GEI Consultants

Memo

To: Julie VanderWiere, Charter Township of Texas

From: Thomas Clement, Aquatic/Wetland Biologist, GEI Consultants of Michigan, P.C.

CC: Thomas Wheat, P.E., Prein & Newhof

Date: May 20, 2019

Re: Baseline Lake Hydrocarbon Sampling-Bentwood Trail

Introduction: Water samples were collected May 13, 2019 from Crooked, Eagle, and Bass Lakes for hydrocarbon analysis. More specifically, samples were collected to analyze the concentrations of Polycyclic Aromatic Hydrocarbons (PAHs) and BTEX compounds. These compounds are a result of utilization or burning of oils, gases, wood, trash, and smoking, among other human behaviors.

Sample Collection Methods: Samples were collected in glass containers from one foot below the surface of all three lakes. Samples were taken further than 100 feet from shore. Once the samples were collected, they were placed on ice and shipped overnight to a lab for analysis.

Sample Analysis Methods: Samples were analyzed using method 8260B for volatile organic compounds and method 8270C-SIM for semi volatile organic compounds. Method detection limits (MDL) and reporting detection limits (RDL) can be seen in the attached results document. There were 19 PAH's and four BTEX compounds analyzed.

Results: Of the 23 analytes assessed, none were in high enough concentrations to be detected. See attachment "20190520_Baseline PAHs and BTEX Results" for a full print out of testing results.

Conclusions: Crooked, Eagle, and Bass Lakes all showed similar results in that there were no PAHs or BTEX compounds detected. With no hydrocarbons being detected, there should be no concerns of pumping water from one lake into another as far as hydrocarbons are concerned. It is unlikely that these concentrations will change over the period of the pumping, therefore GEI does not feel that additional sampling for PAHs or BTEX compounds is necessary.

Attachments: Baseline PAH and BTEX Analytical Report

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ANALYTICAL REPORT

May 17, 2019

GEI Consultants - Traverse City, MI

Sample Delivery Group:	L1098518
Samples Received:	05/14/2019
Project Number:	
Description:	Texas Township

Report To: Tom Clement
1755 Barlow St
Traverse City, MI 49696

Entire Report Reviewed By:

John Hawkins
Project Manager

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EAGLE LAKE L1098518-01 GW

Collected by	Collected date/time	Received date/time
	05/13/19 13:30	05/14/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1282328	1	05/17/19 03:38	05/17/19 03:38	BMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1280929	1	05/14/19 17:48	05/15/19 03:50	DMG	Mt. Juliet, TN

CROOKED LAKE L1098518-02 GW

Collected by	Collected date/time	Received date/time
	05/13/19 13:10	05/14/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1281078	1	05/15/19 02:12	05/15/19 02:12	ACG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1280929	1	05/14/19 17:48	05/15/19 04:12	DMG	Mt. Juliet, TN

BASS LAKE L1098518-03 GW

Collected by	Collected date/time	Received date/time
	05/13/19 12:28	05/14/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1282328	1	05/17/19 03:57	05/17/19 03:57	BMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1280929	1	05/14/19 17:48	05/15/19 04:33	DMG	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

John Hawkins
Project Manager

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	05/17/2019 03:38	WG1282328
Toluene	ND		0.00100	1	05/17/2019 03:38	WG1282328
Ethylbenzene	ND		0.00100	1	05/17/2019 03:38	WG1282328
Total Xylenes	ND		0.00300	1	05/17/2019 03:38	WG1282328
(S) Toluene-d8	*101*		*80.0-120*		*05/17/2019 03:38*	WG1282328
(S) a,a,a-Trifluorotoluene	*0.301*	J2	*80.0-120*		*05/17/2019 03:38*	WG1282328
(S) 4-Bromofluorobenzene	*93.3*		*77.0-126*		*05/17/2019 03:38*	WG1282328
(S) 1,2-Dichloroethane-d4	*119*		*70.0-130*		*05/17/2019 03:38*	WG1282328

