ, ug/m^3	mpXYL, ug/m^3	oXYL, ug/m^3	1122TetCA, ug/m^3	135TMB, ug/m^3	124TMB, ug/m^3	
RL =	11.3	4.22	0.68	1.01	1.04	0.76	0.49	0.36	0.46	0.42	0.59	0.36	0.64	0.48	
00750576	<11.4	<4.25	<0.69	<1.02	<1.05	6.10	<0.49	<0.36	<0.47	<0.43	<0.60	<0.36	<0.65	<0.48	
00750577	<11.4	<4.25	<0.69	<1.02	<1.05	145	<0.49	<0.36	<0.47	<0.43	<0.60	<0.36	<0.65	<0.48	
00750578	<11.4	<4.24	<0.69	<1.02	<1.04	863 E	<0.49	<0.36	<0.47	<0.43	<0.60	<0.36	<0.64	<0.48	
00750579	<11.4	48.8	<0.69	<1.02	<1.05	3420 E	<0.49	<0.36	<0.47	<0.43	<0.60	<0.36	<0.65	<0.48	
00750580	<11.4	51.8	<0.69	<1.02	<1.04	4270 E	<0.49	<0.36	<0.47	<0.43	<0.60	<0.36	<0.64	<0.48	
00750581	<11.4	<4.24	<0.69	<1.02	<1.04	1100 E	<0.49	<0.36	<0.47	<0.43	<0.60	<0.36	<0.64	<0.48	
00750582	<11.4	<4.25	<0.69	<1.02	<1.05	2.54	<0.49	<0.36	<0.47	<0.43	<0.60	<0.36	<0.65	<0.48	
00750583	<11.4	104	<0.69	5.18	<1.05	2800 E	<0.49	<0.36	<0.47	4.59	4.25	<0.36	12.0	9.59	
00750584	<11.4	<4.25	<0.69	<1.02	<1.05	95.3	<0.49	<0.36	<0.47	<0.43	<0.60	<0.36	<0.65	<0.48	
00750585	<11.4	<4.25	<0.69	6.05	<1.05	11.2	<0.49	<0.36	0.51	0.82	<0.60	<0.36	<0.65	<0.48	
00804458	<11.2	<4.19	<0.68	4.87	1.98	40.2	<0.48	<0.36	0.90	2.57	1.82	<0.36	1.21	3.25	
00804459	<11.2	<4.19	<0.68	<1.00	<1.03	134	<0.48	<0.36	<0.46	<0.42	<0.58	<0.36	<0.63	<0.47	
00804462	<11.3	<4.19	<0.68	<1.00	<1.03	61.0	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.63	<0.47	
00804463	<11.3	<4.19	<0.68	11.5	1.51	37.3	<0.48	<0.36	0.81	2.73	1.26	<0.36	<0.63	0.52	
00804464	<11.3	<4.19	<0.68	<1.00	<1.03	1.54	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.63	<0.47	
00804465	<11.3	<4.19	<0.68	<1.00	<1.03	3.02	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.63	<0.47	
00804466	<11.3	<4.20	<0.68	<1.00	<1.03	<0.76	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.63	<0.48	
00804466D	<11.3	<4.20	<0.68	<1.00	<1.03	<0.76	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.63	<0.48	
00804467	<11.3	<4.20	<0.68	<1.00	<1.03	4.02	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48	
00804468	<11.3	<4.20	<0.68	<1.00	<1.03	<0.76	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.63	<0.48	
00804469	<11.3	<4.20	<0.68	3.23	3.98	<0.76	<0.48	<0.36	<0.46	0.85	<0.59	<0.36	<0.63	0.54	
00804470	<11.3	<4.20	<0.68	<1.00	<1.03	<0.76	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.63	<0.48	
00804470D	<11.3	<4.20	<0.68	<1.00	<1.03	0.76	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.63	<0.48	
00804471	<11.3	<4.20	<0.68	5.19	<1.03	66.8	<0.48	<0.36	<0.46	0.99	<0.59	<0.36	<0.64	<0.48	
00804472	<11.3	<4.20	<0.68	<1.00	<1.03	16.2	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48	
00804473	<11.3	<4.20	<0.68	<1.00	<1.03	12.2	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.63	<0.48	
00804474	<11.3	12.8	<0.68	<1.00	<1.03	744 E	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48	
00804475	<11.3	113	<0.68	2.83	3.48	722 E	<0.48	<0.36	<0.46	0.67	<0.59	<0.36	<0.64	<0.48	
00804475D	<11.3	109	<0.68	2.88	3.62	602	<0.48	<0.36	<0.46	0.63	<0.59	<0.36	<0.64	<0.48	
00804476	<11.3	334	<0.68	<1.00	<1.03	4240 E	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48	
00804477	<11.3	8.25	<0.68	3.32	<1.03	3120 E	<0.48	<0.36	<0.46	0.50	<0.59	<0.36	<0.64	<0.48	
00804478	<11.3	<4.20	<0.68	<1.00	<1.03	1660 E	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48	
00804479R	<11.3	<4.20	<0.68	<1.00	<1.03	54.6	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48	
00804480	<11.3	<4.20	<0.68	2.20	<1.03	2.54	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48	
00804482	<11.3	<4.20	<0.68	3.32	6.86	<0.76	<0.48	<0.36	0.48	1.40	1.22	<0.36	<0.64	0.48	
00804483	<11.3	<4.20	<0.68	2.02	<1.03	5.39	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48	
00804484	<11.3	<4.20	<0.68	<1.00	<1.03	<0.76	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48	
00804486	<11.3	<4.21	<0.68	18.9	2.46	3.77	<0.48	<0.36	6.02	31.2	16.8	<0.36	8.12	11.4	
00804487	<11.3	5.12	<0.68	<1.00	3.02	6.10	<0.48	<0.36	<0.46	0.52	0.70	<0.36	<0.64	<0.48	
00804487D	<11.3	6.19	<0.68	<1.00	3.49	6.83	<0.48	<0.36	<0.46	0.52	0.67	<0.36	<0.64	<0.48	
00804488	<11.3	<4.21	<0.68	<1.00	<1.03	11.8	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48	
00804489	<11.3	<4.21	<0.68	2.61	1.61	23.5	<0.48	<0.36	1.14	5.90	6.01	<0.36	2.47	4.22	
00804490	<11.3	<4.21	<0.68	3.86	<1.03	675	<0.48	<0.36	0.60	2.99	2.22	<0.36	1.45	1.95	
00804491	<11.3	51.7	<0.68	1.19	<1.03	650	<0.48	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48	
00804492	<11.3	31.0	<0.68	5.81	3.12	8.13	<0.49	<0.36	0.53	1.20	0.92	<0.36	<0.64	<0.48	
00804493	<11.3	<4.21	<0.68	<1.01	<1.03	1470 E	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48	
00804494	<11.4	41.6	<0.69	1.93	<1.05	137	<0.50	<0.37	<0.47	<0.43	<0.60	<0.37	<0.65	<0.49	
00804495	<11.3	524	<0.68	6.72	93.9	1140 E	<0.49	<0.36	1.54	3.96	2.46	<0.36	<0.64	0.64	
00804496	<11.3	<4.22	<0.68	1.34	<1.04	29.2	<0.49	<0.36	<0.46	1.45	1.78	<0.36	1.59	2.37	
00804497	<11.3	<4.22	<0.68	1.06	3.50	218	<0.49	<0.36	<0.46	1.88	2.57	<0.36	0.91	1.68	
00804498	<11.3	<4.22	351	24.4	352	93.5	<0.49	<0.36	20.6	72.5	47.1	<0.36	4.93	7.58	
00804499	<11.3	<4.22	<0.68	6.43	3.32	296	<0.49	<0.36	0.55	1.88	1.60	<0.36	<0.64	0.68	
00804500	<11.3	<4.22	<0.68	<1.01	<1.04	53.6	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48	
00804501	<11.3	136	<0.68	1.15	1.28	155	<0.49	<0.36	<0.46	0.46	0.62	<0.36	<0.64	<0.48	
00804501D	<11.3	138	<0.68	1.20	1.18	153	<0.49	<0.36	<0.46	0.44	<0.59	<0.36	<0.64	<0.48	

AMPLIFIED GEOCHEMICAL IMAGING, LLC
 210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE 19702
 TRAVIS/PETERSON ENVIRONMENTAL CONSULTANTS, AK
 STANDARD TARGET VOCs/SVOCs
 ESTIMATED SOIL GAS CONCENTRATIONS
 GAVORA MALL
 ORDER # 02138

DATAFILE					estimated			estimated						
NAME	CCl4, ug/m^3	TCE, ug/m^3	112TCA, ug/m^3	TOL, ug/m^3	OCT, ug/m^3	PCE, ug/m^3	CIBENZ, ug/m^3	1112TetCA, ug/m^3	ETBENZ, ug/m^3	mpXYL, ug/m^3	oXYL, ug/m^3	1122TetCA, ug/m^3	135TMB, ug/m^3	124TMB, ug/m^3
00804502	<11.3	453	<0.68	<1.01	2.19	1260 E	<0.49	<0.36	<0.46	0.42	<0.59	<0.36	<0.64	<0.48
00804503	<11.3	1290	<0.69	<1.01	<1.04	1140 E	<0.49	<0.36	<0.47	<0.42	<0.59	<0.36	<0.64	<0.48
00804503D	<11.3	1160	<0.69	<1.01	<1.04	1060 E	<0.49	<0.36	<0.47	<0.42	<0.59	<0.36	<0.64	<0.48
00804504	<11.3	191	<0.68	1.10	<1.04	260	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
00804505	<11.3	<4.22	<0.68	1.71	<1.04	46.1	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
00804507	<11.3	1280	<0.68	<1.01	<1.04	3710 E	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
00804508	<11.3	7.96	<0.68	<1.01	<1.04	358	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
00804509	<11.3	<4.23	<0.68	<1.01	<1.04	81.6	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
00804510	<11.3	<4.23	<0.68	1.11	<1.04	1.85	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
00804511	<11.3	4.97	<0.68	<1.01	<1.04	39.7	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
00804512	<11.3	68.1	<0.68	<1.01	<1.04	206	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
00804513	<11.3	269	<0.68	1.95	<1.04	2120 E	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
00804514	<11.3	35.2	<0.68	<1.01	<1.04	1850 E	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
00804515	<11.3	5.51	<0.68	1.25	<1.04	604	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	0.53
00804516	<11.3	<4.23	<0.68	1.20	<1.04	8.88	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
00804517	<11.3	<4.23	<0.68	<1.01	<1.04	5.99	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
00804518	<11.3	<4.23	<0.68	<1.01	<1.04	<0.76	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
00750586	<11.3	<4.22	<0.68	<1.01	<1.04	<0.76	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
BLK-1	<11.3	<4.22	<0.68	<1.01	<1.04	<0.76	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
BLK-2	<11.3	<4.22	<0.68	<1.01	<1.04	<0.76	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
BLK-3	<11.3	<4.22	<0.68	<1.01	<1.04	<0.76	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48
BLK-6	<11.3	<4.22	<0.68	<1.01	<1.04	<0.76	<0.49	<0.36	<0.46	<0.42	<0.59	<0.36	<0.64	<0.48

AMPLIFIED GEOCHEMICAL IMAGING, LLC
 210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE 19702
 TRAVIS/PETERSON ENVIRONMENTAL CONSULTANTS, AK
 STANDARD TARGET VOCs/SVOCs
 ESTIMATED SOIL GAS CONCENTRATIONS
 GAVORA MALL
 ORDER # 02138

DATAFILE	13DCB, ug/m^3	14DCB, ug/m^3	12DCB, ug/m^3	estimated UNDEC, ug/m^3	estimated NAPH, ug/m^3	estimated TRIDEC, ug/m^3	estimated 2MeNAPH, ug/m^3	estimated Acenaphthylene, ug/m^3	estimated PENTADEC, ug/m^3	estimated Acenaphthene, ug/m^3	estimated Fluorene, ug/m^3
RL =	0.38	0.39	0.37	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
00750576	<0.39	<0.39	<0.37	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
00750577	<0.39	<0.39	<0.37	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
00750578	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00750579	<0.39	<0.39	<0.37	<0.90	<0.90	3.31	<0.90	<0.90	2.49	<0.90	<0.90
00750580	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00750581	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00750582	<0.39	<0.39	<0.37	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
00750583	<0.39	<0.39	<0.37	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
00750584	<0.39	<0.39	<0.37	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
00750585	<0.39	<0.39	<0.37	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
00804458	<0.38	<0.39	<0.36	4.66	1.77	6.37	4.66	<0.88	2.73	<0.88	<0.88
00804459	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804462	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804463	<0.38	<0.39	<0.36	<0.88	<0.88	0.96	<0.88	<0.88	<0.88	<0.88	<0.88
00804464	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804465	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804466	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804466D	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804467	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804468	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804469	<0.38	<0.39	<0.36	1.10	0.95	3.69	<0.88	<0.88	<0.88	<0.88	<0.88
00804470	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804470D	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804471	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804472	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804473	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804474	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804475	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804475D	<0.38	<0.39	<0.36	<0.88	<0.88	1.40	<0.88	<0.88	1.02	<0.88	<0.88
00804476	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804477	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804478	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804479R	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804480	<0.38	<0.39	<0.36	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804482	<0.38	<0.39	<0.37	1.35	<0.88	1.52	<0.88	<0.88	<0.88	<0.88	<0.88
00804483	<0.38	<0.39	<0.37	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804484	<0.38	<0.39	<0.37	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804486	<0.38	<0.39	<0.37	<0.88	<0.88	1.55	<0.88	<0.88	<0.88	<0.88	<0.88
00804487	<0.38	<0.39	<0.37	<0.88	<0.88	2.07	<0.88	<0.88	1.79	<0.88	<0.88
00804487D	<0.38	<0.39	<0.37	<0.88	<0.88	1.77	<0.88	<0.88	1.12	<0.88	<0.88
00804488	<0.38	<0.39	<0.37	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804489	<0.38	<0.39	<0.37	4.66	1.95	11.2	2.75	<0.88	5.27	<0.88	<0.88
00804490	<0.38	<0.39	<0.37	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804491	<0.38	<0.39	<0.37	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804492	<0.38	<0.39	<0.37	<0.88	<0.88	7.51	<0.88	<0.88	10.4	<0.88	<0.88
00804493	<0.38	<0.39	<0.37	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
00804494	<0.39	<0.40	<0.37	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
00804495	<0.38	<0.39	<0.37	<0.89	<0.89	1.19	<0.89	<0.89	<0.89	<0.89	<0.89
00804496	<0.38	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804497	<0.38	<0.39	<0.37	1.78	<0.89	5.54	<0.89	<0.89	3.36	<0.89	<0.89
00804498	<0.39	<0.39	<0.37	2.08	<0.89	1.24	<0.89	<0.89	<0.89	<0.89	<0.89
00804499	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804500	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804501	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804501D	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89

AMPLIFIED GEOCHEMICAL IMAGING, LLC
 210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE 19702
 TRAVIS/PETERSON ENVIRONMENTAL CONSULTANTS, AK
 STANDARD TARGET VOCs/SVOCs
 ESTIMATED SOIL GAS CONCENTRATIONS
 GAVORA MALL
 ORDER # 02138

DATAFILE	13DCB, ug/m^3	14DCB, ug/m^3	12DCB, ug/m^3	estimated UNDEC, ug/m^3	estimated NAPH, ug/m^3	estimated TRIDEC, ug/m^3	estimated 2MeNAPH, ug/m^3	estimated Acenaphthylene, ug/m^3	estimated PENTADEC, ug/m^3	estimated Acenaphthene, ug/m^3	estimated Fluorene, ug/m^3
00804502	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804503	<0.39	<0.39	<0.37	<0.89	<0.89	0.96	<0.89	<0.89	<0.89	<0.89	<0.89
00804503D	<0.39	<0.39	<0.37	<0.89	<0.89	1.08	<0.89	<0.89	<0.89	<0.89	<0.89
00804504	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804505	<0.39	<0.39	<0.37	38.5	<0.89	38.7	<0.89	<0.89	4.33	<0.89	<0.89
00804507	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804508	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804509	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804510	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804511	<0.39	<0.39	<0.37	3.55	<0.89	2.79	<0.89	<0.89	<0.89	<0.89	<0.89
00804512	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804513	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804514	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804515	<0.39	<0.39	<0.37	1.83	<0.89	2.48	<0.89	<0.89	0.96	<0.89	<0.89
00804516	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804517	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00804518	<0.39	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
00750586	<0.38	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
BLK-1	<0.38	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
BLK-2	<0.38	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
BLK-3	<0.38	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
BLK-6	<0.38	<0.39	<0.37	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89

KEY TO DATA TABLE

UNITS

µg	micrograms, relative mass value
µg/m ³	micrograms per cubic meter; estimated soil gas concentration
µg/L	micrograms per Liter; calculated water concentration

DATA QUALIFIERS

>	greater than; value exceeds calibration range, estimated value
<	less than; compound value is below the LOD and RL
J	mass value below LOQ or RL, but above LOD, estimated mass value
E	mass value exceeds upper calibration level, estimated mass value
Q	one or more quality control parameters failed for the compound

ABBREVIATIONS

AVG RL	average reporting limit; calculated based on individual field sample RLs
LOD	limit of detection
LOQ	limit of quantification
MDL	method detection limit
RL	reporting limit

1112TetCA	1,1,1,2-tetrachloroethane	CIBENZ	chlorobenzene
111TCA	1,1,1-trichloroethane	ct12DCE	cis- & trans-1,2-dichloroethene
1122TetCA	1,1,2,2-tetrachloroethane	EtBENZ	ethylbenzene
112TCA	1,1,2-trichloroethane	mpXYL	m-, p-xylene
11DCA	1,1-dichloroethane	MTBE	methyl t-butyl ether
11DCE	1,1-dichloroethene	NAPH	naphthalene
124TMB	1,2,4-trimethylbenzene	OCT	octane
12DCA	1,2-dichloroethane	oXYL	o-xylene
12DCB	1,2-dichlorobenzene	PCE	tetrachloroethene
135TMB	1,3,5-trimethylbenzene	PENTADEC	pentadecane
13DCB	1,3-dichlorobenzene	PHEN	phenanthrene
14DCB	1,4-dichlorobenzene	t12DCE	trans-1,2-dichloroethene
2MeNAPH	2-methyl naphthalene	TCE	trichloroethene
BENZ	benzene	TMBs	combined masses of 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene
BTEX	combined masses of benzene, toluene, ethylbenzene, and total xylenes (Gasoline Range Aromatics)	TOL	toluene
C11,C13&C15	combined masses of undecane, tridecane, and pentadecane (C11+C13+C15) (Diesel Range Alkanes)	TPH	total petroleum hydrocarbons
c12DCE	cis-1,2-dichloroethene	TRIDEC	tridecane
CCl4	carbon tetrachloride	UNDEC	undecane
CHC13	chloroform	VC	vinyl chloride

SUMMARY OF SAMPLING RATE CALIBRATION FOR AGI SPG-0008 SAMPLER IN A GAS PHASE

PURPOSE:

The purpose of this document is to:

1. Summarize the test protocol,
2. Summarize the methodology for analysis of data,
3. Present general results for generating concentration calibration

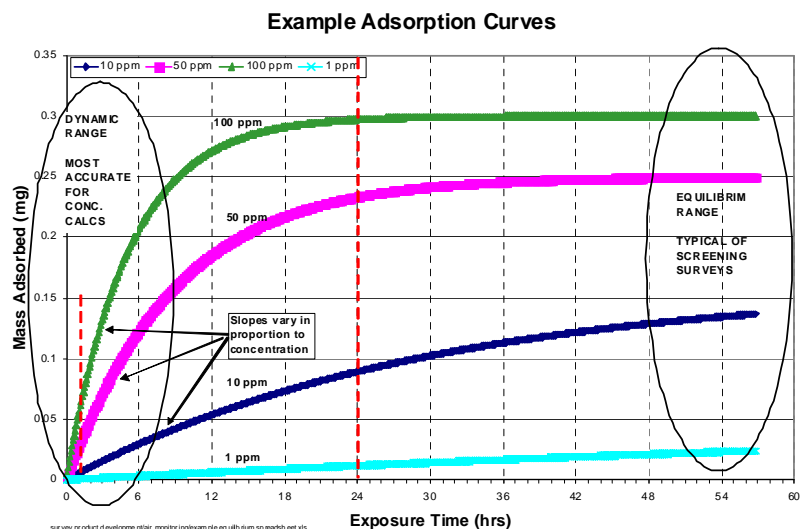
of the AGI Sampler, SPG-0008, in a gas phase (air or soil gas) following AGI's "Standard practice for determining the sampling rate of passive diffusion samplers in various environmental media," SPG-SOP-0493. The work will be summarized in two parts: Part 1: air, Part 2: soil gas.

Principle of Operation of the AGI Sampler

The AGI Sampler is designed with solid adsorbents enclosed inside a tubular microporous PTFE membrane. When placed in soil or saturated soil, the pores and hydrophobic nature of the PTFE keep liquid water from entering the membrane. The membrane will not keep water vapor from entering but the adsorbents are very hydrophobic and testing of the SPG-0008 sampler has validated it to be unaffected by this moisture vapor. Compounds in air with vapor pressures above about 1 millionth of a mm of Hg will diffuse through the microporous membrane and be immediately captured on the solid adsorbent housed inside. The membrane porosity and dimensions are well controlled as is the mass of the adsorbent contained inside the sampler. The average pore diameter of the membrane is 1000 times larger than that of the compounds of interest, meaning the membrane offers a minimal resistance. On the other hand, the membrane pore size is small enough that colloidal particles and microbes can not pass through the membrane. This keeps the adsorbent from getting contaminated and eliminates any need to add preservative or chill during storage or transportation.

When a sampler is exposed to compounds in air, mass from the volatile compound are collected on the solid adsorbent inside the microporous PTFE membrane. To the right is a generalized example of mass uptake with time for this sampler.

Notice the initial slope and ultimate equilibrium mass both increase with increasing concentrations. For shorter time the increase is virtually



linear but as the mass increases toward the steady state, mass uptake slows and mass eventually reaches an asymptote. The initial range is referred to as the dynamic linear range while the later stage is referred to as the equilibrium range.

The sampling rate calibration for this passive sampler will apply to the linear and near-linear dynamic range, where accuracy and precision are best.

Temperature can affect both the diffusivity in air, which is part of the sampling rate but also the binding energy of the compound to the adsorbent. In general passive sampling devices are not highly affected by temperature although the effect will be more important for lower MW compounds. It is not uncommon to have an Arrhenius factor, $-E_a/R$ of <1000 , which means a 5°C temperature change will make less than a 5% change in sampling rate.

In soil, the matrix of particles and water creates a resistance to soil gas diffusion. Millington (Millington 1959) has modeled this resistance and developed a model to correct the diffusion for this added resistance based upon the porosity of the soil and the fraction of pores filled with water. This "Soil Effectiveness Factor" can lower the sampling rate in soil to 40% to 10% of that in free air. This will be discussed further in Part 2.

PART 1: Calibration in Air

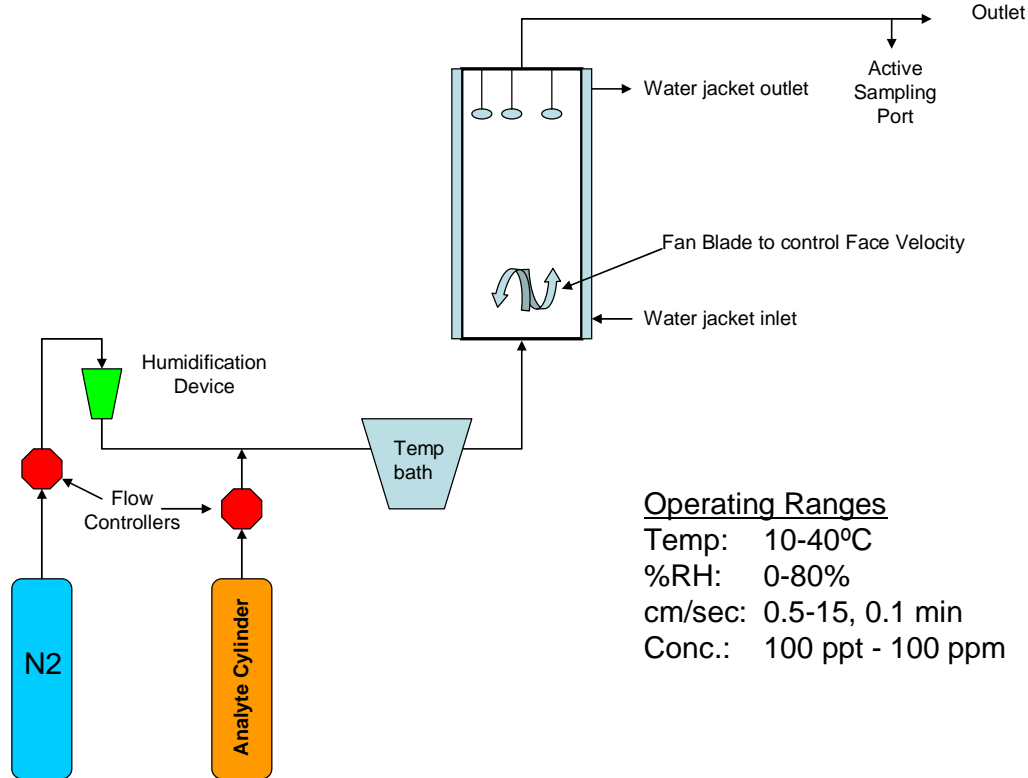
Part 1 summarizes the work in free air generating calibration data, evaluating the physical and chemical factors affecting the sampling rate, and measurement of the actual sampling rates or regression calibration equations needed to determine concentrations.

Sample Generation in Air

In this calibration work, gaseous mixtures of analytes at known concentrations were generated inside a 3 liter glass vessel by mixing flow from gaseous standard cylinders with nitrogen using electronic flow controllers. A diagram of the set up is shown below. Total flow through the vessel ranged from 2 to 50 liters/min with an aim, where possible, of using a flow 20 or more times the combined sampling rate of AGI® Sampler being tested.

This gas mixture was temperature controlled by running it through a coil in a temperature controlled chiller. Similarly, the glass vessel was also temperature controlled by circulating the chiller fluid through the vessel jacket. A mercury thermometer in the vessel was used to determine the experiment temperature. The humidity level of the mixed gas was modified by passing the nitrogen portion of the gas mixture through a bubbler. Different humidity levels could be achieved by using water or saturated salt solutions in the bubbler that generate different relative humidities.

Passive Diffusion Sampling Rate Measurement Apparatus



Internal wind velocity was controlled using a propeller blade attached to a shaft and motor. RPM was measured to calculate air velocity based on propeller pitch and rpm.

Before each experiment, the system was run for minutes to hours to allow temperature, humidity, and compound density on the vessel walls to stabilize. When changing concentrations, a stabilization time, typically, 2-10 hours, was provided to allow the vessel walls to reach a new equilibrium with the analyte concentrations and wall temperature.

AGI samplers were hung inside the vessel at time zero. They were removed at various intervals to generate samples along with duplicates that showed mass increasing with exposure time. The sampler exposure time was selected to span minutes to hours and was generally reduced for high concentration tests to maintain uptake with time, in roughly the linear dynamic range. Samplers were removed and placed back into their original jars for analysis. They were analyzed by AGI's 8260C method (SPG-WI-0318 or SPG-WI-10028) in duplicate, which is based on EPA SW846 Method 8260C.

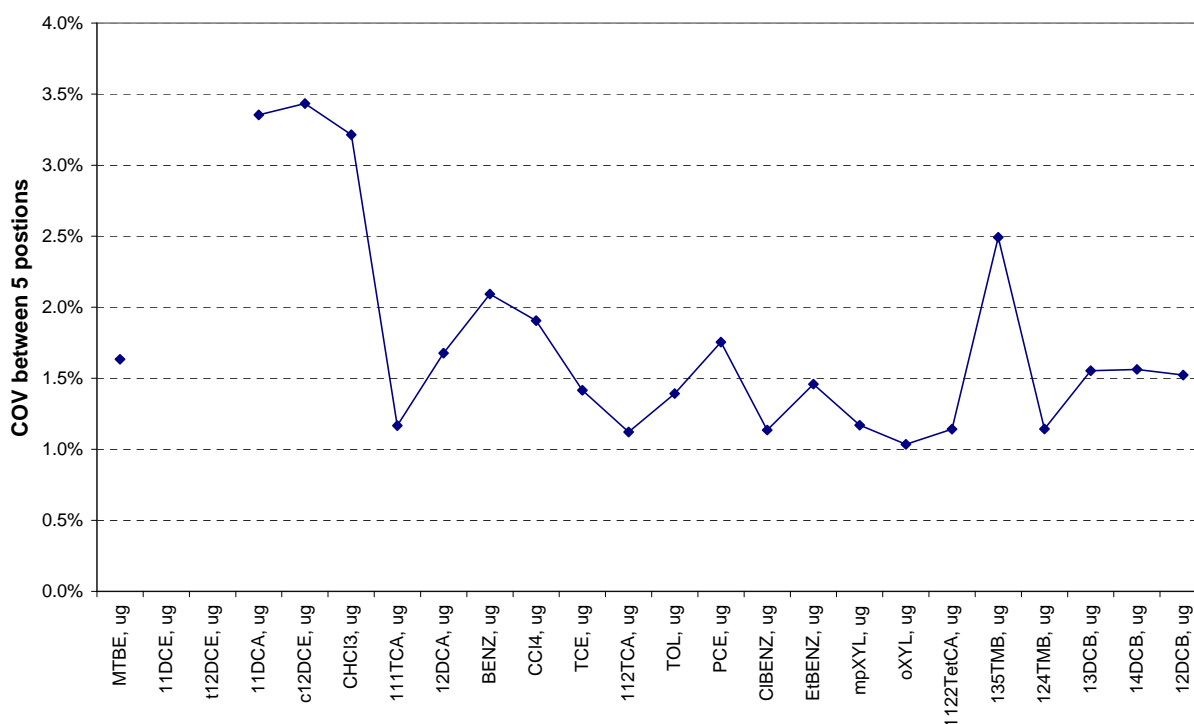
Vessel concentration was also measured during the tests using a TO-17 type of method. A MSA pump pulled about 1.5 L/hr of atmosphere from the chamber through two thermal desorption tubes in series, the first packed with Tenax-TA, and the second packed with a strong adsorbent carbon molecular sieve. Flow rate through the series of tubes was measured at the start and end of the pumping. Analysis of the thermal desorption tubes were performed by appropriate

analytical methods. Each Tenax-TA tube was analyzed by AGI's 8260C method (SPG-WI-0319 or SPG-WI-10028) and each carbonaceous tube by AGI's screening method (SPG-WI-0292). Typically only a small portion of the lower molecular weight compounds, such as DCA & DCE passed through the Tenax-TA tube to be captured on the carbon tube. Concentration was determined by

$$(\text{sum of mass on both tubes}) / (\text{avg flow rate} \times \text{hours}) = \text{ug/L}$$

Up to five sampler can be placed simultaneously in the chamber. Testing confirmed good sample uniformity among the locations as shown by coefficients of variation generally below 3% in the chart below.

Good Sample Uniformity between 5 Positions



Most of the runs were performed using a TO-15 mix of compounds in a cylinder made up at nominally 1 ppm. Using nitrogen dilution, sampling rate measurements were done at concentrations from about 1 ppb to 50 ppb. Higher concentration cylinders can be used to generate concentrations in the ppm range if desired.

Sampling rate calibrations were run using multiple concentrations, typically 5-50 ppb and temperatures, typically 5°C to 35°C. Samples were run in duplicate. A total of 94 data points were generated using 23 compounds from AGI's standard compounds list. In addition, another 23 compounds were tested from those in the TO-15 mix. This is a living calibration and as additional data are generated, they may be qualified and added to this data set to improve the precision of the sampling rate calibration and broaden the compound list.

Key Variable Effects

Based on theory, at short to moderate exposure times mass will increase roughly linearly proportional to exposure time, as well as, proportional to concentration. For passive samplers in air, temperature generally does not have a major effect on sampling rate. Even so, this work examined the impact of temperature because it could have a small effect on diffusivity in air and potentially adsorption strength for low MW compounds.

Except in indoor environments, air velocity is expected to be low and of inconsequential importance. The passive adsorbent is protected by wind stopping AGI membrane. Even so, we looked at velocity effects. Based on the hydrophobic nature of the adsorbents in SPG-0008 sampler, humidity is not expected to impact sampling rate.

Sampling rate has been found to be generally independent of concentration and time at mass values significantly below saturation. In the following sections we have characterized the sampling rate for each compound as affected by temperature and also developed calibrations using regression which account for the minor impact of time, and mass.

Concentration using Simple Sampling Rate Determination

A simple way to determine concentration is to measure mass on the AGI sampler, divide by exposure time, and divide by sampling rate, SR.

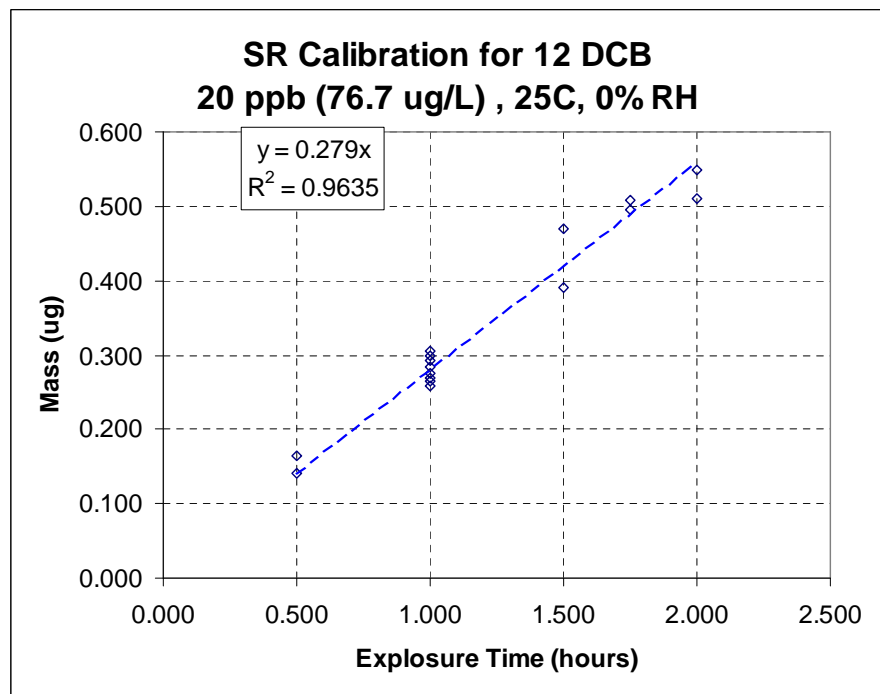
$$\text{Conc [ug/L]} = \text{mass/time/SR} \quad (1)$$

The sampling rate can be determined via measurements of mass versus time at a known concentration and temperature according to the following modification of equation (1).

$$\text{SR} = \text{mass/time/concentration} \quad (2)$$

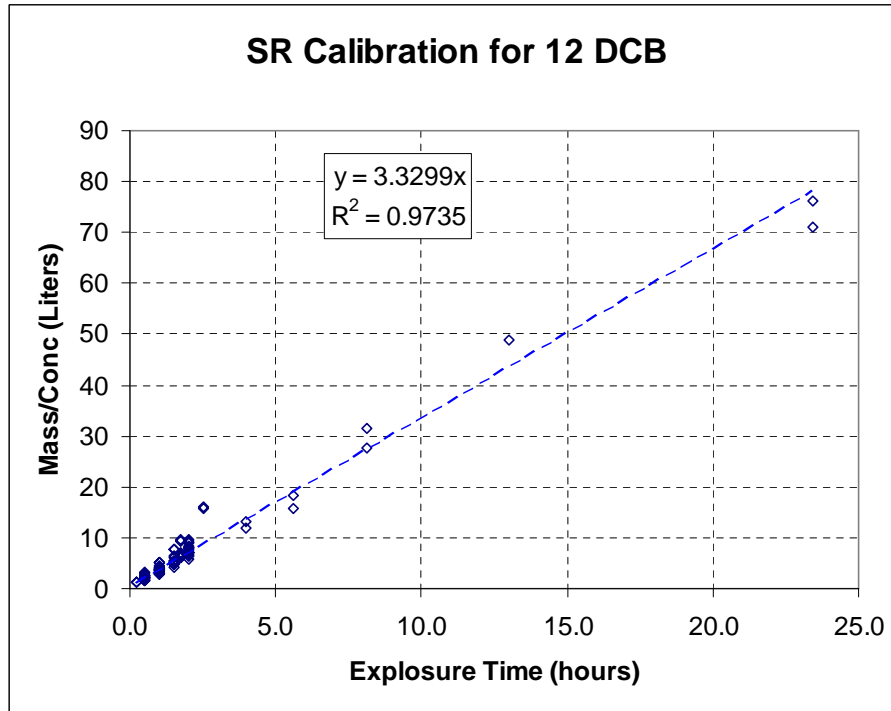
Sampling rates in L/hr were determined by measuring the trend or regression mass uptake versus time and dividing by the concentration. Such a sampling rate can be measured at any concentration and temperature.

The chart to the right shows a plot of mass versus time at 12DCB in nitrogen at nominally 20 ppb or 76.7 ug/cu m and



297K. This is actual data for one test run. The slope of 0.279 ug/hr divided by the concentration of 0.0767 ug/L yields a sampling rate, SR, of 3.64 L/hr.

The data could also be plotted as mass/Conc vs. time in which case the slope is the sampling rate directly as shown in the chart below. This allows the use of a larger data set incorporating multiple concentration tests.



Rigorous Concentration using Regression

A preferred method for determining concentration that will yield improved accuracy over a wide range of concentrations, exposure times, and temperatures is to use all data in a regression analysis. This allows adjustments for the minor non-linear influences of mass and time as well as the effects of temperature. This is done by regressing equation (1) or a universal version of equation (1)

$$\text{Conc} = (\text{mass})^b / (\text{time})^{-d} / [\text{SRo} * \exp(-Ea/R/T)] \quad (3)$$

The subtle non-linear effects of mass and time will be evident in the deviation of coefficients b and d from 1.0. This regression generates four constants b, d, SRo, and $-Ea/R$ by regressing $\ln(\text{conc})$ versus $\ln(\text{mass})$, $\ln(\text{time})$, $1/\text{temp}$. These four constants can be used to determine concentration via the equation:

$$\text{Conc} = (\text{mass})^b / (\text{time})^{-d} / [\text{SRo} \times \exp(-Ea/R(1/T))] \quad (4)$$

Where conc is in ug/L, mass is in ug, time in hours, T in degrees Kelvin.

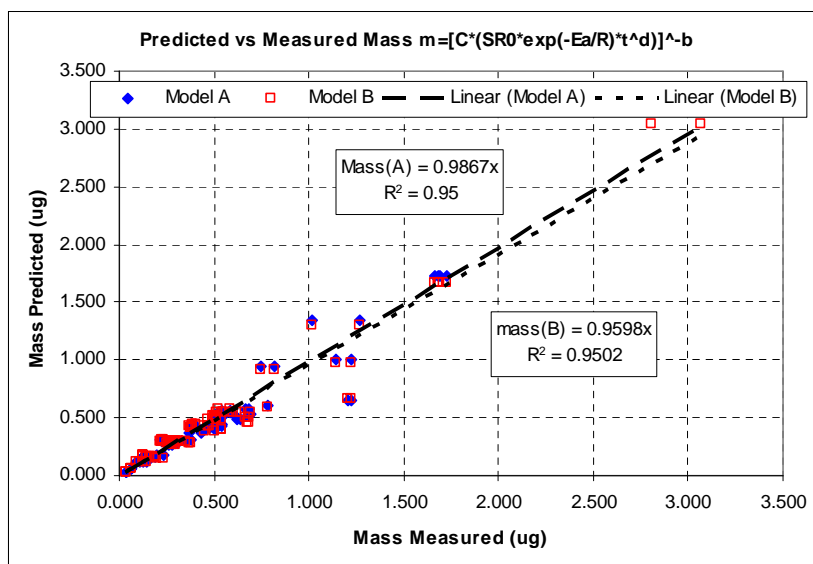
Equation (4) can also be expressed at a reference temperature, T_r , such as 15°C by

$$\text{Conc} = (\text{mass})^b / (\text{time})^{-d} / [\text{SRr} \times \exp(-E_a/R(1/T_r - 1/T))] \quad (5)$$

This allows sampling rates, SRr , at any reference temperature, T_r , and for any analyte to easily be compared. These values of SRr at 25°C 298.14°K can be found in Table A.

The chart to the right is a plot of the 12DCB predicted mass from the 4 constant regression compared to the measured mass. Agreement is excellent for the 95 data points.

Model A or the blue points are the 4 constant model, while Model B or the red squares are a 3 constant model ignoring temperature. Error for 12DCB is slightly lower for Model A and for lower MW compounds it is much better.



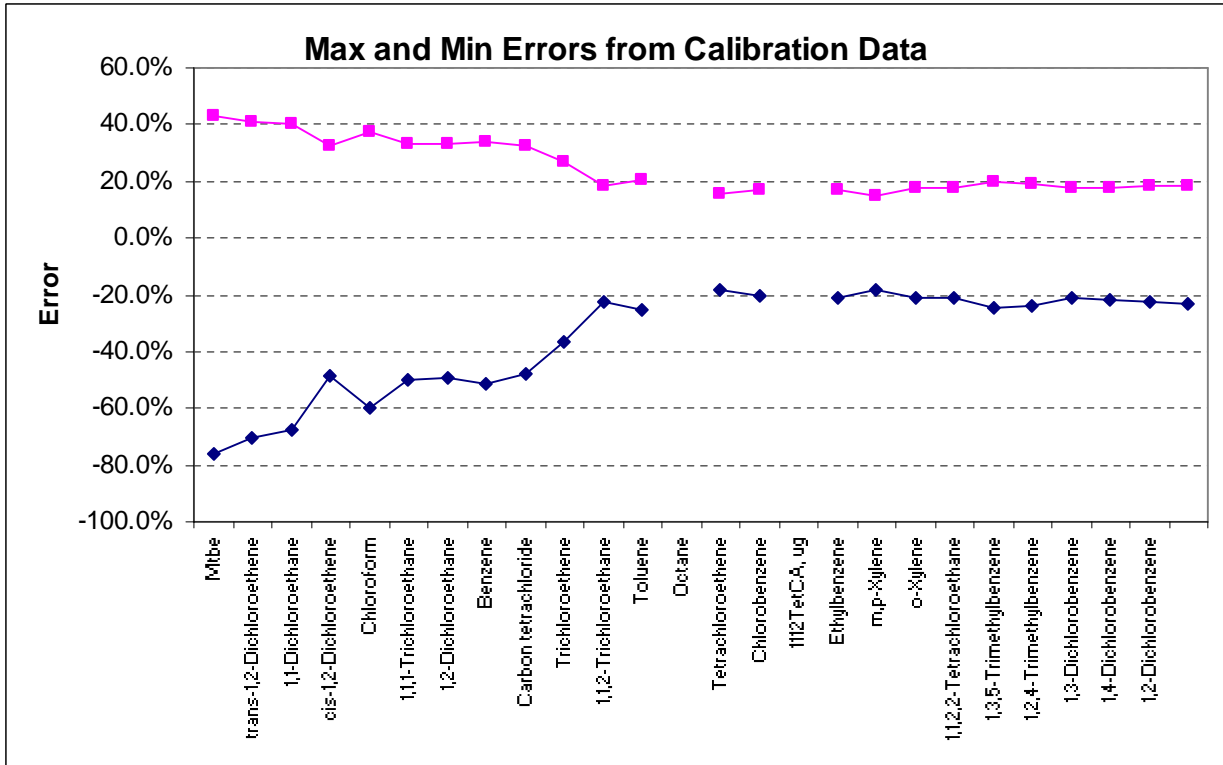
The 4 constant equation has been adopted for determining concentration in the gas phase.

Table B shows the tabulated summary of the 4 constants regression with R_{sq} values and error estimates for the 4 constants for each analyte. With the exception of MTBE and t12DCE the regression R_{sq} values are 0.9 or greater for each analyte. In general, temperature is more important for early eluting compounds where $-E_a/R$ ranges from 2000 to 4000 while later eluting compounds (112TCA and above) are in the range of 500 to 1000 meaning they are less affected by temperature. Similarly, early eluting compounds have mass and time coefficients, b and d respectively, that deviate from 1.0.

Error Estimates

Table C shows the error in the mass values from the 8260C low sensitivity method (SPG-WI-318), which at a 95% confidence level is typically 10% - 15%. The error between the primary sample and the duplicate in the sampler is generally about 5% and shown in table D.

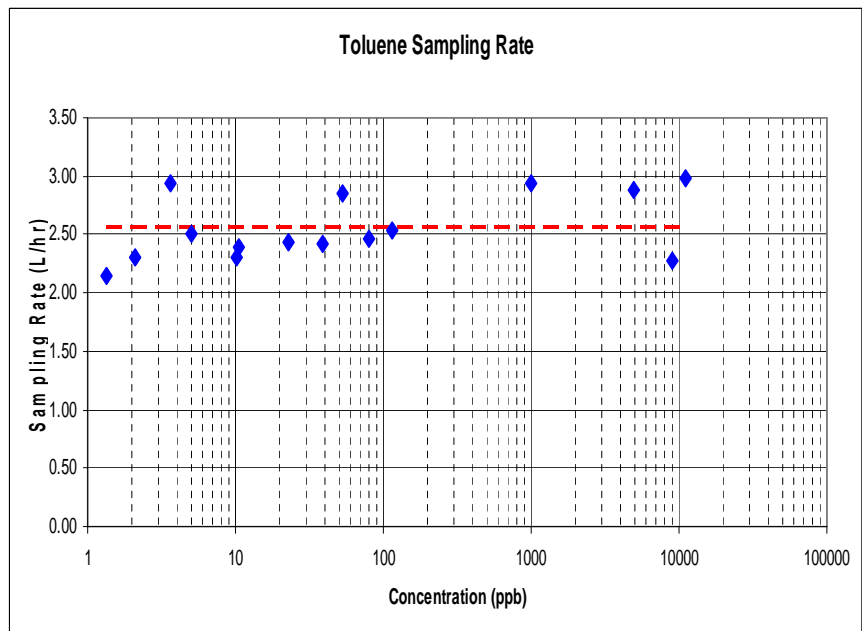
The standard error of the regression and standard errors of the constants can be found in table B. For each compound we have measured the error between the derived concentration and the actual concentration. This is tabulated in table D and shown below by compounds.



The maximum total error range is +/-20% for 112TCA and later eluting compounds. The maximum error range increases for compounds that elute earlier than 112TCA.

Effect of Concentration

The measurement of sampling rate, SR, is effectively independent of concentration. The chart below shows statistically consistent sampling rate over four decades of concentration change for toluene. This has also been observed for other tested compounds.



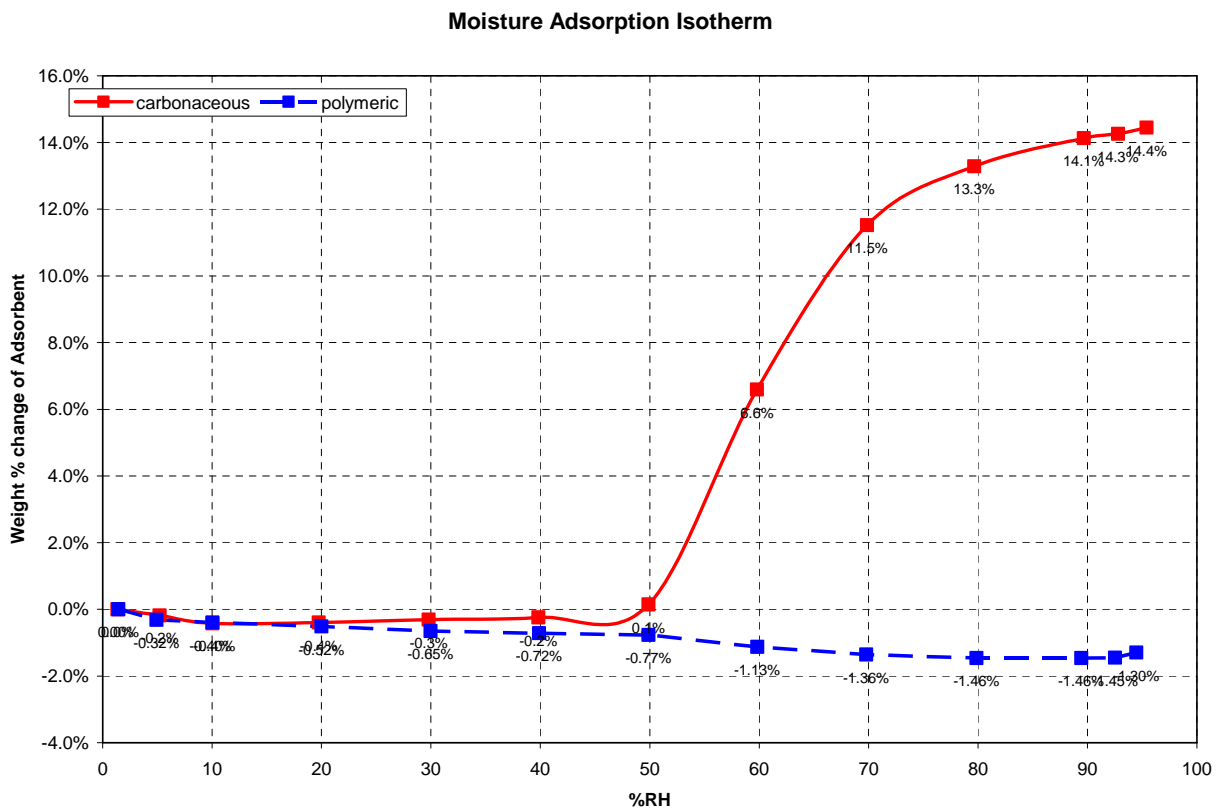
Sorbent Saturation

As mass increases on a solid sorbent and approaches saturation, reverse diffusion can occur causing the sampling rate to drop. Eventually the mass level will reach a maximum steady state value at any concentration. A rate of mass uptake with time that deviates significantly from linear, indicates that sorbent saturation could be an issue. When using equation (1), staying in the linear range to avoid the effects of adsorbent saturation is important. We recommend keeping the total mass on the sampler below 50 ug or flagging when this is exceeded.

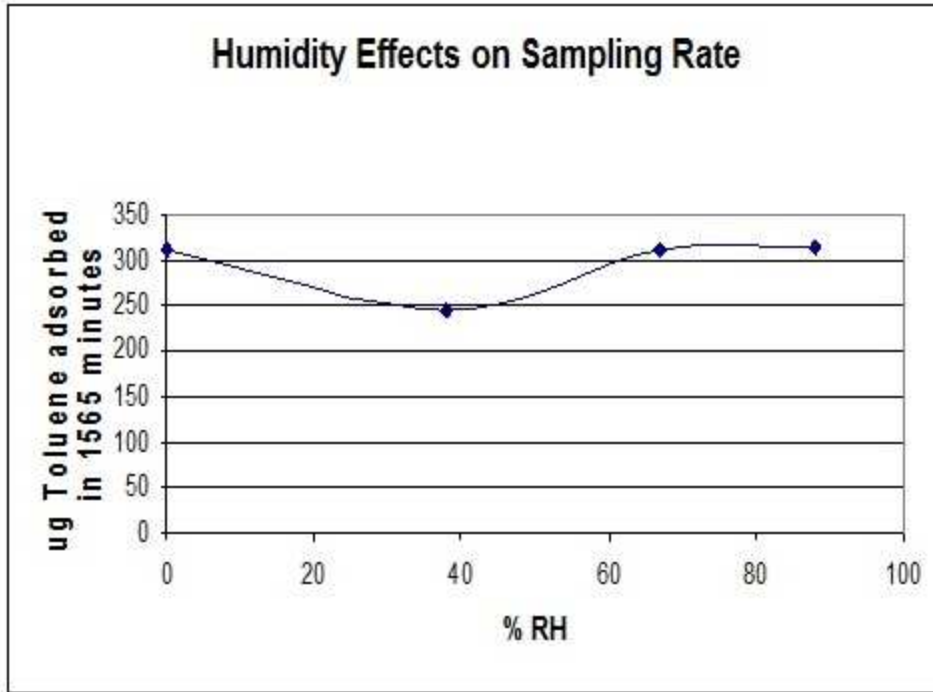
The 4 constant regression accounts for some of the non linearity allowing good accuracy at higher mass levels. From the experimental data we have found this safe range can be extended potentially up to 100 ug.