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
Acenaphthene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
Acenaphthylene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
Benzo(a)anthracene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
Benzo(a)pyrene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
Benzo(b)fluoranthene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
Benzo(g,h,i)perylene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
Benzo(k)fluoranthene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
Chrysene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
Dibenz(a,h)anthracene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
Fluoranthene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
Fluorene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
Indeno(1,2,3-cd)pyrene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
Naphthalene	ND		0.000250	1	05/15/2019 03:50	WG1280929
Phenanthrene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
Pyrene	ND		0.0000500	1	05/15/2019 03:50	WG1280929
1-Methylnaphthalene	ND		0.000250	1	05/15/2019 03:50	WG1280929
2-Methylnaphthalene	ND		0.000250	1	05/15/2019 03:50	WG1280929
2-Chloronaphthalene	ND		0.000250	1	05/15/2019 03:50	WG1280929
(S) Nitrobenzene-d5	*124*		*31.0-160*		*05/15/2019 03:50*	WG1280929
(S) 2-Fluorobiphenyl	*95.3*		*48.0-148*		*05/15/2019 03:50*	WG1280929
(S) p-Terphenyl-d14	*89.5*		*37.0-146*		*05/15/2019 03:50*	WG1280929

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	05/15/2019 02:12	WG1281078
Toluene	ND		0.00100	1	05/15/2019 02:12	WG1281078
Ethylbenzene	ND		0.00100	1	05/15/2019 02:12	WG1281078
Total Xylenes	ND		0.00300	1	05/15/2019 02:12	WG1281078
(S) Toluene-d8	*99.0*		*80.0-120*		*05/15/2019 02:12*	WG1281078
(S) a,a,a-Trifluorotoluene	*100*		*80.0-120*		*05/15/2019 02:12*	WG1281078
(S) 4-Bromofluorobenzene	*94.7*		*77.0-126*		*05/15/2019 02:12*	WG1281078
(S) 1,2-Dichloroethane-d4	*85.2*		*70.0-130*		*05/15/2019 02:12*	WG1281078

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
Acenaphthene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
Acenaphthylene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
Benzo(a)anthracene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
Benzo(a)pyrene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
Benzo(b)fluoranthene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
Benzo(g,h,i)perylene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
Benzo(k)fluoranthene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
Chrysene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
Dibenz(a,h)anthracene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
Fluoranthene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
Fluorene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
Indeno(1,2,3-cd)pyrene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
Naphthalene	ND		0.000250	1	05/15/2019 04:12	WG1280929
Phenanthrene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
Pyrene	ND		0.0000500	1	05/15/2019 04:12	WG1280929
1-Methylnaphthalene	ND		0.000250	1	05/15/2019 04:12	WG1280929
2-Methylnaphthalene	ND		0.000250	1	05/15/2019 04:12	WG1280929
2-Chloronaphthalene	ND		0.000250	1	05/15/2019 04:12	WG1280929
(S) Nitrobenzene-d5	*119*		*31.0-160*		*05/15/2019 04:12*	WG1280929
(S) 2-Fluorobiphenyl	*90.5*		*48.0-148*		*05/15/2019 04:12*	WG1280929
(S) p-Terphenyl-d14	*84.2*		*37.0-146*		*05/15/2019 04:12*	WG1280929

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	05/17/2019 03:57	WG1282328
Toluene	ND		0.00100	1	05/17/2019 03:57	WG1282328
Ethylbenzene	ND		0.00100	1	05/17/2019 03:57	WG1282328
Total Xylenes	ND		0.00300	1	05/17/2019 03:57	WG1282328
(S) Toluene-d8	*98.4*		*80.0-120*		*05/17/2019 03:57*	WG1282328
(S) a,a,a-Trifluorotoluene	*0.000*	J2	*80.0-120*		*05/17/2019 03:57*	WG1282328
(S) 4-Bromofluorobenzene	*93.5*		*77.0-126*		*05/17/2019 03:57*	WG1282328
(S) 1,2-Dichloroethane-d4	*117*		*70.0-130*		*05/17/2019 03:57*	WG1282328

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
Acenaphthene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
Acenaphthylene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
Benzo(a)anthracene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
Benzo(a)pyrene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
Benzo(b)fluoranthene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
Benzo(g,h,i)perylene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
Benzo(k)fluoranthene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
Chrysene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
Dibenz(a,h)anthracene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
Fluoranthene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
Fluorene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
Indeno(1,2,3-cd)pyrene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
Naphthalene	ND		0.000250	1	05/15/2019 04:33	WG1280929
Phenanthrene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
Pyrene	ND		0.0000500	1	05/15/2019 04:33	WG1280929
1-Methylnaphthalene	ND		0.000250	1	05/15/2019 04:33	WG1280929
2-Methylnaphthalene	ND		0.000250	1	05/15/2019 04:33	WG1280929
2-Chloronaphthalene	ND		0.000250	1	05/15/2019 04:33	WG1280929
(S) Nitrobenzene-d5	*119*		*31.0-160*		*05/15/2019 04:33*	WG1280929
(S) 2-Fluorobiphenyl	*90.5*		*48.0-148*		*05/15/2019 04:33*	WG1280929
(S) p-Terphenyl-d14	*82.1*		*37.0-146*		*05/15/2019 04:33*	WG1280929