Effect of Relative Humidity

The adsorbent system used in the SPG-0008 sampler is a proprietary multi-polymer system. It was tested compared to a carbon adsorbent in a RH chamber for weight gain and found to be effectively unaffected by moisture.



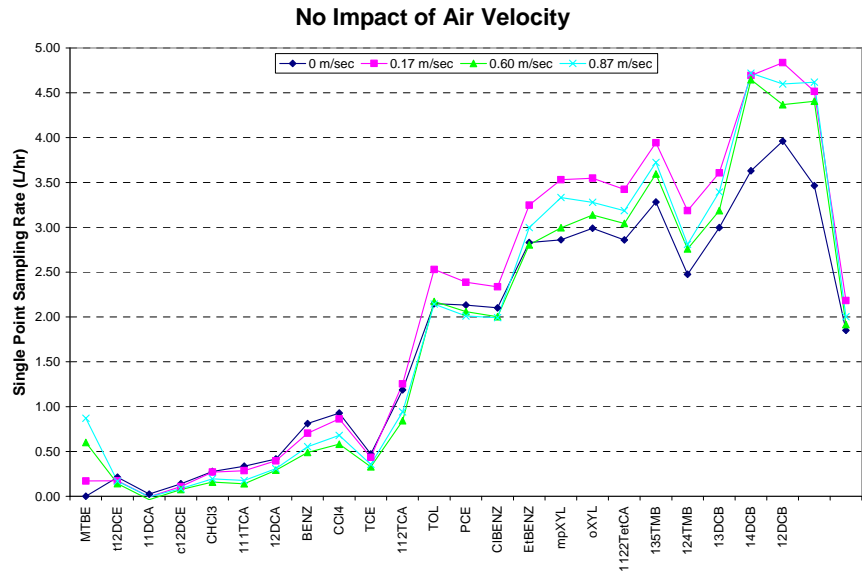
Additionally, mass adsorption was relatively constant at relative humidity ranging from 0% to 95%.



Impact of Air Velocity

To examine the potential impact of air velocity on sampling rate, five samplers were exposed for varying times up to 2 hours at 20 ppb of TO-15 mixture.

The chart to the right shows the calculated sampling rates from zero to 0.87 m/sec velocity. There is no structured impact of velocity on sampling rate.

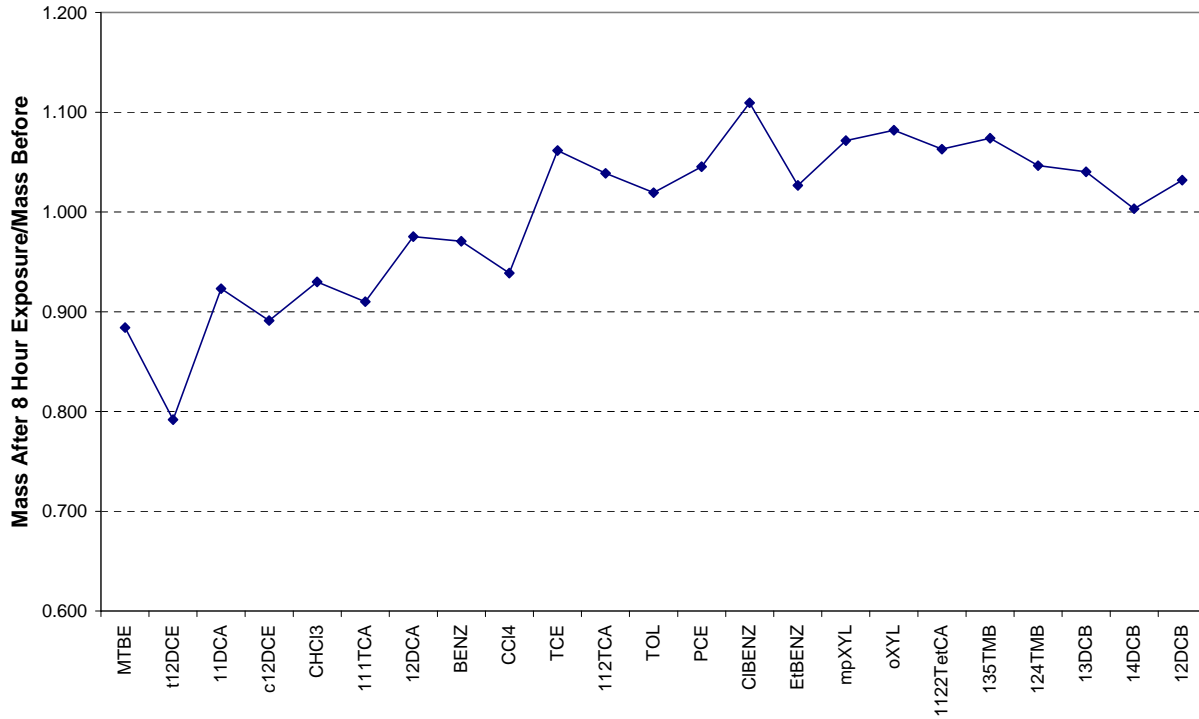


Impact of Open Sampler Jar

Typically returning the exposed sampler to its jar and tightening the lid will maintain the mass. A test was run to look at the unexpected consequence of leaving the sampler in fresh air for 7.5 hours after exposure to 20 ppm of TO-15 mixture for 1 hour. Three samplers were tested without ambient air exposure and two with exposure and their mass levels measured. The chart below shows most compounds masses after the 7.5 hour exposure to fresh air are within 10%. One compound, t12DCE, is more affected losing 20% in this time.

Ambient air exposure post sampling would typically be expected to be < 5 minutes, so based on this we do not expect this will cause significant errors in reported mass or concentration. Care should be taken not to pinch the sampler between the jar and lid, which could allow contamination into the sample or loss of lower molecular weight compounds.

Impact of 8 hour bench exposure



Part 2: Calibration in Soil

Part 2 describes the effect of soil on the sampling rate and concentration measurement.

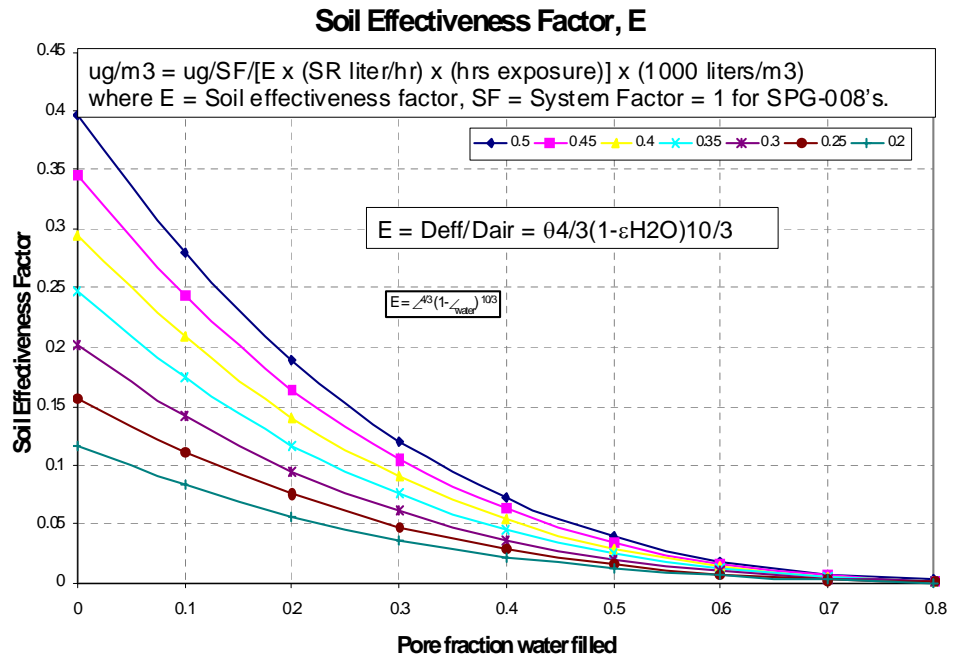
In a porous media, such as soil, diffusion of the analyte in the soil gas to the sampler is restricted. More porous soils have less restriction. This restriction has been experimentally modeled by Millington (Millington, R. J., “Gas Diffusion in Porous Media”, Science, (1959), Vol. 130, 100-102) and found to be represented by the equation below:

$$SR_{soil} = E(SR_{air}) \tag{6}$$

where E is the “Soil Effectiveness Factor” expressed a function of total soil porosity (θ) and water filled porosity (ε , volume of water/volume of pores) as:

$$E = \theta^{(4/3)}(1 - \varepsilon)^{(10/3)} \tag{7}$$

The chart to the right shows how E varies with soil porosity and fraction of pores filled with water.



Summary

The AGI Sampler can be used to determine the concentration of volatile and semi-volatile compounds in a gas phase. This requires knowing the exposure time and temperature and if in soil also requires values or estimates for soil porosity and the fraction of pores filled with water. Regressions of large amounts of data were used to generate a four constant equation to generate concentration values in air. Potential error in the concentration values is excellent typically less than 20% when used in gas phase sampling within the following conditions:

Condition	Acceptable Range
Temperature	0°C to 35°C
Velocity	0 to 0.9 m/sec
Relative Humidity	0 – 95%
Mass Level	0.01 – 50 ug

TABLE A
AIR SAMPLING RATES STANDARD LIST

	SR @ 298.94
MTBE	1.10
t12DCE	1.08
11DCA	0.96
c12DCE	1.51
CHCl3	1.18
111TCA	0.75
12DCA	1.87
BENZ	1.91
CCl4	0.93
TCE	1.83
112TCA	2.40
TOL	2.54
OCT	
PCE	2.33
CIBENZ	3.05
1112TetCA	
EtBENZ	3.02
mpXYL	3.02
oXYL	3.10
1122TetCA	3.35
135TMB	3.19
124TMB	3.35
13DCB	3.97
14DCB	4.09
12DCB	3.93
Total mass	1.80

Values in L/hr, Total mass does not include Oct, 1112TetCA (23 compounds)

TABLE B

4 CONSTANT REGRESSION OUTPUT

	Adjusted Rsq	Standard Error	ln(SR0)	b	- Ea/R	d	Std Error ln(SR0)	Std Error b	Std Error - Ea/R	Std Error d
MTBE	0.77	0.2684	6.1531	0.7137	-1862	-0.2973	1.1215	0.0421	309	0.0346
t12DCE	0.80	0.2498	14.2118	0.6315	-4261	-0.1411	1.2463	0.0358	343	0.0323
11DCA	0.91	0.2016	13.7734	0.8038	-4094	-0.2544	0.8973	0.0294	251	0.0258
c12DCE	0.89	0.2092	9.4567	0.7241	-2941	-0.2710	0.8774	0.0286	248	0.0267
CHCl3	0.91	0.2048	12.2405	0.8364	-3699	-0.3365	0.8737	0.0294	246	0.0261
111TCA	0.94	0.1701	8.3160	0.9176	-2393	-0.5136	0.6652	0.0257	189	0.0222
12DCA	0.92	0.1921	9.0559	0.8093	-2886	-0.4404	0.7728	0.0275	220	0.0248
BENZ	0.89	0.2178	7.6871	0.7990	-2485	-0.4583	0.8687	0.0326	247	0.0286
CCI4	0.91	0.2219	7.0239	0.8972	-2071	-0.5182	0.8597	0.0324	246	0.0289
TCE	0.94	0.1680	7.0333	0.8809	-2276	-0.5871	0.6541	0.0244	188	0.0224
112TCA	0.97	0.1401	3.0297	0.9933	-1165	-0.8405	0.5251	0.0205	153	0.0202
TOL	0.96	0.1468	2.9135	0.9448	-1147	-0.7896	0.5506	0.0220	160	0.0213
OCT										
PCE	0.97	0.1229	2.2557	0.9912	-925	-0.8337	0.4611	0.0183	134	0.0178
CIBENZ	0.97	0.1410	1.2078	0.9832	-693	-0.8819	0.5267	0.0210	153	0.0211
1112TetCA										
EtBENZ	0.96	0.1521	0.4685	0.9696	-469	-0.9107	0.5663	0.0226	165	0.0231
mpXYL	0.96	0.1505	0.7733	0.9883	-560	-0.9123	0.5594	0.0227	163	0.0229
oXYL	0.96	0.1554	0.5660	0.9495	-506	-0.8713	0.5776	0.0233	169	0.0234
1122TetCA	0.95	0.1715	0.5319	0.9793	-519	-0.9313	0.6375	0.0252	186	0.0262
135TMB	0.94	0.1783	1.1480	0.9370	-688	-0.8545	0.6646	0.0266	194	0.0266
124TMB	0.95	0.1702	1.4973	0.9590	-807	-0.8819	0.6368	0.0255	185	0.0257
13DCB	0.95	0.1641	0.9194	0.9644	-685	-0.8908	0.6115	0.0245	178	0.0250
14DCB	0.95	0.1619	1.4086	0.9556	-840	-0.8854	0.6030	0.0242	176	0.0246
12DCB	0.95	0.1713	0.9920	0.9620	-704	-0.9037	0.6388	0.0254	186	0.0261
Total mass	0.966	0.1302	3.4894	0.9213	-1215	-0.7716	0.4835	0.0195	142	0.0190

TABLE C
8260C MASS UNCERTAINTY

AGI 8260C Method for Mass using SPG-0008 Sampler

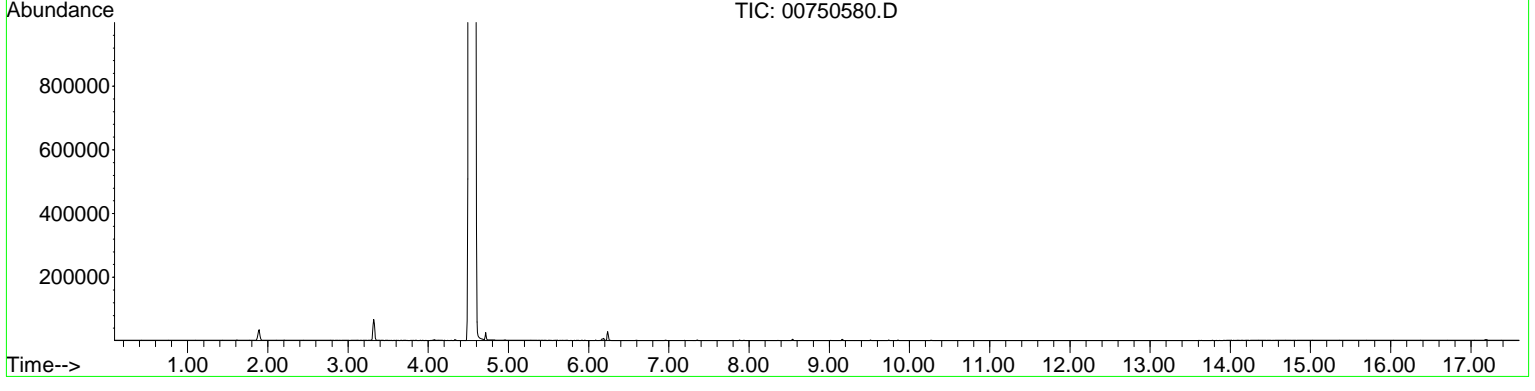
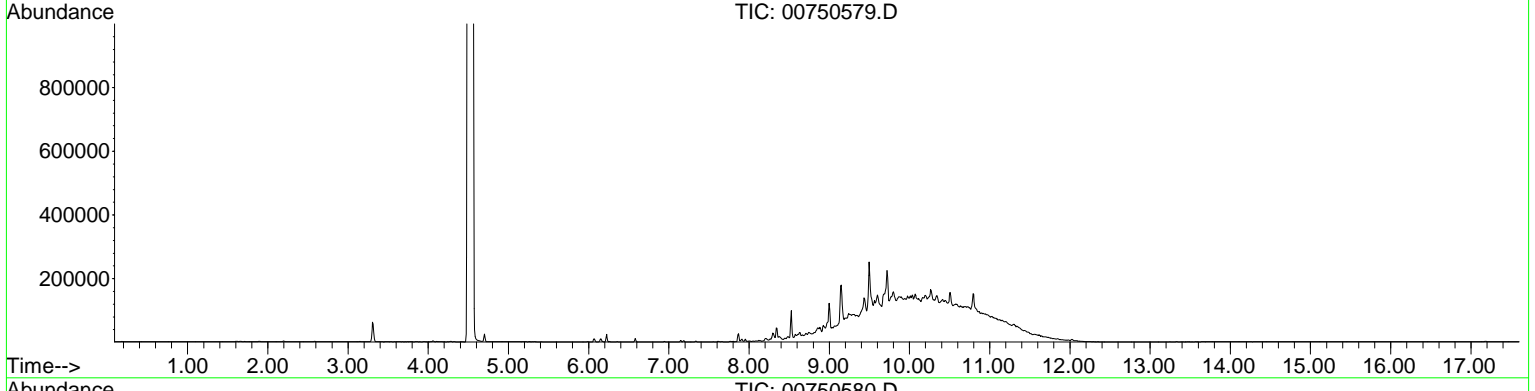
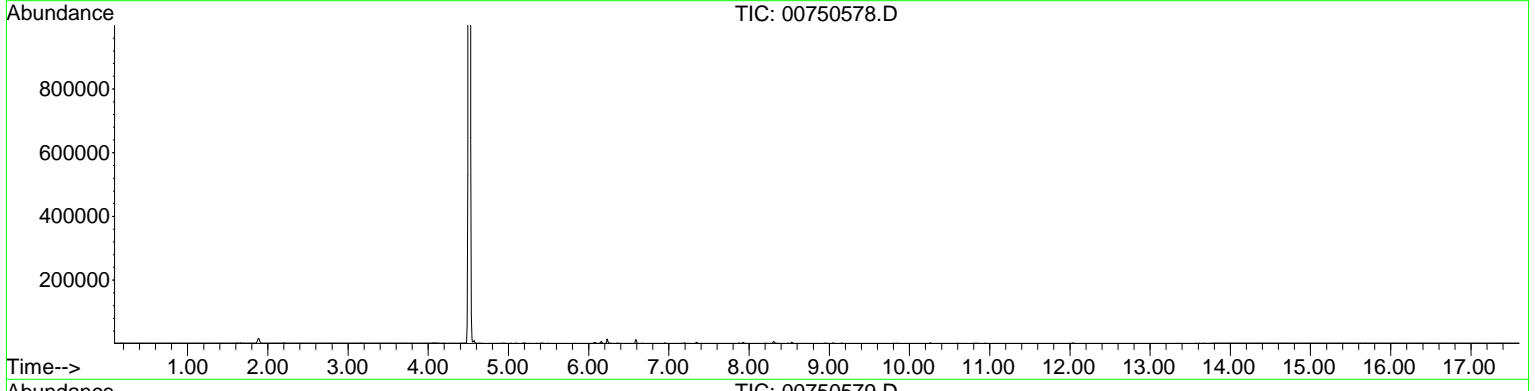
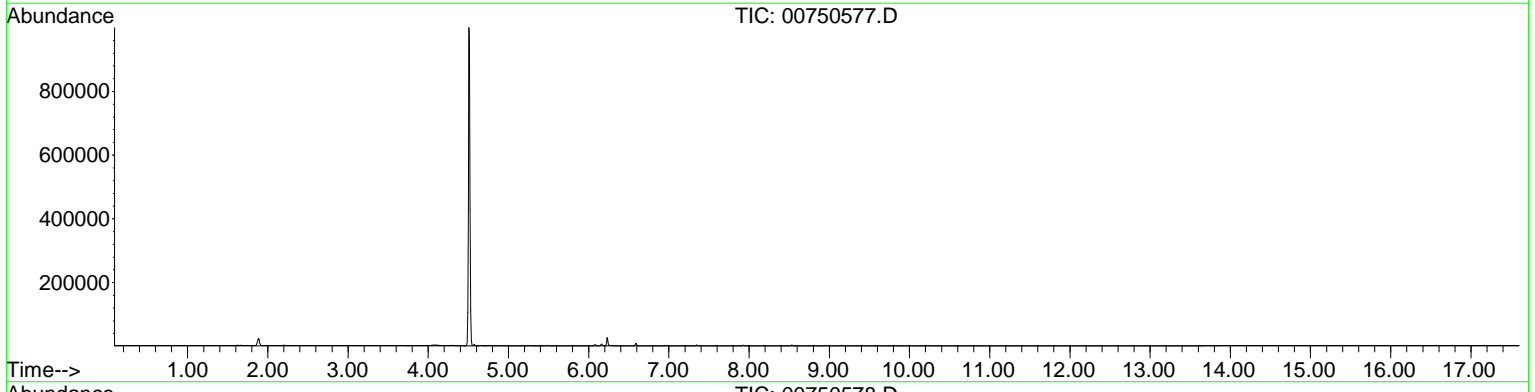
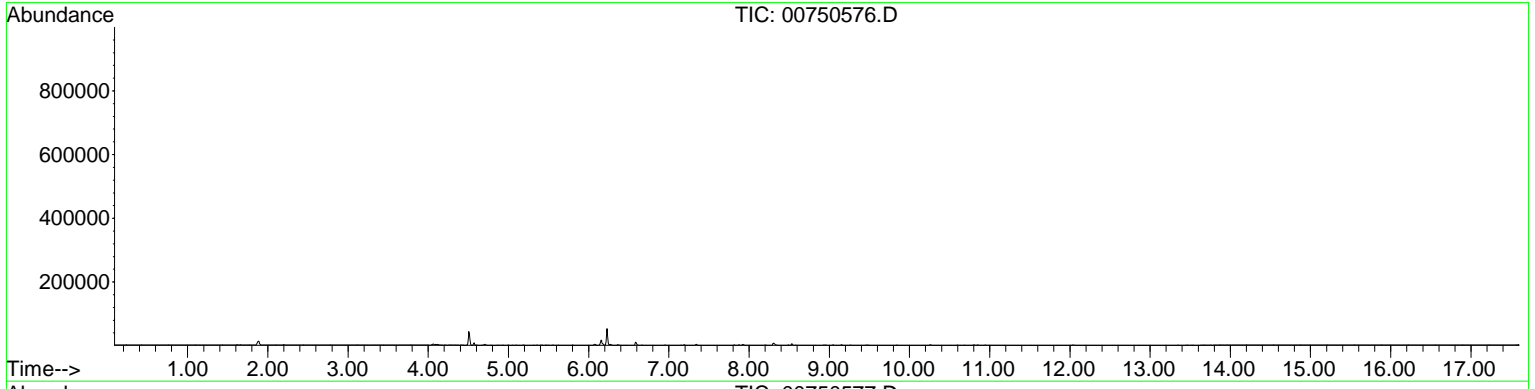
	99% Uncertainty Range +/-	95% Uncertainty Range +/-
MTBE	20%	14%
t12DCE	22%	15%
11DCA	18%	12%
c12DCE	18%	12%
CHCl3	16%	11%
111TCA	18%	12%
12DCA	20%	13%
BENZ	16%	10%
CCl4	19%	12%
TCE	15%	10%
112TCA	18%	12%
TOL	15%	10%
OCT	20%	13%
PCE	16%	11%
CIBENZ	18%	12%
1112TetCA	19%	13%
EtBENZ	18%	12%
mpXYL	18%	12%
oXYL	18%	12%
1122TetCA	23%	15%
135TMB	21%	14%
124TMB	20%	14%
13DCB	19%	13%
14DCB	19%	13%
12DCB	20%	14%
NAPH	21%	14%
2MeNAPH	25%	17%

TABLE D
4 CONSTANT AIR CONCENTRATION UNCERTAINTY

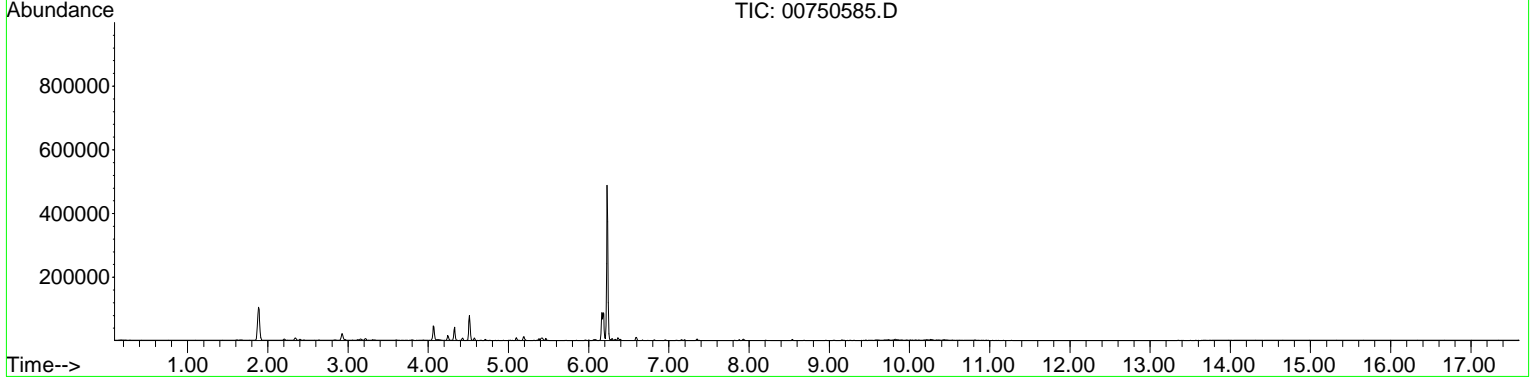
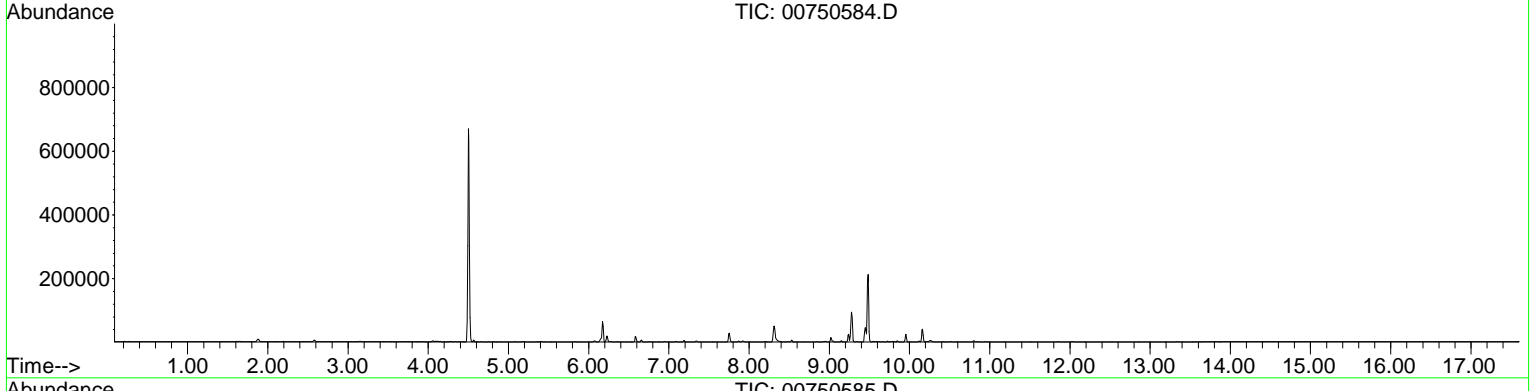
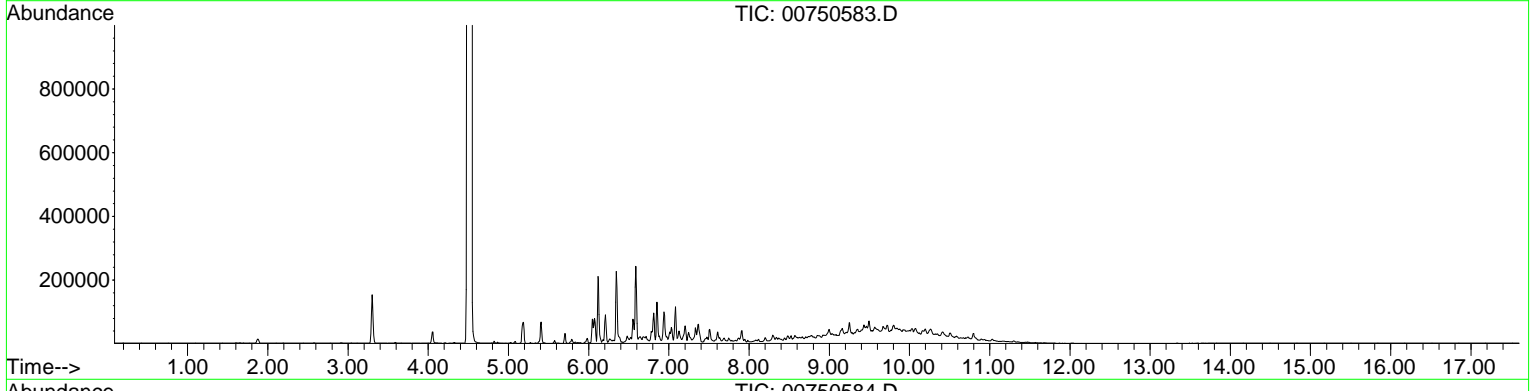
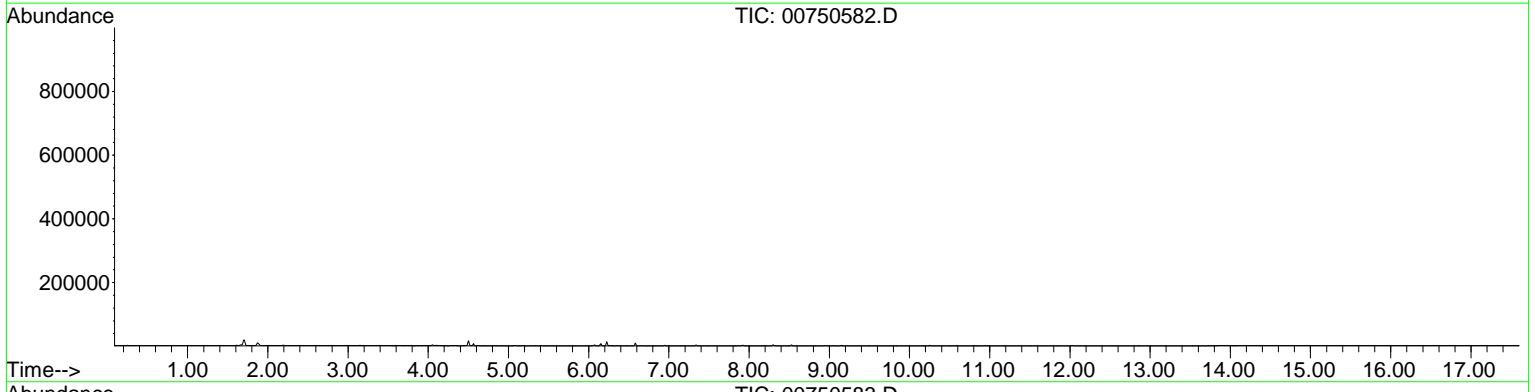
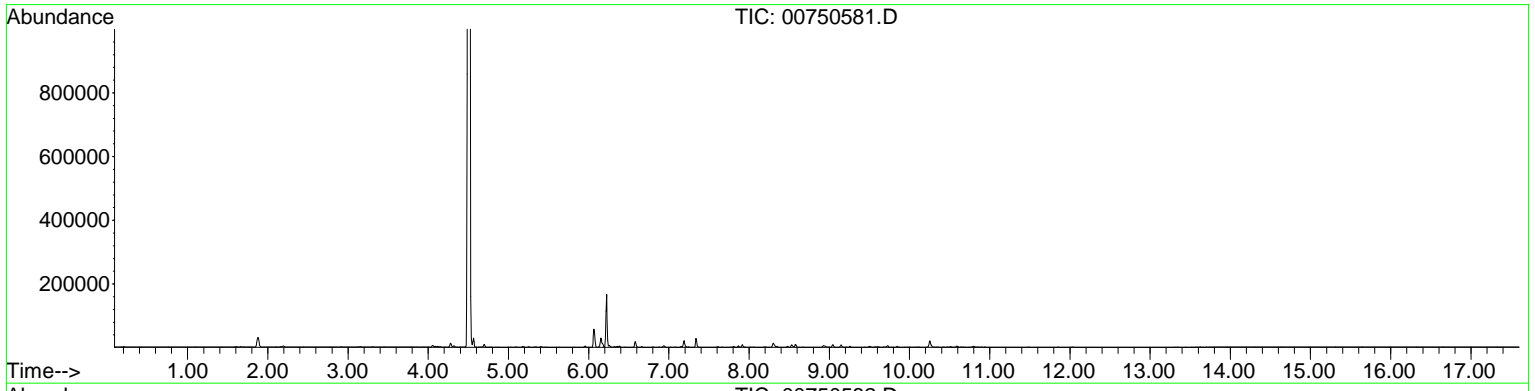
ERROR IN CONCENTRATION REPORTING (1)

	Primary-Duplicate Error	Minimum Error	Maximum Error
MTBE	4.3%	-76%	43%
t12DCE	10.4%	-70%	41%
11DCA	5.2%	-68%	40%
c12DCE	6.0%	-49%	33%
CHCl3	4.8%	-60%	37%
111TCA	5.4%	-50%	33%
12DCA	5.4%	-49%	33%
BENZ	4.4%	-52%	34%
CCl4	5.3%	-48%	32%
TCE	5.7%	-37%	27%
112TCA	5.9%	-23%	18%
TOL	5.3%	-26%	20%
OCT			
PCE	5.7%	-18%	15%
CIBENZ	3.9%	-20%	17%
1112TetCA			
EtBENZ	5.1%	-21%	17%
mpXYL	4.5%	-18%	15%
oXYL	4.7%	-21%	17%
1122TetCA	5.2%	-21%	18%
135TMB	8.0%	-25%	20%
124TMB	7.0%	-24%	19%
13DCB	6.7%	-21%	18%
14DCB	6.1%	-22%	18%
12DCB	7.4%	-22%	18%
Total Mass	4.3%	-23%	18%

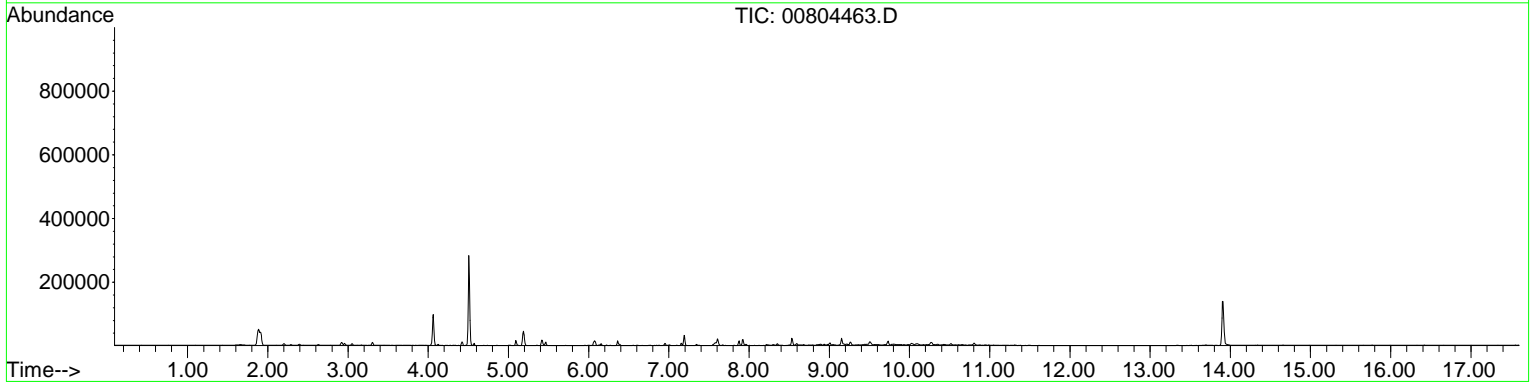
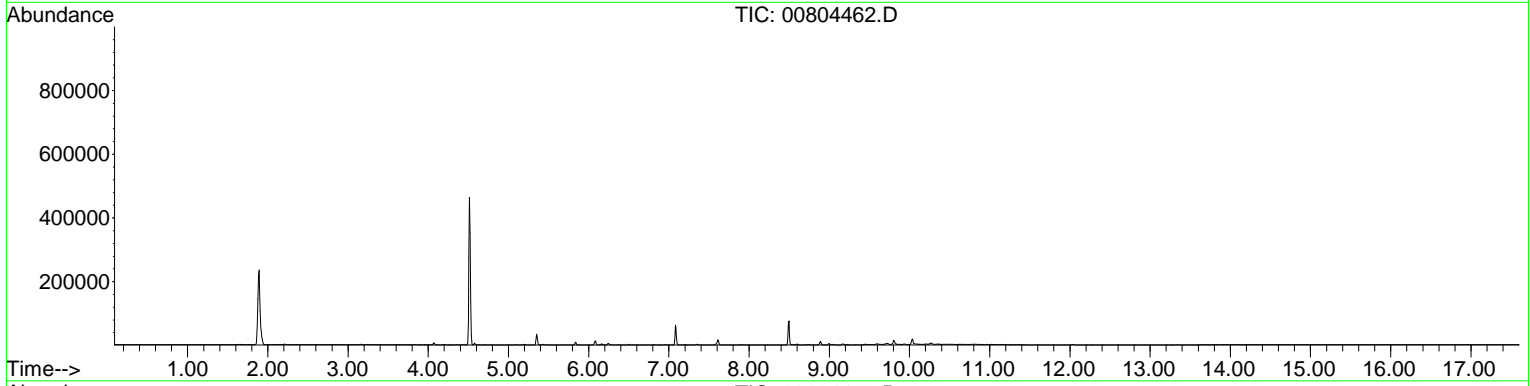
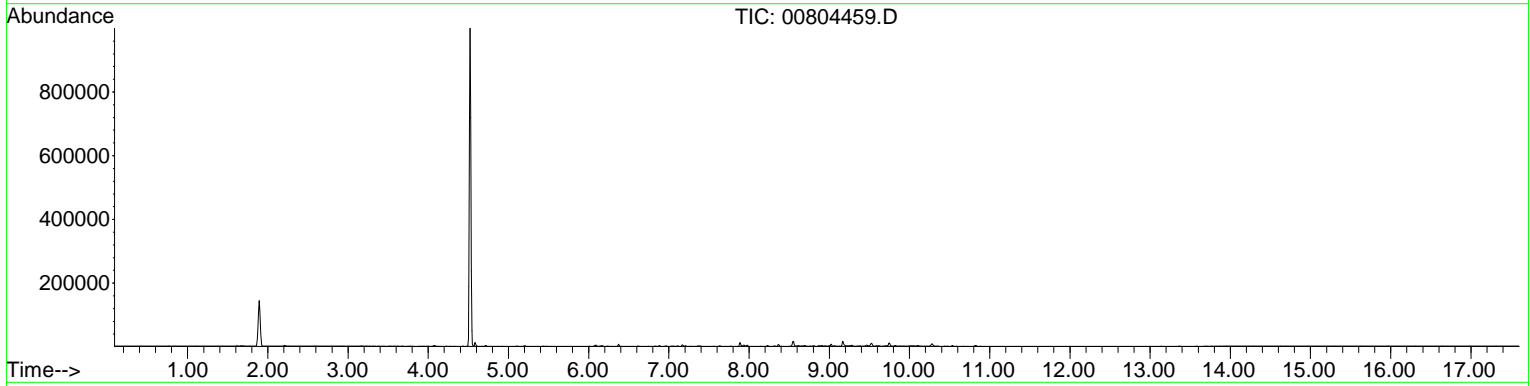
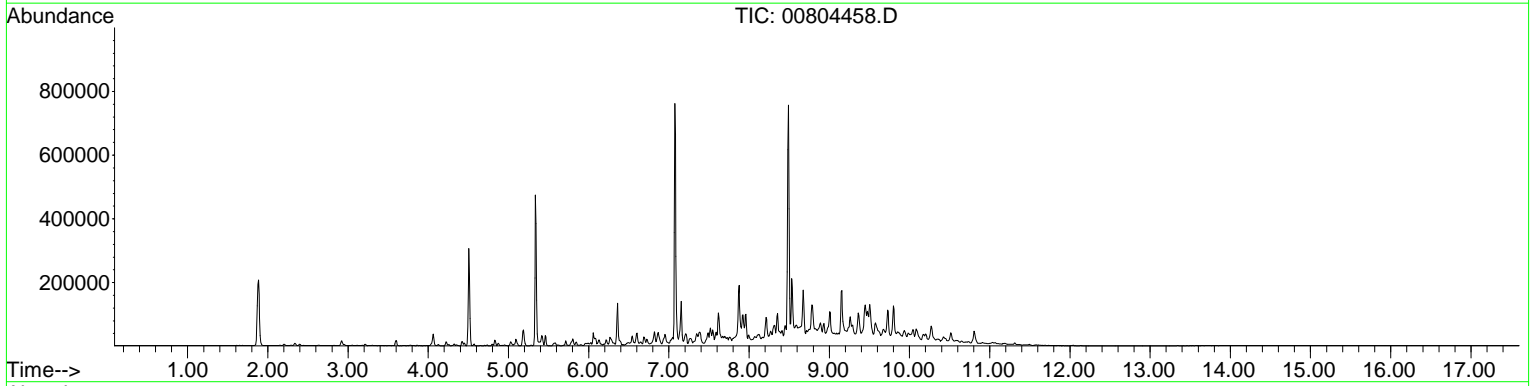
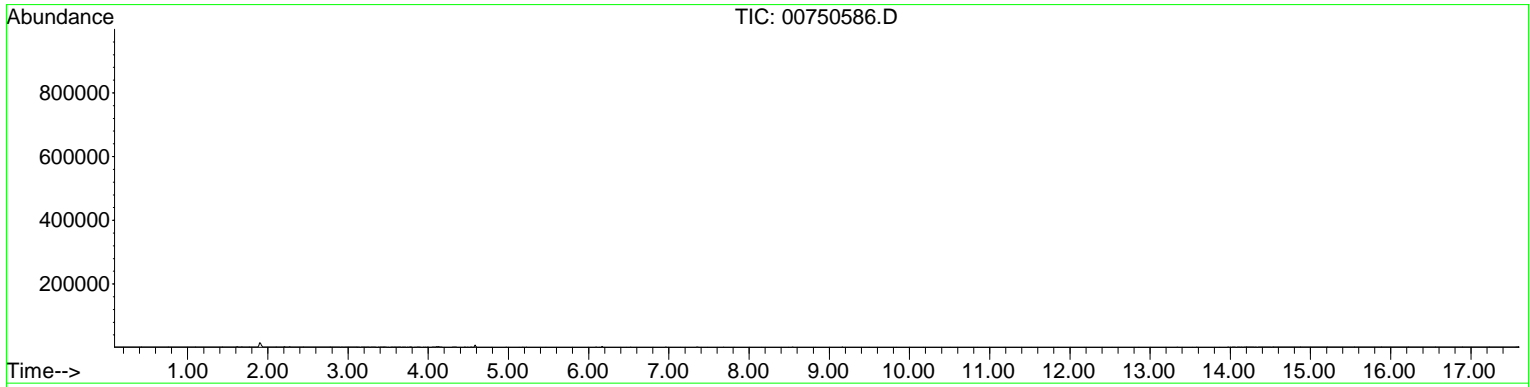
TICS - 02138
IN NUMERICAL ORDER



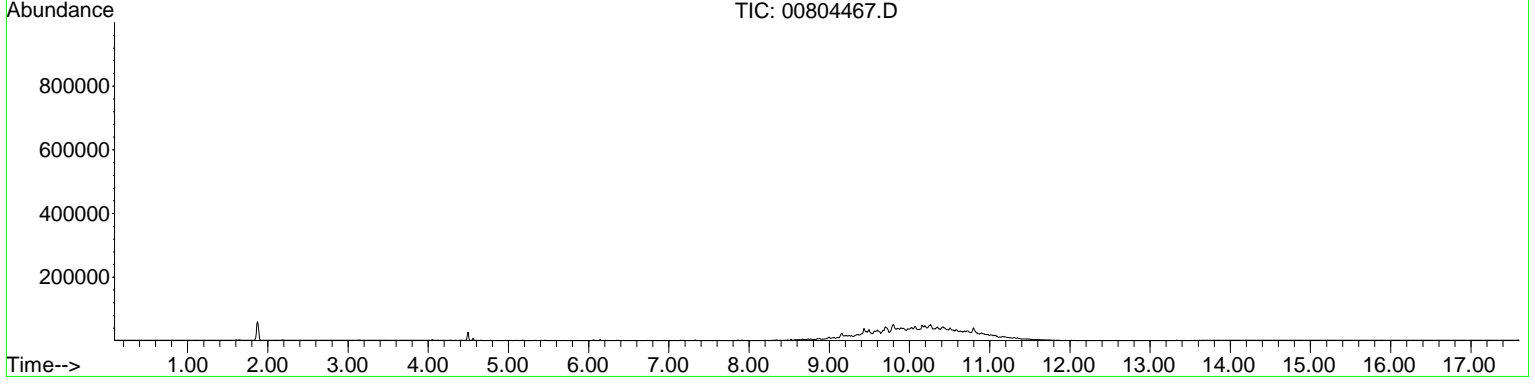
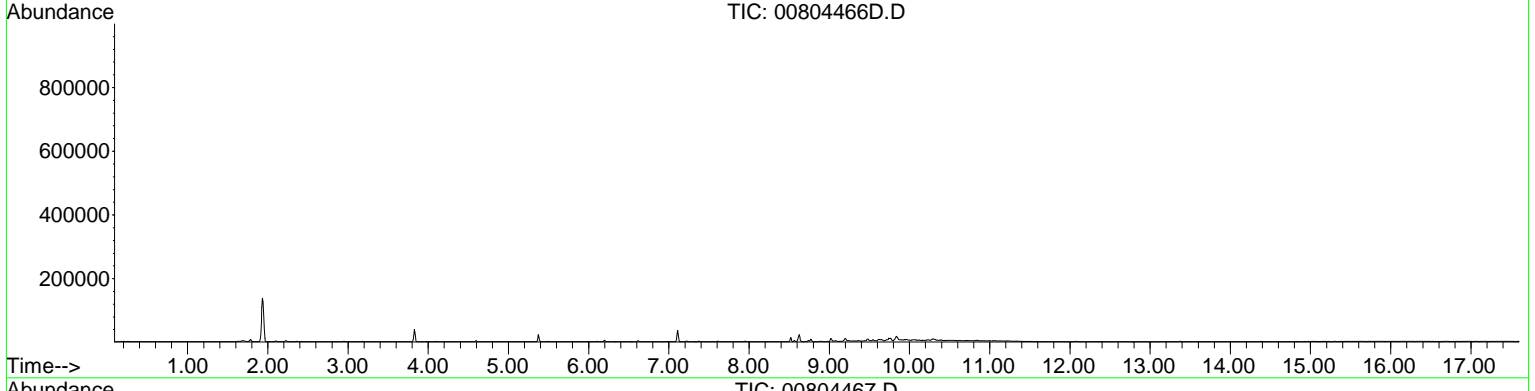
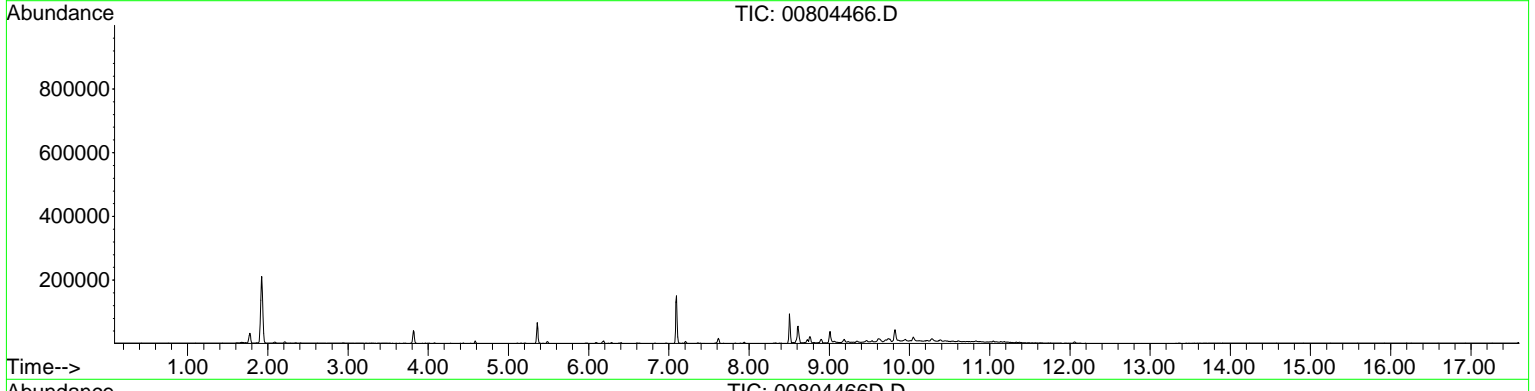
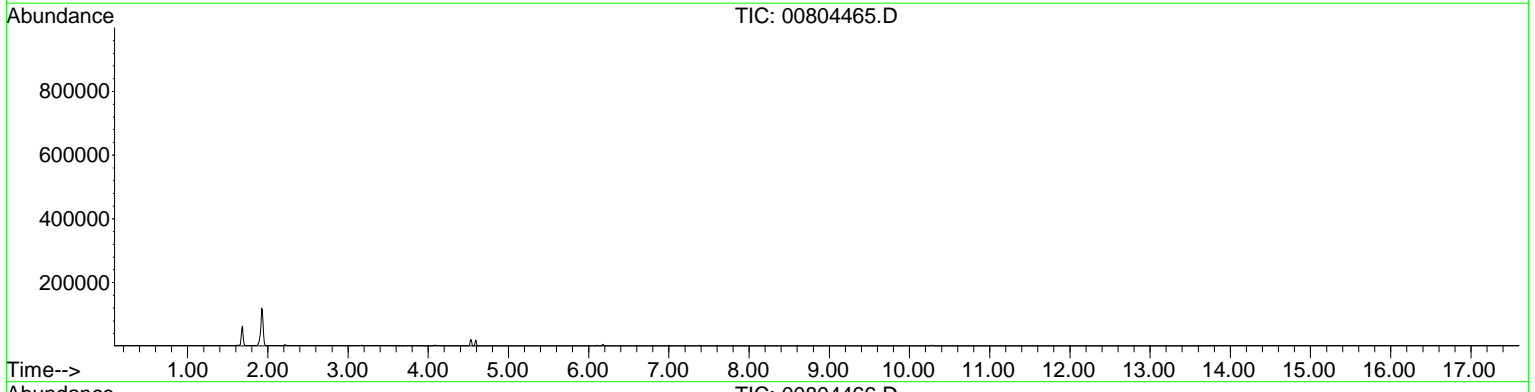
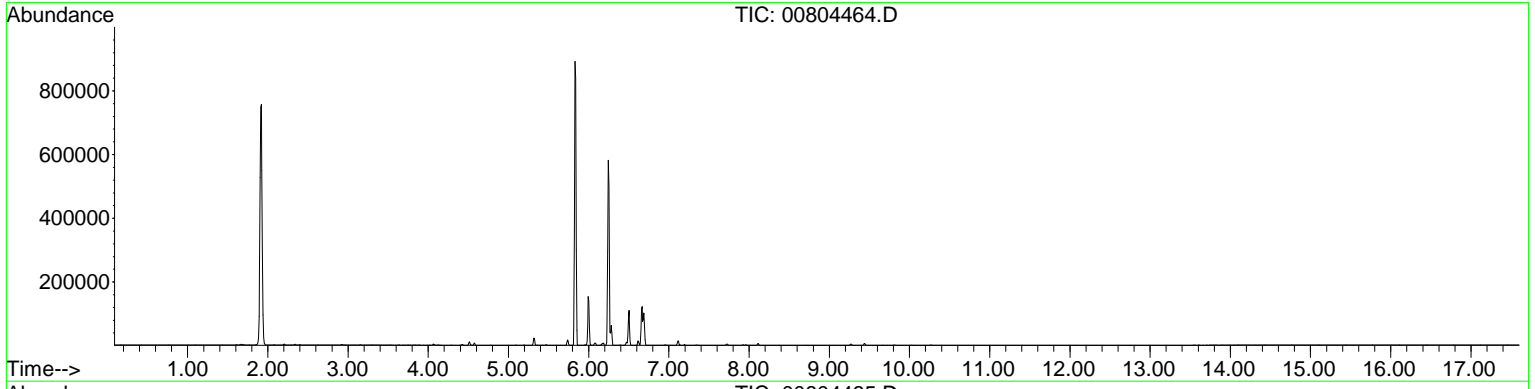
TICS - 02138
IN NUMERICAL ORDER