Method Blank (MB)

(MB) R3411901-3 05/14/19 20:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.000331	0.00100
Ethylbenzene	U		0.000384	0.00100
Toluene	U		0.000412	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*102*			*80.0-120*
(S) a,a,a-Trifluorotoluene	*108*			*80.0-120*
(S) 4-Bromofluorobenzene	*94.8*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*91.2*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3411901-1 05/14/19 19:12 • (LCSD) R3411901-2 05/14/19 19:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0250	0.0217	0.0225	86.9	90.0	70.0-123			3.48	20
Ethylbenzene	0.0250	0.0231	0.0233	92.3	93.3	79.0-123			1.00	20
Toluene	0.0250	0.0218	0.0221	87.1	88.4	79.0-120			1.56	20
Xylenes, Total	0.0750	0.0676	0.0701	90.1	93.5	79.0-123			3.63	20
(S) Toluene-d8				*101*	*102*	*80.0-120*				
(S) a,a,a-Trifluorotoluene				*103*	*108*	*80.0-120*				
(S) 4-Bromofluorobenzene				*88.6*	*90.7*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*91.7*	*96.2*	*70.0-130*				

Method Blank (MB)

(MB) R3412163-2 05/17/19 02:58

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.000331	0.00100
Ethylbenzene	U		0.000384	0.00100
Toluene	U		0.000412	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*99.0*			*80.0-120*
(S) a,a,a-Trifluorotoluene	*0.000*	J2		*80.0-120*
(S) 4-Bromofluorobenzene	*94.3*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*114*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R3412163-3 05/17/19 06:55

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.0250	0.0210	84.0	70.0-123	
Ethylbenzene	0.0250	0.0227	91.0	79.0-123	
Toluene	0.0250	0.0210	84.1	79.0-120	
Xylenes, Total	0.0750	0.0674	89.9	79.0-123	
(S) Toluene-d8			*97.8*	*80.0-120*	
(S) a,a,a-Trifluorotoluene			*0.000*	*80.0-120*	J2
(S) 4-Bromofluorobenzene			*92.8*	*77.0-126*	
(S) 1,2-Dichloroethane-d4			*118*	*70.0-130*	

Method Blank (MB)

(MB) R3411279-3 05/15/19 00:33

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Anthracene	U		0.0000140	0.0000500
Acenaphthene	U		0.0000100	0.0000500
Acenaphthylene	U		0.0000120	0.0000500
Benzo(a)anthracene	U		0.00000410	0.0000500
Benzo(a)pyrene	U		0.0000116	0.0000500
Benzo(b)fluoranthene	U		0.00000212	0.0000500
Benzo(g,h,i)perylene	U		0.00000227	0.0000500
Benzo(k)fluoranthene	U		0.0000136	0.0000500
Chrysene	U		0.0000108	0.0000500
Dibenz(a,h)anthracene	U		0.00000396	0.0000500
Fluoranthene	U		0.0000157	0.0000500
Fluorene	U		0.00000850	0.0000500
Indeno(1,2,3-cd)pyrene	U		0.0000148	0.0000500
Naphthalene	U		0.0000198	0.000250
Phenanthrene	U		0.00000820	0.0000500
Pyrene	U		0.0000117	0.0000500
1-Methylnaphthalene	U		0.00000821	0.000250
2-Methylnaphthalene	U		0.00000902	0.000250
2-Chloronaphthalene	U		0.00000647	0.000250
(S) Nitrobenzene-d5	*121*			*31.0-160*
(S) 2-Fluorobiphenyl	*89.5*			*48.0-148*
(S) p-Terphenyl-d14	*83.5*			*37.0-146*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3411279-1 05/14/19 23:49 • (LCSD) R3411279-2 05/15/19 00:11