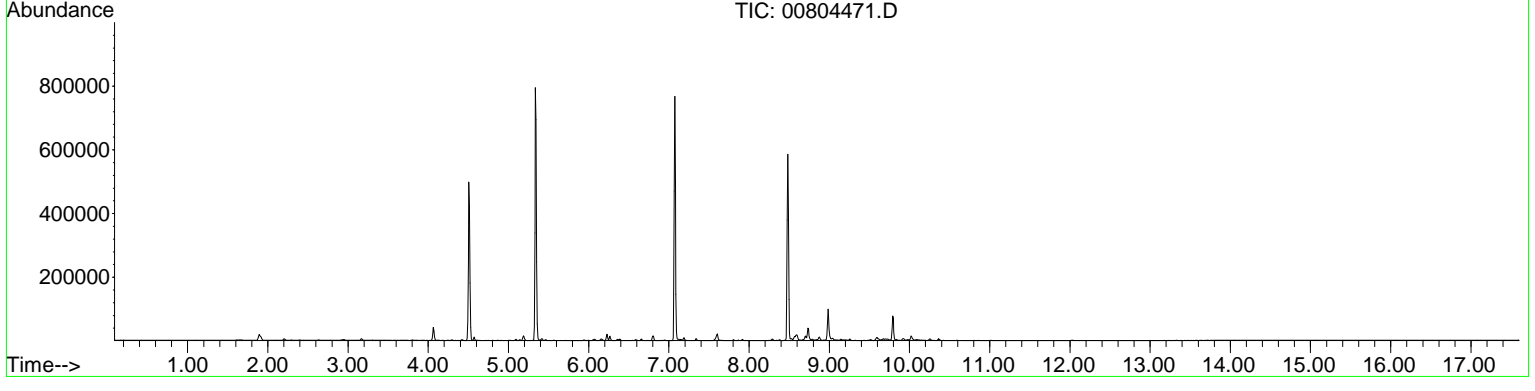
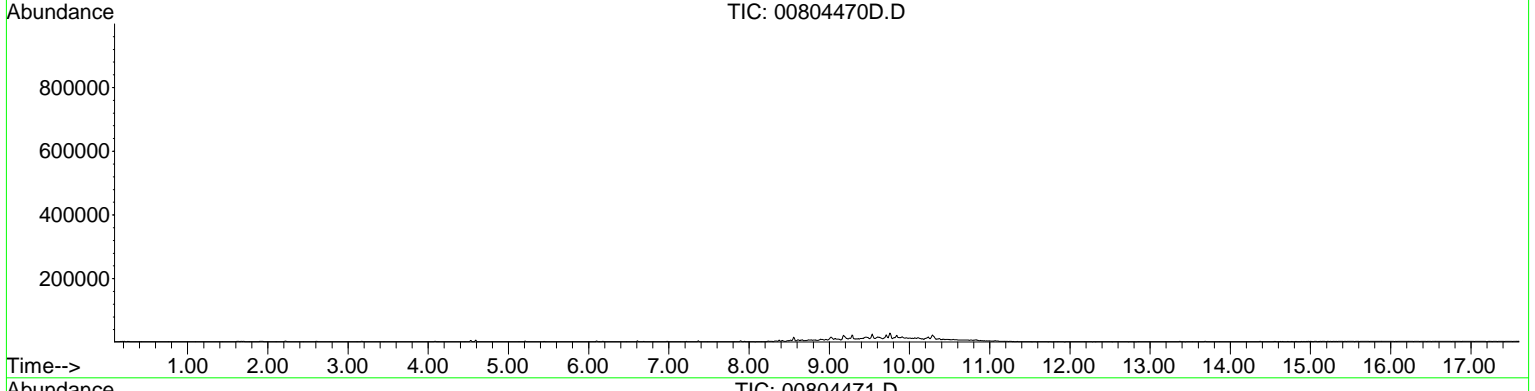
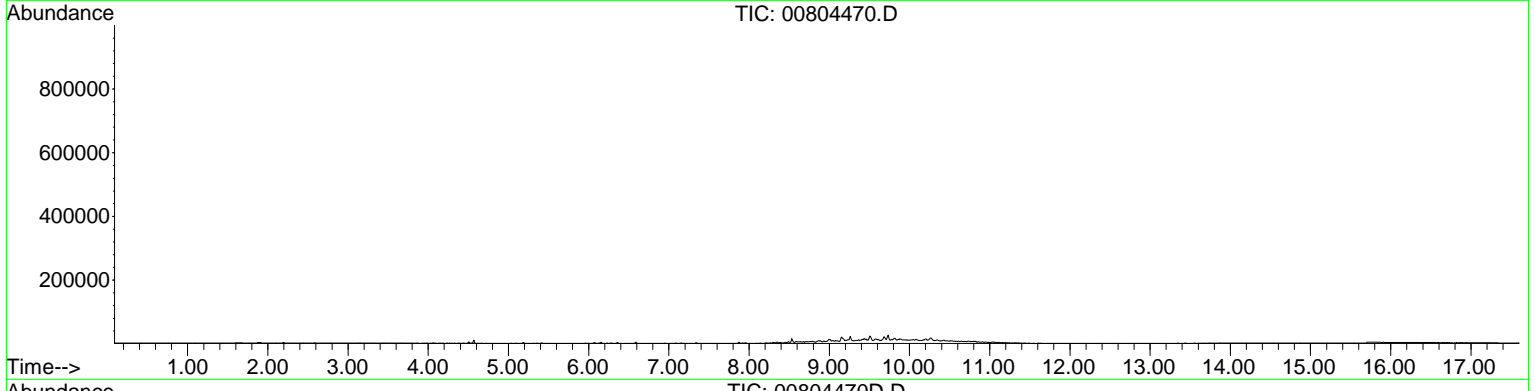
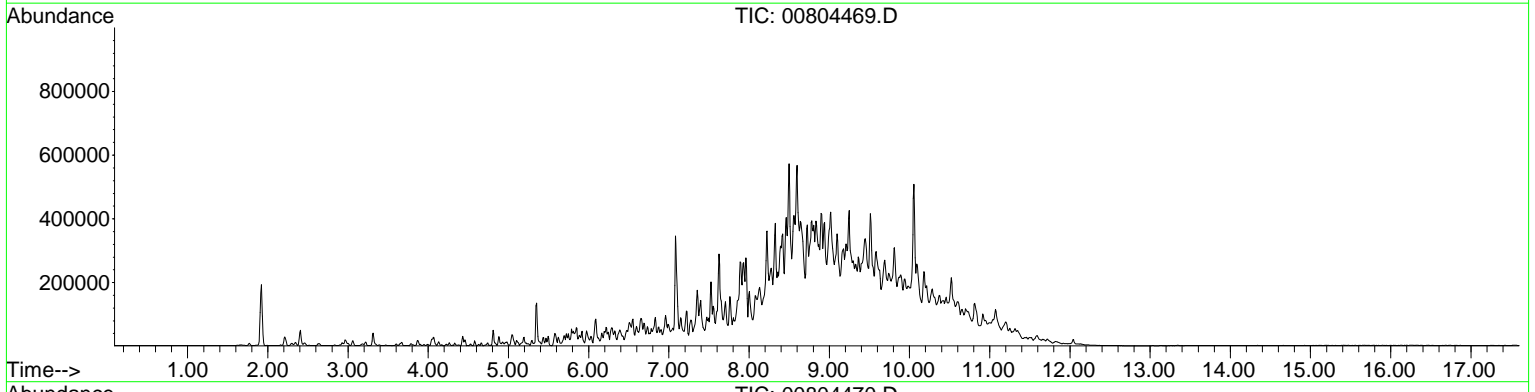
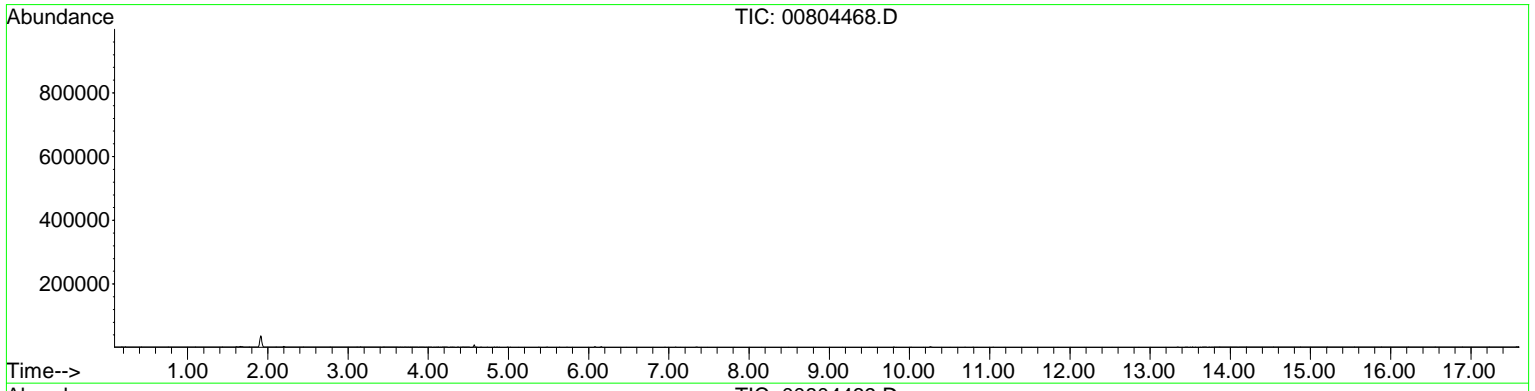
TICS - 02138
IN NUMERICAL ORDER



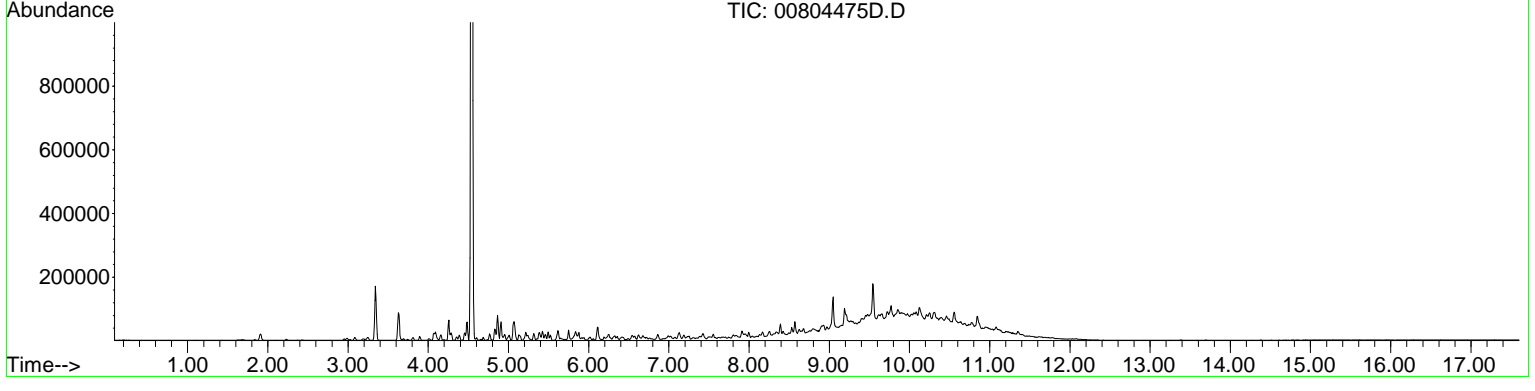
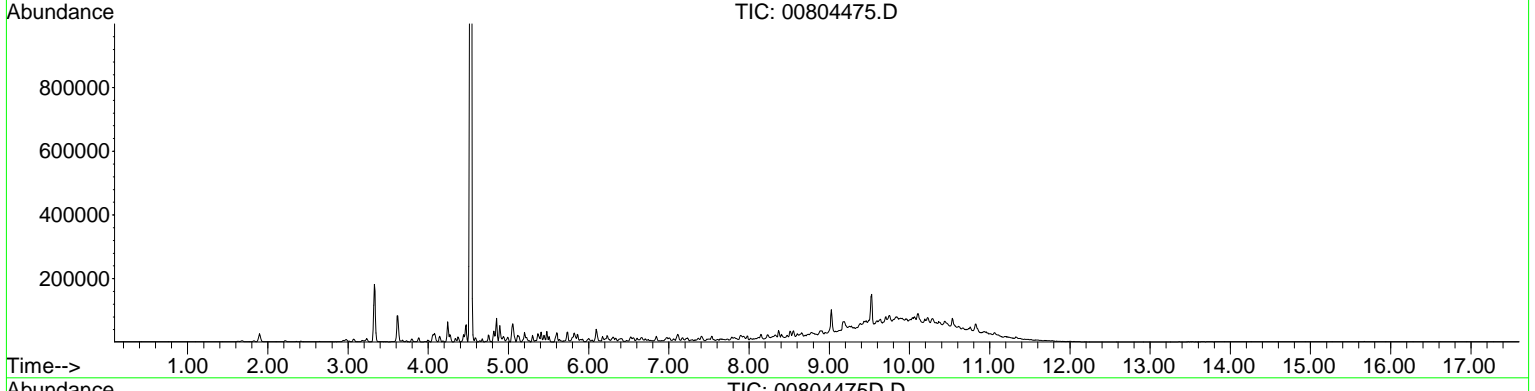
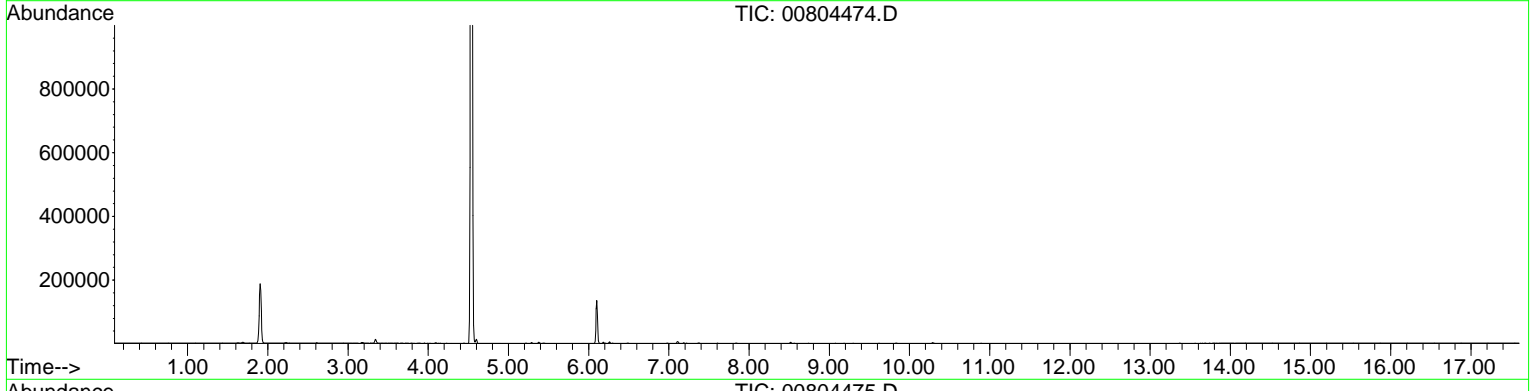
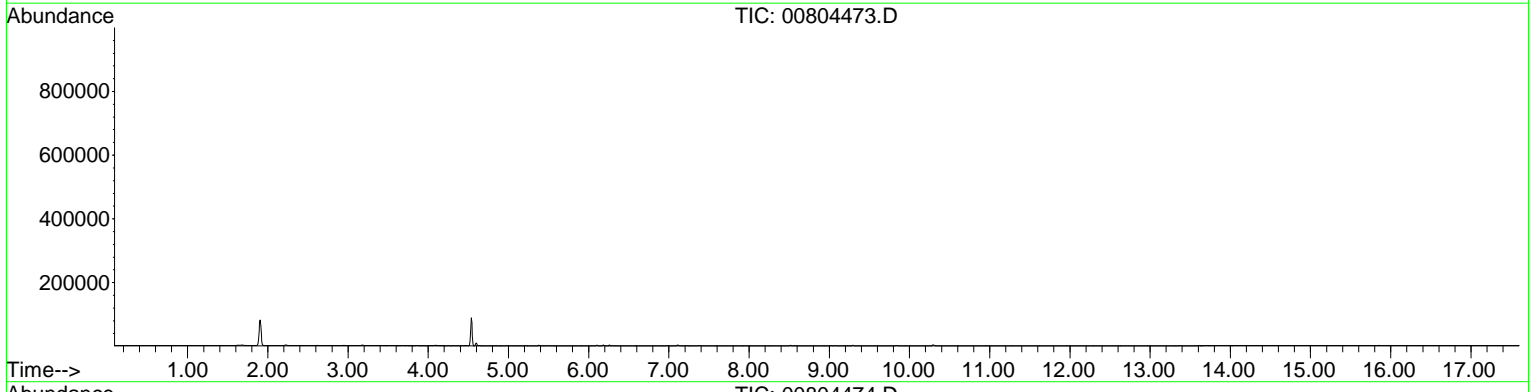
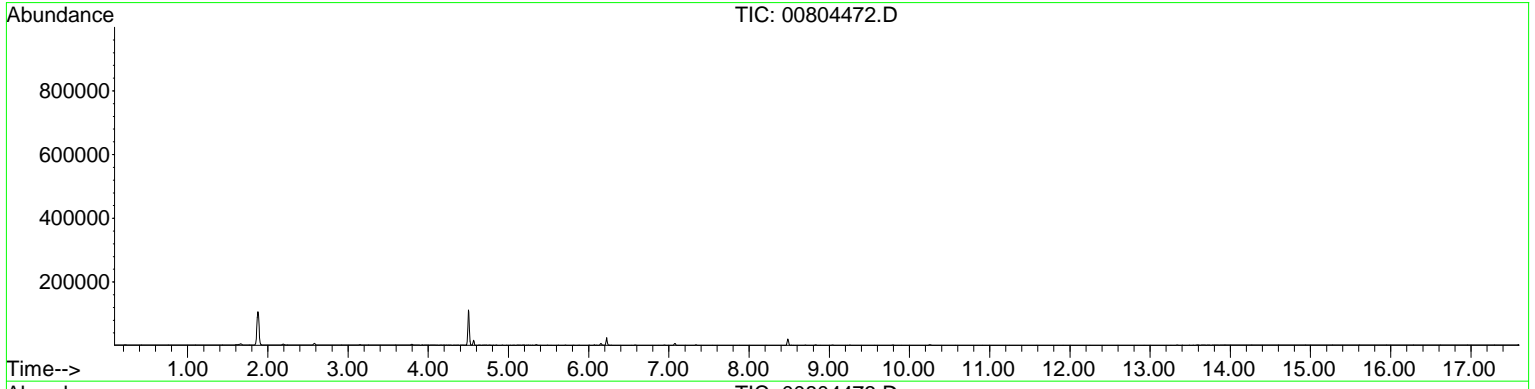
TICS - 02138
IN NUMERICAL ORDER



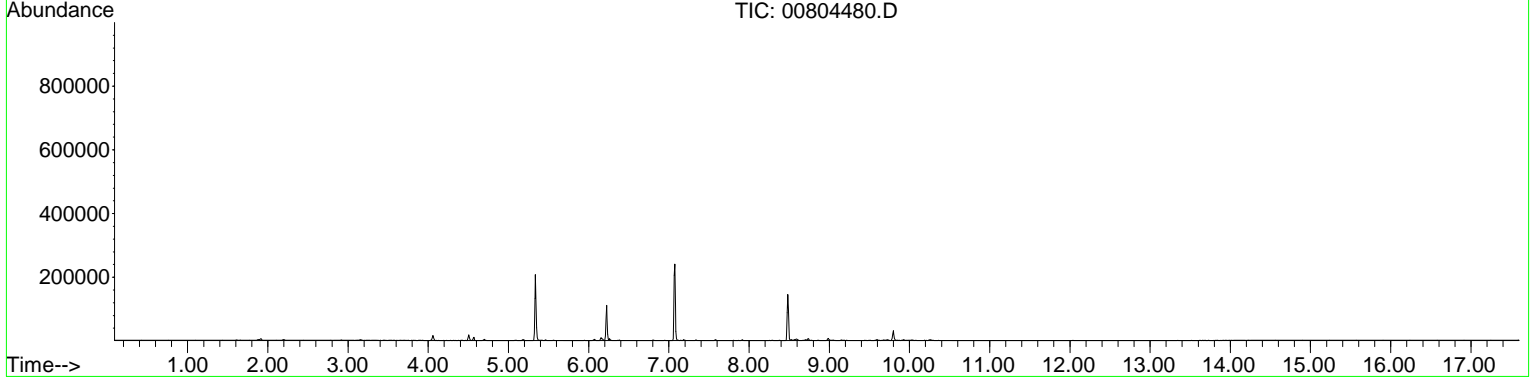
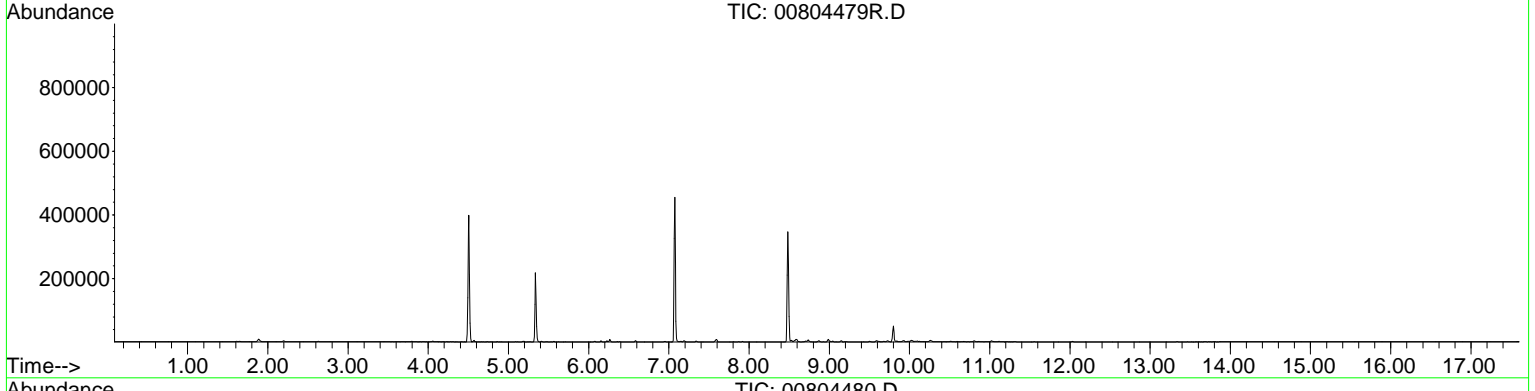
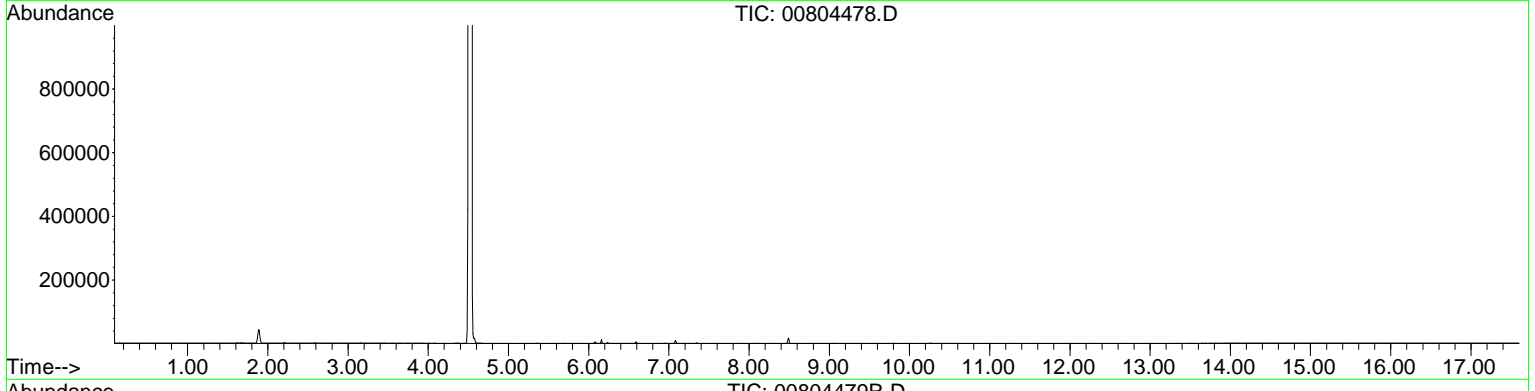
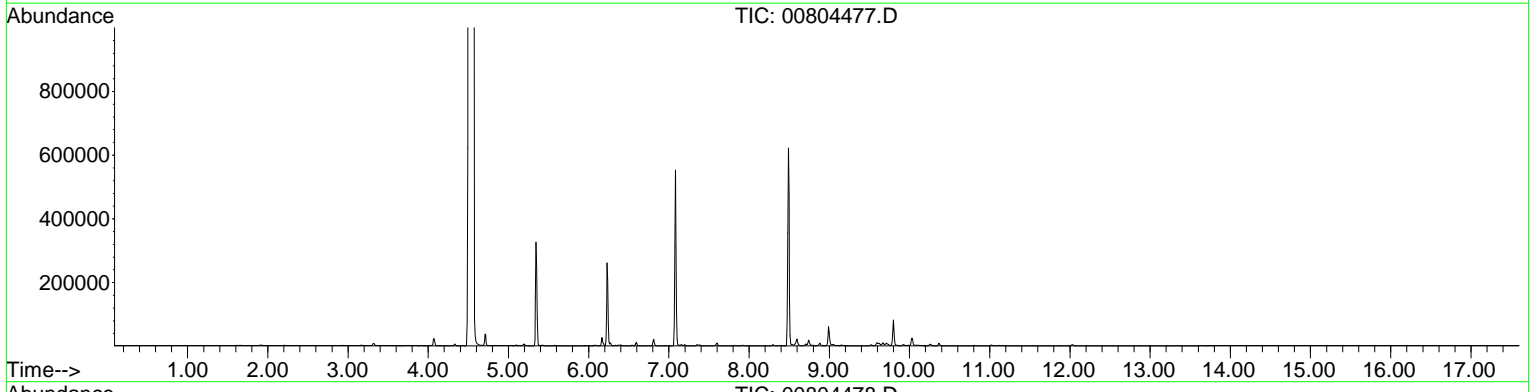
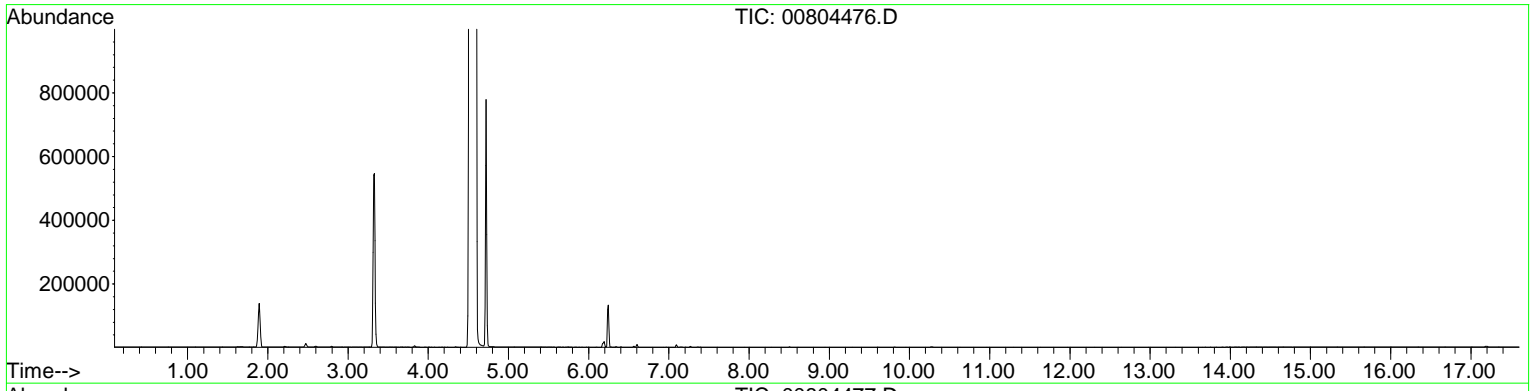
TICS - 02138
IN NUMERICAL ORDER



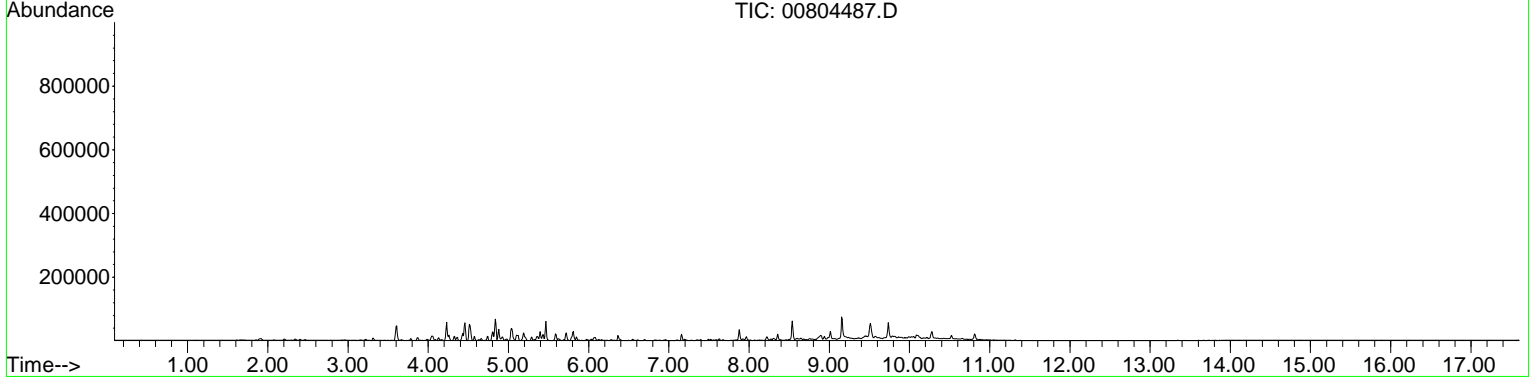
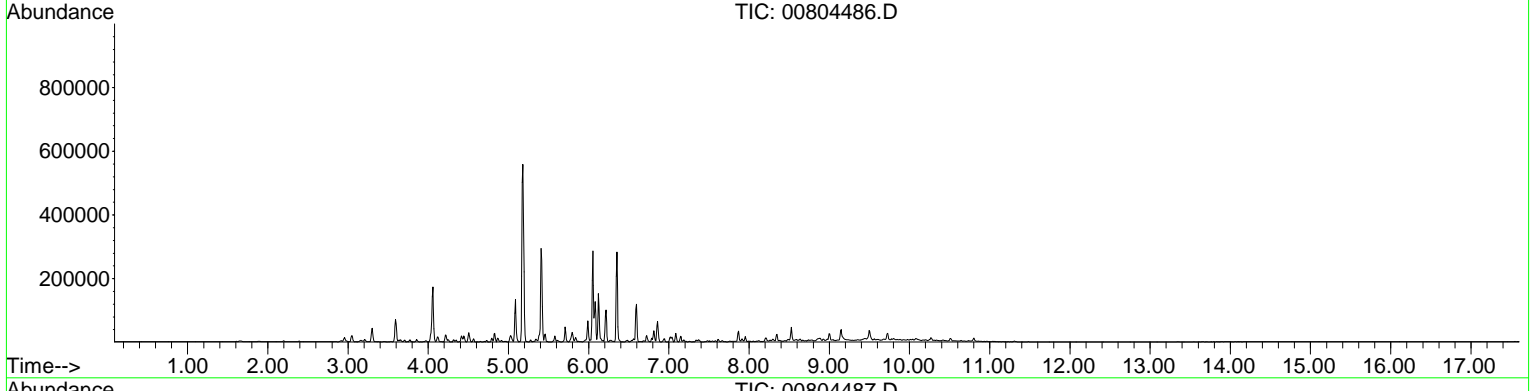
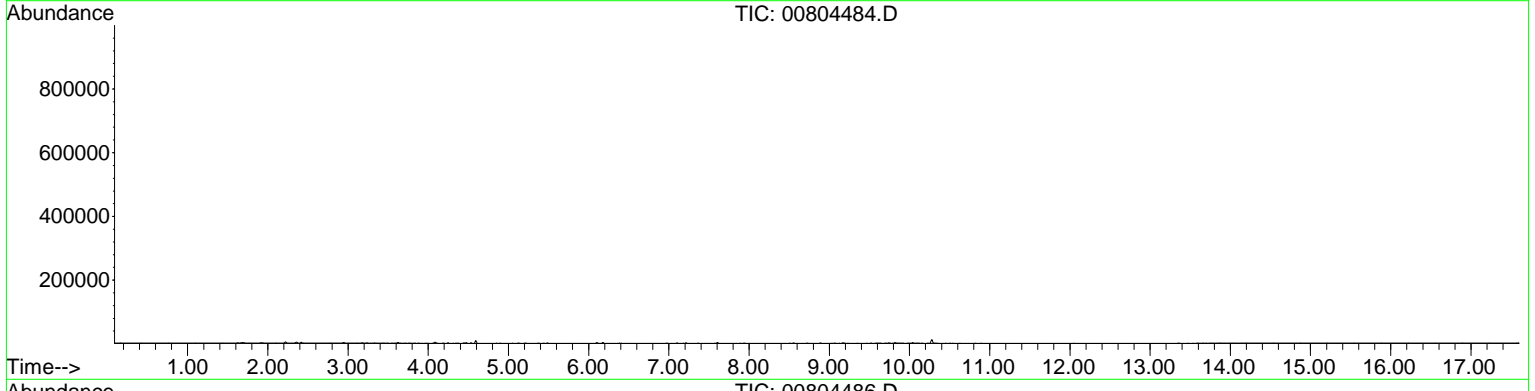
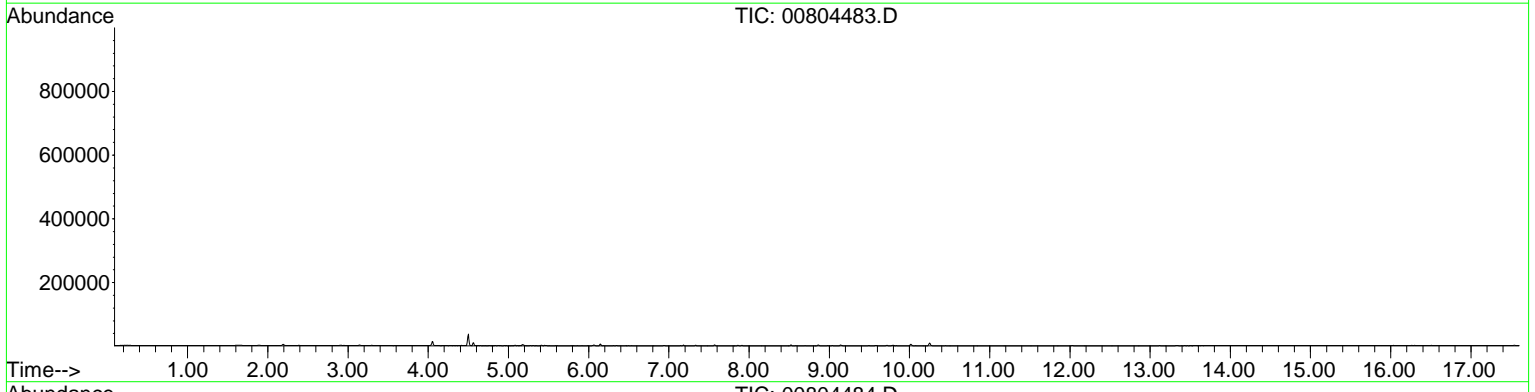
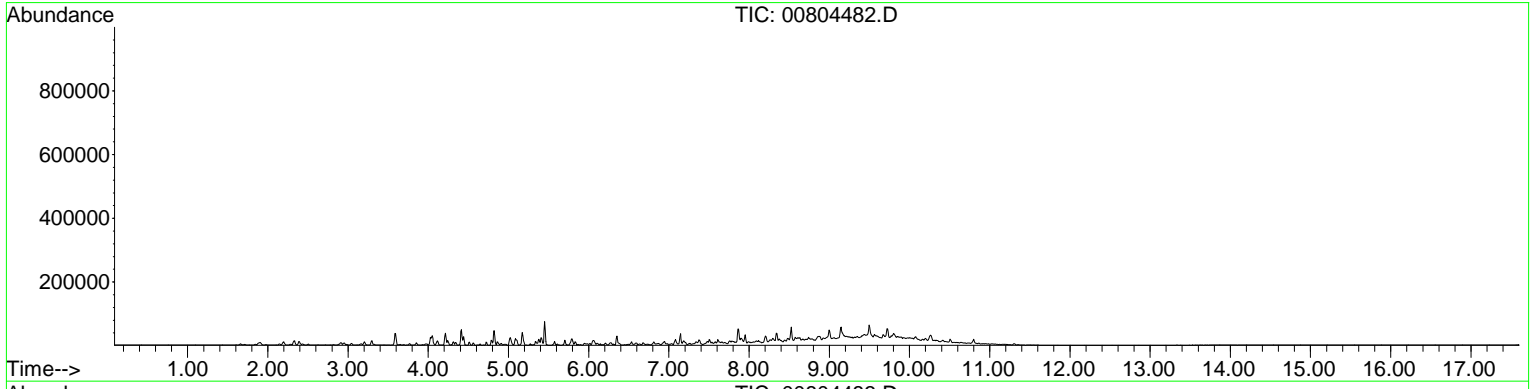
TICS - 02138
IN NUMERICAL ORDER



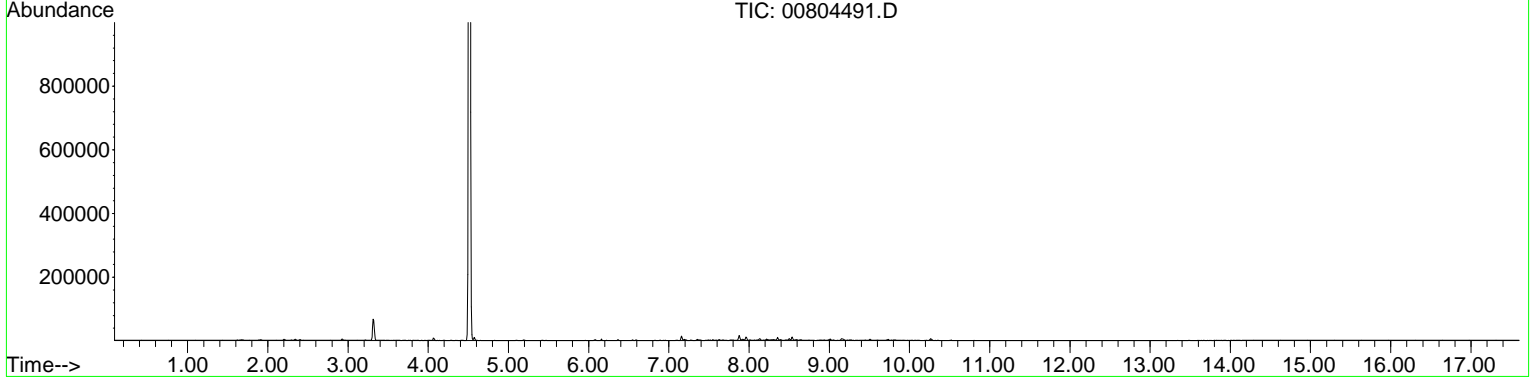
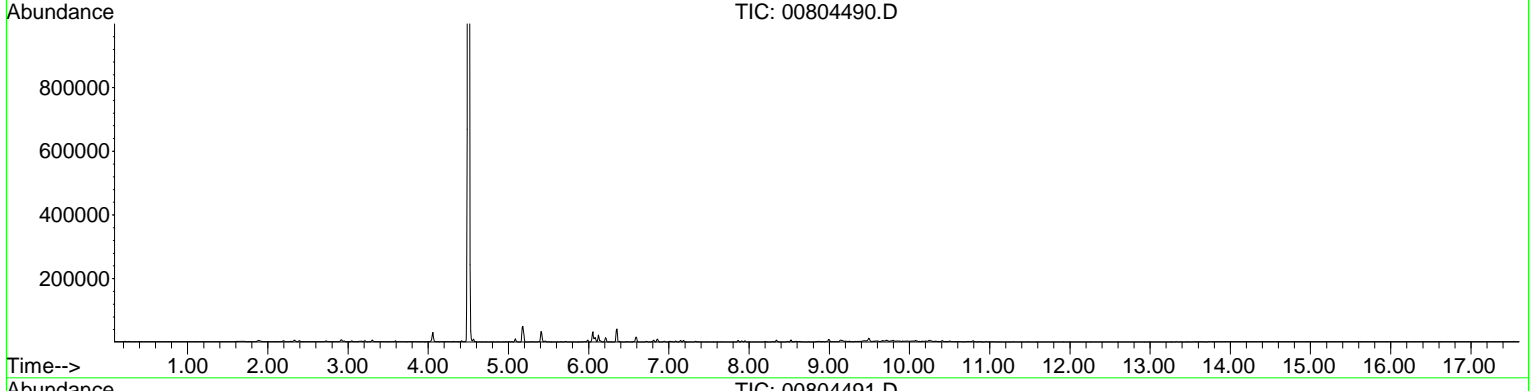
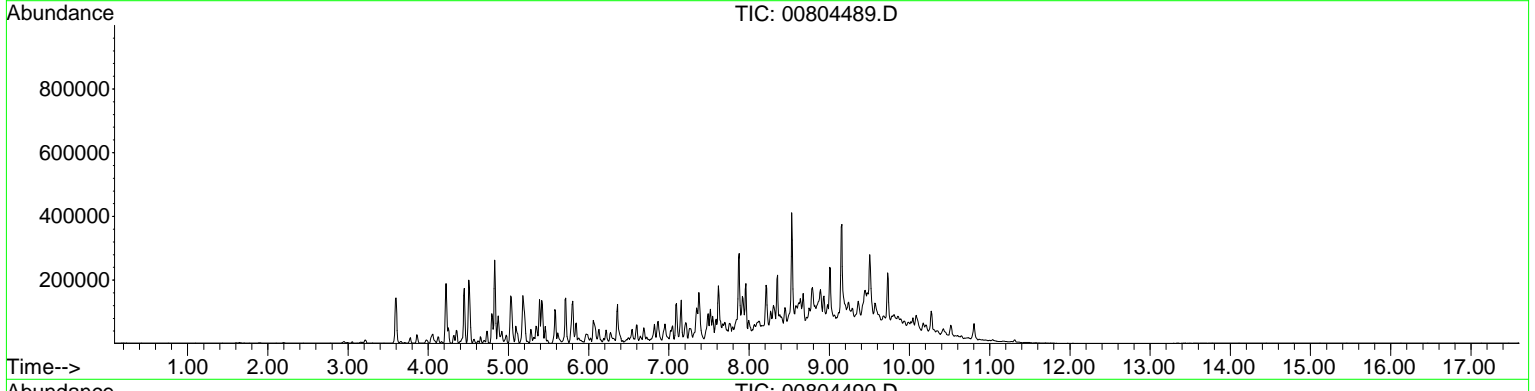
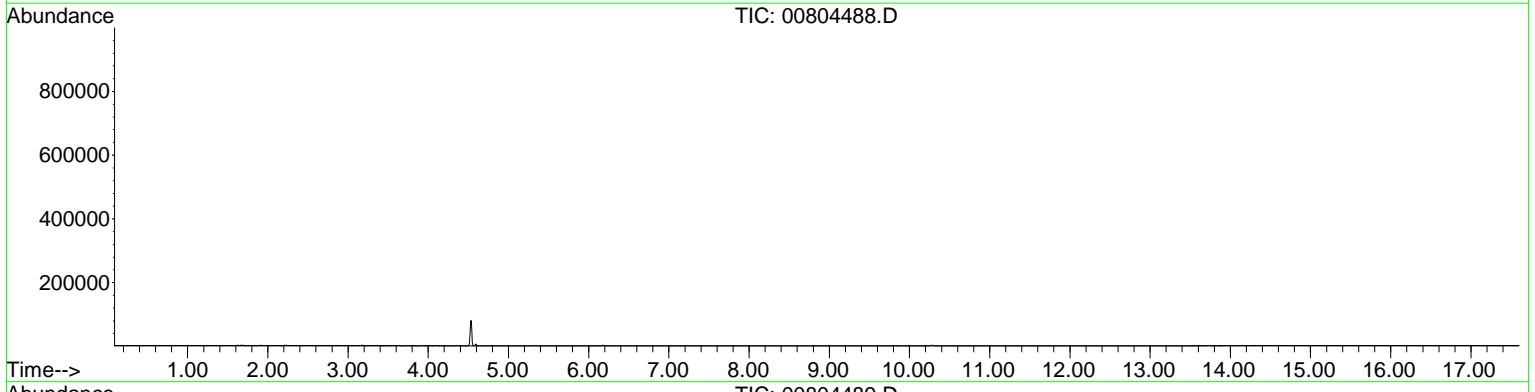
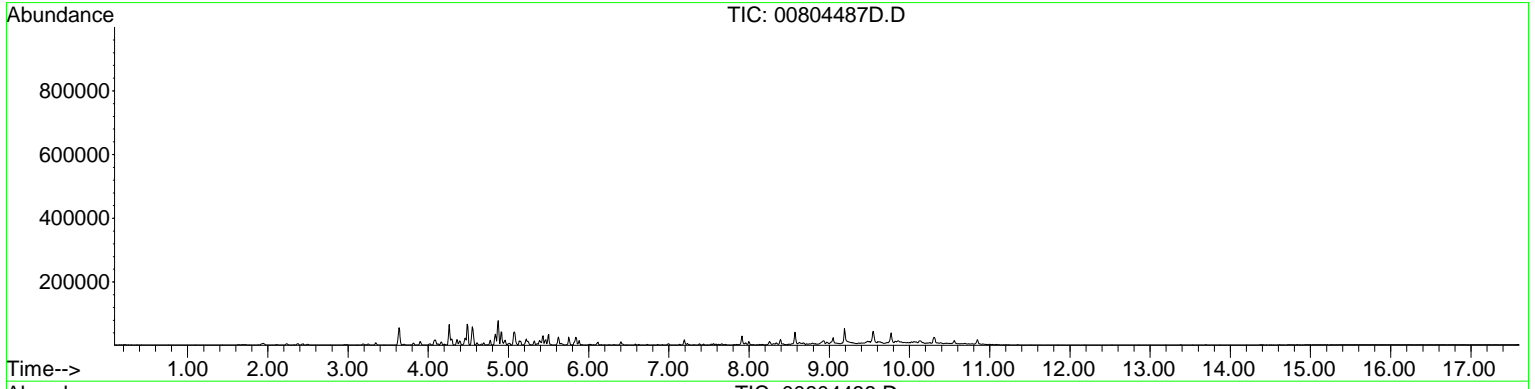
TICS - 02138
IN NUMERICAL ORDER