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Anthracene	0.00200	0.00185	0.00191	92.5	95.5	67.0-150			3.19	20
Acenaphthene	0.00200	0.00169	0.00171	84.5	85.5	65.0-138			1.18	20
Acenaphthylene	0.00200	0.00175	0.00177	87.5	88.5	66.0-140			1.14	20
Benzo(a)anthracene	0.00200	0.00163	0.00168	81.5	84.0	61.0-140			3.02	20
Benzo(a)pyrene	0.00200	0.00169	0.00174	84.5	87.0	60.0-143			2.92	20
Benzo(b)fluoranthene	0.00200	0.00159	0.00175	79.5	87.5	58.0-141			9.58	20
Benzo(g,h,i)perylene	0.00200	0.00168	0.00175	84.0	87.5	52.0-153			4.08	20
Benzo(k)fluoranthene	0.00200	0.00178	0.00170	89.0	85.0	58.0-148			4.60	20
Chrysene	0.00200	0.00171	0.00174	85.5	87.0	64.0-144			1.74	20
Dibenz(a,h)anthracene	0.00200	0.00171	0.00177	85.5	88.5	52.0-155			3.45	20
Fluoranthene	0.00200	0.00180	0.00187	90.0	93.5	69.0-153			3.81	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3411279-1 05/14/19 23:49 • (LCSD) R3411279-2 05/15/19 00:11

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Fluorene	0.00200	0.00151	0.00158	75.5	79.0	64.0-136			4.53	20
Indeno(1,2,3-cd)pyrene	0.00200	0.00173	0.00179	86.5	89.5	54.0-153			3.41	20
Naphthalene	0.00200	0.00163	0.00165	81.5	82.5	61.0-137			1.22	20
Phenanthrene	0.00200	0.00159	0.00164	79.5	82.0	62.0-137			3.10	20
Pyrene	0.00200	0.00162	0.00167	81.0	83.5	60.0-142			3.04	20
1-Methylnaphthalene	0.00200	0.00152	0.00156	76.0	78.0	66.0-142			2.60	20
2-Methylnaphthalene	0.00200	0.00150	0.00153	75.0	76.5	62.0-136			1.98	20
2-Chloronaphthalene	0.00200	0.00161	0.00162	80.5	81.0	64.0-140			0.619	20
(S) Nitrobenzene-d5				*121*	*117*	*31.0-160*				
(S) 2-Fluorobiphenyl				*89.0*	*90.5*	*48.0-148*				
(S) p-Terphenyl-d14				*83.5*	*84.5*	*37.0-146*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

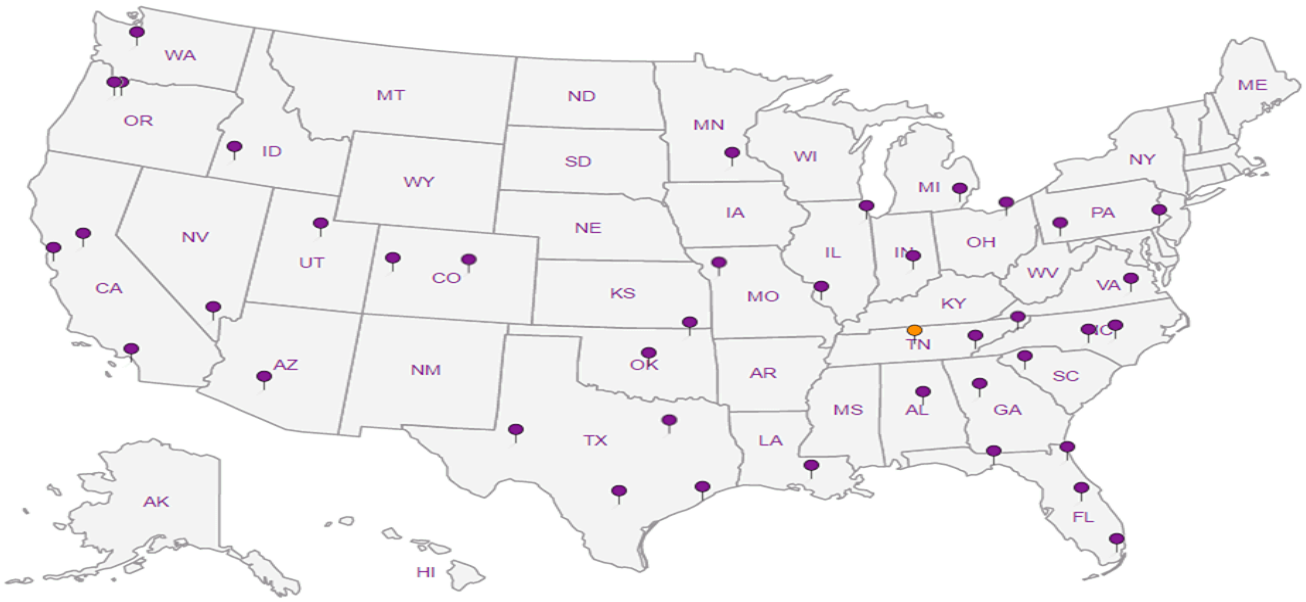
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