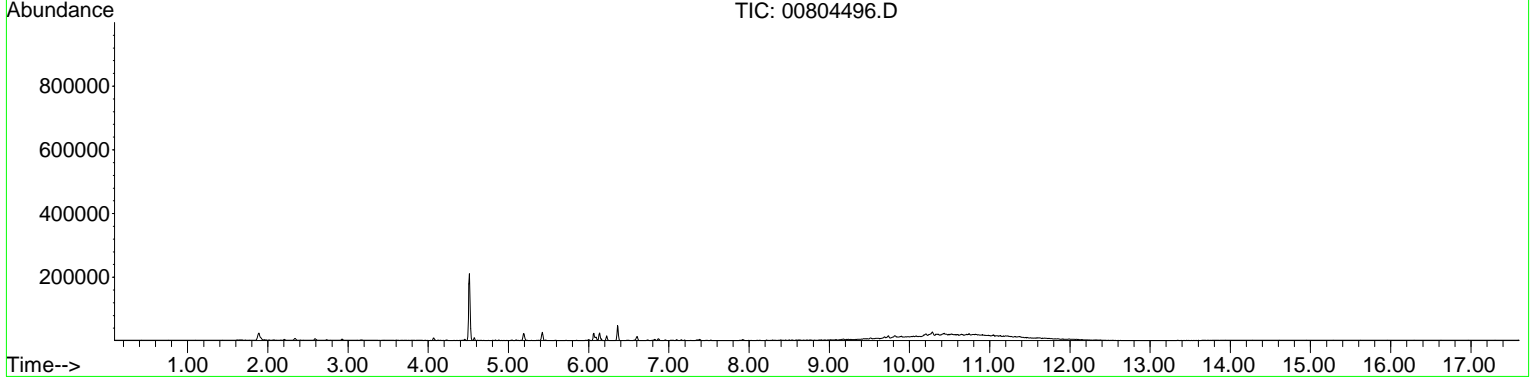
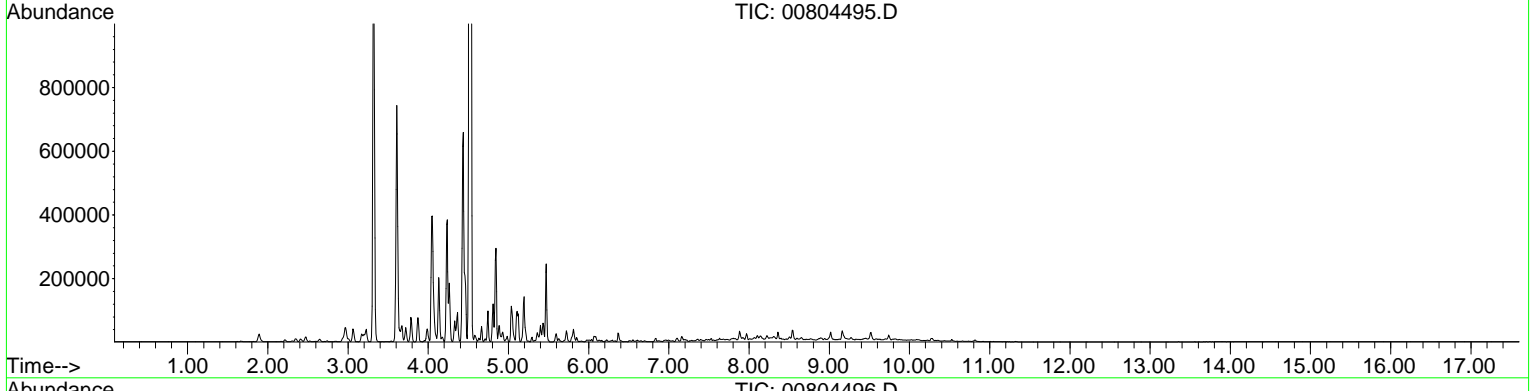
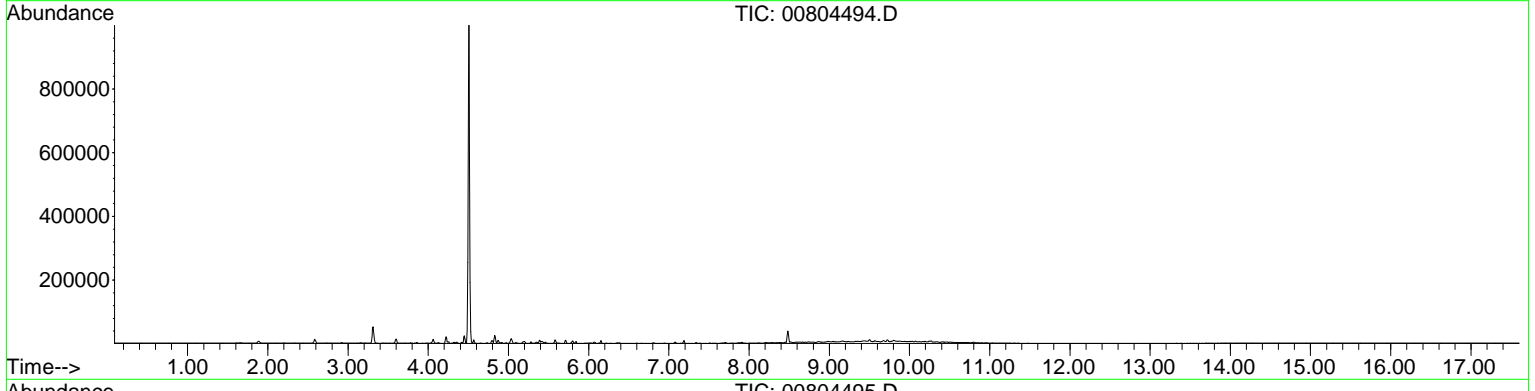
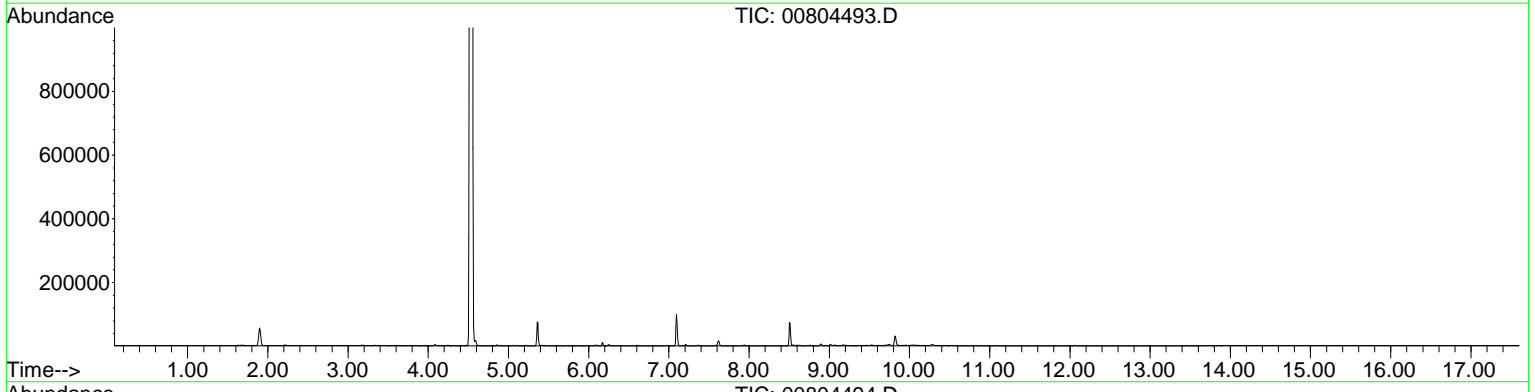
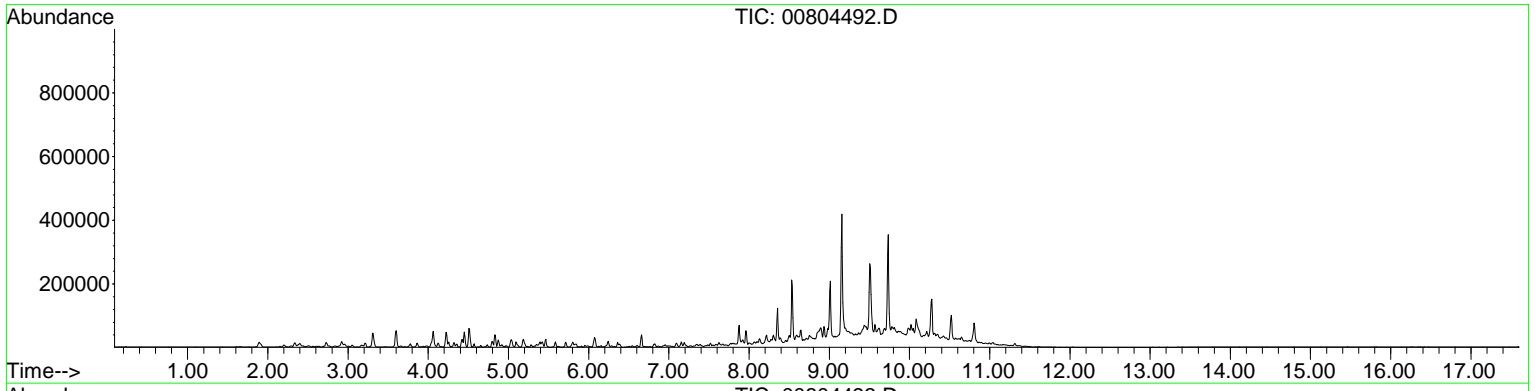
TICS - 02138
IN NUMERICAL ORDER



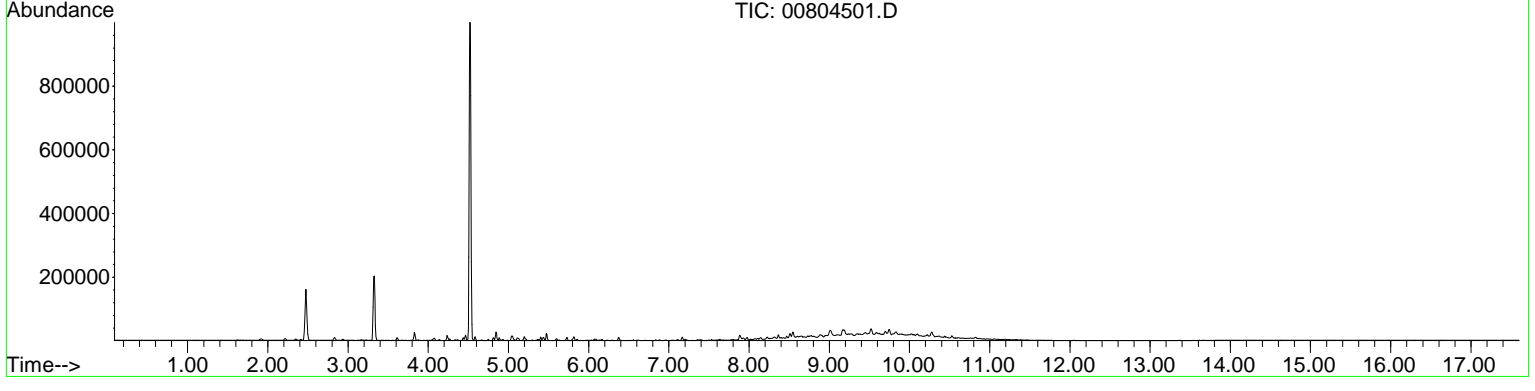
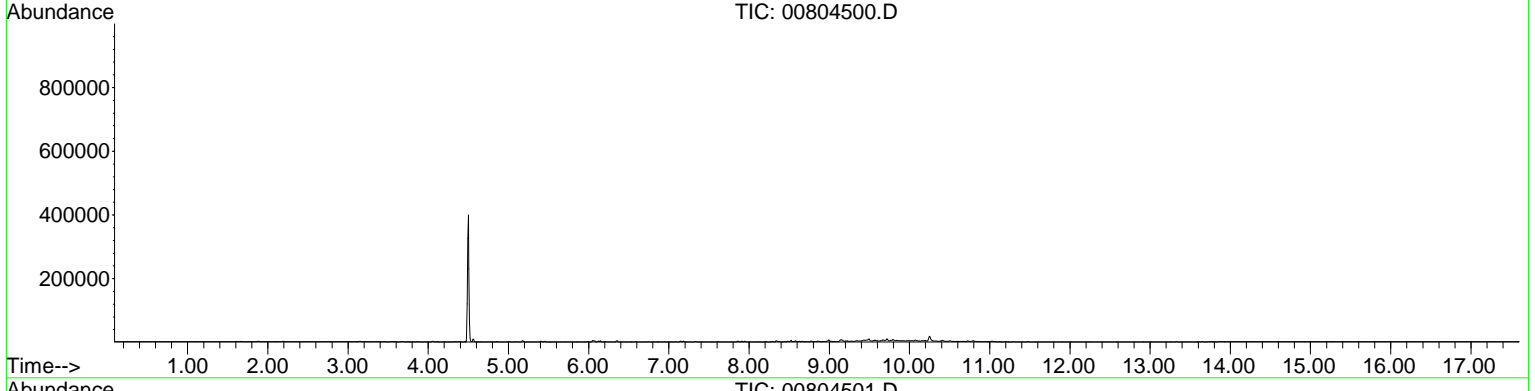
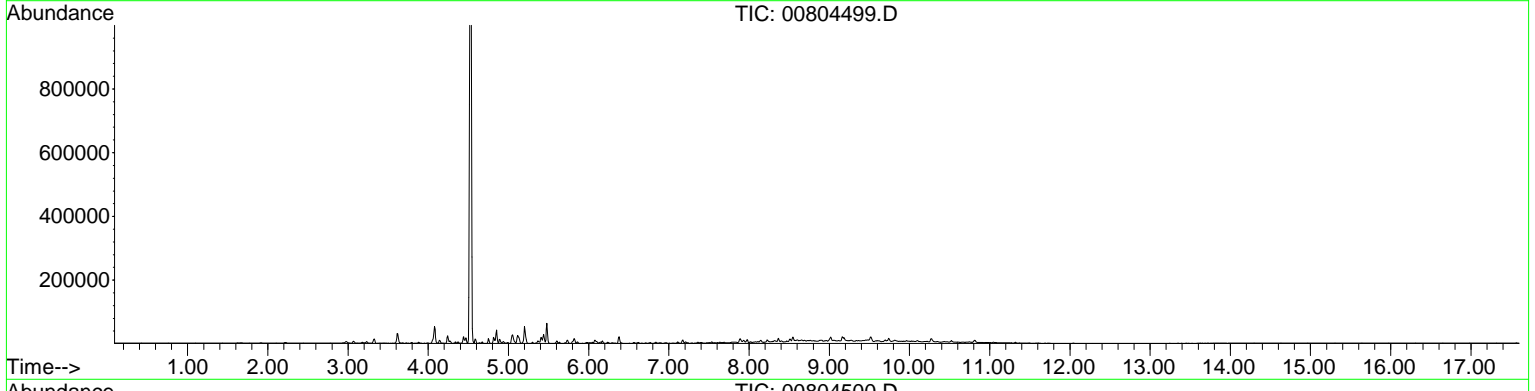
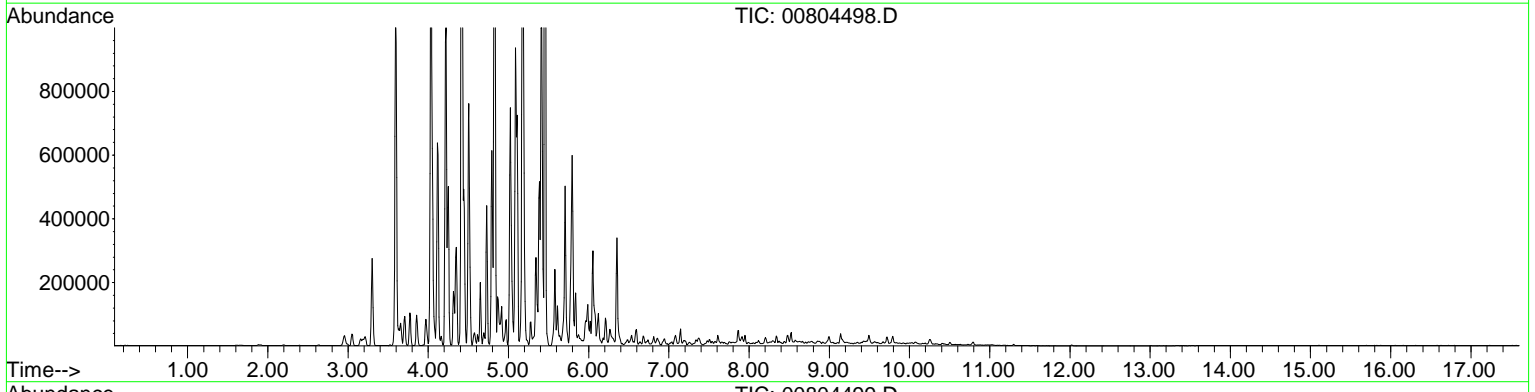
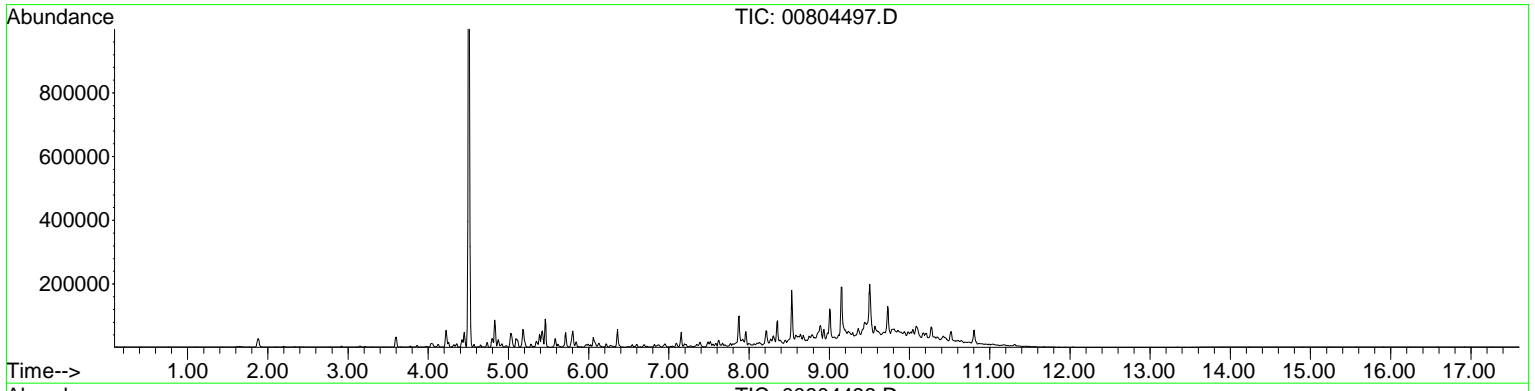
TICS - 02138
IN NUMERICAL ORDER



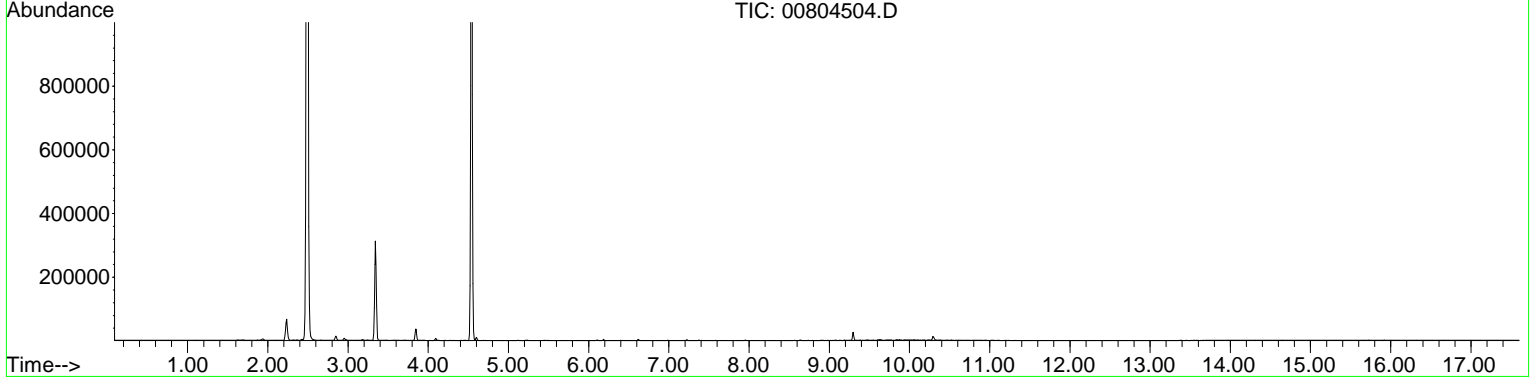
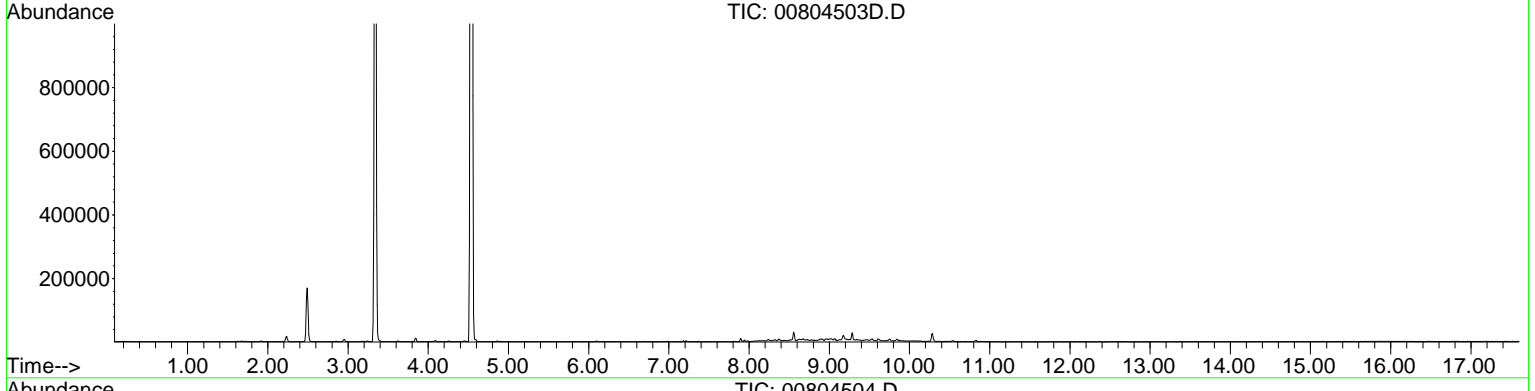
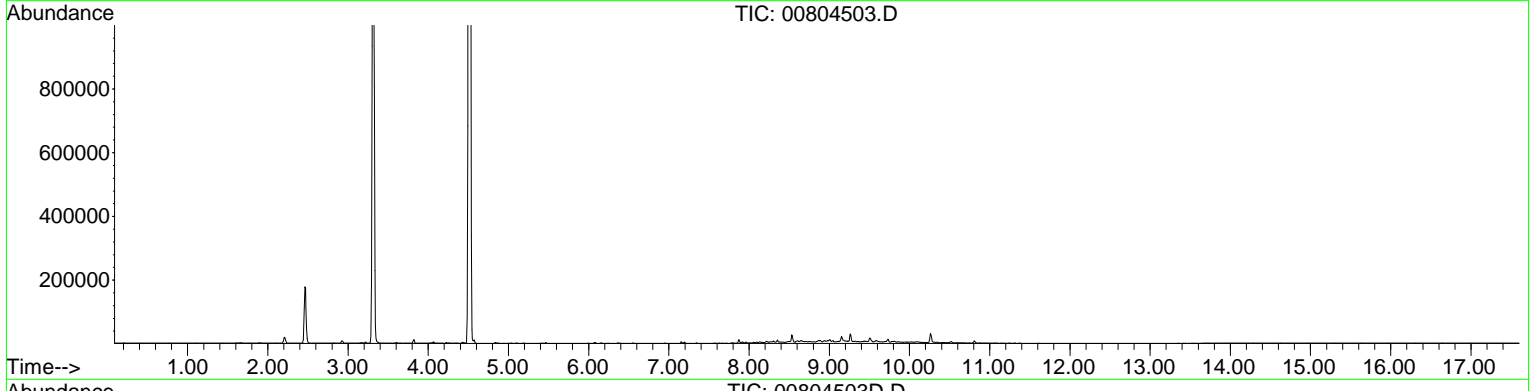
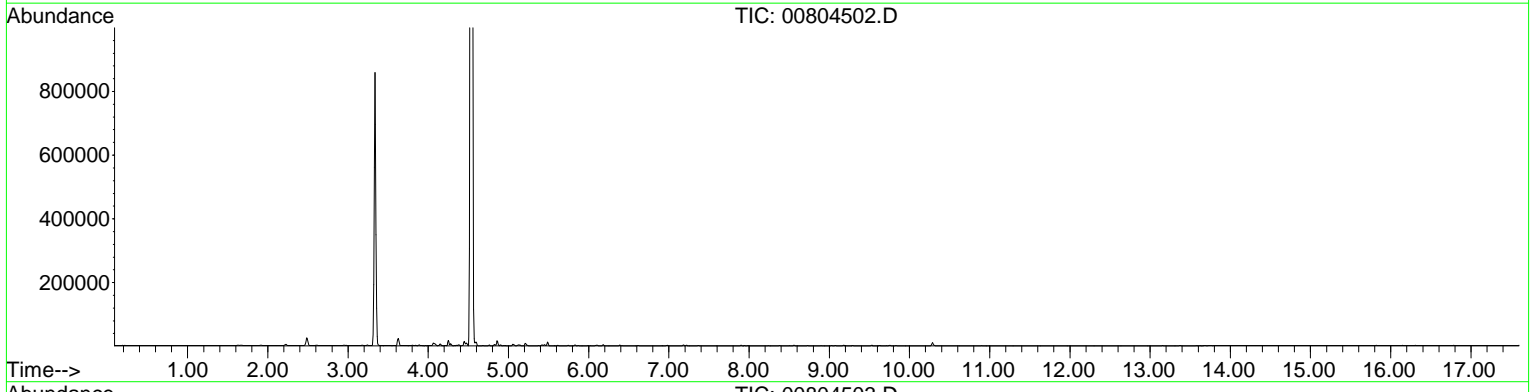
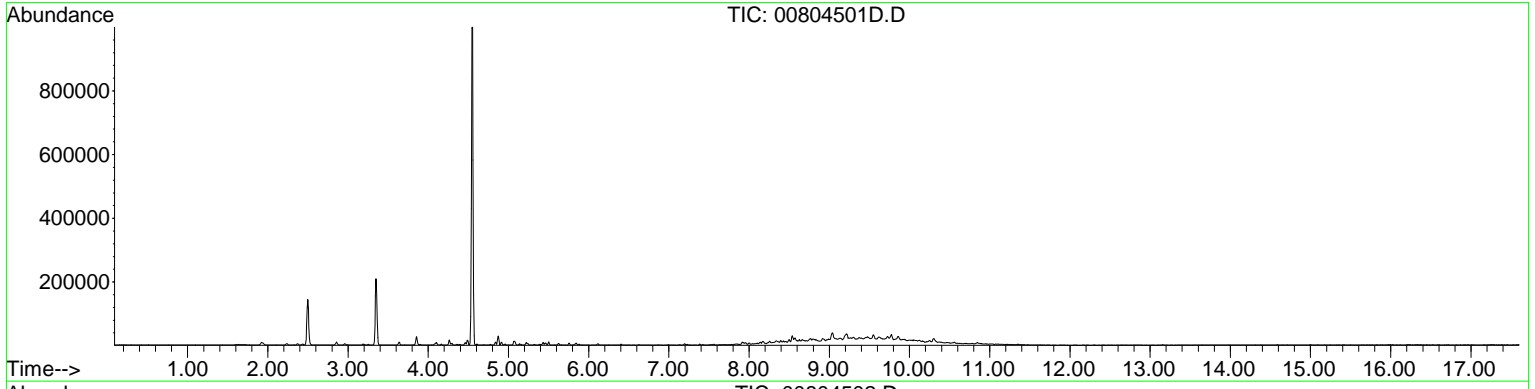
TICS - 02138
IN NUMERICAL ORDER