GEI Consultants - Traverse City, MI

1755 Barlow St
Traverse City, MI 49696

Billing Information:
Tom Clement
1755 Barlow St
Traverse City, MI 49696

Report to: **Tom Clement**

Email To: **tclement@geiconsultants.com**

Project Description: **Texas Township**

City/State Collected:

Phone: **231-933-4041**
Fax:

Client Project #

Lab Project # **GEICONTCMI-TEXASTSP**

Collected by (print): TAC

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
X Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # 109818

D101

Acctnum: **GEICONTCMI**
Template: **T150233**
Prelogin: **P708776**
TSR: **341 - John Hawkins**
PB:
Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	PAHSIMLVI 40mlAmb-NoPres-WT	V8260BTEX 40mlAmb-HCl	Pres Chk	Remarks	Sample # (lab only)
EAGLE Lake	Grab	GW	1ft	5/13/2019	1:30	5	X	X			-01
Crooked Lake	Grab	GW	1ft	5/13/2019	1:10	5	X	X			-02
Bass Lake	Grab	GW	1ft	5/13/2019	12:28pm	5	X	X			-03
		GW				5	X	X			
		GW				5	X	X			

RAD SCREEN: <0.5 mR/hr

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other Surface Water

Remarks:

pH ___ Temp ___
Flow ___ Other ___

Samples returned via:
__ UPS __ FedEx ✓ Courier ___

Tracking # 7751 9334 3741

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	5/13/2019	2:45pm	7751 9334 3741
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes (No) HCL / MeoH TBR

Temp: °C 20.0 -1.9 Bottles Received: 15

Date: 5/14/19 Time: 8:45

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

RAD SCREEN: <0.5 mR/hr

Shipping Batch Detail Report

Batch ID: P708776

Date: 05/09/19

Client: GEICONTCMI GEI Consultants - Traverse City, MI **Active: Y**
TSR: John Hawkins

Order#	Frequency	Type	Description	Due Dt	#Kit	Template
P708776	As Needed	BRANCH	Ground Water	05/10/19	P 1	T150233

Proj.Desc.: Texas Township ESC Key : GEICONTCMI-TEXASTSP

Project No: Site ID:

Comments:

Client ID: Sample No:P708776-01

Packing List: Analysis Required	QTY	Container/Preservative
8270C PAHSIM by LVI	2	40mlAmb-NoPres-WT
BTEX by 8260	3	40mlAmb-HCl
Total Cntrs:	5	

Client ID: Sample No:P708776-02

Packing List: Analysis Required	QTY	Container/Preservative
8270C PAHSIM by LVI	2	40mlAmb-NoPres-WT
BTEX by 8260	3	40mlAmb-HCl
Total Cntrs:	5	

Client ID: Sample No:P708776-03

Packing List: Analysis Required	QTY	Container/Preservative
8270C PAHSIM by LVI	2	40mlAmb-NoPres-WT
BTEX by 8260	3	40mlAmb-HCl
Total Cntrs:	5	

Client ID: Sample No:P708776-04

Packing List: Analysis Required	QTY	Container/Preservative
8270C PAHSIM by LVI	2	40mlAmb-NoPres-WT
BTEX by 8260	3	40mlAmb-HCl
Total Cntrs:	5	

Client ID: Sample No:P708776-05

Packing List: Analysis Required	QTY	Container/Preservative
8270C PAHSIM by LVI	2	40mlAmb-NoPres-WT
BTEX by 8260	3	40mlAmb-HCl
Total Cntrs:	5	

2-0.0-1=1.9 Pr KR

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1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Shipping Batch Detail Report

Batch ID: P708776

Date: 05/09/19

Client: GEICONTCMI GEI Consultants - Traverse City, MI **Active: Y**
TSR: John Hawkins

Outbound Method of Shipment	Return Method of Shipment	Paid By
FedEX Ground	FedEX Standard	ESC

Shipping Audit Trail Date Shipped:_____ Carrier:_____ # Pieces:_____
Cooler:_____ Size:____ Color:_____ Initials:_____

Ship To: GEI Consultants - Traverse City, MI
Tom Clement
1755 Barlow St
Traverse City, MI 49696

RAD SCREEN: <0.5 mR/hr