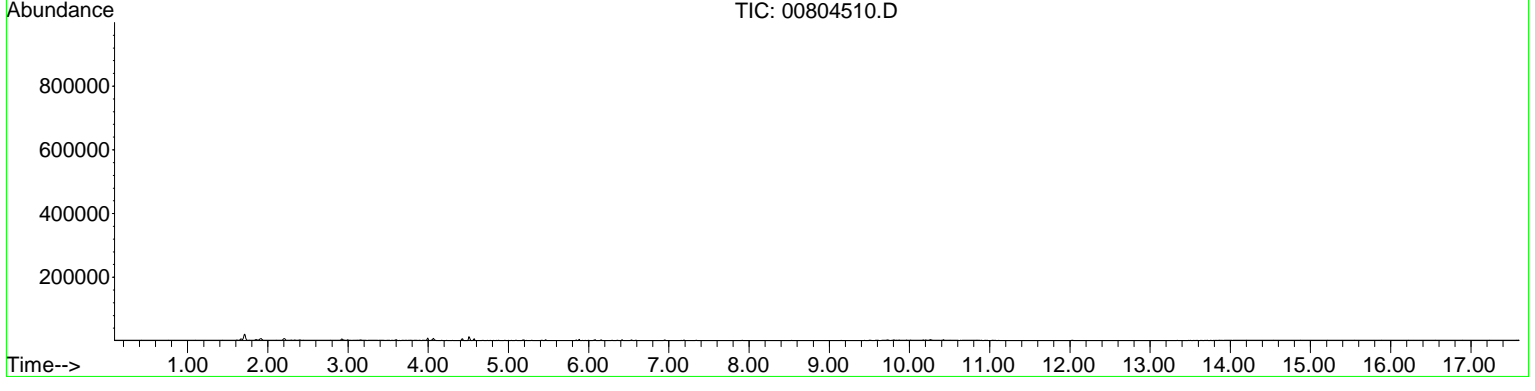
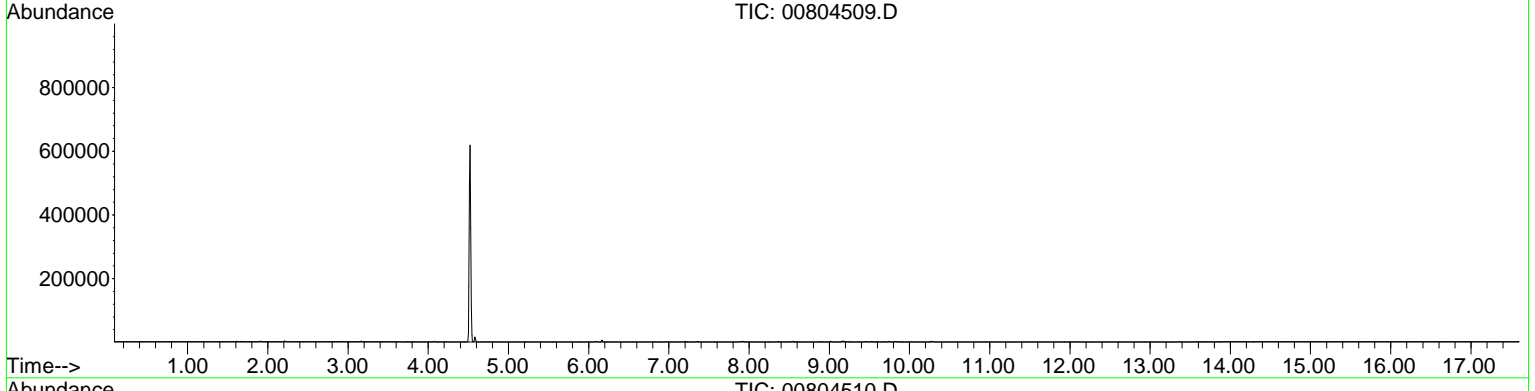
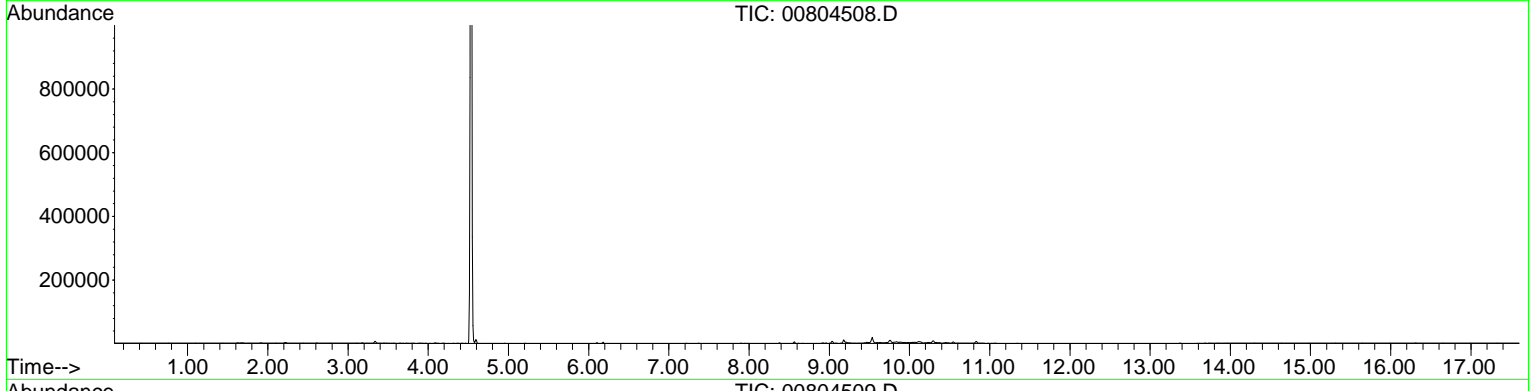
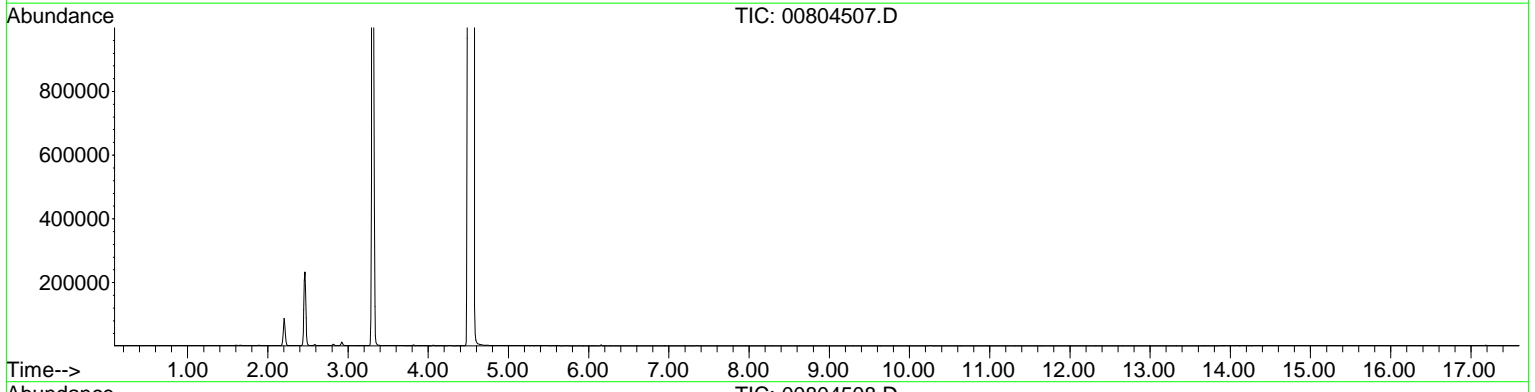
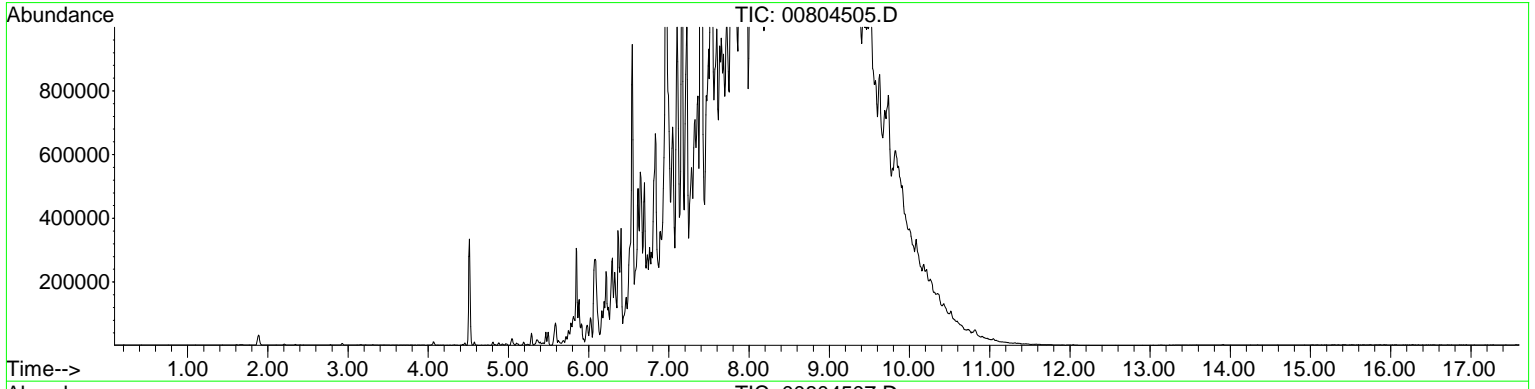
TICS - 02138
IN NUMERICAL ORDER



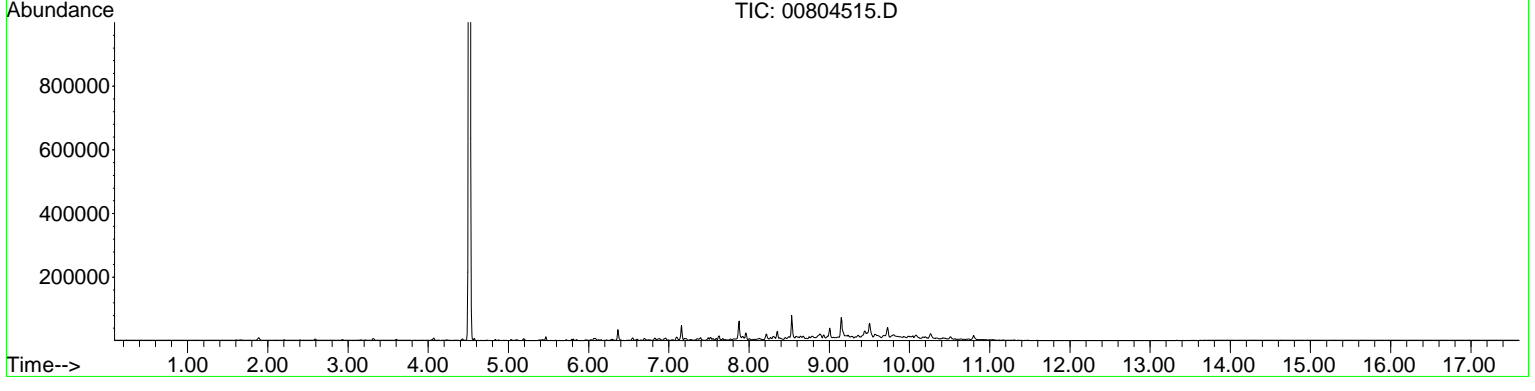
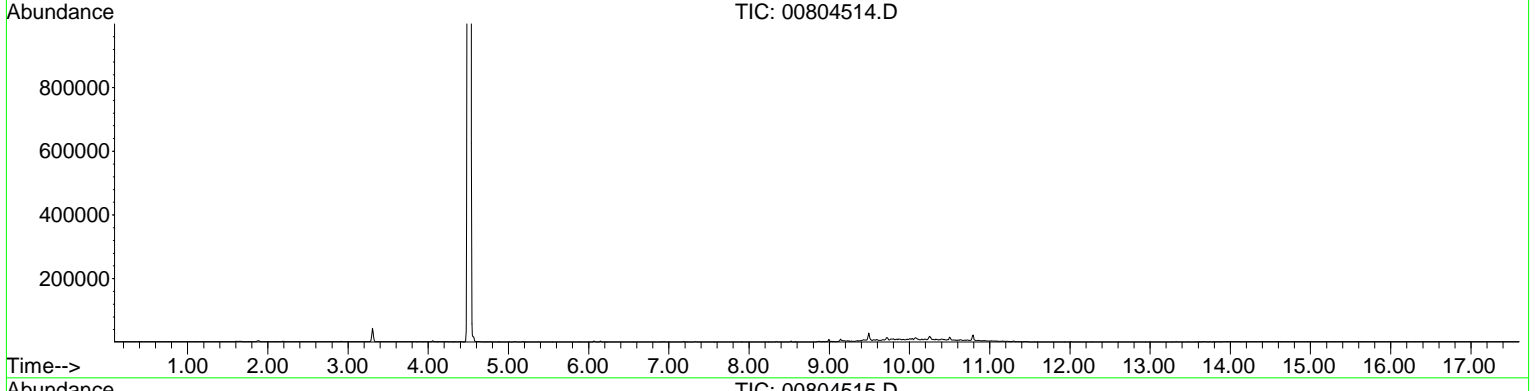
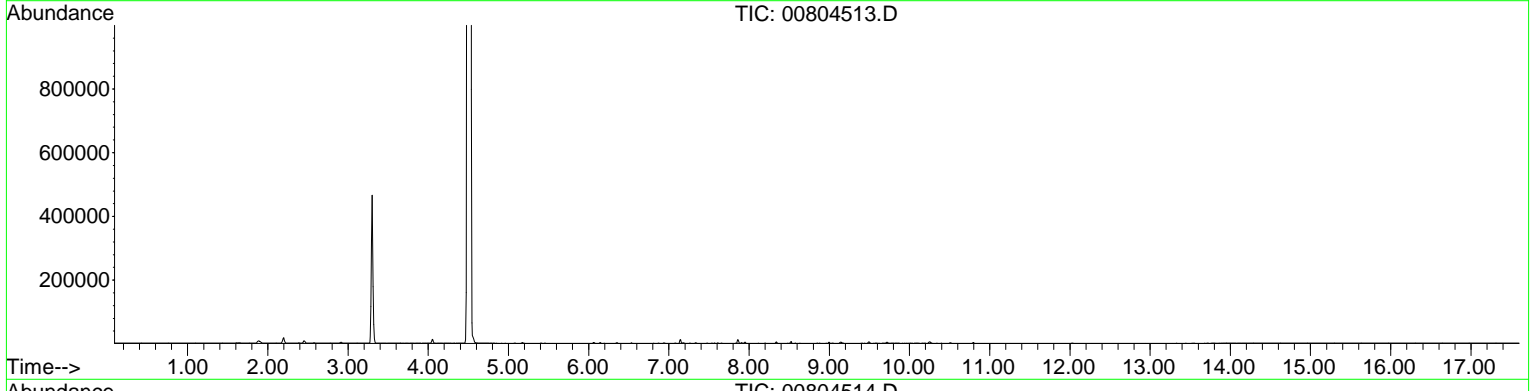
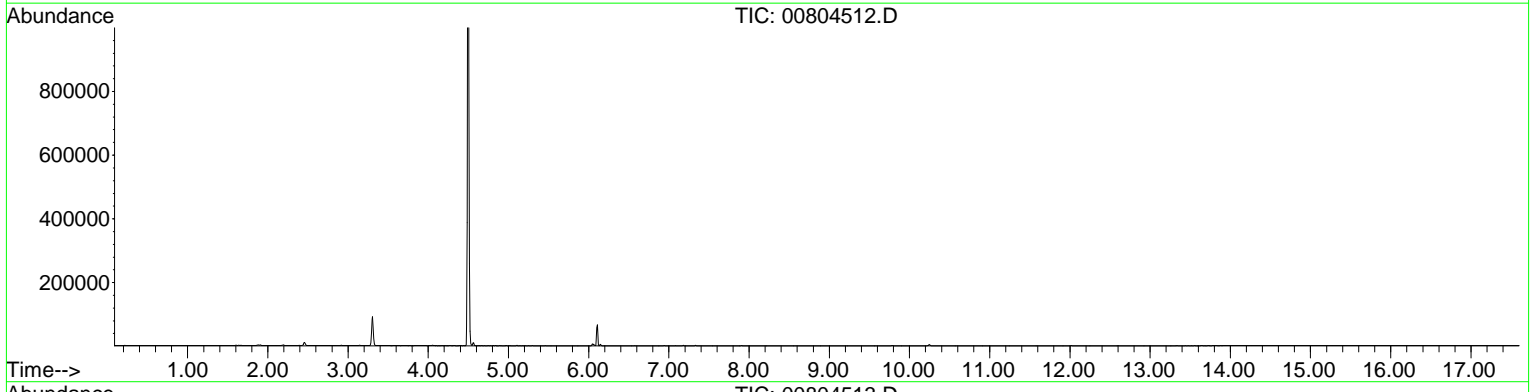
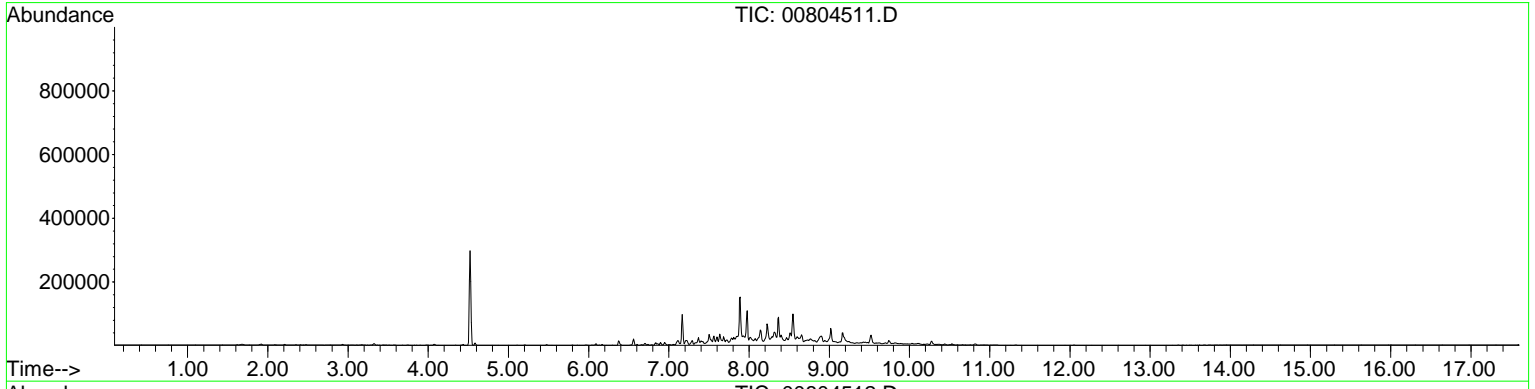
TICS - 02138
IN NUMERICAL ORDER



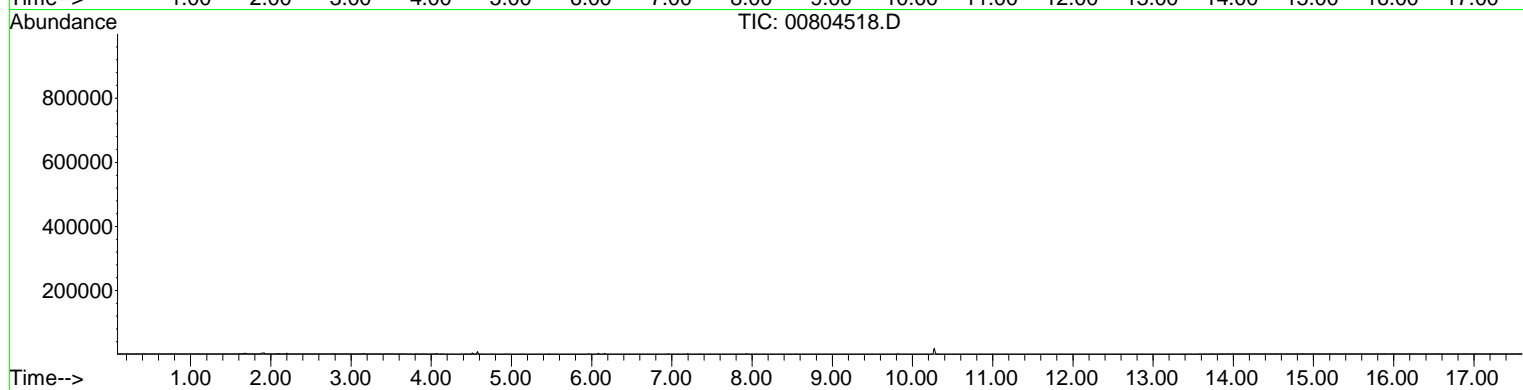
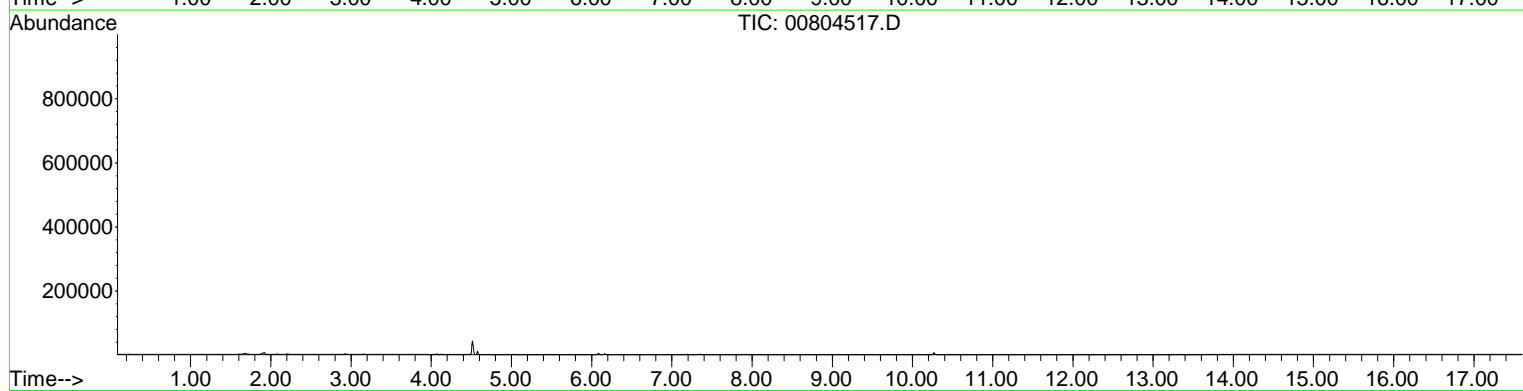
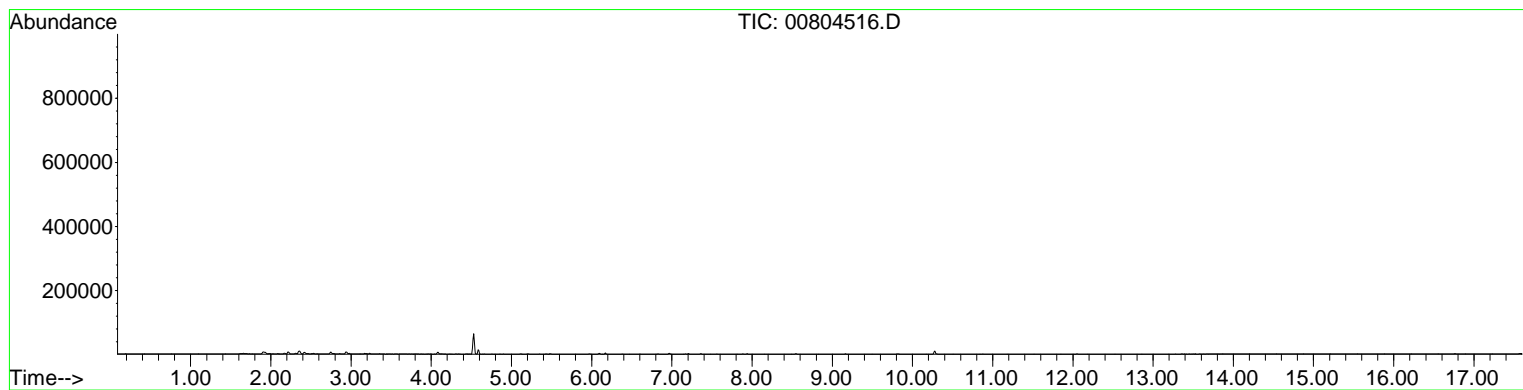
TICS - 02138
IN NUMERICAL ORDER



TICS - 02138
IN NUMERICAL ORDER



TICS - 02138
IN NUMERICAL ORDER





Delaware Office and AGI Laboratory:

210 Executive Drive, Suite 1
Newark, Delaware 19702-3335 USA
Phone: +1-302-266-2428
Fax: +1-302-266-2429

German Sales Office:

Amplified Geochemical Imaging GmbH
Alte Landstrasse 23,
85521 Ottobrunn GERMANY
Phone: +49 89 6387927-12
Fax: +49 89 6387927-10

Corporate Office:

7112 W. Jefferson Avenue, Suite 106
Lakewood, CO 80235 USA
Phone: +1-303-988-1968
Fax: +1-303-986-2898

www.agisurveys.net

APPENDIX H
CONCEPTUAL SITE MODEL

Human Health Conceptual Site Model Scoping Form

Site Name:

File Number:

Completed by:

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: Follow the italicized instructions in each section below.

1. General Information:

Sources (*check potential sources at the site*)

- | | |
|--|---|
| <input type="checkbox"/> USTs | <input type="checkbox"/> Vehicles |
| <input type="checkbox"/> ASTs | <input type="checkbox"/> Landfills |
| <input type="checkbox"/> Dispensers/fuel loading racks | <input type="checkbox"/> Transformers |
| <input type="checkbox"/> Drums | <input checked="" type="checkbox"/> Other: <input type="text" value="Former Dry Cleaner Facilities/Unknown"/> |

Release Mechanisms (*check potential release mechanisms at the site*)

- | | |
|---|---|
| <input type="checkbox"/> Spills | <input type="checkbox"/> Direct discharge |
| <input checked="" type="checkbox"/> Leaks | <input type="checkbox"/> Burning |
| | <input checked="" type="checkbox"/> Other: <input type="text" value="Unknown"/> |

Impacted Media (*check potentially-impacted media at the site*)

- | | |
|---|--|
| <input checked="" type="checkbox"/> Surface soil (0-2 feet bgs*) | <input checked="" type="checkbox"/> Groundwater |
| <input checked="" type="checkbox"/> Subsurface soil (>2 feet bgs) | <input type="checkbox"/> Surface water |
| <input type="checkbox"/> Air | <input type="checkbox"/> Biota |
| <input type="checkbox"/> Sediment | <input type="checkbox"/> Other: <input type="text"/> |

Receptors (*check receptors that could be affected by contamination at the site*)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Residents (adult or child) | <input checked="" type="checkbox"/> Site visitor |
| <input checked="" type="checkbox"/> Commercial or industrial worker | <input type="checkbox"/> Trespasser |
| <input checked="" type="checkbox"/> Construction worker | <input type="checkbox"/> Recreational user |
| <input type="checkbox"/> Subsistence harvester (i.e. gathers wild foods) | <input type="checkbox"/> Farmer |
| <input type="checkbox"/> Subsistence consumer (i.e. eats wild foods) | <input type="checkbox"/> Other: <input type="text"/> |

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.)

If the box is checked, label this pathway complete:

Complete

Comments:

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)?

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

Contaminants are present between 0-15 feet bgs, but are not listed in Appendix B

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future?

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350.

If both boxes are checked, label this pathway complete:

Complete

Comments:

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future?

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods?

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)?

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.)

If all of the boxes are checked, label this pathway complete:

Incomplete

Comments:

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Are the contaminants in soil volatile (see Appendix D in the guidance document)?

If both boxes are checked, label this pathway complete:

Complete

Comments:

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminated soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures)



Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)?



If both boxes are checked, label this pathway complete:

Complete

Comments:

Inhalation of indoor air has been studied in the past resulting in the installation of a sub slab depressurization system

3. Additional Exposure Pathways: *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:

Comments:

- Groundwater may be encountered during construction activities in the area

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:

Comments:

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM₁₀). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.
- Chromium is present in soil that can be dispersed as dust particles of any size.

Generally, DEC direct contact soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because it is assumed most dust particles are incidentally ingested instead of inhaled to the lower lungs. The inhalation pathway only needs to be evaluated when very small dust particles are present (e.g., along a dirt roadway or where dusts are a nuisance). This is not true in the case of chromium. Site specific cleanup levels will need to be calculated in the event that inhalation of dust containing chromium is a complete pathway at a site.

Check the box if further evaluation of this pathway is needed:

Comments:

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed:

Comments:

4. Other Comments (*Provide other comments as necessary to support the information provided in this form.*)